

The National Biodiversity Strategy of Japan 2012-2020

**Roadmap towards the Establishment of an Enriching Society in
Harmony with Nature**

28th September, 2012

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Preamble

A great variety of life on earth, which is estimated to be approximately 30 million species, has evolved through adapting to diverse environments over four billion years since the birth of the earliest form of life. Individual species live in a web of interconnection and interaction of living things as part of the global ecosystem. The foundation for all forms of life including human beings is created through the various activities of diverse ecosystems.

Diverse and flourishing organisms provide the source of diverse cultures in addition to having a useful value for humans at the present time and in the future. Therefore, it can be said that these diverse organisms are essential indigenous assets for each local area. In addition, diverse and healthy ecosystems support safe and secure life through contributing to securing safe drinking water and food.

In light of the above-mentioned importance of the conservation and sustainable use of biodiversity, it is necessary to create a truly enriching society grounded on natural ecosystem through spreading balanced and healthy relationships between nature and humans based on the order of nature into every corner of the society, so that humans can obtain blessings of nature into the future.

The Tenth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10) was held in Nagoya City, Aichi in October 2010 with the theme of “Life in Harmony, into the Future,” where historically significant outcomes were produced. One of the outcomes is the adoption of a new global biodiversity target, i.e. the Strategic Plan for Biodiversity 2011-2020 which stipulates the course of action that the international community should take over the next 10 years. The Strategic Plan for Biodiversity 2011-2020 was adopted as a new global target for the post-2010 period, in light of the fact that the Parties could not meet the 2010 Biodiversity Target of achieving by 2010 a significant reduction of the current rate of biodiversity loss, which was adopted at the Sixth meeting of the Conference of the Parties (COP 6). The Strategic Plan for Biodiversity 2011-2020 also stipulated based on a Japanese proposal that its overall vision of achieving a world of “Living in Harmony with Nature” shall be achieved by 2050. This vision is based on the idea which has been cultivated in Japan for many centuries that humans live as part of nature, rather than drawing a line between humans and nature. The fact that the proposal based on this important idea was agreed upon and adopted by the international community as a new long-term global goal was one of the most significant outcomes of COP 10.

With the recognition that the loss of biodiversity continues and it is necessary to stop the loss, the Strategic Plan stipulates its mission of taking effective and urgent action to halt the loss of biodiversity by 2020. In addition, 20 individual targets with the target year set at 2015 or 2020 (the “Aichi Biodiversity Targets”) were set as targets for specific actions for achieving the mission. The Aichi Targets were set under five strategic goals and they provide the actions to be taken by considering the issue of biodiversity as a social issue that needs to be understood from a socio-economic standpoint including the utilization of benefits of nature and factors which harm ecosystems, rather than purely from the natural science point of view. Parties are invited to set their own targets by taking into account their current biodiversity situation, national priorities for actions, etc. and integrate the targets into their national biodiversity strategies, in an effort to achieve the Aichi Targets. In addition, at the 65th Session of the UN General Assembly in December 2010, it was decided that the period between the year 2011 and 2020 would be declared the United Nations Decade on Biodiversity due to the need for all parties of the international community to work together to tackle the issue of biodiversity in order to achieve the Aichi Targets.

The earthquake and tsunami in the Great East Japan Earthquake which occurred in March 2011, as well as the accompanying serious accidents at Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station (hereinafter referred to as the "Fukushima Daiichi Nuclear Power Station") which resulted in the release of large amounts of radioactive materials into the environment, caused devastating damage to the lives and livelihoods of people particularly on the Pacific coast in the Tohoku Region, as well as having a great impact on the environment which supports people's lives. This was an opportunity to recognize once again that nature which provides us with plentiful benefits also becomes a threat on occasion causing disasters and that we have to live with these two opposing characteristics of nature. Japanese people have had awe and respect for nature, adapted to nature and cultivated the wisdom and belief that living with nature is preferable to confronting it. We will need to use this opportunity to review the relationships between humans and nature and deepen our understanding of the forces of nature based on the experience of the Great East Japan Earthquake. Through the process, it is necessary to reestablish beneficial relationships between humans and nature by reevaluating the importance of areas which have provided safety and security for people and the importance of sustainable agriculture, forestry and fisheries which have traditionally been practiced in satoyama landscapes (socio-ecological production landscape) and Sato-umi areas (a coastal area where biological productivity and biodiversity has increased through human interaction).

The experience of the Great East Japan Earthquake also exposed the vulnerability of Japanese socio-economic systems where the production and distribution of energy and goods are extremely centralized. It also made us recognize once again the importance of the connection between people as well as the connection within/between local communities. It is necessary to prioritize the establishment of independent and distributed local communities where local resources are produced for local consumption as much as possible and local resources are recycled and utilized sustainably within local areas. For problems which cannot be solved at the local level, it is also necessary to find solutions from larger-area perspectives including solutions at the national and international levels. In addition, it is important to strengthen urban-rural cooperation and exchange, based on the idea of a "socio-ecological sphere" where rural areas, which supply blessings of nature such as water and food, and urban areas, which benefit from the blessings of nature, support one another.

We must use the experience of the Great East Japan Earthquake as an opportunity to work towards achieving a world of "Living in Harmony with Nature."

Background to and the role of the National Biodiversity Strategy of Japan 2012-2020

The National Biodiversity Strategy of Japan is the basic plan for the conservation of biodiversity and the sustainable use of its components formulated by the government based on the stipulations in Article 11 of the Basic Act on Biodiversity. The plan is named the National Biodiversity Strategy of Japan in the law based on the fact that the three National Biodiversity Strategies of Japan were formulated before the establishment of the Basic Act on Biodiversity.

As explained earlier, the National Biodiversity Strategy of Japan 2012-2020 was formulated following two major events: the adoption of the global biodiversity target for the next 10 years (the Aichi Targets) and the Great East Japan Earthquake. Therefore, the National Biodiversity Strategy of Japan has the role of providing the Japanese road map for achieving the Aichi Targets as well as providing the direction for achieving a world of "Living in Harmony with Nature," in light of the fact that the Great East Japan Earthquake gave us a chance to review the relationships between humans and nature. The strategy also sets guidelines for formulating and revising the "regional

biodiversity strategies” that are the basic plans for the conservation and sustainable use of biodiversity in local areas.

History of the National Biodiversity Strategy of Japan

The National Biodiversity Strategy of Japan is formulated based on the Article 6 of the Convention on Biological Diversity (CBD) which came into effect in 1993. Since the Basic Act on Biodiversity came into force in 2008, it is also serving as a National Biodiversity Strategy formulated based on the law.

The CBD was adopted in time for the United Nations Conference on Environment and Development (the Earth Summit) held in Rio de Janeiro, Brazil in 1992, along with the United Nations Framework Convention on Climate Change (UNFCCC). The convention was drawn up out of a sense of crisis over the rapid reduction of tropical rainforests, the ongoing extinction of species and the loss of biological resources essential to the survival of mankind, with the aim of setting up a comprehensive international framework for the conservation and sustainable use of these resources. Japan became the 18th country to sign the convention in May, 1993. The convention came into effect in December of the same year. The objectives of the convention include “the fair and equitable sharing of the benefits arising out of the utilization of genetic resources” in addition to “the conservation of biological diversity” and “the sustainable use of its components.” Twenty years after its adoption, the CBD has grown into one of the largest environmental conventions, which has been signed by 192 countries and EU. The convention has produced some results including the provision of directions for resolving major issues faced by biodiversity and the facilitation of international cooperation.

Japan formulated the First National Biodiversity Strategy of Japan in October 1995 as a national strategy aimed at the conservation and sustainable use of biodiversity based on the CBD. The National Biodiversity Strategy of Japan was formulated without delay after Japan signed the convention. It was the first plan which comprehensively compiled individual efforts that were made in line with the CBD through cooperation between the ministries and agencies concerned.

The Second National Biodiversity Strategy of Japan was formulated in March 2002 through a major revision of the first National Biodiversity Strategy of Japan. In the Second National Biodiversity Strategy, the current status of biodiversity in Japan was summarized as “three crises.” It also provided rationales and specific priority policies and measures in an easy-to-understand manner. The strategy also strengthened the cooperation between ministries and agencies concerned when implementing policies and measures for the restoration of nature, the conservation of satoyama landscapes, etc. These plans produced significant results such as successfully promoting the implementation of specific cooperation policies and measures.

The Second National Biodiversity Strategy of Japan was revised and the Third National Biodiversity Strategy of Japan was endorsed by the Cabinet in November 2007. The Third National Biodiversity Strategy of Japan had the following superior characteristics: it newly covered crises caused by global warming; it provided a vision of long-term targets for the ecological management of national land, in particular referring to its relationship to global biodiversity; and it provided an action plan which included as many targets and indicators for specific efforts as possible so as to provide a clear path towards the implementation of the strategy.

In 2008, it was decided that COP 10 would be held in Nagoya City, Aichi Prefecture in 2010 and the Basic Act on Biodiversity was established. The basic act stipulates the fundamental principles for

the conservation and sustainable use of biodiversity as well as matters that serve as a basis of policies for the conservation and sustainable use of biodiversity. The law also requires that the government formulate the National Biodiversity Strategy. In line with the stipulations, the National Biodiversity Strategy of Japan 2010 was endorsed by the Cabinet in March 2010 as the first statutory national biodiversity strategy. The National Biodiversity Strategy of Japan 2010 made the establishment of a society in harmony with nature the long-term target and strengthened policies and measures with a view to implementing the efforts needed in preparation for COP 10 in light of progress in the implementation of current policies and measures and changes in circumstances, while maintaining the basic framework of the Third National Biodiversity Strategy of Japan such as the structure of the strategy and the period of the plan.

Finally, the National Biodiversity Strategy of Japan 2012-2020 was formulated by including the outcomes of COP 10 and the lessons learned from the Great East Japan Earthquake, as the Japanese road map for achieving the Aichi Targets and the specific strategy for establishing a society in harmony with nature.

The National Biodiversity Strategy of Japan 2012-2020 is the fifth strategy when counting from the first National Biodiversity Strategy formulated based on the CBD, and the second strategy which has been formulated based on the Basic Act on Biodiversity.

Structure of the National Biodiversity Strategy of Japan 2012-2020

The National Biodiversity Strategy of Japan 2012-2020 consists of three parts: “Part 1. The Strategy towards Conservation and Sustainable Use of Biodiversity”; “Part 2. Road Map towards Achieving the Aichi Biodiversity Targets”; and “Part 3. The Action Plan on Conservation and Sustainable Use of Biodiversity.” Part 1 gave descriptions of: the importance of biodiversity that supports life and livelihoods as well as the current situation and issues surrounding biodiversity; Japanese targets towards the conservation and sustainable use of biodiversity; the grand design describing the future of national land in a society in harmony with nature; seven basic perspectives for developing policies and measures, including “scientific recognition and preventive and adaptive attitude”; and five basic strategies which added “strengthening the scientific foundation and utilizing it for policies” to the existing four basic strategies which includes “mainstreaming biodiversity in our daily life.” Part 1 thereby clarified the direction for priority policies and measures to be implemented by around FY2020. Part 2 described: the Japanese targets, etc. set in light of the Aichi Targets; target years and related indicators for identifying the achievement levels for the targets and progress where possible; and the road map towards achieving the Aichi Targets. Part 3 systematically described all of our policies and measures on biodiversity including the policies and measures for achieving the Aichi Targets, as specific action plans.

Check and review for the implementation of the strategy

Parties to the CBD need to submit the fifth national reports on the implementation of the convention by March 2014, based on the Article 26 of the convention. In parallel with the preparation of the report, the first comprehensive check for the implementation of the National Biodiversity Strategy of Japan will be conducted.

The planned period for the National Biodiversity Strategy of Japan 2012-2020 is up to FY2020 which is the target year for the Aichi Targets. However in the Twelfth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 12) which is to be held in 2014 or the beginning of 2015, midterm review of the achievement levels for the Aichi Targets will be made

based on the fifth national reports. Therefore, the strategy will be revised if needed based on the midterm review results.

The second comprehensive review for the achievement level of the National Biodiversity Strategy of Japan 2012-2020 will also be conducted by FY2020 which is the final year of the planned period for the National Biodiversity Strategy, with a view to formulating the next-term National Biodiversity Strategy of Japan.

The committee of the ministries on the National Biodiversity Strategy of Japan will review and revise the strategy.

In the above-explained processes, the committee will solicit comments from a wide range of the public and submit reports to the Central Environment Council. The Central Environment Council will comment on the progress of the policies and measures implemented by ministries and agencies concerned based on the National Biodiversity Strategy of Japan and on the direction for future policies and measures, where necessary.

Part 1 The Strategy towards Conservation and Sustainable Use of Biodiversity

Chapter 1 Importance of Biodiversity and Rationales for Achieving a Society in Harmony with Nature

There are currently an estimated 30 million species on earth and our lives depend on benefits from biodiversity. This chapter summarizes the importance of biodiversity through looking at the relationship between human lives and the benefits that we can obtain from ecosystems where diverse organisms interact. It also explains the rationales for achieving a society in harmony with nature, which is supported by biodiversity.

Section 1 What is biodiversity?

1 Origin of the earth and the birth of life

The earth was formed about 4.6 billion years ago. It is thought to be about four billion years ago that a protobiont was produced from organic matter in the primitive sea. It is believed that there was no oxygen in the atmosphere of the early earth, but with the emergence of blue green algae and other organisms that photosynthesize, the oxygen in the atmosphere began to increase. An ozone layer surrounding the earth was formed from the oxygen and it prevented harmful intense ultraviolet rays from the sun so that the atmosphere was composed as it is now and the climate became stable, leading to the creation of an environment that enabled life to emerge on the land. Then, plants got on shore to create ancient forests, where animals landed, resulting in the creation of terrestrial ecosystems. Thus, innumerable organisms and their interconnection formed the atmosphere and soil of the earth over a long period of time, and organisms in the next geologic age evolved in the environments created by the organisms in the preceding geologic age in sequence.

In the process, a variety of changes occurred in the environment. Species that could not adapt themselves to the changes became extinct, while many new species were developed through adaptation to new environments to create diverse species of organisms and their interconnection, the web of life, that we know of today.

2 Mass extinction and human activities

The present age, we might say, is “the sixth era of mass extinction.” Since the earliest form of life was born on the earth, the earth is said to have undergone five major extinctions, during which a large number of organisms became extinct. In the mass extinction of the present age, it is believed that the rate of extinction is higher than the past mass extinction events and that the main cause of the extinction is the impact of human activities.

Humans have developed science and technology and increased their influence. However, even today, humans are not able to revive extinct species, nor can we reproduce an identical ecosystem which has changed to an irreversible extent, exceeding its capacity to recover. Once the population of a species has decreased considerably, there may be problems which need to be solved before the species become able to naturally maintain its population at a stable level, even after the population has steadily increased through efforts to restore the population. For example, Japanese red-crowned

cranes living in the eastern part of Hokkaido (Japan's second largest island; it is also the largest and northernmost of Japan's 47 prefectures) were once believed to have become extinct. They were found to have survived in the Taisho Period (1912-1926) and thanks to feeding and the protection of habitats since then, the number which had once dropped to several tens has increased to over one thousand. However, it is reported that the number of genetic strains remains at a very low level. The population of wild geese such as white-fronted geese greatly decreased due to hunting in the Meiji Period (1868-1912). Although the population is recovering through protection after the Meiji Period, their wintering areas are limited to specific areas and the population is not distributed over a wide area as it used to be.

As seen in the examples above, there are many things in nature that humans do not understand or humans cannot control. In addition, the global population, which was four billion in the 1970s, has reached seven billion. According to the United Nations (UN) future population estimates, the population is expected to reach 10 billion by the end of the 21st century. Therefore, there is more need than ever to share the earth's limited resources between all of us. Some ecosystems are already in irreversible condition due to development and overuse. We need to understand that we can continue obtaining benefits from ecosystems only by continuously conserving ecosystems and utilizing ecosystems within their capacity to recover rather than pursuing short-term productivity and efficiency. Based on this understanding we humans need to continue thinking about ways to maintain the irreplaceable web of life which has been nurtured over time in the long history of the earth and take action accordingly.

3 What is biodiversity?

The CBD defines biodiversity as the variability among all living organisms. It provides that biodiversity includes diversity at three levels: within species (genes), between species and of ecosystems.

Diversity of ecosystems refers to the existence of various types of ecosystems in different areas including tidal flats, coral reefs, forests, wetlands and rivers. A variety of environments exist on the earth ranging from tropical zones to polar zones, and from coastal/oceanic areas to mountainous areas. Ecosystems have historically developed through adaptation to the environment in each area. Generally speaking, the types of ecosystems are distinguished from each other based on natural environmental units and differences in physical appearances. However, they do not necessarily have clear boundaries and are interrelated through the circulation of organisms and substances in many cases. There are also attempts to consider mosaic landscape as one unit, such as a satoyama landscape which is made up of various ecosystems including secondary forests, artificial forests, agricultural land, reservoirs and grassland, in order to consider the relationships between humans and the environment in local areas from an ecological standpoint.

Diversity of species refers to the inhabitation and breeding of various animals, plants, fungi, bacteria, etc. About 1,750,000 species have been identified in the world and there is an estimated 30 million species on the earth when including undiscovered species. The Japanese archipelago extends over a long distance from north to south and has complex topography. It enjoys a humid climate, a plenty of rain and four distinct seasons. These natural conditions allowed over 90,000 already identified species, or the estimated 300,000 plus species when including undiscovered species, to flourish. Biotas found in Japan have a large percentage of endemic species which cannot be found elsewhere. When considering the conservation of biotas in Japan, it is important to conserve species endemism rather than solely focusing on the number of species and the population

size. For example, the Ogasawara Islands were registered as the fourth world natural heritage site in Japan in June 2011. This was because various speciation processes seen in land snails, etc. indicated unique evolution processes and this uniqueness was highly valued. However, even on the Ogasawara Islands which is recognized as a globally important area, alien species such as black rats, green anoles and bishopwoods have been introduced and are causing problems by invading habitats of endemic species, etc. unique to the Ogasawara Islands.

The diversity of genes refers to the gene-level differences between individuals or between populations, although they belong to the same species. For example, the patterns on Asian lady beetles and on the shells of Japanese littleneck clams vary. This is due to the genetic differences. Japanese medaka and Japanese woodland primroses are known to have different gene pools in different areas. Japanese medaka can be largely divided into the population in Northern Japan and the population in Southern Japan based on the genetic differences. The population in Northern Japan was recorded as a new species in 2011. It is also known that the population in Southern Japan can be further divided into multiple local populations based on genetic differences.

Therefore, there are differences at various levels in nature and more importantly, biodiversity as we know it today has been maintained as a result of these differences being inherited through generations in the long history of evolution. When conserving biodiversity, it is important to conserve differences in ecosystems and biotas that are indigenous to each area.

However, there are opinions that the importance of biodiversity is still not fully understood by people partly because the word “biodiversity” is difficult to understand and partly because it is difficult to imagine what action should be taken in everyday life to contribute to the conservation and sustainable use of biodiversity. We could translate “biodiversity” into two concepts, “interconnection” and “characteristics,” to help to understand what biodiversity is. “Interconnection” refers to a food chain made up of prey-predator relationships between organisms, the connection within an ecosystem and between ecosystems. There are also various other links on different scales such as links between generations of living things which existed over a long period of evolution, links between Japan and the rest of the world, links between different regions and connections in a watershed area. “Characteristics” refer to, for example, subtle differences between individuals of the same species as well as natural conditions and landscape characteristic to each area, which are combined with local culture to create the specific local characteristics of the area. “Interconnection” and “characteristics” have developed through a long history of evolution. “Biodiversity” made up of “interconnection” and “characteristics” of various organisms and groups of organisms supports life on the earth and our livelihoods by providing a variety of benefits.

Section 2 Biodiversity that supports life and livelihoods

1 What are ecosystem services?

The global environment and biodiversity which supports the environment are irreplaceable assets that were created through the long history of various life forms including humans. Biodiversity is therefore intrinsically valuable and it should be conserved.

Our lives are supported by benefits that can be obtained from ecosystems where diverse organisms interact, such as food, water and a stable climate. These benefits are referred to as “ecosystem services.” In the Millennium Ecosystem Assessment (2005) conducted on the initiative of the UN, ecosystem services are divided into four categories: “provisioning services” which provide food,

water, timber, fiber, resources for the development of medicines, etc.; “regulating services” including water purification, climate regulation, prevention of natural disasters and the mitigation of damage, control of pests through natural enemies, etc.; “cultural services” which provide spiritual and religious values, aesthetic values such as natural landscape, recreational spaces, etc.; and “supporting services” which include nutrients cycle, soil formation, supplying oxygen through photosynthesis, etc.

In the market economy, it is difficult to see the value of ecosystem services which can not be traded in markets. However, in order to consider ecosystems, biodiversity and natural resources which provide ecosystem services as “natural capital” and to sustainably utilize them without degrading them, it is necessary to conserve them by paying the appropriate costs. Therefore, there are ongoing efforts to evaluate the value of ecosystem services and to visualize their value.

When looking at the relationships between biodiversity and ecological services, there are cases where “provisioning services” do not necessarily appear to have a direct connection with biodiversity as can be seen in the example of efficient production of food using a single species of crop. However, maintaining biodiversity enables us to obtain provisioning services for various uses such as ornamental plants and medicines. Ecosystems with high biodiversity can provide superior regulating services such as pest control. Many cultural services including the provision of recreational spaces have an important connection with biodiversity. Therefore, in order to make it possible for us and future generations to continue benefiting from various ecosystem services, it is important to maintain and restore biodiversity which is the source of the services.

When looking at the relationships between ecosystem services, pursuing the improvement of an ecosystem service results in the synergy and therefore the improvement of other ecosystem services in some cases. In other cases, two ecosystem services have a trade-off relationship where one ecosystem service improves while the other ecosystem service deteriorates. For example, securing vegetated land in urban areas leads to the improvement of multiple ecosystem services such as absorption of carbon dioxide (CO₂) and provision of recreational spaces for urban residents. On the other hand, cutting down mangrove forests and developing shrimp farms, etc. could result in loss of fish breeding grounds and the deterioration of various other ecosystem services such as the absorption of CO₂ and the conservation of the sea coast, although it produces short-term commercial profits through shrimp farming. Therefore, when considering the conservation of biodiversity and the sustainable use of its components through the conservation and utilization of ecosystem services, it is also necessary to consider the relationships between different ecosystem services as shown in the examples above. Ecosystems have various functions which are important for maintaining biodiversity including the provision of habitats for organisms and it is necessary to ensure that these functions are not lost.

The following explains the importance of promoting the conservation and sustainable use of biodiversity using specific examples of ecosystem services.

2 Biodiversity that supports life and livelihoods

(1) Atmosphere and water produced by organisms (supporting services)

Oxygen, which is essential for our survival, accounts for about 20% of the earth’s atmosphere. This is not the case with other planets. Oxygen has been produced through the photosynthetic activity of blue-green algae and various plants over several billions of years. Plants which constitute forests

and other ecosystems absorb CO₂ and release oxygen. Released oxygen enables animals and plants to respire. Stabilized temperature brings abundant water, which is followed by the generation of clouds and rainfall that gives rise to the hydrologic cycle. A sound hydrologic cycle then nurtures many organisms. This virtuous circle supports the earth's environment. We should become aware of the fact that the global environment is based on oxygen produced by plants and that humans themselves cannot create an atmosphere which contains oxygen.

Plants use solar energy for primary production, which supports food chains. Fertile soil is produced from the decomposition of dead animals and leaves by soil microbes such as bacteria. In the circulation of water which is indispensable to maintaining life and the circulation of nutrients such as nitrogen and phosphorus which are indispensable to the sea abounding in organisms, the water conservation function of forests and the supply of nutrients by forests play significant roles. The temperature and humidity are regulated by circulation of the atmosphere and transpiration by plants which constitute forests and other ecosystems. Thus, the environment which all life forms including humans rely on is maintained based on the above-mentioned natural material circulation.

(2) Basis for human life (provisioning services)

[Resources such as food and timber]

Resources such as rice, vegetables, fish and meat we eat, timber used for houses and cotton and hemp used for clothing are provided from paddy fields, forests, the sea, etc. through agricultural, forestry, fisheries and other activities in Japan or through importation.

Japan is rich in fresh water and fertile soil and a variety of agricultural products including rice have been produced in the country. These agricultural products are grown through interaction with beneficial insects, pests and other various organisms. Spiders live on various insects including pests on farmland and support agricultural production. There are a variety of organisms on agricultural land including paddy fields and we produce agricultural products through making use of the circulation function that involves various organisms to rear animals and plants.

Food gathered from the forests is also important. People used to live by utilizing abundant benefits from forests to the full such as mushrooms, edible wild plants and nuts. Today, with changing lifestyles, the food collected from forests is not as vital for our diet as it used to be. However, forests are still a treasury of foodstuffs which characterize Japanese culture, as they are cultivated by local climates.

Since the Jomon Period (from 145 B.C. to 10 B.C.), seafood has been a precious foodstuff which supported the diet of Japanese people. The ocean, seaweed beds and tidal flats in the coastal areas, rivers and lakes bring us blessings of nature, including numerous kinds of fish, shellfish, squid, octopi and seaweed. Japanese people never miss a day without seafood.

In the Hokuriku Region, the Tohoku Region and Hokkaido, shoals of salmon travel to the rivers from the sea. In many rivers in various parts of Japan, ayu are seen swimming up the streams in spring. Most cultured eel and tuna are artificially raised using caught glass eels and small-sized tuna rather than being raised on farms throughout the process from the ovum collection from cultured parent fish, hatching, to adult fish production. Therefore, their aquaculture also largely relies on nature. To ensure a stable supply of marine resources, it is essential that diversity of organisms in the ocean is rich and sound, in addition to having valuable fish stocks in a sound condition. Humans

must utilize marine resources in a sustainable manner, while conserving biodiversity of marine organisms.

Wood has long been a major material used in Japan. Traditional architectures including Horyuji Temple, which was registered as a world cultural heritage site, are built of wood. Timber was and still is an essential material for our housing facilities. Wood was also an indispensable material for people's lives, because various tools including farm equipment were also made of wood. Thus, in Japan, people have long been utilizing the forest-rich environment to create "wood culture" where wood is incorporated into our life in varied ways in accordance with its type and properties.

Even today, large amounts of timber are used to build housing. Timber is being rediscovered as an important element to create living spaces for relaxation. Wood is also seen in a new light as fuel for heating in some areas where stoves for burning solid pellet fuel made from pulverized wood are becoming popular. In addition, paper is consumed in large quantities today and a large volume of wood is used to produce it. For our daily lives, we have always needed wood, which is one of the benefits from forests that have been an important component of biodiversity.

Animal fibers such as silk and wool and plant fibers such as cotton and hemp are used for clothing and other various purposes in accordance with their characteristics.

Japan imports 60% of its food and 70% of its wood from overseas. Therefore, we live on the benefits arising from the utilization of global biodiversity. Globally, biodiversity loss is progressing as is seen in land degradation due to resource-stripping production activities including excessive cultivation and grazing, deforestation and forest degradation caused by excessive or illegal logging and wildfires, and decrease in marine biological resources due to overfishing. Therefore, each of us should become aware that our consumption supported by natural resources of foreign countries is based on the loss of biodiversity in the exporting countries as well as recognizing that our life is supported by many lives of various organisms. It is then important for us to make conscious efforts in our daily lives to ensure the sustainable use of biodiversity along with its conservation overseas as well as in Japan. In an era where global biodiversity loss is a concern, it is necessary for us to realize that the importation of a great part of our food, wood and other resources means the importation of large quantities of substances such as nitrogen. For example, excess amounts of nitrogen, etc. cause eutrophication of inland waters and the sea. There are also cases where some plants whose growth is facilitated by the accumulation of nitrogen exterminate other plants, which causes changes in the composition of plant communities. Therefore, it is necessary for Japan to strive to achieve the sustainable use of the natural environment and resources from the international perspective, by incorporating material balances including nitrogen cycle into the efforts.

[Utilization of the functions and shapes of organisms]

• Medicines

The functions and shapes of organisms are characteristic to individual species. These properties are inherited by the next generations. Genetic information encoded in the DNA of individual species has been created in four billion years of organic evolution. Humans make use of the information regarding the functions and shapes of various organisms which has evolved over a long period, in varied ways.

One of the familiar examples of the use of organisms' functions by humans is in medicines. Traditionally a variety of organisms including plants have been used as medicines. For instance, aspirin was synthesized based on the fact that a component of willow bark had an analgesic and

antipyretic effect. Ingredients of oseltamivir phosphate (marketed as Tamiflu) used for influenza treatment are synthesized based on shikimic acid which was extracted from star anise (seeds of *illicium verum*) which is used as a spice for Chinese cooking. Components and enzymes in fungi and bacteria are used as ingredients for new drugs, beauty products, functional food, etc. as well as playing important roles in the progress in biotechnology which contributes to the development of these products. Some of the currently unused biological resources have potential to create important value as a result of developments in science and technology in the future. The conservation of diverse organisms means that various future possibilities for their uses can be passed down to future generations.

- **Selective breeding**

The main foodstuffs which support the Japanese diet include rice, wheat, soybeans, corn, beef, pork and chicken. In Japan, there are supposedly over 7,000 species of vascular plants (such as herbs and trees) alone. It may be said that progress in agriculture is the history of crossbreeding useful organisms for humans which have been selected among numerous wild species. Indeed humans have attained a good life through improving the efficiency of food production by improving specific organisms using selective breeding. However, selective breeding has the effect of enhancing uniformization (species concentration). Although this seems to be the opposite process to conserving diversity, selective breeding requires sound maintenance of rich genetic resources of closely related wild organisms in order to broaden the choice available for selective breeding. In addition, genetic resources for further improvements have to be available for times when uniformized crops and livestock fail to adapt to changes in the environment in the future. For example, it is known that only a single variety of potato was cultivated in Ireland in the early 19th century. Due to a lack of genetic diversity, all the potato plants failed in blight epidemics which occurred for several years from 1845, which led to a famine. On the other hand, it is reported that there was a traditional practice of cultivating a mixture of multiple varieties of potatoes in the Andes where potatoes originated, and this spared the region from the total failure of potatoes through a specific blight epidemic. Therefore, biodiversity is important because it provides the foundation for efficient and effective agricultural production.

- **The utilization of shapes and functions**

Organisms, which have evolved and adapted to various environments over an extended period of time, have many excellent functions that are far beyond the technologies available to humans. Silk spun from the cocoons of silkworms is excellent in breathability and hygroscopicity, and has a soft touch as well as being able to filter out UV rays. Worn-out silk goods naturally decompose and add no burden to the ecosystem. Any textile synthesized chemically with advanced technology cannot achieve the exact functions of silk.

There are cases where problems faced by humans can be solved or epoch-making innovations in technology can be achieved by mimicking or getting inspiration from the shapes and functions found in nature. This is called “biomimicry,” meaning mimicking organisms. Simple examples of biomimicry include: the shape of the nose cone of the Japanese high speed trains Shinkansen (bullet trains) with a low air resistance which was designed after the shape of a common kingfisher’s bill; and a stain-resistant paint finish method which was developed by mimicking the surface structure of a lotus leaf.

Therefore, rich biodiversity possesses a lot of hidden functions and abilities of organisms and is a treasury of resources for future potential technological development.

(3) Supporting cultural diversity (cultural services)

[Wisdom and tradition of Japan that has coexisted with nature]

Japan is an island country and warm and cold currents flow in its neighboring seas. It has four distinct seasons and the humid climate brings about plentiful rainfall. Numerous animals live and a variety of plants grow in Japan. Since ancient times, Japan has been called “Toyoashihara-no-mizuho-no-kuni,” a country abundant in vigorous rice plants with green reeds growing on watersides. In the country where all life grows richly, Japanese people have nurtured a culture in which humans live in accordance with the changing seasons, while being forced to always live with the fear of natural disasters such as earthquakes, volcanic eruptions and landslides.

Thus in the face of the rich but violent natural environment, Japanese people have cultivated a wide range of knowledge, techniques, characteristic arts which use the beauties of nature as motifs for example, great sensitivity, a sense of beauty as well as diverse cultures, which adapt to nature instead of conflicting with nature. Through this process, it is thought that our traditional view of nature was formed where we value life in harmony with nature.

For example, in Japan, people have developed dry fields, paddy fields, reservoirs, grassland, etc. for agricultural production. When they did, they also built a guardian shrine dedicated to numerous gods which was placed in a grove, based on their awe for nature. This idea of leaving some nature without using up all the resources and people’s devout attitude towards nature are reflections of Japanese people’s attitude of living in harmony with nature. Similarly, in the utilization of satoyama landscapes, there are local rules and systems which prevent people from overexploiting the areas. Even today, when people pick edible wild plants, many of them set aside a portion of the edible wild plants untouched so that the plants will grow back again in the following years. In order to build a society in harmony with nature which provides us with benefits and becomes a major threat at times, we need to learn from and share the traditional wisdom and view of nature where people have awe and respect for nature and a great deal of importance is placed on finite nature and limited resources.

[Local climates with rich local characteristics]

There is a word “fudo” in Japanese which means local characteristics created through the integration of local natural features, climate and culture (due to having no exact equivalent in English, “fudo” is translated as “local characteristics” or “local climates” depending on the context). These local characteristics are closely related with its specific biodiversity and have nurtured diverse food cultures, crafts, performing arts and so on. For example, food culture is created by cooking vegetables, fish, mushrooms and other various ingredients produced in the local area using recipes that are suitable for the area. “Zoni,” a vegetable soup with rice cakes on New Year’s Day, is one Japanese traditional cuisine. Its characteristics vary depending on the area in terms of its ingredients, recipe and the shape of the rice cakes. A variety of fermented food products have developed in Japan due to its high temperature and humid climate, including pickles, “narezushi” (sushi made of rice and fish fermented with salt in a barrel), “miso” (soybean paste), soy sauce and “sake” (Japanese alcoholic beverage that is made from fermented rice). They are produced from complex combinations of microorganisms, climate, water and ingredients suitable for the local characteristics. Today, mass production of food and large-scale distribution of food products are prevailing and this has led to the progressing loss of traditional techniques and knowledge as well as a decrease in the population of endemic organisms that are to be supplied as foodstuffs. This in turn results in ongoing loss of traditional food cultures representing local characteristics.

In the cities, more residents are eager to enjoy nature in the immediate environment and to participate in activities to experience nature in areas with rich biodiversity. More children grow up without opportunities to have contact with nature in their daily life and therefore do not know how to live with nature. Some also point out that growing up without any experience of playing in nature or intimately contacting with nature contributes to causing mental instability in children. Such current urban environments make it ever more important to offer children opportunities to have contact with rich nature and learn from nature, in order to help the healthy growth of children who will lead the future society.

As seen above, we should fully understand that cultural diversity supported and nurtured by rich biodiversity is a basis for our good life which provides us with mental benefits and that it has served as an indigenous asset which deepens culture in each local area, as well as contributing to the sustainable development of local communities.

(4) Our life secured by nature (regulating services)

Our life is secured by sound ecosystems. For example, conservation of natural forests and appropriate management of artificial forests including the promotion of thinning, conversion of planted coniferous forests into broad-leaved forests and employing long rotation management, facilitate the management and conservation of diverse and healthy forests which provide habitats to many animals and plants. Sound forest conservation and management, along with the creation of rivers abounding in habitats of many organisms and the conservation of riverside forests, contributes to the prevention of mountain disasters, soil erosion and the securing of safe drinking water from a watershed management standpoint. Rich forests also mitigate damage caused by torrential rain and heavy winds. Coral reefs serve as natural breakwaters which protect land from high waves in typhoons, etc. as well as preventing coastal erosion. In the past, when large-scale civil engineering technologies were not available, people used to utilize land in accordance with the natural terrain. Developing residential environments in line with the natural landscape using the past wisdom is an important way to ensure safety more efficiently.

From the standpoint that agriculture is an activity of not only producing food but also creating habitats and rearing environments for diverse organisms, promoting the environmentally appropriate use of agricultural chemicals and fertilizers as well as actively introducing conservation oriented agriculture (environmentally-friendly farming) including organic agriculture will contribute to ensuring safe food products in addition to the conservation of biodiversity. The conservation of biodiversity containing soil microorganisms and endemic natural enemies in agricultural surroundings will elicit pest-control potential in agro-ecosystems.

As can be seen from the examples shown above, it can be said that ensuring safety of our lives by promoting practices which value biodiversity give us the advantage of enhancing economic investment efficiency, particularly when looking at the long-term cost effectiveness over generations.

Biodiversity is an irreplaceable asset developed over a long period of time by diverse life forms including humans. However, we will need to strive to control the outbreaks of organisms which may cause significant changes to the original ecosystems in local areas and organisms that are hazardous or harmful to humans. In such cases, it is necessary to understand that biodiversity is based on an extremely complex balance of interrelationships between diverse organisms, of which humans are yet to discover the whole picture, and that biodiversity contains currently unused

species which may become useful in the future as well as species which have the potential to create important value. Above all, we must never forget the significance of any species coexisting on the earth with humans after a long period of evolution and to recognize the intrinsic value of the species even if they are hazardous or harmful to humans.

Section 3 The rationales for achieving a society in harmony with nature supported by biodiversity

[Four rationales for conserving biodiversity]

The importance of conservation and the sustainable use of biodiversity, which was explained using specific examples in “Section 2. Biodiversity that supports life and livelihoods,” can be summarized into four points as shown below. They are in line with the idea of ecosystem services that were described in Section 2.

1 “Biodiversity provides the foundation for the existence of all life.”

Living organisms on the earth are closely related and connected to each other within one circle called the global ecosystem. Various functions of the diverse ecosystem provide the foundations essential for the existence of all life at the present time and in the future.

2 “Biodiversity has useful value for humans.”

We, humans, have relied on diverse organisms in our daily lives. In addition, there are possibilities for indirect or potential utilization of organisms. Therefore, biodiversity has useful value for humans which contributes to a good life at the present time and in the future.

3 “Biodiversity becomes a fountain of rich culture.”

Similarly to Japan, there are communities around the world which consider humans as part of nature, where people have created diverse cultures by respecting nature and living with nature. Biodiversity provides a foundation for spiritual worlds. It supports and becomes a fountain of diverse cultures which are the assets full of local characteristics indigenous to each area.

4 “Biodiversity ensures the safety of life into the future.”

The management and conservation of diverse and healthy forests, the abstention from improperly converting the landscape and the promotion of sustainable agriculture contribute to preventing soil erosion and disruption as well as securing safe drinking water and food. Maintaining a sound balance of nature and its use by humans from a biodiversity standpoint will lead to efficiently ensuring the safety of life, when looking from a long-term perspective over generations.

[Basic approach for achieving a society in harmony with nature]

In order to achieve the goal of living in harmony with nature which the Aichi Targets aim at, all the people need to understand the importance of the conservation and sustainable use of biodiversity and take action accordingly.

Keeping in mind the importance of the conservation and sustainable use of biodiversity, the section below explains the principle approach for achieving a society in harmony with nature which is supported by biodiversity.

“Realizing a truly enriching society grounded on natural ecosystem”

It is important to have gratitude, awe and respect for nature, which provides us with abundant benefits and becomes a threat at times. We should also understand that humans are part of nature.

Based on this understanding, we should select activities that are in line with the order of nature based on the idea of harmony with nature and the mechanisms of material circulations, so that our activities will not disrupt nature's balance and we will be able to continue benefiting from nature into the future.

For us to ensure such practices, it is necessary to elaborate a sustainable economy which can maintain the healthy state of nature by considering nature as an asset to be handed down to next generation and appropriately recognizing its value.

We must realize a truly enriching society grounded on natural ecosystem through spreading balanced and healthy relationships between nature and humans to every corner of society.

Chapter 2 The Current Situation and the Challenges concerning Biodiversity

The Tenth Meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10) and the Fifth Meeting of the Conference of the Parties serving as the Meeting of the Parties to the Cartagena Protocol on Biosafety (COP-MOP 5) were held in Nagoya City, Aichi Prefecture in October 2010. Section 1 of this chapter explains the main outcomes of the meetings. In Section 2, the current situation of biodiversity in the world and in Japan is explained based on the latest data. Regarding global biodiversity, its loss still continues although efforts to curb the loss are progressing in some fields. It is believed that actions to be taken in the following 10-20 years will be crucial in order to avoid the “tipping points” where ecosystems undergo irreversible changes. It is necessary to recognize the fact that Japan is greatly contributing to the loss of biodiversity on a global scale. In Section 3, the causes of biodiversity loss in Japan are summarized under four categories: (1) the first crisis (caused by human activities and development); (2) the second crisis (caused by reduced human activities); (3) the third crisis (caused by artificially introduced factors); and (4) the fourth crisis (caused by changes in the global environment). Although various measures have been taken against these crises and some results were produced, the four crises are still ongoing and the overall loss of biodiversity in Japan has not been halted. Sections 4 and 5 explain the current situation of biodiversity in Japan and efforts being made in Japan, in light of these crises.

In Section 6, challenges concerning the promotion of conservation and sustainable use of biodiversity are summarized based on the current situation of biodiversity in Japan and the occurrence of the Great East Japan Earthquake.

Section 1 Summary of the outcomes of COP 10 and COP-MOP 5

COP 10 was held under the slogan of “Living in Harmony, into the Future” and had the largest ever number of participants. It was a historic conference which produced major outcomes including the adoption of the Strategic Plan for Biodiversity 2011-2020 (the Aichi Biodiversity Targets) which is the new global target on biodiversity, and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (the Nagoya Protocol on Access and Benefit-sharing (ABS)). Other major outcomes include: the promotion of the early establishment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Global Platform for Business and Biodiversity; a recommendation towards the adoption of the United Nations Decade on Biodiversity; the launch of the International Partnership for the *Satoyama* Initiative (IPSI) and the Japan Business and Biodiversity Partnership; the endorsement of the Plan of Action on Sub-national Governments, Cities, and other Local Authorities for Biodiversity; and the welcoming of the resolution on enhancing biodiversity in rice paddies as wetland systems under the Ramsar Convention with regard to agricultural biodiversity.

At COP-MOP 5 which was held prior to COP 10, the Nagoya - Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety was adopted.

As the Presidency of COP 10 and COP-MOP 5, Japan needs to set an example of effort to tackle the international challenges in response to the outcomes of COP 10 and COP-MOP 5, including the achievement of the Aichi Targets and the early entry into force of the Nagoya Protocol on ABS. The following gives outlines of the major outcomes of COP 10 and COP-MOP 5.

[Strategic Plan for Biodiversity 2011-2020 (the Aichi Biodiversity Targets)]

At COP 6 held in The Hague, the Netherlands in 2002, the Parties adopted the 2010 global biodiversity target, which was “to achieve by 2010 a significant reduction of the current rate of biodiversity loss.” However, in the Global Biodiversity Outlook 3 (GBO 3) published by the CBD Secretariat in May 2010, it was concluded that this target was not achieved. It was therefore expected that a new strategic plan which contains a global biodiversity target should be adopted at COP 10 which was to be held in October of the same year and that global efforts should be promoted towards the conservation and sustainable use of biodiversity without a blank period. It was in this context that the Strategic Plan for Biodiversity 2011-2020 which contains new global targets for the years from 2011 (the Aichi Biodiversity Targets) was adopted and the vision for 2050 and the mission for 2020 were established. In the vision, the achievement of a world of “living in harmony with nature” was set as a goal. The concept of “living in harmony with nature” was proposed by the Japanese government to the CBD Secretariat in January 2010. It can be said that the wisdom and idea of living in harmony with nature which have been developed over a long period of time in Japan obtained broad support and empathy from countries around the world. The mission was set as “taking effective and urgent action to halt the loss of biodiversity.” In order to achieve the mission, five strategic goals were set as well as 20 targets (the Aichi Targets) which were set under the five strategic goals.

[Nagoya Protocol on ABS]

“The fair and equitable sharing of the benefits arising out of the utilization of genetic resources” is provided as the third objective of the CBD. However, the CBD does not provide an international framework for the implementation and negotiations on this issue had continued for many years. In light of this situation, it was decided at COP 8 in 2006 that the consideration of an international framework on ABS should be completed by COP 10 and the world looked to Japan, the Presidency of COP 10, with high expectations. At COP 10, although discussions continued until the final day due to persisting differences in the opinions between developing and developed countries, the adoption of the Nagoya Protocol was eventually achieved owing to compromise among the Parties in an effort to reach consensus for the common benefit of human beings. The Nagoya Protocol stipulated the measures that provider countries and user countries of genetic resources should take in order to implement ABS. The following effects are expected through the entry into force of the Nagoya Protocol: provider countries will provide for legal certainty, clarity and transparency of their domestic access and benefit-sharing legislation or regulatory requirements, which enables the users to access to genetic resources smoothly; the conservation and sustainable use of biodiversity will be strengthened through the fair and equitable sharing of the benefits; and compliance with domestic legislation or regulatory requirements of provider countries on ABS will be ensured, which will promote the appropriate use of genetic resources. Japan signed the Nagoya Protocol in May 2011 and is currently having discussions towards its ratification.

[IPBES]

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is expected to greatly contribute to the promotion of global biodiversity conservation efforts through scientifically evaluating the current situation and changes in biodiversity and ecosystem services and appropriately reflecting the results in policies. In the second session to determine the modalities and institutional arrangements for IPBES which was held in Panama in April 2012, it was decided that the secretariat will be established in Bonn, Germany. Japan needs to actively participate and contribute to the development of an effective and efficient framework based on a scientific basis, and to develop domestic systems for participation in the framework.

[Participation of businesses]

A decision on the participation of the private sector was adopted for the first time at COP 8 held in Curitiba, Brazil in 2006. The decision recognized that the participation of the private sector in biodiversity-related efforts has not progressed and that good practices by influential private businesses can make a considerable contribution to the prevention of biodiversity loss and will become key to bringing the conservation and sustainable use of biodiversity to mainstream society. The decision led to the establishment of the Japan Business Initiative for Biodiversity (JBIB) in Japan in 2008 through which businesses cooperate with each other to conduct activities for the conservation of biodiversity and the sustainable use of its components. At COP 9 held in Bonn, Germany in the same year, the German government-led Business and Biodiversity Initiative was proposed and 34 companies including nine Japanese companies participated in the initiative. At COP 10, the decision to further facilitate the involvement of the private sector was made and the establishment of the Global Platform on Business and Biodiversity was called for. This led to the holding of the First Meeting of the Global Platform for Business and Biodiversity in Japan in December 2011. During the period of COP 10, the Japan Business and Biodiversity Partnership was launched with the initiative of Nippon Keidanren (Japan Business Federation), the Japan Chamber of Commerce and Industry and the Japan Association of Corporate Executives. The partnership aims to promote biodiversity-related efforts by private businesses and has a membership of 497 organizations as of September 2012.

[United Nations Decade on Biodiversity]

The United Nations Decade on Biodiversity was put forward by the Japanese government based on a proposal by NGOs. At COP 10 it was decided that the Parties will invite the United Nations General Assembly to consider adopting the proposal. At the 65th Session of the UN General Assembly in December 2010, it was decided that 2011-2020 would be declared the United Nations Decade on Biodiversity during which all parties of the international community will work together to tackle the issue of biodiversity in order to contribute to the achievement of the Aichi Targets. This led to the establishment of the Japan Committee for the United Nations Decade on Biodiversity in September 2011. The promotion of activities with cooperation between various parties is expected for the mainstreaming of biodiversity in society.

[The Satoyama Initiative]

Japan, along with the United Nations University, has been proposing the *Satoyama* Initiative which aims to achieve both the conservation and sustainable use of biodiversity in human-influenced natural environments that people have developed and maintained through agriculture, forestry and other human activities. During the period of COP 10, the International Partnership for the *Satoyama* Initiative (IPSI) was launched as a platform for promoting information sharing and cooperative activities between interested parties as well as promoting specific efforts that are based on the approach proposed by the *Satoyama* Initiative. 123 organizations from 37 countries including government agencies, NGOs, indigenous and local community organizations, research institutes, businesses and international organizations are participating in the IPSI as of September 2012.

[Local governments]

Local governments play a critical role in the conservation and sustainable use of biodiversity because it is important to take measures in accordance with local conditions. At COP 10, the Plan of Action on Sub-national Governments, Cities, and other Local Authorities for Biodiversity for 2011-2020 was endorsed. The action plan describes the roles of local governments in promoting the conservation and sustainable use of biodiversity and the actions expected of local governments such as the formulation of “regional biodiversity strategies.” Further, the City Biodiversity Summit 2010

was held concurrently with COP 10 by Aichi Prefecture, Nagoya City and others, where the promotion of biodiversity-related efforts by local governments was discussed and the Aichi/Nagoya Declaration on Local Authorities and Biodiversity was decided upon. Following the meeting, the Local Government Network on Biodiversity was established in October 2011 with the aim of promoting information sharing between local governments and the dissemination of information about efforts for biodiversity conservation and their results. 123 organizations are participating in the network as of September 2012.

[Nagoya - Kuala Lumpur Supplementary Protocol]

The Cartagena Protocol on Biosafety stipulates measures to prevent the impacts of the transboundary movement of genetically modified organisms on biodiversity. At COP-MOP 5, measures to be taken by the Parties were discussed regarding the “liability and redress” when the transboundary movement caused damage on the conservation and sustainable use of biodiversity. The discussions resulted in the adoption of the Nagoya - Kuala Lumpur Supplementary Protocol which stipulates that, when such damage has occurred, the managers of genetically modified organisms shall be identified and necessary measures such as the restoration of biodiversity shall be ordered. Japan signed the supplementary protocol in March 2012 and is currently having discussions towards its conclusion.

[Contribution of Japan to the achievement of the Aichi Targets]

The global implementation of the Aichi Targets and other outcomes of COP 10 requires assistance for capacity development in developing countries and other measures. During the period of COP 10, Japan announced its financial contributions to the Japan Biodiversity Fund which supports capacity development for the revision of the national biodiversity strategy and other activities and to the Nagoya Protocol Implementation Fund for assistance to developing countries on ABS.

Section 2 The current situation of biodiversity in the world and its connection to Japan

1 Biodiversity in the world

[Species in the world]

A variety of ecosystems exist on the earth ranging from tropical zones to polar zones, and from coastal/oceanic areas to mountainous areas, on which various organisms rely. About 1,750,000 species are already known - mammals: 6,000, birds: 9,000, insects: 950,000, and vascular plants: 270,000. There is an estimate that the total number of species on the earth including unknown species is 30 million.

Some species that have diversified in the course of evolution are threatened with extinction by human activities. The Red List prepared by the International Union for Conservation of Nature (IUCN) in 2012 reports that more than 30% of evaluated species are at the risk of extinction. The evaluated species included about 36,000 vertebrates, about 13,000 invertebrates, 15,000 plants and so on.

[Global Biodiversity Outlook 3]

The Global Biodiversity Outlook 3 (GBO 3) was prepared by the CBD Secretariat in order to evaluate the achievement level for the 2010 target that the Parties shall achieve by 2010 a significant reduction of the current rate of biodiversity loss, which was adopted at COP 6 held in the Hague, the Netherlands in 2002. The GBO 3 was published in May, 2010.

The GBO 3 reported that there are multiple indications of continuing decline in biodiversity in all three of its main components: genes, species and ecosystems. It also concluded that none of the 21 sub-targets set towards the achievement of the 2010 target can be said definitively to have been achieved globally, although some have been partially or locally achieved, such as the increase in protected areas and pollution reduction.

The report also points out that, if the current rate of loss continues and biodiversity exceeds tipping points, there is a high risk that biodiversity will be dramatically reduced and broad ecosystem services will degrade. It also points out that the action taken over the next decade or two will determine whether the relatively stable environmental conditions on which human civilization has depended for the past 10,000 years will continue beyond this century.

The following describes the current situation of terrestrial ecosystems, inland water ecosystems, marine and coastal ecosystems and genetic diversity, based on the content reported in GBO 3 and other information.

• Terrestrial ecosystems

It is estimated that in forests, which occupy approximately 31% of the earth's land surface, more than half of the terrestrial animal and plant species inhabit, and the great majority of them inhabit in the tropics. However, the deforestation of tropical forests continues at an alarmingly high rate particularly in South America and Africa. Approximately 130,000 km² of forest has been converted to other uses such as agricultural land and lost through natural causes each year from 2000 to 2010. The net loss of forests after subtracting the increase in forests through plantation, etc. was about 50,000 km² per year over the same period.

- **Inland water ecosystems**

Inland water ecosystems such as rivers, lakes and wetlands have undergone dramatic changes in the past several decades, due to human activities including drainage for agriculture, extraction of water for irrigation, industrial and household use, the inflow of nutrients and other pollutants, the introduction of alien species and the damming of rivers which resulted in the fragmentation of ecosystems. It is expected that demand for water will increase on a global scale and it will cause further stress on inland water ecosystems.

- **Marine and Coastal ecosystems**

Regarding mangrove forests which are one type of coastal and marine ecosystems, about one-fifth of the world's mangroves, covering 36,000 km², were lost between 1980 and 2005. Although the rate at which mangroves are declining has been reduced when compared to the 1980s, an average of 1,020 km² was lost each year from 2000 to 2005. As for seagrass beds or meadows, it is estimated that some 29% of seagrass habitats have disappeared since the 19th century, with a sharp acceleration in recent decades. Since 1980, the loss of seagrass beds has averaged approximately 110 km² per year.

According to a report by the Global Coral Reef Monitoring Network (GCRMN), the world has already lost 19% of the original area of coral reefs and it is predicted that a further 15% of coral reefs will be lost within the next 10-20 years, and 20% will be lost in 20-40 years if no effective measures are taken.

It is estimated that about 80% of the world marine fish stocks are fully exploited or overexploited.

- **Genetic diversity**

Genetic diversity is being lost in natural ecosystems and in systems for crop and livestock production. As for wild animals and plants, their genetic diversity has been markedly reduced on a global scale due to population shrinkage, the fragmentation and isolation of habitats. Regarding crop varieties, the number of native species of rice being cultivated in China has declined from 46,000 in the 1950s to slightly more than 1,000 in 2006, for example. Over 21% of the world's 7,000 livestock breeds are classified as being at risk. More than 60 breeds are reported to have become extinct during the first six years of this century alone. A breed or variety of little significance now may prove to be very valuable in the future. If genetic diversity continues to be allowed to disappear, natural ecosystems, crop and livestock production systems could become vulnerable to future changes such as climate change.

[The Economics of Ecosystems and Biodiversity]

The Economics of Ecosystems and Biodiversity (TEEB) is a project to economically evaluate the value of biodiversity. The European Commission and Germany proposed the project at the meeting of G8+5 Environment Ministers held in Potsdam, Germany in 2007 and a series of reports were prepared before COP 10.

As examples for the valuation of biodiversity, TEEB reports that some 30 million people in coastal and island communities are totally reliant on reef-based resources as their primary means of food production, income and livelihood and that estimates of the value of human welfare benefits provided by coral reefs range from 30 billion US dollars to 172 billion US dollars annually. It also reports that, for 2005 alone the total economic value of insect pollination in agriculture was estimated at 153 billion euros.

TEEB also evaluated potential cost reductions by appropriately conserving ecosystems and the costs of not conserving ecosystems. For example, halving the deforestation rates by 2030 would avoid damage from natural disasters caused by climate change estimated at more than 3.7 trillion US dollars. This deforestation rate reduction would correspond to the reduction of global greenhouse gas emissions by 1.5 to 2.7 gigaton greenhouse gases per year. Competition between highly subsidized industrial fishing fleets coupled with poor regulation and weak enforcement of existing rules has led to overexploitation of most commercially valuable fish stocks, reducing the income from global marine fisheries by 50 billion US dollars annually, compared to a more sustainable fishing scenario.

TEEB also gives brief explanations of policies that have utilized the economic valuations. Mexico introduced the payment for ecosystem services (PES) scheme which has enrolled forest owners covering an area of 2,365 km² and involves payments of over 300 million US dollars. The scheme is estimated to have more than halved the annual rate of deforestation. In New York City, the authorities introduced a scheme to pay landowners in the mountains which provide water catchment areas to improve farm management techniques and prevent the run-off of waste and nutrients into nearby watercourses. The cost of this choice, between one billion US dollars and 1.5 billion US dollars for the payments, avoided the projected cost of a new water filtration plant at six billion dollars or more, plus 300 million to 500 million dollars in estimated annual operating costs.

Therefore, TEEB points out to us the importance of utilizing the economic valuation of biodiversity as a tool to mainstream biodiversity. However, TEEB also points out that, such valuations do not imply that all the components of biodiversity should necessarily be valued economically. TEEB considers that, since it is important to incorporate the values of biodiversity into decision making, economic valuations should be seen as a tool to help such decision making.

It also points out that mainstreaming biodiversity requires that the value of biodiversity is appropriately considered in various arenas including policies at local, regional and national levels, corporate strategies and operations, agriculture, fisheries, forestry practices, public procurement and private consumption. Therefore, TEEB conducts awareness raising activities for different parties: it prepares reports for national policy makers, local and regional policy makers and businesses, as well as creating websites for citizens.

Echoing the idea of economic valuation of ecosystems and biodiversity, some advanced efforts are being made including the Wealth Accounting and Valuation of Ecosystem Services (WAVES) led by the World Bank which aims at incorporating the value of natural capital into national accounting systems. Another example is the disclosure of the environmental profit and loss statement by a European sporting goods manufacturer which quantitatively evaluates the impacts on ecosystems of its business activities including the supply chain.

[Impacts of changes in the global environment on biodiversity]

There is a concern that changes in the global environment will have serious effects on biodiversity, including the disturbance of ecosystems and the extinction of species. The Fourth Assessment Report (2007) of the Intergovernmental Panel on Climate Change (IPCC) concluded that global warming has occurred in the climate system and that most of the observed increase in global average temperatures since the mid-20th century is very likely due to the increase in anthropogenic greenhouse gas concentrations. According to the report, the global average temperature increased by 0.74°C (0.56-0.92°C) in the past 100 years (1906-2005), and the pace of increase in the average temperature in the last 50 years is about twice that of the past 100 years. It is predicted that the

impacts of climate change in the coming several decades are unavoidable even with the most serious mitigation efforts.

Biodiversity is particularly vulnerable to climate change. The report predicts that, when the increase in the global average temperature exceeds 1.5 to 2.5°C, 20% to 30% of animals and plants that have been assessed will be at an increased risk of extinction. If the increase exceeds 4.0°C, it is predicted that there will be a grave global extinction of 40% or more of species. It is also estimated that an increase in the sea surface temperature by about 1 to 3°C will cause the frequent occurrence of coral bleaching and extinction over wide areas.

Disasters caused by abnormal weather have occurred frequently in various parts of the world in recent years, including strong typhoons, hurricanes, cyclones, local downpours, droughts and heat waves. It cannot be asserted that global warming is contributing to the occurrence of abnormal weather, but it is pointed out that there is the possibility of an increase in the occurrence and the intensity of abnormal weather as global warming progresses. Although forests and coral reefs mitigate the impacts of heavy rain, strong winds, high waves and other phenomena caused by typhoons, etc., extremely strong typhoons for example may destroy forests and coral reefs. The increased intensity and frequency of the occurrence of abnormal weather could have major impacts on ecosystems.

Changes in the global environment could have impacts on broad areas of the ocean. Recent studies showed that the occurrence of phytoplankton, a main producer in the oceanic region, is decreasing. It is believed that this is because the water stratification was enhanced by the increase in Sea surface temperatures due to global warming and this has caused the decrease in the supply of nutrients from intermediate water to sea surface. In the northwestern part of the Sea of Okhotsk, cold, heavy seawater with high salinity sinks and flows out from the continental shelf as sea ice forms. The process carries iron supplied by the Amur River to the southern part of the Sea of Okhotsk and the North Pacific. It is known that the iron is supplied back to the surface water through seawater circulation which occurs due to the cool sea surface in winter, and the supplied iron triggers the propagation of phytoplankton, thereby supporting marine and terrestrial ecosystems. It has been pointed out that a decrease in the formation of sea ice caused by global warming could have impacts on the production of organisms in related marine ecosystems over broad areas. Ocean acidification is also progressing; as a result of the ocean absorbing about a quarter of the CO₂ generated through human activities in the past 200 years, the average pH value in surface seawater has decreased by 0.1. Data published by the Japan Meteorological Agency in May 2012 showed that the CO₂ concentration in surface seawater in the Northwest Pacific Ocean in winter is increasing at a rate of 1.6±0.2 ppm/year. It has been pointed out that, if oceanic acidification progresses, some species may lose their ability to form exoskeletons because it will prevent the calcification needed for exoskeleton formation in large numbers of oceanic organisms including reef producing corals, shellfish and many planktonic species. There is a concern that the loss of these organisms which support marine biodiversity would have serious impacts on the functions of marine ecosystems.

In addition to having an impact on biodiversity, changes in the global environment are predicted to greatly affect human life and the socioeconomy by changing biodiversity. Globally, the potential producible amount of food is projected to increase within a regional average temperature range of 1 to 3°C increase, but it is predicted to decrease if the temperature exceeds this range. There is also an indication that extreme weather phenomena such as droughts and heat waves will increase with climate change and that these events will have significant effects on grains and other foods around the world. With respect to the effects on the health of humans, it is predicted that populations of

mosquitoes that carry infectious diseases will increase and their habitats will move northward as the air temperature increases.

2 Characteristics of biodiversity in Japan from the global perspective

The number of known species in Japan is over 90,000. The estimated number exceeds 300,000 when unknown species are included. Therefore, Japan has rich biotas on its 380,000 km² land area. Japanese biodiversity is characterized by a high percentage of endemic species: about 40% of land mammals and vascular plants, about 60% of reptiles and about 80% of amphibians are endemic to Japan. Japan has rich natural environments which provide habitats for wild monkeys (Japan is the only developed country which has a wild monkey population) and many other medium and large wild animals including bears and the Sika deer. Therefore, Japan is recognized as a priority area for biodiversity conservation in the world.

The characteristics of biotas in Japan have been formed by the following factors: most of its land is part of an island arc situated in the edge of the continent and on multiple plate borders; its land extends over about 3,000 km from north to south in the middle-latitude area from 20 degrees north to 45 degrees north; it has land with large altitude differences ranging from seacoasts to mountains as well as swift rivers with steep longitudinal slopes; it has several thousand large and small islands; monsoons create four distinct seasons and a wet climate with a rainy season and typhoons; and it underwent the geohistorical processes of joining and separating from the continent; and it belongs to multiple geographical regions in terms of its flora and its fauna. In addition, diverse habitats were developed through various disturbances including volcanic eruptions, earthquakes and tsunamis, the flooding of rivers and typhoons. Agriculture and forestry created partially artificial environments allowing species which prefer light environments such as pasqueflowers and *Shijimiaeoides divina* to survive.

A 1:50,000 current vegetation map of Japan, covering the entire area of Japan has been developed based on the results of the National Survey on the Natural Environment. With respect to the percentage of each vegetation type to the total land area, forests (natural forests, secondary forests close to natural forests, other secondary forests and afforested land) account for 67%, which is similar to Scandinavian countries such as Sweden (70%). The forest coverage in Japan is also very high compared to other developed countries including the United Kingdom (12%) and the United States (33%). Forests account for about two thirds of the total area of Japan, of which natural forests account for 17.9% of the total area of Japan. Natural vegetation (natural forests plus natural grasslands) accounts for 19.0% of the total area of Japan. Natural vegetation areas are distributed mainly in areas which tend to be isolated from human activities such as steep mountains, peninsulas and islands. On flatland and gently contoured mountains, the percentages of secondary substitutional vegetation such as secondary forests and secondary grassland as well as afforested land and farmland are also high. These various types of vegetation developed through different levels of interaction between nature and human activities are distributed at various latitudes, altitudes, etc., and they provide the foundation for the very rich and diverse ecosystems found in Japan.

Japan has much steep terrain and rainwater falling on catchment areas rapidly flows down through the rivers. The flow of rivers fluctuates greatly in the rainy season and during typhoons. Within the rivers, diverse and characteristic environments develop including deep pools and rapids as well as floodplains in downstream areas. Floras and faunas developed through adapting to these characteristic ecosystems can be found in rivers across Japan.

Japan has large amounts of precipitation with a relatively mild climate and succession tends to progress at a high rate in this environment. In order to allow many plants and insects which prefer

light environments to live and thrive in Japan, it is important that light environments are maintained on wetlands, grassland (including secondary grassland), floodplains, secondary forests, etc. through human intervention or in other ways. It can be said that these secondary natural environments resulted from the Japanese climate, its geohistory and the lifestyles of its people to live in harmony with nature, but these environments are currently undergoing large-scale losses.

Japan has the world's sixth largest exclusive economic zone (EEZ). Diverse environments have been formed in the EEZ of Japan, due to many cold and warm currents including the Kuroshio Current, the Oyashio Current and the Tsushima Current flow along the Japanese archipelago that extends from north to south. In coastal areas, we can see diverse ecosystems with long indented coastlines of about 35,000 km, a length equivalent to seven-eighths of the earth's circumference, and tidal flats, sea grass beds, coral reefs, etc. that are rich in biotas. The ecotones in the areas between the terrestrial areas and coastal waters along the coastlines have rich biodiversity. For example, intertidal zones at different altitudes are inundated with seawater at different times. This creates varied environments with different aridity, temperature and salinity, where diverse organisms that adapted to each environment inhabit. In parts of Hokkaido including the Shiretoko Peninsula which is a world natural heritage site, seasonal sea ice reaches the coast of the Sea of Okhotsk and nutrients contained in the ice nurtures diverse marine ecosystems. In tropical and subtropical zones, distinct ecosystems have formed in brackish waters at the estuaries where seawater mixes with fresh water, for example many organisms resistant to fluctuating salinity inhabit and mangrove forests grow. In the deep sea, ecosystems which are entirely different from the ones in coastal areas and the sea surface have formed including the chemosynthetic ecosystem at hydrothermal vents and cold water coral communities.

Due to the diverse environments, Japan features many sea fish species living in its neighboring seas when compared to the Mediterranean Sea and the west coast of North America located on the same latitude. The Japanese waters have rich diversity of species, including 50 species of marine mammals out of 127 worldwide (40 species of whales and dolphins; eight species of seals and sea lions; sea otters; and dugongs), about 3,700 species of sea fish species which is about 25% of an estimated 15,000 worldwide sea fish species, and 122 species of seabirds out of about 300 worldwide. Japanese waters have very high levels of biodiversity, with over 30,000 species living in the areas ranging from bacteria to mammals, which is about 15% of the total number of marine species worldwide.

Biotas in Japan have particularly wide connections with other Asian regions. Through repeated connection with and separation from the continent in the repeated glacial ages and interglacial ages, species which migrated from the continent in glacial times and then became isolated in alpine zones and on islands have survived to create distinctive biotas. For example, the Ryukyu Arc which used to be part of the continent was divided into many islands. Organisms which now live on each island have undergone individual evolution processes as they were isolated from organisms living on the continent and from other neighboring islands by the sea. Many endemic species are found on the Okinawa Islands and the Amami Islands including the Japanese black-breasted leaf turtle, the Ishikawa's frog, the Amami rabbit and the Spiny rat.

Migratory birds, sea turtles and some marine mammals come to Japan from the Pacific Rim countries including Asian countries. Many white-fronted geese and whooper swans, which are typical winter birds found in Japan, breed in Siberia and the Russian Far East in the summer and pass the cold winter in Japan or other countries. Swallows that come to Japan in the summer pass the winter mainly in the Philippines, Indonesia, Malaysia, and southern Vietnam, and therefore

Taiwan is an important stopping point for them. Shore birds use tidal flats in Japan as a stopping point in the spring and autumn. The black-faced spoonbill breeds on remote islands in the Yellow Sea coastal area and winters in Japan, Taiwan, etc. The habitats of sea birds such as the short-tailed albatross and Procellariiformes which breed in Japan extend not only to Japanese waters but also to international waters. In order to conserve these wildlife species through integrated efforts in the entire region of Asia, it is important to consider these connections because migratory birds that come to Japan cannot survive unless both the habitats in Japan and the breeding and wintering places in Asian countries are conserved. For example, the Schrenck's bittern which is a famous bird species coming to Japan in the summer and the fairy pitta with vivid-colored wings are endangered species. In addition to changes in habitats in Japan, destruction of wintering environments in Southeast Asia has also been pointed out as a cause of the threatened survival of these species.

As for organisms other than migratory birds, loggerhead turtles hatched in Japan migrate to the coast of North America where they mature, before returning to Japan to lay their eggs. It is becoming clear that Japanese eels, which are familiar ingredients in Japanese food culture, are born in the sea off the Mariana Islands in the North Pacific. It is also known that many migratory fish species and marine mammals travel over vast areas of sea crossing national borders, for example salmon born in Japanese waters then travel all over the Bering Sea and humpback whales that breed in Japanese waters use the Northern Pacific coast as a feeding ground. In order to conserve and sustainably utilize these wildlife species which travel across borders, cooperation efforts with other countries are essential in addition to domestic efforts.

3 Japan causing impacts on global biodiversity

As explained in Chapter 1, our life is supported by biodiversity. The ecological footprint is an indicator to measure the impact of the lives of people around the world on biodiversity, which converts various impacts on the global environment generated by human consumption activities into the land area needed to meet the consumption. According to the Living Planet Report 2012 published by the WWF, the ecological footprint is increasing every year: 1.5 planets are required to sustain the current lives of people around the world and it is predicted that two planets will be needed by the mid-2030s. The ecological footprint per Japanese person in 2008 is about 1.5 times the global average and 2.3 planets would be needed if the entire world's population is to live in the same way as Japanese people. One of the characteristics seen in Japan is that its ecological footprint is high considering its level of land productivity for renewable resources and its capacity to absorb CO₂. Analysis results from another study show that 30% of the world's threatened species are significantly affected by the production and development by developing countries for the exportation to developed countries. It reports that Japanese consumption activities have the second largest impact after the United States on many threatened species through international trade. These studies show that Japanese people rely on imports from overseas for much of our domestic consumption of resources, which is affecting biodiversity overseas.

For example, Japan is one of the main importers of wood. In 2010, it imported 52,020,000 m³ of timber (wood except for shiitake mushroom logs and fuelwood) from North America, Australia, Southeast Asia, Europe and other parts of the world, which accounts for 74% of domestic demand for timber. Japan therefore is involved in logging and the development of forests around the world through the importation of wood, thus possibly causing impacts on biodiversity overseas. In addition, deforestation abroad could affect biodiversity in Japan, for example where forests in Southeast Asia provide important habitats for migratory birds which spend the summer in Japan. Illegal logging has particularly serious effects on forests around the world. Government

procurement in Japan based on the Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities (Green Purchasing Act) requires that contractors should prove the legality and sustainability of the wood and wood products subject to the law. There are voluntary efforts among private businesses to take biodiversity into consideration by creating their own timber procurement guidelines. The United States and EU have strengthened efforts to prevent illegal logging by establishing laws to prohibit private companies from importing illegal wood.

Japan is one of the largest consumers of marine products, which include not only the products caught in its EEZ where Japan has the sovereign right to resource utilization, but also products caught in international waters and within the EEZs of other countries based on agreements. Our consumption of marine products is supported by global marine biodiversity, because about half of the seafood consumed in Japan is imported and many fish species migrate over extended areas of the oceans that are connected with each other globally. For example, Japan consumes about one quarter of the total global tuna catch. In order to prevent Japanese imports from leading to overexploitation of marine resources, systems for only trading legally caught tuna have been introduced for the northern bluefin tuna and the southern bluefin tuna. Japan is calling on the international community to introduce similar systems for other tuna species. In addition, Japan is known as an importer and consumer of shrimp. It imports a large portion of its shrimp from Southeast Asian countries including Vietnam, Indonesia and Thailand. Many mangrove forests are disappearing in these countries and one of the causes for the deforestation is logging for the development of shrimp farms.

Therefore, we need to recognize that global biodiversity is never irrelevant to our lives: rather, our everyday lives are closely connected to global biodiversity.

Section 3 The structure of the biodiversity crisis

The structure of the biodiversity crisis in Japan caused by human-related causes can be summarized into three categories based on analysis of its causes and results: the first crisis was caused by human activities and development; (2) the second crisis was caused by reduced human activities; and (3) the third crisis was caused by artificially introduced factors. In addition, changes in the global environment including global warming are affecting biodiversity. These impacts are summarized as the fourth crisis separated from the above-mentioned three crises because, although human activities constitute one cause of the impacts, it is difficult to specify direct causes, these impacts have global implications and they are caused by a combination of human activities and global environmental changes. Various measures have been taken against these four crises at the national and global levels and some results have been produced, but the crises are still in progress.

1 First crisis (caused by human activities including development)

The first crisis is the effects on biodiversity due to negative factors generated by human activities such as development and overexploitation. Development such as land reclamation in coastal areas and changes in land use such as the conversion of forests for other uses led to the destruction and deterioration of habitats. In addition, direct collection of organisms for ornamental and commercial uses led to decreases in populations due to the overexploitation of the populations, illegal digging and excessive harvesting. In particular, many tidal flats and wetlands were lost through development. The straightening and fixing of river channels, the development of dams and weirs as well as the development of agricultural land and waterways which prioritized the economy and efficiency led to the deterioration of wildlife habitats and greatly affected biodiversity.

The first crisis occurred in the context of the below-described dramatic changes over the 50 years since the end of World War II including the high economic growth period. The real gross domestic product (GDP) was 48 trillion yen in 1955, 10 years after the end of World War II and after the special procurement boom which accompanied the Korean War had passed. The real GDP then grew more than 10 fold to 481 trillion yen by 1995, 50 years after the end of World War II. For example, product shipment in the industrial statistics has expanded to 309 trillion yen (1995) from 15.5 trillion yen (1960), indicating a 20-fold increase over 35 years, and the amount of investment in construction/civil engineering industries shows more than a 30-fold increase over the same 35 years. According to changes in the housing land area (private land) for which data has been available since the Meiji Period, the annual increase in the 1960s is more than 10 times the average for the 50 years up to 1940 and the annual increase in the 1970s is nearly 20 times the average for the 50 years up to 1940, indicating a sharp increase in the housing land area since around 1960. When looking at changes in land use, the urban area including the housing land area has increased by about two fold in the period between the 1960s and the 2000s.

At present such rapid development has slowed down. Since 1995, product shipment has been leveling off and construction/civil engineering investment has been decreasing, although real GDP has slightly increased. However, the size of the reclamation area in coastal areas is still increasing at a rate of about 8 km² per year, and agricultural land and forests are still being converted to urban land use at an annual rate of 170 km². Therefore, although the development speed is slowing down when compared to the past, new developments are still ongoing. Biodiversity, once lost through the conversion of land use, cannot be restored easily.

The first crisis needs to be mitigated by appropriately avoiding or reducing the impact of human activities in accordance with the characteristics and importance of biodiversity influenced by the human activities. It is important to strengthen conservation efforts in order to ensure that primeval nature will not be lost through development, etc. It is also important to carefully examine if an act of significantly changing natural ecosystems is really necessary by taking into consideration the securing of the safety of life such as disaster prevention as well as the social circumstances. As for already lost or degraded ecosystems, their restoration should be actively promoted based on scientific findings.

2 Second crisis (caused by reduced human activities)

Contrary to the first crisis, the second crisis is caused by reduced or discontinued human activities in nature. Satoyama forests such as the fuelwood forests and farm woodlands in satoyama landscapes and secondary grasslands such as meadows had been maintained as necessities for economic activities. Such human-influenced areas had grown a variety of organisms specific to each environment. With the decrease in areas that suffer natural disturbances such as floodplains, it is thought that human-influenced areas served as substitutional habitats. However, with the changes to industrial structures and resource utilization methods as well as the decreased vibrancy due to a decrease in population and the aging of people, a crisis caused by reduced human activities in nature is continuing and expanding in satoyama landscapes.

Satoyama landscapes areas had an intricate landscape like a mosaic pattern made up of paddy fields, waterways, reservoirs, firewood forests and meadows. These ecosystems in satoyama landscapes were developed through various disturbances by humans such as paddy field management, coppicing for firewood and mowing. Therefore, ecosystems where human disturbance has stopped are losing their diversity and many animals and plants that once inhabited satoyama landscapes are now designated as threatened species. For example in firewood forests, periodic management such as coppicing, removing undergrowth and removing fallen leaves makes it possible for animals and plants which prefer light forest floors such as dogtooth violets and Gifu butterflies to inhabit the forests. However, if the forests are left unmanaged, forest succession progresses and forest floors will become dark, leading to changes in the flora and fauna.

With respect to artificial forests, there is a concern that insufficient management including thinning caused by a decrease in profitability and a decline in forestry production activities may cause a deterioration in the forest functionality (such as the water conservation function and the soil erosion prevention function) and the quality of the forests as habitats for organisms.

On the other hand, the populations of medium and large mammals including the Sika deer, the Japanese macaque and the wild boar have increased considerably with their distribution expanding, which is causing serious damage to agriculture and forestry and is affecting ecosystems as well as causing injuries to humans every year. This is because population decreases in intermediate and mountainous areas and the reduced and aged workforce in agriculture and forestry are making it difficult to manage agricultural land and forests properly and this is creating living environments preferable for the medium and large mammals on abandoned farmland and neglected Satoyama forests. Reduced hunting levels due to the decreasing number of hunters and their aging is accelerating the problem.

One background factor for the second crisis is the changes in the industrial structure. When looking at changes in the percentage distribution of the number of employees by industry, the primary

industry accounted for a little less than 50% of the total working population for several years after World War II, but it drastically decreased to 6% in 1995 (50 years after the end of the war) and to about 4% in 2010. During this period the number of core persons mainly engaged in farming decreased from 11.75 million (1960) to 2.56 million (1995) and to 1.86 million (2011). The rate of senior citizens was around 20% until the 1980s, but it greatly increased to 40% by 1995 and to 59% by 2011. Considering the fact that the agricultural population did not change significantly during the period from the Meiji Restoration to around 1960 although the total population increased, the decrease and aging of the agricultural population since 1960 were rapid and great.

Furthermore, during the period from the end of the war to the 1970s in particular, energy sources shifted to fossil fuels including oil, and fuelwood was driven out of use and the production of chemical fertilizers increased rapidly. Thus the use of biologically derived resources such as fuelwood and manure in rural areas was reduced and the connection of people with Satoyama forests and wild grassland has become less intimate. As a result, much of the Satoyama forests and wild grassland that had been maintained through management by humans through coppicing, burning, etc. is now being left to grow wild. Bamboo forests have had a close connection to Japanese people's lives for many generations, by providing bamboo shoots and materials for buildings, farm equipment and various types of bamboo ware. However, their use has been reduced because cheap imported bamboo shoots and plastic products replaced them and a remarkable expansion of bamboo forests has been seen particularly in Western Japan. It has been pointed out that the expansion of uncontrolled bamboo forests would lead to the homogenization of vegetation and biodiversity degradation. Their expansion into neighboring agricultural land is also a problem.

The total population of Japan peaked in 2004 and is predicted to decrease into the future. Depopulation and the arrival of an aged society is forecast: the total population is expected to decrease to approximately 87 million and the percentage of the population aged 65 or older is expected to reach 39.9% by 2060. It is also estimated that 20% of current residential areas will become non-residential areas and that the population will more than halve in over 40% of current residential areas. In particular, in areas remote from cities including intermediate and mountainous areas as well as areas around remote mountains, it is predicted that 30-50% of residential areas will become non-residential areas. Therefore, relationships between people and satoyama landscapes may become even more disconnected in the future.

In order to tackle the second crisis, more effective conservation and management methods need to be considered in accordance with the natural and social characteristics of the relevant areas under current socioeconomic conditions. It is also necessary to promote the structuring of systems for conserving and utilizing relevant natural resources through cooperation between various parties including non-local residents.

3 Third crisis (caused by artificially-introduced factors)

The third crisis is caused by factors introduced by humans in the process of leading modern lives, such as alien species and chemical substances. Regarding alien species, the mongoose, the raccoon, the largemouth bass, the cutleaf coneflower and other alien species were introduced intentionally or unintentionally by humans from overseas or from other areas of Japan, beyond the traveling capacity of the wildlife. These introduced species have become a great threat because they alter locally-specific biotas and ecosystems. There are also cases where livestock animals and pets have become established in the wild and are influencing ecosystems. Especially in ecosystems on isolated islands where many endemic species inhabit, these alien species can greatly affect existing

biotas and ecosystems. With respect to the alien species problem, the importation, rearing, etc. of Invasive Alien Species(IAS) are controlled based on the Invasive Alien Species Act, but it takes a good deal of time and effort to control alien species that have already become established in Japan. It is also difficult to control organisms which are brought into Japan unintentionally on imported materials or other animals/plants using the law. Controlling organisms introduced from other parts of Japan to islands or important conservation areas using the law alone is also difficult. These organisms are a great threat to the original ecosystems. Chemical substances were developed and spread rapidly from the beginning of the 20th century. Ecosystems are currently exposed to many kinds of chemical substances and this has been the case for a long period of time. While the utilization of chemical substances contributed greatly to the convenient lifestyles people enjoy today, some are harmful to organisms as well as being widespread in the environment. Their impact on ecosystems has been pointed out. Much of the impact of chemical substances on ecosystems is still unknown, and they may be affecting ecosystems in ways that we are unaware of at the present time.

One background factor for the alien species problem is the globalization of the economy and society which advanced rapidly in the 50 years after the end of the war. The total value of imports expanded to 32 trillion yen in 1995, which is 91 times the 348.1 billion yen in 1950. It increased further to 68 trillion yen in 2011. This shows that Japan's connections with other parts of the world have further increased through the trading of materials in recent years. The import volume of goods involved has increased from 10.5 million tons in 1950 to 760 million tons in 1995 (72 times the 1950 level). The volume decreased to 690 million tons in 2009, but Japan still imports a large volume of goods. When looking at people's movement across national borders, the annual number of people entering Japan increased from 0.58 million in 1965 to 26 million in 2010, which is 45 times the 1965 level.

Furthermore, Japan imports large numbers of animals and plants including pets. We should recognize the fact that such importing of animals and plants could affect not only biodiversity in Japan but also biodiversity in the exporting countries as the imported animals and plants include wildlife. Imported living animals in 2011 included: about 240,000 mammals (excluding livestock) such as hamsters; about 20,000 birds (excluding poultry); about 320,000 reptiles such as tortoises and turtles; about 40 million insects; and about 40 million ornamental fish. As the movement of both humans and materials rapidly increases due to the globalization of the economy and society, it is thought that the number of organisms which may affect biodiversity is increasing regardless of whether it is intentional or unintentional. It is expected that the risk of the further introduction of alien species will increase as Asian economies, which trade large volumes of goods with Japan, develop further.

In order to control the problem of alien species, it is necessary to strengthen countermeasures at different stages including: (1) preventing the invasion; (2) detecting and promptly controlling at an early stage of invasion; (3) long-term control and containment of alien species which have established themselves in Japan. There are also reports that organisms unintentionally brought in from Japan are causing problems as alien species overseas, for example the wakame seaweed which originated from Japan is propagating and affecting native seaweed species and fisheries overseas. Japan needs to take into consideration these impacts.

Examples of the impact of chemical substances on ecosystems include the effect of DDT (which was used as an insecticide) on birds and the influence of some of the tributyltin compounds (which were used in paint for ships' hulls) on shellfish. The manufacturing and use of these chemical substances are now banned due to their large impacts on ecosystems. The use of agricultural chemicals and chemical fertilizers rapidly spread in the period between the 1950s and the 1970s. It

is thought that inappropriate use of agricultural chemicals and fertilizers is one of the factors which greatly affected biodiversity. Although the total production of agricultural chemicals has been decreasing since the 1990s and the safety of agricultural chemicals is improving, their impact on biodiversity is still a concern. For example, agricultural chemicals released into the environment could be affecting insects other than the target organisms. Many of the mechanisms through which chemical substances including agricultural chemicals affect biodiversity are yet to be clarified. For this reason, it is necessary to make vigorous efforts to detect changes in wildlife and the signs of impacts as well as conducting risk management based on appropriate risk assessments on the impacts of chemical substances on ecosystems.

4 Fourth crisis (caused by changes in the global environment)

The fourth crisis is the impact of changes in the global environment such as global warming on biodiversity. In addition to global warming, climate change such as more frequent strong typhoons and changes in precipitation as well as other changes in the global environment such as a decrease in primary production in the oceans and the acidification of the oceans could have a serious impact on biodiversity, and it is expected to be impossible to completely avoid their impact. In addition, it is predicted that changes in biodiversity which accompany global environmental changes would have a large impact on human lives and socioeconomy.

The Fourth Assessment Report of the IPCC concluded that most of the observed increase in global average temperatures since the mid-20th century is very likely due to the increase in anthropogenic greenhouse gas concentrations. In this respect the impact of the changes in the global environment on biodiversity can be considered as one type of the first crisis, but they have the following characteristics which separate them from the first crisis: it is difficult to specify direct causes of impacts on biodiversity; and these impacts have global implications. In addition, the impacts may have been caused by changes in the global environment which cannot necessarily be determined to be caused by human activities. In that case it may not be appropriate to consider them as crises, but nonetheless they are caused by a combination of factors that cannot be separated from impacts caused by human activities. Due to these characteristics, they are categorized as the fourth crisis.

The Fourth Assessment Report predicts that progress in global warming is likely to lead to an increased risk of extinction for many animals and plants on earth. Global warming is also expected to change the phenology in Japan such as the flowering and fruition seasons for plants and the seasons for insect occurrence, as well as changing the distributions of various organisms. Since the speed of change in the distribution and the phenology differ between species and taxonomic groups and this increases the possibility of distortions in the interrelationships between organisms such as predation, insect pollination and the dispersal of seeds by birds.

There is a report that the climatic zones in Japan will move northwards at a rate of 4-5 km per year if there is a 3-4°C increase in the global average temperature by 2100. Through such changes, it is predicted that areas suitable for the distribution of beech forests, subalpine and subarctic coniferous forests will decrease and alpine plant communities will rapidly decline in some areas, for example. As for animals, it is predicted that the extinction risk for the Ptarmigan which inhabit high mountains will increase and that areas suitable as habitats for the char which live in cold water will decrease nationwide. Expansion of bamboo forests and pine mass-dieback in the Tohoku Region is also predicted.

Regarding the changes in the phenology, the blooming date of the cherry that marks the beginning of spring has moved forward by about 4.2 days in the past 50 years since the Japan Meteorological Agency started phenological observation in 1953. According to a survey for the breeding ecology of the red-cheeked starling in Niigata City, the egg-laying time has become earlier (by 0.73 days per year) since 1978. It is surmised that this may be related to temperature increases in Niigata City as well as in Naha City in Okinawa situated on their travel route.

It is predicted that disturbances to forests and coral reefs are likely to increase due to an increase in the frequency of strong typhoons as well as because of the direct impact of temperature increases. For example, although the agitation of seawater by typhoons has an effect of curbing coral bleaching by lowering the seawater temperature, it is thought that the expansion of coral reef destruction is likely as the occurrence of strong typhoons becomes more frequent. As the precipitation changes, the snowfall and the streamflow change and this could have significant impacts on the distribution of organisms and ecosystems. For example, snowfall is thought to have effects on the habitation of the Sika deer and it has been pointed out that the increase in the population surviving the winter and the expansion of the distribution range into areas not originally habitats of the Sika deer are associated with the trend of mild winters caused by global warming. In Lake Biwa, a serious drought occurred in the summer of 1994. It is known that the extremely reduced supply of water from rivers resulted in significant changes in the vertical distribution of organisms where the population of large phytoplankton decreased and small phytoplankton accumulated in a layer at which the temperature dramatically changes between the upper layer and the lower layer.

With regard to marine ecosystems, an increase in the seawater temperature is predicted to cause changes in the distribution ranges of organisms, coral bleaching and the disappearance of seagrass beds. In Sekisei Lagoon situated between Ishigaki Island and Iriomote Island, the frequency of the occurrence of serious coral bleaching phenomena has been increasing since 1998 and the coral coverage by reef forming corals has been decreasing. It has also been pointed out that a decrease in phytoplankton which is a main producer in the oceanic region could have impacts on marine ecosystems over wide areas. Further, it is predicted that acidification of the oceans will have negative impacts on organisms which form exoskeletons as well as the organisms which rely on these species, such as reef forming corals, shellfish and many planktic species.

When organisms can no longer tolerate these changes, they will become extinct unless they can “evolve in that place” or “migrate to a habitable place.” Although sufficient scientific knowledge has not been accumulated for a prediction of the effects on the life and ecosystems in Japan if changes in the global environment advance, it is expected to be inevitable that there will be serious impacts on the biodiversity in Japan, particularly in areas that are vulnerable to environmental changes, such as islands, coasts, subalpine zones and alpine zones.

Changes in the global environment are predicted to have a large impact on human lives and socioeconomy through changing biodiversity, including changes in the areas suitable for food production, an increase in the number of pests, etc., changes in the area and period of their occurrence and an expansion of the distribution areas for vectors. As for food, the effects of temperature increases on rice have been pointed out. It is predicted that, when global warming progresses, the yield and quality of rice will decline in some areas if no measures are taken, although increases in yield are predicted in other areas. With respect to fisheries, it has been pointed out that fishing grounds and the fishing season could change as the habitats of target species move northwards. The northward migration of organisms that adversely affect fisheries is also indicated.

For example in Hokkaido, it has been confirmed that more northern sea urchins are now caught in areas further north than before. The Longheaded Eagle Ray, which was originally found in coastal areas in the subtropical to tropical zones, is now found in the Ariake Sea and the Seto Inland Sea in large numbers and is reported to be damaging Japanese littleneck and the pen shell fisheries. With respect to the effects on people's health, the immediate occurrence of large-scale infectious diseases epidemics due to global warming is not predicted, but the risk of infection is expected to increase due to the expansion of the distribution range for vectors caused by global warming.

As countermeasures to the fourth crisis, it is necessary to strive to identify the impact of changes in the global environment on biodiversity as well as considering measures to mitigate the global environmental changes and measures to adapt to the effects caused by the changes, from a biodiversity standpoint.

Section 4 The current situation of biodiversity in Japan

1 Japan Biodiversity Outlook

In order to comprehensively assess the current situation for biodiversity loss in Japan, the Japan Biodiversity Outlook was compiled in May 2010. It was the result of two years of discussions starting in FY2008 through meetings of the Japan Biodiversity Outlook Science Committee made up of experts from different fields. 208 experts cooperated with the process. The committee evaluated the loss of biodiversity in Japan for the period between the latter half of the 1950s and 2010 and produced the five main conclusions as shown below.

- (1) Loss of biodiversity as a result of human activities in Japan has affected all ecosystems, and the loss is continuing on the whole.
- (2) The degree of biodiversity loss has been especially large in inland water ecosystems, marine and coastal ecosystems, and island ecosystems. The trend towards biodiversity loss is continuing at present.
- (3) As for the drivers of the loss, the “first crisis,” particularly development, has had the greatest impact, but the speed at which loss attributable to this crisis has slightly abated. The “second crisis” continues to intensify. Furthermore, among all the factors falling under the “third crisis,” the effects of alien species are particularly prominent in recent years. The “climate change crisis*” poses serious concerns for certain ecosystems that are particularly vulnerable. Various countermeasures have been taken to address these crises. These countermeasures have been effective to a certain degree, but given the major socioeconomic changes in Japan that indirectly drive biodiversity loss, they have not been sufficiently effective.
- (4) The Japanese people currently enjoy lifestyles characterized by material wealth and convenience, but for the past 50 years those lifestyles have meant the domestic loss of biodiversity and dependence on the supply of ecosystem services from overseas. From 2010 onwards, the lingering effects of past development (first crisis), the increasing seriousness of the problem of reduced use and management of satoyama landscapes (second crisis), the establishment and further encroachment by alien species (third crisis), rising temperatures (global warming crisis*), and other related factors are expected to result in further loss. Thorough response measures, including those that address indirect drivers, are necessary. For that purpose, it is important to build consensus at the local level.
- (5) Some biodiversity loss in inland water ecosystems, island ecosystems, and marine and coastal ecosystems may in the future transform into a grave loss, causing irreversible changes or having other serious consequences.

* In the National Biodiversity Strategy of Japan 2010, which was in use when the Japan Biodiversity Outlook was published, “global warming crisis” was used instead of “global environmental change crisis.”.

2 The current situation of wildlife, etc.

[The current situation of threatened wildlife]

In Japan, the first Red Data Book was created in 1991 by compiling information about threatened wildlife species in Japan including their survival state. The Red List has been revised three times since then. In the fourth Red List published in 2013 by the Ministry of the Environment, the number of threatened species had increased from 3,155 before the revision to 3,597. When looking at the number for each taxon, a little over 30% of the reptile and amphibian species, a little over 20% of the mammal and vascular plant species and a little over 10% of the bird species inhabiting Japan have been designated as threatened species.

Many of the threatened species inhabit island areas including the Nansei Islands and the Ogasawara Islands, and efforts are being made for the protection and proliferation of some species including the Okinawa rail and the Tsushima leopard cat. As typified by diving beetles, many familiar species living in satoyama landscapes and those living in waterside areas are also designated as threatened species. Threatened species also include those that are threatened nationwide such as the golden eagle as well as wildlife species which are threatened locally due to habitat fragmentation as in the case of the Japanese black bear in the Shikoku Mountain Range.

The destruction and fragmentation of habitats, environmental change due to decreased human activities in nature, overexploitation and the impact of alien species have been pointed out as the causes of the decrease in these organisms. On the other hand, there are also species that have become less threatened through conservation efforts, such as *Callicarpa parvifolia*, a plant species whose wild population size recovered through efforts to eradicate feral goats on the Ogasawara Islands. Conservation measures for these species should be continued. The following gives an outline of the fourth Red List published in 2012, for each taxon.

Regarding mammals, the total number of threatened species excluding marine mammals which do not land on shore (other than the dugong that depend on neritic areas) was 34, decreasing by eight species from the previous list. This is mainly because three species formerly designated as threatened species were newly determined as extinct species, the taxon subject to the assessment were rearranged (consolidation of subspecies) and the amount of available information about the survival state of mammals increased through the implementation of surveys. Therefore, the decreased number of threatened species cannot necessarily be considered as a sign of improvement in the survival state of mammals. The Japanese river-otter (the Hokkaido subspecies), the Japanese river-otter (the subspecies in Honshu and southwards) and *Rhinolophus pumilus miyakonis* were newly determined to have become extinct since they have not been detected in habitation surveys, etc. for a long period of time. On the other hand, the harbor seal and the Steller's sea lion were ranked lower than before due to the increasing populations detected in recent surveys.

As for birds, the total number of threatened species was 97, an increase of five species from the previous list. When looking at changes in rank in detail, there are eight species that ranked lower than before, but 18 species ranked higher than before including nine species that were newly included in the threatened species. Thus many species were recognized as being more threatened than before. For example, five species including the Kentish plover were newly designated as threatened species due to population decreases confirmed through monitoring surveys of shore birds conducted by the Ministry of the Environment and others. With regard to the crested ibis, for which a program to return them to the wild is in progress on Sado Island, breeding in the wild succeeded for the first time in the spring of 2012. However, in reference to the IUCN (International Union for

Conservation of Nature) criterion that the less threatened survival state needs to be maintained for five years or more in order to move a species to a lower rank, the crested ibis remained in the same category as before, which is “extinct in the wild.”

As for reptiles, the total number of threatened species was 36, an increase of five species from the previous list. There was no species which ranked lower than before while there were 10 species which were ranked higher or newly added to the list. This indicates that the survival status of reptiles in Japan remains unimproved. In particular, many reptiles on the Nansei Islands are in a critical state and there is concern about the deterioration of habitats and the impact of alien species.

As for amphibian species, the total number of threatened species was 22, an increase of one species from the previous list. Since the last revision, many species were further divided into different species before they were assessed. The black-spotted pond frog, which is a familiar species of frog, was newly designated as “near threatened” although it was not included in the threatened species. Therefore, it became clear that the risk of extinction is increasing even for species which are widespread in Japan.

As for insects, the total number of threatened species increased by 119 from the previous list and reached 358. The number of species increased particularly because there was progress in the assessment of moths and beetles. It was also pointed out that there was degradation of all types of habitats in flat areas other than forests (such as grassland, dry riverbeds and wetlands). In addition, impacts caused by the degradation of waterside habitats around human settlements, predation by alien species and overexploitation for breeding purposes were pointed out since many water bug species including whirligig beetles were ranked higher than before.

With regard to shellfish, the total number of threatened species increased by 186 from the previous list to 563. Many of the species were newly added to the list because species inhabiting tidal flats, etc. in deeply indented bays were newly added to the species subject to the assessment. There were no freshwater bivalve species ranked lower than before, which confirms that the species are still in a serious situation due to the decrease in areas suitable for their habitation. Many land snail species endemic to the Ogasawara Islands (registered as a world natural heritage site) were ranked higher than before, which revealed the critical situation that these species are in.

As for other invertebrates, the total number of threatened species was 61, an increase of five species from the previous list. The main factor for the increase was the new designation of shrimp and crab species on the Nansei Islands. The results show that many species are in a critical state, including *Amamiku occulta*. Three species were ranked lower than before due to the discovery of new habitats, which is the result of progress in the accumulation of knowledge.

With respect to plants I (vascular plants), the total number of threatened species increased by 89 to reach 1,779. It was discovered that deer feeding damage and changes in habitats due to progressing vegetation succession on wetlands and grassland became the main factor affecting many species. In addition, there were 15 species which were not found even in known habitats in on-site surveys and were thought to have become almost extinct. Further, there are species whose survival state is worsening, due to overexploitation for cultivation and ornamental purposes.

As for plants II (non-vascular plants), the total number of threatened species was 480, an increase of 17 from the previous list. This shows that the deterioration of the survival state within this taxon is also progressing. There were also changes in rank due to newly obtained information, including the

rediscovery of one species each in the bryophytes, algae, lichens and fungi which were previously believed to have become extinct.

[Changes in the distribution of medium and large mammals and the expansion of conflicts]

As a result of a comparison between the Sixth National Survey on the Natural Environment: Report of the distributional survey of Japanese animals (Mammals) conducted from FY2000 to FY2003, and the nationwide distribution survey in 1978, the distribution areas for all seven assessed species (the Sika deer, the Japanese serow, the Japanese macaque, bears, the wild boar, foxes and raccoon dogs) were on the increase. In particular, the nationwide species occupation rate of the Sika deer increased from 24% to 42% and that of the Japanese serow increased from 17% to 29%. When predicting the future expansion of the distribution of the Sika deer based on the above survey results, it is likely that there will be further expansion of the distribution in Western Japan and the Pacific side of East Japan which have low snowfall levels. The combination of several social and natural factors is possibly the cause of the expansion in distribution. These factors include: depopulation and the aging of communities causing an increase in abandoned farmland and a decrease in snowfall in heavy snowfall areas in the Tohoku Region, etc., which have created an environment preferable for medium and large mammals; and aging and decreasing numbers of hunters which have caused increases in the animal populations.

As the populations and the distribution range of the medium and large mammals increase, the damage and impacts on agriculture, forestry and natural ecosystems are becoming serious. For example, the amount of damage to farm produce by animals and birds was 23.9 billion yen in FY2010. Although the number of pest mammals and birds caught including the Sika deer and the wild boar has increased in an effort to prevent damage, there is no sign of a decrease in the amount of damage. In addition, impacts on natural ecosystems have been observed in 20 National Parks in the Southern Alps, Nikko, etc., including feeding damage on rare alpine plants and debarking in forests caused by the Sika deer. There were 66 incidents involving bears which caused injury or death to humans and over 1,800 animals were captured in FY2011.

In order to tackle the problems caused by animals and birds that conflict with human lives and ecosystems associated with the recent rapid increases in distribution and population, it is necessary more than ever to take comprehensive conservation and management measures to avoid such conflicts. These measures should include damage prevention, habitat management and population management, while responding to the decrease in number and aging of hunters and developing leaders for local conservation and management.

[Changes in the breeding distribution of birds]

As a result of the comparison between the Sixth National Survey on the Natural Environment: Report of the distributional survey of Japanese animals (Birds) conducted in 2002 and the nationwide distribution survey in 1978, there were no significant changes in the breeding distribution of about 80% of the 248 surveyed species, but some species expanded or reduced their breeding distributions to a relatively large extent.

In particular, the distribution of the Great Cormorant and the Grey Heron that feed on river fish, etc. expanded greatly. However, the Great Cormorant causes damage to fisheries due to their feeding on the ayu and the pale chub as well as causing the death of trees due to its feces sticking to leaves and leaves and branches being broken and taken away. On the other hand, the distribution of the Japanese quail, the Brown Shrike and the Tiger shrike that live on forest edges through to grassland and wetlands shrank greatly. The breeding distribution of some shore birds which breed on wetlands,

etc. in Japan also shrank. As for alien species, the red-billed leiothrix and the Hwamei expanded their distributions, while the Red Avadavat reduced their distribution.

In general terms, it is thought that changes in habitat environments are a major cause for the expansion and reduction of the breeding distribution, although the precise reasons for the expansion and reduction have to be looked into for each species and they cannot be concluded from the results of this survey alone.

[Alien species]

The effects of invasive alien species on ecosystems and human lives have become increasingly serious in recent years. Although the enforcement of the Invasive Alien Species Act has achieved some positive results, for example invigorating alien species control activities, it has not succeeded in controlling the expansion of the distribution of alien species which have become established in Japan, as can be seen from the limited number of cases of successful eradication or containment of IAS. It is expected that the damage will continue to increase in the future. In particular, alien species are greatly affecting important biodiversity conservation areas including islands which have endemic ecosystems.

For example, the mongoose was introduced on Okinawa Island in 1910 and Amami-oshima Island in around 1979 with the aim of controlling the habu and rats that damaged farm produce. They then expanded their habitats year by year up to recently and have become a major threat as a predator of rare wildlife species such as the Okinawa rail and the Amami rabbit. It is estimated that the population of mongooses on Okinawa Island had increased from the original several dozens to about 30,000 by 2003. In addition, inhabitation of the mongoose in Kagoshima City was also confirmed in 2009.

Raccoons, which were introduced as pets, established themselves in the wild and have expanded their distribution. Although large populations were found only in areas around Sapporo city in Hokkaido and areas around the borders of Aichi, Gifu and Nagano Prefectures in the mid-1990s, distributions in 36 prefectures were reported in a survey conducted in 2006. There are reports of the destruction of heron colonies and the predation of native species such as salamanders as well as damage to farm produce which were likely caused by raccoons. They caused damage to farm produce of approximately 350 million yen nationwide in FY2010.

Regarding the largemouth bass and the bluegill, the impacts on ecosystems and fisheries caused by their predation of native species have been observed in various areas. The largemouth bass was introduced as a fishery resource and was found in five prefectures in the 1950s. Their distribution area rapidly expanded with intentional releases in the 1970s and their habitats were observed in all prefectures except for Hokkaido by the 1990s. They were found in Hokkaido in 2001, but they were successfully eradicated by 2007. However, they have become established in other prefectures and control efforts are still ongoing.

The buff-tailed bumblebee used for pollination of farm crops may have impacts on ecosystems through competition with native bumblebees over nest sites, hybridization which causes genetic disturbances and the inhibition of propagation of wild plants due to their habit of sucking nectar without contributing to pollination of plants. About 3,000 colonies were distributed in 1992, but the number increased to about 70,000 by 2004. The number distributed was slightly reduced after they were designated as an IAS in 2006 (reduced to about 56,000 colonies in 2011), but they have

become established in wider areas of Hokkaido, where a decrease in the native bumblebee population has been observed.

Weeping lovegrass was introduced as vegetation cover in 1959. It has become established in areas nationwide, ranging from Hokkaido which is the north island of Japan to Okinawa in the south and there are concerns that it is affecting ecosystems by driving out native plant species. There are cases where the populations of threatened species such as *Aster Kantoensis* were considerably reduced by the thickly growing weeping lovegrass. Control measures such as the removal of weeping lovegrass are being taken in various parts of Japan.

There are also cases where species living in Japan are introduced into other areas of Japan which were originally not inhabited by the species and they have great impacts on the ecosystems of the areas. For example, on Miyake Island in the Izu Islands, the Japanese weasel was released in order to eradicate rats in the 1970s and 1980s. This caused considerable decreases in the populations of the Okada's blue-tailed skink and the Izu Islands thrush. The population of the Okada's blue-tailed skink, which is estimated to have been about five million before the introduction of the Japanese weasel, was dramatically reduced to 50,000-100,000 by 1985 and to several hundreds by 2000, even with an optimistic estimation. There are also cases where livestock and pet species become established in the wild and affect ecosystems, as can be seen with feral goats on the Ogasawara Islands and feral cats in the Yanbaru area on Okinawa Island.

The impacts of organisms which are unintentionally introduced via imported goods, such as timber, crops and marine products are also a concern. For example, the establishment of the Argentine ant which was first observed in Hiroshima in 1993 is causing concerns that they are driving out native ants due to their aggressive character. Established populations were later found in Hyogo, Yamaguchi, Osaka, Aichi, Tokyo and other parts of Japan. Many of the sites where established populations were confirmed were in distribution hubs such as harbors and this suggests that they have invaded the sites and expanded their habitats through the distribution of imported goods, etc. The *Euspira fortune* from China and the Korean Peninsula was originally only found in very limited Japanese waters such as the Ariake Sea. However, they have invaded the Tohoku Region and other parts of Japan in recent years and are eating the flesh of the Japanese littleneck by boring through the shells. It is thought that the release of Japanese littleneck stock from China in Japan caused the unintentional introduction of *Laguncula pulchella* from the continent along with the stock.

[Diversity of agricultural crops and livestock]

In the process of productivity improvements, uniformization of varieties progressed and this has reduced the number of local varieties of locally characteristic agricultural crops which have been cultivated by farmers in different parts of Japan over a long period of time. The number of rice varieties cultivated has dramatically decreased: about 4,000 varieties were cultivated in the early Meiji Period, but only 88 varieties (varieties which have 5 km² or more of the planted area) were cultivated in 2005. On the other hand, the National Institute of Agrobiological Sciences and other institutes preserve about 220,000 units of plant genetic resources as of March 2012, which are greatly contributing to the development of new varieties.

The number of native livestock animals which have been kept for generations in Japan is decreasing rapidly in pursuit of productivity improvement, etc. For example, there are now only about 2,000 native horses in eight varieties. As for livestock in general, the popularization of superior varieties and strains among livestock farmers has reduced the genetic deviation of livestock. On the other

hand, livestock breeding businesses are preserving genetically diverse livestock for the purpose of securing materials for future livestock improvements.

3 The current situation of ecosystems

The following explains the current situation of ecosystems with a description of changes over the past 50 years including the high economic growth period when there was a great impact on biodiversity in Japan. Ecosystems are divided into six categories in reference to the ecosystem classification employed in the CBD: forest ecosystems, cultivated ecosystems, urban ecosystems, inland water ecosystems, marine and coastal ecosystems and island ecosystems.

[Forest ecosystems]

In Japan, forests cover about 250,000 km² of land which accounts 67% of the national land. When the continuity of forests nationwide is assessed based on the current vegetation map which was developed from the results of the National Survey on the Natural Environment, the continuity of forests on most of the national land can be observed, especially on the backbone of the mountains. The forest area increased by about 10,000 km² over the period between 1943 and 1966. Although the forest area has remained the same since then, the area of forests with a high level of naturalness (natural forests and secondary forests) out of the total forest area greatly decreased in the period between 1943 and the 1980s. This was partly because forests with a high level of naturalness as well as artificial forests were cleared in response to the increasing demand for timber for building and other purposes after the end of World War II, which was accompanied by large-scale monoculture reforestation using the Japanese cedar, the Japanese cypress, etc.

On the other hand, the amount of fuelwood production has rapidly decreased since the 1950s due to changes in energy demand. Although demand for fuelwood in 1955 was about 20 million m³, it was hardly in use by the 1970s. With this backdrop, Satoyama forests used as fuelwood forests were left unmanaged and succession of the forests progressed, which led to decreased populations of organisms living in Satoyama areas that prefer bright environments.

The effects of the Sika deer on forest vegetation have become serious in recent years as their distributional range expands nationwide. In the results of a questionnaire survey conducted by the Society of Vegetation Science in 2009 and 2010, it was reported that impacts on vegetation were observed in the entire distributional range for the Sika deer and that serious impacts were observed over a wide area especially in the Kinki Region. Seriously affected areas included areas which have typical natural environments in Japan such as Shiretoko, Okunikko, Okutama, Mt. Fuji, the Southern Alps, Odaigahara and Yaku Island.

It is expected that all types of forest vegetation will move to higher elevations as global warming progresses. However, alpine vegetation might decrease as it cannot go higher than the summit. It is reported that on Mt. Apoi in Hokkaido, the creeping pine zone has moved upwards as snowfall decreases and alpine meadows are rapidly receding. There is also a possibility that alpine vegetation will receive devastating impacts by the invasion of alpine zones by the Sika deer, which is thought to be facilitated by decreasing snowfall.

[Cultivated ecosystems]

Through the long and continuous management of agricultural land by people in accordance with local climates, natural environments specific to the local area have been created and maintained on agricultural land and grassland, providing precious habitats for many organisms. For example, it is

reported that 5,668 species of organisms have been found in paddy fields in Japan. However, due to reduced agricultural land areas, grassland areas and management activities as well as conversion of paddy fields into dry fields through field adjustment and the increase in concrete-finished channels, the number of organisms commonly found in these environments for many generations is now on the decrease.

The agricultural land area was about 61,000 km² around 1960. The area continued to decrease in areas other than Hokkaido, particularly due to a decrease in the paddy field area, and fell below 50,000 km² in the 2000s. The area of fields also began decreasing in the 1980s. Even in Hokkaido, the agricultural land area has been on the decrease since the 1990s. As the aging of farmers progresses and the shortages in the workforce worsen, the area of abandoned farmland increased. Its area increased three fold from 1,349 km² in 1985 to 3,960 km² in 2010.

In the high economic growth period which took place from around the 1960s, the development of agricultural land and waterways prioritizing economy and efficiency were pushed forward. In particular, the area of improved paddy fields expanded rapidly in the period between the 1960s and the late 1970s, and the percentage of improved paddy fields reached 60% in the 2000s. The development of agricultural land and waterways which prioritized economy and efficiency resulted in reduced numbers of ridges and waterways and disturbed the movement of organisms which used to go back and forth between rivers, waterways, reservoirs and paddy fields. This contributed to the deterioration of habitats for organisms and greatly affected biodiversity. In recent years, the development of agricultural land and waterways which takes into consideration the health of ecosystems is being promoted, along with such farming methods as organic farming and winter flooding of paddy fields.

Though grasslands are estimated to have encompassed 25,000 to 45,000 km² of area in the beginning of the 1900s, it continued to decrease with the decreasing use of grassland as meadowlands to harvest roofing materials and pastureland for horses and cattle. The grassland area had dropped sharply to about 12,000 km² by the 1960s and to about 4,000 km² by the 1980s.

[Urban ecosystems]

In Japan, as urbanization rapidly progressed after the end of the war, the disappearance, shrinkage and fragmentation of vegetated land such as forests and agricultural land progressed. This resulted in many cases of isolation of habitats for animals and plants on the fragmented vegetated land. When comparing land use in the Kanto Region (which includes Tokyo) in 1976 and 2006, the area of urban districts increased by about 1,750 km², while the forest area decreased by about 1,300 km², the paddy field area decreased by about 550 km² and the area of upland fields, orchards, etc. decreased by about 590 km². In Yokohama City which is a city neighboring Tokyo, forests and agricultural land rapidly disappeared as housing land was developed in the 1960s and the 1970s. The area of vegetated land has continued to decrease since then, and the percentage covered with vegetation was reduced to about 30% by 2009, although it was about 50% in 1970.

When comparing the Tokyo of the 1970s and the 1990s, the distribution of larks which live on agricultural land and grassland has decreased. On the other hand, it is reported that the distribution of white-eyes has expanded due to the development of urban parks which increased the area of forest.

[Inland water ecosystems]

The habitats of organisms in inland water ecosystems such as rivers, lakes and wetlands were largely modified by the construction of river-crossing structures, land reclamation on lakes and wetlands, etc.

With regard to rivers, river-crossing structures are interrupting the flow between the upstreams and downstreams of rivers as well as the flow between rivers and the sea. It has been pointed out that the interruption of the flow could prevent organisms which swim up the rivers from migrating and prevent the movement of soil from the upper reaches to the lower reaches. In the National Survey on the Natural Environment, river sections from the estuary to the lower-to-middle reaches of 113 main rivers nationwide (such as Class A rivers) were surveyed in order to find out how far up the rivers the fish that would normally have been able to swim up the rivers in the past, such as the masu salmon and the ayu, could reach at the time of the survey. The results of the 1990s survey show that the number of rivers in which the fish could swim up less than 25% of the surveyed distance was 17 out of the 113 surveyed rivers, and the number of rivers in which the fish could swim up less than 50% of the surveyed distance was 46 out of the 113 surveyed rivers. Artificial shorelines are also increasing: in the 1990s, more than 20% of shorelines were artificially formed. The construction of artificial shorelines causes the loss of the ecotones of vegetation along riverbanks and degrades the quality of habitats for amphibians and fish.

As for lakes, 15% of the total area of the main natural lakes nationwide was drained or landfilled for land reclamation in the period between 1945 and the 1980s. About 30% of shorelines had been artificially formed by the 1980s.

Regarding wetlands, over 60% of the total area nationwide disappeared due to causes related to development, mainly the development of agricultural land and housing sites, in the period between around 1900 and the 1990s. In particular, the area of wetlands in Hokkaido greatly decreased from about 1,800 km² in around 1900 to about 700 km² by the 1990s.

In inland water ecosystems, the impacts caused by invasive alien species such as the largemouth bass and the bluegill on existing ecosystems have been enormous. According to the national census on river environment, the largemouth bass and the bluegill have been confirmed in more than 60% of the surveyed rivers.

Although deterioration in water quality and eutrophication affected ecosystems in the past due to the inflow of household effluent, industrial effluent and pollutants leaking from agricultural land, etc., these problems have improved nationwide.

[Marine and coastal ecosystems]

Coastal areas have been subject to severe environmental stresses such as land reclamation, water pollution, interruption or reduction of the water flow from rivers to estuaries and coastal waters, due to large concentrated populations and many industries. These stresses have caused a decrease in the area of tidal flats, etc. and the deterioration of the environment. Artificial coastlines increased and people were separated from the sea. Although the environmental load in coastal areas was successfully reduced, the nutritional balance was lost and is yet to recover and red tides and anoxic water masses are occurring in some waters. Major outbreaks of jellyfish have caused problems in recent years affecting fisheries and marine ecosystems.

Tidal flats often exist in deeply indented bays and tend to become subject to development. Therefore, the area of tidal flats was significantly reduced by landfilling and draining for land reclamation during the high economic growth period. The area of tidal flats was reduced by more than 40% over the 50 years between 1945 and 1995. The Japanese horseshoe crab and the fiddler crab living in tidal flats have been designated as threatened species and their threatened status is thought to be mainly caused by the deterioration of their habitats. Salt marshes influenced by seawater during high tides are important environments for biodiversity conservation as ecotones between the land and the sea. Threatened species (vascular plants) living in such ecotones are found on the coast of the Seto Inland Sea including the Sea of Suo, the Ariake Sea and Omura Bay.

Artificial coastlines rapidly increased in the 1960s and the 1970s. The length of coastlines where banks, revetments and other protection structures were developed has reached about 10,000 km, accounting for about 30% of the total length of coastlines. The length of natural coastlines which do not have artificial structures on the shorelines had decreased to about 50% of the total length of coastlines by 1998. There are even fewer coasts which have natural hinterland areas behind natural shoreline areas.

Seagrass beds made up of seaweed greatly decreased nationwide because of alterations such as land reclamation and water pollution. It is estimated that the area of sea grass beds, which was about 2,100 km² nationwide in the 1970s, has been reduced by 40% in about 30 years. The rising seawater temperature has been pointed out to be one of the primary causes for the decrease.

The area of coral communities in coral reefs located in the Amami and Ryukyu Islands decreased 4% in about 15 years from the latter half of the 1970s to around 1990. It is said that though the rate of coral cover in the Amami and Ryukyu Islands was almost 100% in the 1970s, about 60% of coral communities around 1990 had coral cover rates of less than 5%, and about 90% had coral cover rates of less than 50 %. Therefore, coral cover is generally shown to be at low levels. Primary factors which have been pointed out to have caused the deterioration in the quantity and quality of reef forming corals include the inflow of red soil (red soil run off from land), feeding damage by crown of thorns starfish and coral bleaching, in addition to development such as land reclamation. Around the Amami and Ryukyu Islands, there were outbreaks of the crown of thorns starfish in the 1970s, the 1980s and in the 2000s, which caused major damage. As a phenomenon which has been pointed out to be related to global warming, coral bleaching has been seen since the 1980s due to abnormally high water temperatures. In addition, it is predicted that ocean acidification affects the survival of organisms which form calcium carbonate skeletons and shells such as reef forming corals.

The development and alteration of coastal areas are affecting fishery resources. For example, the clam catch from tidal flats peaked in the 1960s and then rapidly decreased. The catch in recent years has dropped to about 3% of the peak period. In the Seto Inland Sea, there are indications that the disappearance of sandbanks caused by sea gravel extraction in the past may have led to a decrease in the population of the Japanese sand lance which is a cornerstone species in the food chain.

When looking at the ocean as a whole, the ecosystems are also affected by waste and harmful chemical substances emitted from various countries' territorial land as well as oil leaking from vessels.

[Island ecosystems]

Island ecosystems, including the Nansei Islands which were repeatedly connected with and separated from the continent and the Ogasawara Islands which are isolated oceanic islands, have characteristic biotas containing many endemic species. On each island, unique ecosystems have formed in a small area, based on delicate balances. Therefore, they have vulnerable ecosystems with easily destroyed habitats of wild animals and plants which tend to be affected by invasion of alien species.

On the Nansei Islands, endemic species account for 73% of mammals, 66% of reptiles and 79% of amphibians which live on the island (the percentages are based on the number of species and subspecies). On the Ogasawara Islands, 94% of land snails and 37% of plants inhabiting the islands are endemic species (the percentages are based on the number of species and subspecies).

According to the Red List of the Ministry of the Environment, out of all the endemic species (including subspecies) on the Nansei Islands, 71% of mammals, 44% of reptiles and 47% of amphibians are considered to be threatened species. Out of all the endemic species on the Ogasawara Islands, 42% of land snails and 60% of plants are considered to be threatened species. “Developments,” “alien species” and “capture and gathering” can be considered as main causes for the decreases.

When looking at land use in Okinawa, 77 km² of forests were converted to agricultural land or urban districts in about three decades starting from the 1970s. These developments are thought to have caused the shrinkage and fragmentation of habitats. On islands where unique ecosystems have developed in isolated environments, endemic species such as the Amami rabbit, the Okinawa rail and the Kuroiwa's ground gecko are seriously affected by the mongoose which is an invasive alien species, that preys on these endemic animals. In addition, the effects of escaped or abandoned pets and livestock are becoming serious including the predation of rare species by feral cats, vegetation destruction by feral goats and the predation of seabirds by the black rat. Gathering and capture for ornamental purposes are also a major cause of the population decreases.

4 Impacts of the Great East Japan Earthquake on biodiversity

The natural environment of the Pacific coast in the Tohoku Region was greatly influenced by the Great East Japan Earthquake which occurred in March 2011, because it caused major changes to the topography of the area which provides the foundation for ecosystems. The earthquake caused land subsidence and the tsunami moved vast amounts of soil. The affected area contains many priority areas for biodiversity conservation including some of the 500 Important Wetlands in Japan and Important Bird Areas (IBA).

Although much of the area inundated by the tsunami which occurred after the earthquake was farmland and urban districts, the tsunami also had great impacts on the vegetation in the beach areas including afforested land planted with the Japanese black pine and the Japanese red pine, vegetation in wetlands, rivers, ponds and marshes, secondary grassland and sand-dune plants. Maritime forests were flooded over an area extending about 37 km² along the Pacific coast from Aomori to Chiba. In particular, many of the maritime forests in Iwate, Miyagi and Fukushima were seriously damaged by being washed away, submerged or flattened. Therefore, there were major impacts on the natural environment in the coastal areas. In Takata-matsubara in Iwate, which was designated by the national government as a place of scenic beauty and Rikuchu-Kaigan National Park which had a beautiful stretch of sandy seashore with pine trees, only one tree out of 70,000 miraculously

survived while all the rest were flattened. The tree, which was named the pine tree of hope, unfortunately died in the end. Nebama Beach in Kamaishi City, Iwate was a sandbank extending over about 500 meters and was known as the only habitat of a threatened species Tiger Beetle in Iwate. However, the entire sandbank disappeared after the earthquake.

Tidal flats are distributed in the innermost areas of bays along the ria coastline on the southern part of the Sanriku Coast as well as in Matsushima Bay and Sendai Bay. Many of them were affected by the tsunami. On Nebama Beach mentioned above, tidal flats behind the sandbank have disappeared. On the Gamo Tidal Flats in Miyagi, the lagoons were buried in soil right after the earthquake and its topography is still changing greatly. The composition of species living on some tidal flats has changed significantly due to the changes in topography and the bottom materials in tidal flats in coastal areas.

Much of the eel grass and other seaweeds which grow on the sands in neritic areas have disappeared or had their distribution areas reduced due to the impact of the tsunami. On the other hand, some eel grass plants thought to have germinated from seeds after the tsunami were found.

In back swamps along the coastline which were used as agricultural land, the germination of a threatened species *Monochoria korsakowii* from seeds which were dormant in the soil and medaka swimming in shoals have been observed. The earthquake and the tsunami brought about major disasters for human society, but the recovery of the ecosystems is seen in back swamps which are maintained or created through minor and major disturbances.

The ecosystems are still changing and it is necessary to continue careful monitoring, including the monitoring of whether or not the ecosystems which have undergone major changes will recover.

Large amounts of radioactive materials which were released into the atmosphere and the ocean as a result of the accident at the Fukushima Daiichi Nuclear Power Station pose a concern for the impacts on wild animals and plants. For example, ingestion and shipment of the meat of wild boars and Sika deer were stopped in some areas because radioactive materials were detected in the meat of captured wild boars and Sika deer. Increases in radioactive materials contained in sea-bottom soil have been confirmed on the coast.

There are only limited cases worldwide where large amounts of radioactive materials were released into the natural environment and findings about the impact of radioactive materials on wild animals and plants is limited. Therefore, it has been pointed out that efforts need to be made to understand the impacts of radiation on wildlife. It has also been pointed out that efforts should be made to understand the effects of changes in the relationships between humans and nature in the areas around the Fukushima Daiichi Nuclear Power Station on wildlife habitation and ecosystems.

Section 5 The current status for the conservation of biodiversity and the sustainable use of its components

1 Overview of the legal system for the conservation of biodiversity and the sustainable use of its components

As shown in the table below, the Japanese legal system for the conservation of biodiversity and the sustainable use of its components covers a wide range of fields. It is important that laws constituting the legal system operate effectively in a coordinated manner under the Basic Act on Biodiversity which was put into force in 2008 and the national biodiversity strategy has the role of setting forth the basic policy for the effective operation of the legal system.

For example, in response to the formulation of the 2nd National Biodiversity Strategy of Japan in 2002, the Law for the Promotion of Nature Restoration was established with the aim of restoring nature which has been lost in the past. In addition, as a measure to control the third crisis, the Invasive Alien Species Act was established in 2004 in order to prevent damage to ecosystems, etc. by alien species. Therefore, the legal system for biodiversity has been fleshed out in line with the general direction set forth by the national biodiversity strategy.

The legal system for biodiversity contains various types of systems including: ones that contribute to the conservation of the natural environment through area designation and conduct restriction; ones that contribute to the appropriate conservation and management of national land; ones that regulate the handling of individual wild organisms; ones stipulating procedures which contribute to avoidance and reduction of environmental impacts; ones that regulate human activities with no specification of the area; and ones facilitating actions which contribute to the conservation of biodiversity and the sustainable use of its components.

In order to promote the conservation of biodiversity and the sustainable use of its components and to achieve a society in harmony with nature based on Article 2 of the Supplementary Provisions in the Basic Act on Biodiversity, it is necessary to continue examining progress in the enforcement of laws concerning the conservation of biodiversity and necessary measures should be taken based on the examination results.

Table) Main laws related to biodiversity

Classification	Name of the law
General	Basic Environment Law
	Basic Act on Biodiversity
National land use	National Land Use Planning Law
	National Spatial Planning Act
Conservation of the natural environment and landscape	Natural Parks Law
	Nature Conservation Law
	Law for the Promotion of Nature Restoration
	Landscape Act
	Act on the Promotion of Activities for Biodiversity Conservation through the Cooperation among Regional Diversified Actors (Act on the Promotion of Regional Cooperation for Biodiversity)

Conservation and use of various ecosystems	Forest ecosystems	Forest and Forestry Basic Act
		Forest Law
		Act Concerning Utilization of National Forest
	Agricultural land ecosystems	Food, Agriculture and Rural Areas Basic Act
		Agricultural Land Act
		Land Improvement Act
		Law for the Improvement of the Agricultural Development Area
		Act on Promotion of Organic Agriculture
		Act on Special Measures for Prevention of Damage Related to Agriculture, Forestry and Fisheries Caused by Wildlife
	Urban ecosystems	City Parks Law
		City Green Zone Conservation Law
		City Planning Law
		Law for the Conservation of Green Belts around the National Capital Region
		Law for the Development of Conservation Areas in Kinki Region
		Law Concerning Special Measures for the Preservation of Ancient Cities
		Law Concerning Preservation of Trees for Conservation of Scenic Beauty of City
	Inland water ecosystems	River Act
		Water Pollution Control Act
		Act on Special Measures concerning Conservation of Lake Water Quality
		Erosion Control Act
	Marine and coastal ecosystems *Inland water ecosystems are also subject to the law.	Basic Act on Ocean Policy
		Fisheries Basic Act*
		Fishery Act*
		Act on the Protection of Fishery Resources*
		Act on Development of Fishing Ports and Grounds
		Seacoast Law
		Port and Harbor Act
		Act on Prevention of Marine Pollution and Maritime Disaster
		Interim Law for Conservation of the Environment of the Seto Inland Sea
		Act on Special Measures concerning Rejuvenation of Ariake Sea and Yatsushiro Sea
		Act for the Promotion of the Clearing of Coastal Drifting Debris
		Act on Preservation and Control of Living Marine Resources
		Marine Resources Development Promotion Act
	Island ecosystems	Remote Islands Development Act
		Act on Special Measures for the Amami Islands Promotion and Development
		Act on Special Measures for the Ogasawara Islands Development
		Act on Special Measures for the Promotion and Development of Okinawa
Protection and management of wildlife		Wildlife Protection and Hunting Management Law
		Law for the Conservation of Endangered Species of Wild Fauna and

	Flora
	Invasive Alien Species Act
	Law concerning the Conservation and Sustainable Use of Biological Diversity through Regulation on the Use of Living Modified Organisms (Cartagena Law)
	Act on Welfare and Management of Animals
Prevention of impacts of chemical substances on biodiversity	Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.
	Agricultural Chemicals Regulation Law
	Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof
Others	Environmental Impact Assessment Act
	Act on the Promotion of Environmental Conservation Activities through Environmental Education, etc. (Environmental Education Promotion Act)
	Act on the Promotion of Business Activities with Environmental Consideration by Specified Corporations, etc., by Facilitating Access to Environmental Information, and Other Measures (Environmental Consideration Promotion Act)
	Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities (Green Purchasing Act)
	Act on the Promotion of Ecotourism
	Tourism-based Country Promotion Basic Act
	Law for the Protection of Cultural Properties
	Act on Protection of the Environment in Antarctica
	Fundamental Law for the Promotion of Utilization of Biomass
	Factory Location Act

2 Overview of area designation systems for the conservation of biodiversity

Article 14 of the Basic Act on Biodiversity requires that areas that are found to be important in terms of conservation of biodiversity shall be conserved. The conservation of biodiversity should be conducted centering the conservation within respective wildlife habitats. In Japan, efforts are being made to conserve biodiversity through the following measures based on various laws related to the conservation of the natural environment: making various area designations and appropriately managing the designated areas by considering the conservation of biodiversity as well as securing the continuity of wildlife habitats by considering networks of ecosystems. The types of areas designated under the area designation systems include: Nature Conservation Areas based on the Nature Conservation Law; natural parks based on the Natural Parks Law, Wildlife Protection Areas based on the Wildlife Protection and Hunting Management Law; and Natural Habitat Conservation Areas based on the Species Conservation Act. Designated areas for forests include: protection forests based on the Forest Law; and forest reserves and green corridors based on the Act Concerning Utilization of National Forest. For urban areas, special green space conservation districts are designated based on the City Green Zone Conservation Law.

There are also areas protected internationally, including Ramsar Sites registered under the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (the Ramsar Convention) and world heritage sites registered under the Convention concerning the Protection of

the World Cultural and Natural Heritage (the World Heritage Convention). Protection of these areas contributes to the conservation of internationally important natural environments.

At COP 10, the target that “By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas are conserved through systems of protected areas and other effective area-based conservation measures” was adopted as one of the headline targets in the Aichi Biodiversity Targets.

Japanese area designation systems include those directly aiming at nature conservation and those that contribute to nature conservation through conduct restrictions. Designated areas which come under the former category include Nature Conservation Areas, natural parks, Wildlife Protection Areas, Natural Habitat Conservation Areas, forest reserves and green corridors in national forest. It is necessary for Japan to clarify which areas come under the definition of “terrestrial and inland water areas” among protected areas which were mentioned in the Aichi Targets. Among the areas designated by directly aiming at nature conservation, natural parks play a particularly important role in the conservation of biodiversity. The total area of natural parks was 5.43 million hectares as of September 2012, including National Parks, Quasi-National Parks and Prefectural Nature Parks, accounting for about 14.4% of the Japan’s total land area. In natural parks, there are special zones that require permission for development. These special areas cover an area of 1.51 million hectares in National Parks, 1.27 million hectares in Quasi-National Parks and 0.72 million hectares in Prefectural Nature Parks, accounting for about 9.3% of Japan’s total land area. Wildlife Protection Areas consist of National Wildlife Protection Areas and Prefectural Wildlife Protection Areas. As of September 2012, the total area of Wildlife Protection Areas was 3.64 million hectares, covering about 9.6% of Japan’s total land area, but the total area of special protection zones that require permission for development as well as permission for the capture of wildlife was 0.31 million hectares, which accounted for about 0.8% of Japan’s total land area. With respect to Nature Conservation Areas, the total area of Wilderness Areas, Nature Conservation Areas and Prefectural Wildlife Protection Areas was 100,000 hectares as of September 2012. There were also nine Natural Habitat Conservation Areas totaling 885 hectares as of September 2012. National forest serves a central role in ecological networks as they account for 20% of the national land area and are widely distributed in areas important for national land protection such as up-country mountain backbones and catchment areas. National forest which has particularly primeval forest ecosystems and national forest inhabited by rare animals and plants are specified as forest reserves such as forest ecosystem reserves which are left to succession without human intervention in principle. There are 840 forest reserves as of April 2012 totaling 900,000 hectares, which accounts for a little over 10% of the total area of national forest. Green corridors have also been established in order to secure migration routes between the habitats of wild animals and plants centering on forest reserves. The total area of green corridors was 590,000 hectares as of April 2012.

In urban areas, 2,293 hectares of land had been designated as special green space conservation districts as of March 2011 under the City Green Zone Conservation Law. 97,330 hectares were designated as Suburban Green Conservation Areas based on the Law for the Conservation of Green Belts around the National Capital Region and the Law for the Development of Conservation Areas in Kinki Region, of which 3,516 hectares were designated as Suburban Special Green Conservation Areas. In addition, 118,056 hectares of urban parks, etc. have been developed as of March 2011 based on the City Parks Law. Thus the conservation and creation of green spaces which provide precious habitats for organisms are progressing in urban areas.

In 2001, a questionnaire survey and other surveys were conducted for researchers and prefectural governments nationwide in order to identify and summarize information on ecosystems which are worth noting in terms of biological characteristics such as natural vegetation and faunas. As a result, 396 areas were identified as areas which have a wide distribution of important vegetation, such as Yezo spruce and Sakhalin fir forests in the eastern part of Hokkaido, beech forests in the northern part of Honshu and *Castanopsis sieboldii* forests on the Pacific seaboard in the central part of Honshu. A little over 40% of these important areas are protected under the area designation systems which directly aim at nature conservation (i.e. being designated as Wilderness Areas, Nature Conservation Areas, National Parks, Quasi-National Parks, Prefectural Nature Parks, National or Prefectural Wildlife Protection Areas, forest reserves such as forest ecosystem reserves, etc.).

With respect to coastal and marine areas, 40-50% of the total area of seagrass beds and coral reefs are protected under the area designation systems, but most of them are in loosely controlled “ordinary zones” of National or Quasi-National Parks. Only about 10% of the total area of tidal flats is protected under the area designation systems. Since neritic areas such as tidal flats, seagrass beds and coral reefs are important areas for the conservation of biodiversity, further promotion of the conservation of these areas is needed. In the Marine Biodiversity Conservation Strategy formulated in March 2011, marine protected areas were defined as “marine areas designated and managed by law or other effective means, in consideration of use modalities, aimed at the conservation of marine biodiversity supporting the sound structure and function of marine ecosystems and ensuring the sustainable use of marine ecosystem services.” The definition was acknowledged by the Headquarters for Ocean Policy in May 2011. According to the estimation made for the meeting of the Headquarters for Ocean Policy, marine protected areas as defined above accounted for about 8.3% of the closed sea and the exclusive economic zone (EEZ) of Japan. These marine protected areas are designated under various systems including ones that regulate development in order to conserve habitats and ones that mainly aim at the sustainable use of resources. Therefore, it is necessary to conduct appropriate conservation and management by effectively combining these systems. In addition, it is important to consider standards and methods for evaluating the effects of marine protected areas from the biodiversity standpoint and therefore the promotion of research for this purpose is also necessary.

Based on the purposes of the CBD and the Basic Act on Biodiversity, the Japanese government has been promoting the designation of conservation areas under various area designation systems, as well as improving the systems and conducting activities in national forest which set an example for conservation efforts. It revised the National Park Act and the Nature Conservation Law in 2009, and strengthened conservation measures for National Parks, etc. including the expansion of marine protection systems and the improvement of ecosystem management. In response to changes in the natural environment, social circumstances and the diversification of appreciation of landscapes, the government conducted a comprehensive check of the quality of National and Quasi-National Parks and it published its results in the Report on the Comprehensive Check of National and Quasi-National Parks in October 2010. As a result of the comprehensive check, 18 areas were selected as candidates for new designation as National or Quasi-National Parks or the major expansion of existing parks, including the Amami Islands in Kagoshima and the Yanbaru area in Okinawa. In national forests, various conservation efforts are being made including the development of ecological networks by establishing green corridors and forest reserves which protect precious forest ecosystems around which biodiversity develops, as well as creating forests which reflect local characteristics. In March 2011, the Technical Guidance for Conservation of Biodiversity in Basic Plans on Greenery was formulated in order to secure biodiversity through the creation of ecological networks by connecting vegetated areas in the city.

3 Efforts for the Conservation and Management of Wildlife

Efforts are being made for the conservation and management of wildlife, including the conservation of threatened wildlife species, the protection and management of birds and mammals, and measures to control alien species.

The Law for the Conservation of Endangered Species of Wild Fauna and Flora aims to conserve threatened wild animal and plant species through controlling the capture and transfer of rare species, designating Natural Habitat Conservation Areas and implementing the Conservation Programmes defined by the law. Rare designated wild animal and plant species in Japan whose capture and transfer are controlled under the Law for the Conservation of Endangered Species of Wild Fauna and Flora were only 90 species as of September 2012, including five mammal species, 38 bird species, one reptile species, one amphibian species, four brackish/freshwater fish species, 15 insect species and 26 plant species. Some local governments are taking independent conservation measures for threatened species based on local government ordinances, etc. 31 prefectures have established rare species protection ordinances and designated 457 rare wild animal and plant species in total as of October 2011.

Plans for the Conservation Programmes defined by the law have been formulated and the programs are being implemented for the development of habitats and the breeding of populations for 48 species of rare wild animals and plants found in Japan, under the Law for the Conservation of Endangered Species of Wild Fauna and Flora. Regarding the crested ibis, the last five birds were captured on Sado Island, Niigata in 1981 and the species became extinct in the wild in Japan. Birds were then provided from China, which were successfully bred in captivity, leading to a steadily increasing population. After habitats were developed and community involvement progressed with the aim of returning the birds to the wild, bird releases started in 2008. Birds have been released into the wild six times so far. The birth of ibis chicks was detected in April 2012, for the first time after the release of birds, and young birds were observed to have fledged in the wild in May of the same year, for the first time in Japan for 38 years. Thus steady efforts are being made towards returning the ibis to the wild. The short-tailed albatross were overexploited on a large scale for their feathers and were thought to have become extinct, but about 10 of them were found to have survived on Tori Island in the Izu Islands in 1951. Thanks to vigorous protection activities by experts and others since then, it has been estimated that the population has recovered to about 3,000. Since 2008, the Yamashina Institute for Ornithology and others have been conducting a project to send chicks to Muko Island in the Ogasawara Islands where they are artificially fed and fledged, in order to create a new breeding ground. In 2011, young birds which fledged out the nest on Muko Island were observed to have returned to the island for the first time. Thus artificial population recovery efforts for the species are progressing.

The Law for the Conservation of Endangered Species of Wild Fauna and Flora designates endangered wild animal and plant species which shall be conserved through international cooperation as “international endangered species of wild fauna and flora” and controls their trade within the country.

Regarding the mammals and birds that are causing serious damage to ecosystems and agricultural, forestry and fishery industries, the Basic Guideline for Implementation of Wildlife Conservation Project formulated based on the Wildlife Protection and Hunting Management Law was revised in September 2011, from the following standpoints: emphasizing the conservation of biodiversity; promoting the protection and management of specified wildlife; vigorously promoting measures to

control infectious diseases such as avian influenza; etc. In the revision, measures for wildlife protection and management were strengthened by securing personnel and promoting community activities. For example, those who do not have a hunting license were allowed to participate in the capture of wildlife using traps, nets, etc. under the supervision of licensees in all local government jurisdictions in Japan, because this measure had proven to be an effective measure in special deregulation zones.

IAS have been designated under the Invasive Alien Species Act and their importation, rearing, etc. are controlled. The number of designated IAS as of September 2012 is 105, including: 21 mammal species, four bird species, 16 reptile species, 11 amphibian species, 13 fish species, 10 spider species, five crustacean species, eight insect species, 12 plant species and five molluscan and other species. As measures for areas important for the conservation of biodiversity in Japan such as the habitats of rare species and National Parks, mongoose control projects are conducted in Amami-oshima Island and the Yanbaru area in the northern part of Okinawa Island and green anole control projects are conducted on the Ogasawara Islands. As measures to control IAS which have been established over large areas, model control projects are conducted for the raccoon, the largemouth bass, the Argentine ant and others. In mongoose control projects, capture using traps was started on Amami-oshima Island in 2000 and in the Yanbaru area on Okinawa Island in 2001. Since the number of captured animals per unit of capturing effort is becoming smaller every year, it is thought that the population density of the mongoose is becoming lower. As a result, recovering trends in the population of the Amami spiny rat, the Ryukyu long-furred rat, the Okinawa rail, etc. have been confirmed.

4 Reconstruction Efforts after the Great East Japan Earthquake

The great force of nature brought by the earthquake and tsunami in the Great East Japan Earthquake which occurred in March 2011 caused devastating damage to the lives and livelihoods of people particularly on the Pacific coast in the Tohoku Region. This was an opportunity to recognize once again that nature which provides us with plentiful benefits also becomes a threat on occasion.

The Basic Guidelines for Reconstruction in response to the Great East Japan Earthquake formulated by the Reconstruction Headquarters in response to the Great East Japan Earthquake set forth the following measures: considering the reorganization of existing natural parks such as Rikuchu Kaigan National Park into Sanriku Fukko (Reconstruction) National Park; implementing various projects including promotion of ecotourism; the realization of a society in harmony with nature through nature restoration; conducting studies on the current situation of the natural environment as well as monitoring; the utilization of disaster-prevention forests based on the concept of disaster reduction; among others. Efforts for reconstruction are being made based on the basic guidelines.

The Ministry of the Environment, in response to the publication of the Direction for the Reconstruction of the Sanriku Area Using Natural Parks, etc. by the Nature Conservation Committee of the Central Environment Council in March 2012, compiled the Vision for Green Reconstruction Centered around the Establishment of a Sanriku Fukko (Reconstruction) National Park. The vision set forth the implementation of seven projects (green reconstruction projects) shown below in cooperation and collaboration with various parties.

<Green reconstruction projects>

- (1) The establishment of Sanriku Fukko (Reconstruction) National Park (restructuring of natural parks)

- (2) The development of Satoyama and Satoumi field museums and related facilities
- (3) Tours for enjoying nature in depth using local treasures (reconstruction ecotourism)
- (4) A trail which connects north and south to deepen exchanges (the Tohoku coastal trail)
- (5) The restoration of connections between forests, rural communities, rivers and the sea
- (6) The promotion of education for sustainable development (ESD)
- (7) Understanding the impacts of the earthquake and the tsunami on the natural environment (natural environment monitoring)

The commission on the restoration of coastal disaster prevention forests of the Forestry Agency created technical guidelines for restoring coastal disaster prevention forests on the Pacific coast (over about 140 km) which were seriously damaged by the tsunami and restoration projects have started on parts of the forests. The Fisheries Agency formulated a master plan for the reconstruction of fisheries immediately after the earthquake and is implementing various policies and measures including the removal of debris in line with a new basic plan for fisheries created based on the master plan. The Ministry of Land, Infrastructure, Transport and Tourism formulated the Technical Guidelines for the Development of Parks and Other Green Areas for Reconstruction after the Great East Japan Earthquake which would contribute to the development of parks and other green areas which takes ecosystems into consideration. The ministry is supporting restoration and reconstruction efforts by local governments. The Ministry of Education, Culture, Sports, Science and Technology will conduct a project called Tohoku Ecosystem-Associated Marine Sciences where universities and research institutes from around Japan will work together to clarify the mechanisms for changes in marine ecosystems off the Sanriku coast which was affected by the tsunami. Through the project, it will conduct continuous surveys and research into marine ecosystems.

After the Great East Japan Earthquake, large quantities of radioactive materials derived from the Fukushima Daiichi Nuclear Power Station were dispersed into the environment in addition to damage caused by the earthquake and the tsunami. Although the effects of radioactive materials on ecosystems and wild animals and plants are currently unknown, analysis is being carried out in cooperation with related research institutes by collecting samples such as plant seeds and rats in order to understand their effects.

Many pets were left behind in the exclusion zone around the power station. Support is being provided for relief efforts for affected pets with the cooperation of related organizations including local governments and the Emergency Disaster Animal Relief Headquarters (consisting of the Japan Society for the Prevention of Cruelty to Animals, the Japan Animal Welfare Society, the Japan Pet Care Association and the Japan Veterinary Medical Association).

Section 6 Challenges towards the conservation of biodiversity and the sustainable use of its components

In Japan, nature has provided abundant benefits while at the same time posing a violent threat to people. Japanese people have had awe and respect for nature, adapted to nature and cultivated the wisdom and belief that living with nature is preferable to confronting it. However, in recent years we have been losing our awe, respect, traditional wisdom and beliefs about nature. Witnessing the devastating calamity caused by the large-scale tsunami which accompanied the Great East Japan Earthquake of March 2011, we were reminded of the two opposing characteristics of nature: a provider of plentiful benefits and a threat to people. We recognized once again that we need to live with nature with the two opposing characteristics and also the importance of the connection between people as well as the connection within and between local communities. We must take this experience as an opportunity to work towards the establishment of a society in harmony with nature.

In this section, the future challenges for the conservation of biodiversity and the sustainable use of its components are summarized into the five points shown below, in light of the above-mentioned recognition concerning the Great East Japan Earthquake and the current situation of biodiversity explained above.

- 1 Understanding of and action for biodiversity
- 2 Securing human resources and cooperation
- 3 Recognition of the “socio-ecological sphere” connected through ecosystem services
- 4 Conservation and management of national land in light of the decreasing population, etc.
- 5 Increasing scientific knowledge

1 Understanding of and action for biodiversity

According to a poll conducted by the Cabinet Office in 2009, those who knew the meaning of “biodiversity” accounted for 13%. The number reached 36% when adding those who had heard of the word “biodiversity.” In the same survey conducted in 2012, the numbers significantly increased to 19% and 56% respectively, thus the degree of recognition about biodiversity is thought to have increased in a short period of time thanks to COP 10. In addition to knowing the word and having knowledge of biodiversity, it is necessary to understand, through experiencing nature first-hand, the fact that humans are part of nature and we live on the benefits from biodiversity and to deepen our understanding of what a society in harmony with nature is. However, nowadays, the number of children and young people who have hardly experienced nature is increasing as they have fewer opportunities for swimming in the sea or rivers, catching insects, camping outdoors, etc. As symbolized by “Cool Biz” campaigns, efforts to curb global warming have been implemented as national campaigns to encourage specific actions to reduce CO2 emissions in offices and at home, for example. However, efforts to conserve biodiversity have not become mainstream activities in society unlike activities to curb global warming. The results of the Environment-Friendly Business Behavior Survey conducted by the Ministry of the Environment in FY2010 show that only about 30% of the companies replied that they “have an established policy” or they “are conducting activities” (or both) concerning biodiversity conservation, while over 90% of the companies replied that they “have an established policy” or they “are conducting activities” (or both) concerning efforts to curb global warming. The number of companies which make biodiversity conservation efforts is on the increase when looking at the year-by-year figures, but it is not enough when compared to companies making efforts to curb global warming. In light of this situation, the

challenge is to “mainstream biodiversity.” Such efforts will include promoting the understanding of biodiversity through first-hand experience, having national campaigns to promote efforts towards the conservation and sustainable use of biodiversity and creating social systems and lifestyles which are biodiversity-conscious, in addition to promoting efforts to curb biodiversity crises.

2 Securing human resources and cooperation

Although efforts for the conservation of biodiversity and the sustainable use of its components are progressing in various parts of Japan such as efforts to restore nature, the conservation of satoyama landscapes and the control of alien species, they are limited to individual and isolated efforts in various areas and uncoordinated efforts by individual parties. Therefore, the future challenge is to promote cross-sectional efforts covering larger geographical areas and various fields. In order to achieve successful biodiversity conservation activities, long-term and continuous efforts are important. However, there may be cases where continuous efforts become difficult if the activities rely on the efforts of individuals and specific groups. Therefore, it is also important to structure systems to ensure continuous activities, such as the development of frameworks for activities within local communities and the creation of national networks through the cooperation and collaboration between different parties. Another problem is the shortages of personnel who can provide education and conduct surveys and research locally on the conservation of biodiversity, the protection and management of wildlife, the maintenance and recovery of ecosystems and biodiversity in general. For example, the population of hunters, who are important contributors to the protection and management of wildlife, decreased from about 530,000 in FY1970 to about 180,000 in FY2009. The aging of the population is also progressing. As for school education, it is necessary to develop human resources who fully understand biodiversity and can teach at school and in community by utilizing the new designated Courses of Study for Elementary Schools, Junior High Schools and Senior High Schools in which guidelines on biodiversity education have been improved. In addition to promoting human resources who can be involved in the conservation of biodiversity and the sustainable use of its components, it is also important to increase fields and opportunities where those who have expertise and technical skills can fully utilize their abilities.

3 Recognition of the “socio-ecological sphere” connected through ecosystem services

The Great East Japan Earthquake exposed the vulnerability of socio-economic systems where the production and distribution of energy and goods are extremely centralized. Therefore, it is necessary to aim for the establishment of independent and distributed local communities where local resources including food and energy are produced for local consumption and local resources are recycled and utilized sustainably within local areas. While prioritizing the establishment of independent and distributed local communities, for problems which cannot be solved at the local level, it is also necessary to find solutions from larger-area perspectives including solutions at the national and international levels. Although ecosystem services are mainly provided by rural areas which are rich in nature, larger areas including cities benefit from ecosystem services. For example, through the appropriate management of forests in upstream areas, those living in downstream areas of the same basin can also benefit from ecosystem services provided by the forests, such as the prevention of soil erosion and water conservation. However, since these connections are generally difficult to recognize, urban areas have benefited from ecosystem services provided by rural areas without being burdened with major costs. Therefore, there is a need to revise such relationships and create mutual support systems through which the funds, human resources and information possessed by cities are supplied to rural areas. A future challenge is to collectively recognize the rural and urban areas which have supply-demand relationships for ecosystem services as a “socio-ecological

sphere” and to deepen cooperation and exchanges within the sphere by for example connecting producers and consumers. Further, considering the fact that Japanese people rely on ecosystem services from overseas as mentioned in Section 1, the idea of a socio-ecological sphere can be expanded to include overseas areas, where the same relationship as the one between urban and rural areas can be found between Japan and resource producing countries. Therefore, it is necessary to recognize the connections between suppliers and beneficiaries of ecosystem services at the national and international levels, and to establish mutual support relationships through the supply of services and the abrogation of shortages at each level.

4 Conservation and management of national land in light of the decreasing population, etc.

Much of the landscape and nature surrounding us has resulted from various human interventions needed in different periods in history which created cities and rural districts. These land developments have made our lives better, but some of them prioritized measures to cope with rapid economic growth and population increases. When looking back, we notice a need for improvements to the results of some developments from the standpoint of biodiversity and disaster prevention. As shown in Section 3, Japan has lost a large portion of its biodiversity due to the rapid changes made during the post-war high economic growth period. As a result of past population increases, residential areas expanded onto land which is vulnerable to natural disasters and ensuring the safety of these areas required costly infrastructural development. According to Japanese population estimates for the future published in January 2012, the population in 2060 is predicted to be 86,740,000 (while the population as of 2010 was 128,050,000). The arrival of an era where having a smaller population will allow us to use national land more flexibly may be an opportunity to reestablish a more appropriate relationship between people and the land. With this backdrop, it is necessary to picture the future of national land through determining land use comprehensively. For example, land which will no longer be inhabited by people and difficult to properly manage may need to be left to succession so that it will return to forest. With respect to satoyama landscapes, it will be necessary to consider suitable conservation and management directions with the understanding that it will be difficult to conserve all the existing satoyama landscapes when social structures are changing and depopulation progresses. For example, specific areas which are valued by local communities can be chosen and the conservation of these areas can be prioritized through their own efforts. In addition to restoring the connection between fragmented natural environments on national land, it is also necessary to create ecological networks internationally centering on Asia since biodiversity in our country has deep connections with other parts of the world, particularly Asia. In the time when efforts to restructure the land use in Japan is emerging, it is also important from the global biodiversity standpoint to aim at developing national land which is designed to promote local circulation and sustainable use of materials while taking into consideration the ecosystem service connection based on the above-mentioned idea of the “socio-ecological sphere,” because such efforts in Japan can contribute to reducing our impacts on biodiversity overseas.

5 Increasing scientific knowledge

One of the problems stopping the spread of actions for the conservation of biodiversity and the sustainable use of its components is the lack of a full understanding of the current situation of biodiversity and a lack of evaluations based on scientific knowledge. Regarding information about biodiversity at the national level, there have been several continuous studies including the National Survey on the Natural Environment which has been conducted since 1973. In order to understand chronological changes, it is important to continue these surveys employing a consistent

methodology. It is also important for museums, etc. in each local area to accumulate materials such as biological specimens and literature as the basic biodiversity data. Various parties including the national government, local governments, research institutes, museums, NGOs, NPOs, experts and citizens possess various types of information about the national-level through to local-level biodiversity obtained through their surveys and research. There is a need to provide such information in readily usable formats to each other and utilize them for each party's activities as well as state policies and measures. There is a shortage of comprehensive analyses from both natural and social scientific standpoints and research into options for measures and their expected effects. Therefore, there is not enough information to facilitate decision making and consensus building, for example clear estimated costs and effects of actions and options for future actions which various parties can take. We will need to utilize more scientific knowledge and data in future policies and specific measures.

Chapter 3 Targets for the Conservation of Biodiversity and the Sustainable Use of Its Components

This chapter describes the targets to be achieved against the backdrop of the importance of biodiversity and its rationales explained in Chapter 1 and in response to the current situation and the challenges summarized in Chapter 2.

First of all, Section 1 sets forth the long-term target (to be achieved by 2050) and the short-term target (to be achieved by 2020) as the Japanese targets for the conservation of biodiversity and the sustainable use of its components. In addition, in order to restore already lost ecosystems, it is also important to take action from a very long-term perspective (100 years) although the time needed to restore a lost ecosystem depends on the type of ecosystem. From this standpoint, Section 2 sets forth a “grand design for national land in a society in harmony with nature” as a target vision to be achieved in 100 years time, along with specific descriptions for a desirable future.

Section 1 Japanese targets

The National Biodiversity Strategy of Japan 2010 decided by the Cabinet in March 2010 set forth the Japanese medium- to long-term target for 2050 and short-term target for 2020. The Tenth Meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10) held in October 2010 adopted the Strategic Plan for Biodiversity 2011-2020 which set forth the Vision with the target year of 2050 and the Mission with the target year of 2020. Therefore, in light of the target years and the targets set forth in the Strategic Plan for Biodiversity 2011-2020, the National Biodiversity Strategy of Japan 2012-2020 sets forth the long-term target for 2050 and the short-term target for 2020, as Japanese targets for the conservation of biodiversity and the sustainable use of its components. The Japanese national targets towards the achievement of the Aichi Biodiversity Targets are provided in Part 2.

[Long-term target (2050)]

Through the maintenance and recovery of biodiversity and the sustainable use of its components, the current biodiversity in Japan will be enriched further and a society in harmony with nature will be achieved where humans can benefit from ecosystem services into the future.

[Short-term target (2020)]

In order to halt the loss of biodiversity, effective and urgent action will be taken with the aim of achieving the Japanese national targets towards the achievement of the Aichi Biodiversity Targets.

Section 2 Grand design for national land in a society in harmony with nature

1 Basic approaches set forth in the “Centennial Plan”

The Meiji Shrine forest, where a rich forest ecosystem can now be seen, used to be neglected land with no forest on it. One hundred years ago, people envisioned the creation of the forest we see today and worked towards the development of the forest so that it would grow into a rich mature forest over the next 100 years. As can be seen in this example, in order to conserve biodiversity and sustainably use its components, it is important to consider actions from a long-term perspective (at least 100 years). This is because it takes time for natural ecosystems to establish themselves by, for example, undergoing repeated processes of disturbances and recovery, or responding to artificially induced environmental changes by losing their components, deteriorating, adapting or recovering.

Therefore, a grand design for national land in a society in harmony with nature is provided below as a forward-looking (100-year level) vision to be shared by society, so that various parties engaged in the conservation of biodiversity and the sustainable use of its components can make efforts from a long-term perspective. It is also necessary to implement individual efforts by considering the fact that the time scale for recovery is different for different ecosystems and for different areas.

Firstly, the basic approaches for creating a “grand design for national land in a society in harmony with nature” for 100 years into the future are explained in the “Centennial Plan” below.

“Centennial Plan”

- (1) With the recognition of the benefits and threats derived from nature, ecosystems on national land, which have been damaged or destroyed over the past 100 years with the increasing population, shall be restored in the next 100 years when the population will decrease, by greatly changing human involvement in nature and conserving areas that are found to be important for biodiversity conservation. That means a shift from the unilateral exploitation of natural resources and destruction of nature to making positive contributions to nature.
- (2) Local resources shall be utilized to the upmost extent possible in an age where national land can be used more flexibly due to a decrease in the total population for the purpose of achieving autonomous development of local areas through the creation of characteristic and attractive local areas based on endemic nature and culture. The maintenance and development of mutually beneficial relationships between local areas shall be aimed at regarding supply of and demand for ecosystem services.
- (3) National land use reorganization is underway in the face of some areas being unable to maintain the current national land management level due to the decrease and aging of the working population in the primary sector, and in the face of conversion to intensive urban structures and increased investment in the maintenance/updating of social infrastructure. In implementing such national land use reorganization, ecological land management focusing on the development of safe and secure land in harmony with the nature shall be performed, in addition to prioritizing and streamlining the investment needed for national land management.
- (4) Steady improvement of the quality of nature throughout the country shall be aimed at. Since it takes a long period of time for various efforts to become effective, adaptive approaches are essential. In order to address the issues of wildlife damage to agriculture and forestry, the conservation and utilization of Satochi-Satoyama areas, the conservation of Satoumi and the sea in general and the securing of biodiversity in cities, a better balance between humans and nature shall be restored step by step by obtaining a social consensus.
- (5) In order to conduct adaptive conservation and management by flexibly reviewing the efforts and the methods in response to changes in the natural environment and socioeconomic circumstances over 100 years, it will be necessary to have accumulated scientific data which backs up decisions. It will also be necessary to take into consideration the possibility of changes in international social circumstances, changes in people’s awareness and behavior patterns and the possibilities of new biodiversity-related socioeconomic systems and institutional frameworks being implemented.

As a stepping stone towards the realization of the grand design, the main direction for the national policies to be carried out by 2020 is described in “Basic Strategies” in Chapter 4, Section 1 and the

specific policies and measures which were set in line with the basic strategies are described in “Action Plan” in Part 3.

The grand design will not be changed significantly over the 100 years. However, when revising the national biodiversity strategy once every five years or so, the relationship between the grand design and the direction of efforts stated in the basic strategies will be reviewed if the situation at that time requires it. In the review to be conducted in 10 years time, the need for revisions will be considered in accordance with changes in the natural environment and socioeconomic circumstances.

2 The overall picture of the grand design for national land

The overall picture of the “grand design for national land in a society in harmony with nature” is described below.

- (1) The national biodiversity strategy and regional biodiversity strategies will be put in place by focusing on interconnections and hierarchical relationships between various spatial ranges of ecosystems at the global level, the national level, the local level and the watershed level. The strategies should be designed to meet the hierarchical and organic relationships between the spatial ranges of ecosystems as well as enabling the national and local governments to cooperate with each other by assigning appropriate roles to each government level. Based on the strategies, an ecological network that interconnects and appropriately lays out habitats around large protected areas in accordance with the ecological characteristics of each organism will be formed throughout the country. The overall ecological network of the country will be supported by two core elements: water systems including rivers and wetlands that connect forests, agricultural land, cities, coastal areas, etc. on one hand; and vegetated land including green belts along coastal areas and along roads in cities in particular as well as conserved, restored and created vegetation.
- (2) Although some species living on islands and in alpine zones that are vulnerable to the effects of global warming will be at higher risk of extinction, the overall risk of species extinction nationwide will be lowered. This will be achieved by effectively protecting animals and plants with a monitoring system established nationwide, which will lead to the number of species moving to a lower rank on the Red List exceeding the number of species moving to a higher rank on the Red List. There will be no additional expansion of risk posed by alien species because of the following developments: the dependence on overseas natural resources will decrease due to population decreases and effective utilization of domestic resources; the check system for unintended introduction of alien species at the borders will be improved; systematic efforts to control alien species based on set priorities will advance in various parts of Japan; appropriate rearing management for pets, etc. will be thoroughly practiced; and efforts for the eradication of invasive alien species will be made in priority areas for biodiversity conservation.
- (3) Agriculture, forestry and fishery activities as well as the procurement of raw materials by business entities will be performed in sustainable ways in consideration of the impact on biodiversity. Thus more domestic natural resources will be used effectively in a manner consistent with efforts for the conservation of biodiversity such as the protection of locally endemic rare species.

- (4) The development of transboundary ecological networks will progress centering on the Asia-Pacific region, such as the conservation and restoration of wetlands visited by migratory birds and the networking of marine protected areas. The negative impacts on global biodiversity caused by Japan will be reduced by decreasing its dependence on overseas natural resources including the importation of pet animals and progress on the sustainable use of marine resources through international cooperation.
- (5) The conservation of biodiversity and the sustainable use of its components will be incorporated in various social systems, and there will be well-established international cooperation for supporting resource producing countries, economic measures such as aid provided through funds, and philanthropy by business entities. Education on life and nature will become well developed. People will enjoy the richness of biodiversity while voluntarily participating in biodiversity conservation and restoration activities, making contributions to support the activities and selectively purchasing biodiversity-friendly goods and services. Through these actions, people will establish a new lifestyle in a society in harmony with nature.

3 A grand design in accordance with national land characteristics

When viewing the characteristics of the natural environment in Japan at the national land level, Japan is an island arc extending over about 3,000 km from north to south in the middle-latitude area 20 degrees north to 45 degrees north, to the east of the Eurasian Continent. The archipelago is horizontally divided into several different zones. Climate zones range from the subtropical to subarctic zones. Vegetation is mainly classified into subtropical evergreen broad-leaved forests (the Ryukyu Islands and the Ogasawara Islands), warm temperate evergreen broad-leaved forests (the central part of Honshu and southward), cool temperate deciduous broad-leaved forests (from the central part of Honshu to the southern part of Hokkaido) and subalpine evergreen coniferous forests (Hokkaido), from south to north. Alpine plants have been established in areas above the tree line. Japan is divided into several geographical zones in terms of both its flora and fauna. It is also classified by biogeographical borders such as Watase's Line and Blakiston's Line. Biodiversity in Japan has been formed by the platform of nature characterized by the above-mentioned features and many years of nature's activities and human activities accumulated on the platform. In the grand design for national land in a society in harmony with nature, it is necessary to take into consideration the relationships between biotas and human activities while also understanding that the land is classified into several zones based on differences in topography, geology, climate, vegetation and biotas.

Japan's national land is broadly classified into land areas and sea areas. Land areas are further classified into: natural mountain areas; Satochi-Satoyama/rural areas including areas where artificial forests prevail; and urban areas, based on different biotas and human activities. River/wetland areas connect these areas through water systems including river systems.

Sea areas are dominantly affected by land areas. They are divided into coastal areas where the land area and the sea area lying along the coastline should be considered as one incorporated area, and oceanic areas which extend from the offshore waters to the ocean. In island areas, it is desirable to consider the land area and the coastal area as one incorporated area, because an island provides home to various natural environments in a limited space which create unique ecosystems existing in a delicate balance.

Therefore, in the grand design for national land in a society in harmony with nature, national land and sea areas classified into the below-listed seven categories will be considered as the basic units.

It is important to note that, even if some areas are classified into the same area category, they would have local differences in terms of climate, vegetation zones and human activities: for example, areas in the same category in Hokkaido and Okinawa would have different natural environments and different types of agriculture and fisheries. When looking at topography, urban areas situated in a valley and a floodplain have different surrounding environments. Therefore, it is necessary to keep in mind that areas classified into the same category are not the same nationwide and rather have differences derived from natural environments and human activities, when implementing efforts towards the realization of the grand design for national land.

- (1) Natural mountain areas: Areas with relatively high naturalness
- (2) Satochi-Satoyama/rural areas (including areas where artificial forests prevail): Areas located between (1) and (3)
- (3) Urban areas: Areas where human activities are concentrated
- (4) River/wetland areas: Water systems which are the core connectors of different areas in ecological networks
- (5) Coastal areas: Land areas and sea areas lying along the coastlines
- (6) Oceanic areas: Vast sea areas surrounding the coastal areas
- (7) Island areas: Islands located in the coastal areas and oceanic areas

When implementing efforts towards the realization of the grand design for national land, a blueprint which shows how to connect areas of different categories will also be needed. Although land is used in mosaic patterns in Japan and how areas of different categories are located varies depending on the local area, one way to look at the connection between areas of different categories would be to consider a watershed sphere as one group of areas which includes a watershed and surrounding areas. Based on this idea, the connection between areas of different categories will be considered by aiming at ensuring the diversity of national land and its tolerance to environmental changes, through: utilizing people, goods and resources within the watershed sphere; conserving and recovering a healthy hydrologic cycle, a sound substance cycle and ecosystems; enabling the sustainable supply of water, energy and food; and establishing a society resistant to disasters, etc.

The following explains the grand design for each of the seven categories of areas, which make up each watershed sphere.

(1) Natural mountain areas

[Current status]

Natural mountain areas are areas with relatively high naturalness, which include mountain backbones and receive less human intervention overall. These areas function as the foundation when considering biodiversity in Japan. They contain primeval nature, core habitats for large mammals such as bears and the Japanese serow, and birds of prey with a large home range such as the golden eagle and hawk eagles as well as catchment areas. Much of the natural vegetation (consisting of natural forests and natural grassland), which currently accounts for nearly 20% of Japan's total land area, is distributed in natural mountain areas. Natural mountain areas are distributed widely on ridges in central Honshu and Hokkaido. In regions where natural vegetation remains only in limited areas such as high mountain areas like the Chugoku Region, areas with

relatively high naturalness such as secondary forests which are left to succession are categorized as natural mountain areas.

Large communities of natural vegetation typical of a local area, established in accordance with the local climatic conditions, remain in natural mountain areas. Therefore, natural mountain areas constitute some of the most important “core areas” which are vital for the future survival of typical local animals and plants.

Once vegetation is lost through topographical alteration in steep areas, its recovery is difficult in many cases. In particular, alpine special epilithic ecosystems are susceptible even to small-scale human activities due to the severe environmental conditions. As the habitat of the Sika deer expands and their population increases, their impacts on forest ecosystems are becoming serious, including the degeneration of understory vegetation and resulting denudation. The impacts of the progressing global warming on alpine plant communities are also a concern in subalpine and alpine zones.

[Direction to be pursued]

- Conserve natural mountain areas covering a reasonably large land area in each region.
- Ensure that human activities such as mountain climbing will not cause irreversible changes to ecosystems by prioritizing nature in principle when managing the areas.
- Implement appropriate management of the Sika deer and control their impact on forest ecosystems.

[Descriptions of the desirable future for the areas]

As some of the core areas in the ecological networks on national land and important areas for the survival of typical animals and plants in each area, natural mountain areas will be managed by prioritizing nature in principle.

Substantial areas of natural mountain areas will be established through efforts to improve the quality of nature, for example by letting secondary forests adjacent to natural forests go through succession to a certain extent, so that the secondary forests will be converted into natural forests. The success rate for the breeding of birds of prey such as golden eagles and hawk eagles will be increased. In Western Japan, substantial areas will be covered by secondary forests which have been left to succession to a certain extent. For example, Japanese black bears, whose habitats have been fragmented in the past, will be able to feed on nuts from trees in forests remote from human settlements. The population of Sika deer will be maintained at a size which does not cause irreversible changes to ecosystems. Through these efforts, substantial areas of natural mountain areas will be conserved in each region, as areas which receive small effects from human activities and provide the main habitats for large mammals.

In high-mountain areas which are isolated from other remote mountain areas by surrounding lowland, the composition and distribution of endemic species and relict species will change due to the effects of global warming. However, the areas will continue to be conserved (for example by excluding alien species) and monitored, so that the areas will not become subject to anthropogenic effects other than global warming.

Climbers enjoying exploring mountains will be given entry permission before entering a vulnerable or overused area, and they will follow the rules as they enjoy mountain walking, while giving consideration to nature so as to minimize their impacts on nature in remote mountain areas.

The vegetation in mountain areas damaged by people stepping on them due to overuse in the past will be restored with the cooperation of volunteers. In areas where the natural regeneration of forests is difficult due to lush bamboo grass and in artificially converted areas, auxiliary human intervention will be added to enable regeneration and this will result in the areas having rich forests with high levels of biodiversity.

(2) Satochi-Satoyama/rural areas (including areas where artificial forests prevail)

[Current status]

Satochi-Satoyama/rural areas (including areas where artificial forests prevail) are located between natural mountain areas with relatively high naturalness and urban areas where human activities are concentrated. Satochi-Satoyama/rural areas (including areas where artificial forests prevail) cover a vast area of land containing areas where artificial forests prevail as well as having rural areas covered with paddy fields.

Characteristic types of nature have formed through various human interventions over many generations in Satochi-Satoyama/rural areas. This category of areas contains secondary forests which surround human settlements, artificial forests, agricultural land, reservoirs and grassland.

The natural environment which contains a mixture of secondary forests, paddy fields, waterways and reservoirs provide habitats for diverse organisms including many endemic species and threatened species. Such environments found in suburban areas are becoming more valuable as places for city residents to enjoy nature at a handy distance from their home. At the same time, Satochi-Satoyama/rural areas are places for living and production activities for humans. Thus Satochi-Satoyama/rural areas have a lot of characteristics and they are subject to various values and rights.

In Satochi-Satoyama/rural areas, the diverse biota and rich culture based on the biota have formed as a result of organisms adapting to traditional management methods unique to each local area, including water management methods for paddy cultivation and secondary forest/grassland management methods. Along with natural mountain areas, Satochi-Satoyama/rural areas have played an important role in supporting the diverse biota in Japan.

With the changes in resource utilization caused by the energy revolution and the modernization of agriculture from 1960s, the area of unmanaged or unused secondary forests increased and the area of secondary grassland significantly decreased. The area of abandoned farmland also increased from around 1980s. With these changes, there are expanding habitat distributions and populations of medium and large mammals including bears, Sika deer, wild boars and Japanese macaques, and damage to living environments for humans, agriculture and forestry is also expanding. As the human population decreases and the aging of the population progresses, relationships between humans and nature in Satochi-Satoyama/rural areas in general are expected to become less intimate in the future. The degree of this change will be more significant in Satochi-Satoyama/rural areas than in other categories of areas.

[Direction to be pursued]

- Promote efficient conservation activities by assessing the future changes in the natural environment and social circumstances in different parts of Satochi-Satoyama/rural areas, such as areas closer to remote mountains and areas closer to cities.

- Achieve better harmony between humans and nature through the revitalization of sustainable agriculture and forestry which puts more importance on biodiversity.
- Promote the establishment of appropriate relationships between humans and wildlife, for example by developing buffer zones.
- Promote the revitalization of rural districts through vigorous and effective utilization of local natural resources and the discovery and creation of new value, including the utilization of local areas for ecotours and the utilization of biomass resources.
- Promote support for conservation activities and the creation of systems through which the community as a whole including urban residents and businesses can support conservation activities.

[Descriptions of the desirable future for the areas]

In areas where agricultural land prevails, farming will be conducted by utilizing the circulation function of nature and by employing production methods which put more importance on the conservation of biodiversity. Various organisms thrive on agricultural land including paddy fields. When maintaining infrastructure for agricultural production, the reservoirs and ridges between paddy fields will be managed in a way so that rich biodiversity can be maintained and the ecological connection between paddy fields and rivers will be ensured. As a result, animals and plants which have been maintained through farming since long ago will remain common. Around agricultural land, children will enjoy catching insects and picking flowers. Students from local schools will study organisms together with farmers, by making use of ecosystems on healthy agricultural land. Through these activities, a rich connection between people within their communities will be nurtured. Some parts of abandoned agricultural land will be converted to wetlands and biotopes. Others will be managed as agricultural land. This will be enabled by the revitalization of domestic agriculture through the popularization of conservation oriented agriculture including organic farming which nurtures diverse organisms. In areas where advanced efforts for biodiversity conservation will have been made, people will be living surrounded by various forms of life, including Japanese red-crowned cranes, Oriental storks and crested ibises feeding and flying elegantly in the sky. In areas near the city, Satochi-Satoyama/rural areas will be the source for various animal and plant species and will form ecological networks. The areas will also provide places for residents to experience nature.

Only a limited area of secondary forests will be maintained in the previously employed intensive manner. In areas which have been selected for vigorous management, secondary forests will be maintained as bright and accessible forests which offer children places to explore. In the forests, native species such as great purple emperors and Japanese rhinoceros beetles will be commonplace. The forests will provide seasonal scenery including young leaves coming out in spring and colored leaves in the autumn. Parts of bamboo forests which have expanded over large areas will be returned to natural forests and secondary forests. There will be families digging bamboo shoots in well-managed bamboo forests. Wood harvested through the Satoyama management process will be utilized within the local area as logs for growing shiitake mushrooms and other wild delicacies and as biomass resources for producing pellets.

In artificial forests, the problem of delayed thinning will be solved and the biodiversity conservation function of the forests will be enhanced through conversion of coniferous plantation into broad-leaved forests or the introduction of long rotation management, depending on the characteristics of the location. Various forest management and conservation activities will be implemented in accordance with the local need for enhanced public benefit functions and changes in demand for wood. Wood continuously harvested from artificial forests including thinned logs and

wood waste will be utilized effectively. In Satochi-Satoyama areas which are managed in the above-mentioned manner, secondary forests, artificial forests and agricultural land will be combined in an integrated manner. Here, a mixture of various types of ecosystems will be restored through diverse land use and the utilization of resources as well as cooperation and collaboration between various parties including city residents. Secondary grassland once broadly distributed will be managed continuously throughout the country for the utilization of grass as biomass, etc. Many wild flowers will be blooming and butterflies will be flying on the grassland where currently rare animal and plant species will be commonplace. Beautiful landscape will be maintained in Satochi-Satoyama/rural areas, which will attract more urban residents moving to the areas and more tourists visiting the areas from overseas. This will create vital local areas also with the contribution of popularized ecotourism. Through these developments, the value of Satochi-Satoyama areas will be recognized by broad members of the society and Satochi-Satoyama areas will be maintained partly by public and private funds as well as volunteers. In the relationships between people and rich biodiversity where natural resources are fully utilized, traditional knowledge and techniques for utilizing biodiversity which have been developed in each area will be handed down to children, and local endemic characteristics closely connected with local culture and climates will be valued.

Medium and large mammals including bears, Sika deer, wild boars and Japanese macaques will no longer come down to agricultural land and human settlements frequently, as a result of the following measures: habitat improvements through the development of diverse forests including the conversion of coniferous plantation into broad-leaved forests; the establishment of open buffer zones at the borders between forests and agricultural land or human settlements; removal of farm produce, fruits, etc. left around human settlements which become food for wildlife particularly in winter; control measures such as chasing off wildlife by the entire community; and the population control through appropriate hunting.

(3) Urban areas

[Current status]

Human activities concentrate in urban areas, where intensive land use and concentrated high environmental impacts are observed. Cities rely on other areas for food and many other ecosystem services. Therefore, they have close relationships with other areas through the utilization of ecosystem services. Green spaces in cities such as forests and grassland are precious places for urban residents to experience nature, in addition to providing habitats for organisms living in cities. However, as urban districts expanded, distribution ranges of many commonly found organisms such as larks and fireflies retreated to suburban areas. As a result, only limited types of organisms can now be seen in urban areas, such as those that can survive in small populations in the isolated vegetated spots remaining in cities such as woodland on slopes, groves around temples, shrines and houses, as well as those that succeeded in adapting to artificial environments such as crows and starlings. Nowadays, there are only a small number of fish species living in the moats, rivers and waterways that have historically been integrated in urban environments. In some of these urban waters, pet animals such as red eared sliders have been released and also alien plants are vigorously growing. The demand for experiencing nearby nature and participating in biodiversity conservation activities is rapidly increasing in and around residential areas. However, there are increasing numbers of children who have no knowledge of how to live with nature and adults who cannot teach children how to live with nature, because there are only small areas of vegetated land with low biodiversity in their living environments.

[Direction to be pursued]

- Promote the development of urban areas that are rich in nature, water and vegetation as an integrated effort with surrounding communities.
- Develop ecological networks through connecting green spaces in an effort to ensure biodiversity in cities.
- Ensure fields and opportunities for experiencing nearby nature in people's daily lives.
- Establish socioeconomic activities and consumption activities which are sustainable when looking from a global perspective.

[Descriptions of the desirable future for the areas]

Well-developed public transportation systems will be operating along well-grown thick roadside trees, in compact urban districts with small populations where energy efficient, long-life buildings stand. There will be giant trees rising even in cities and seafront areas through the development of green spaces large enough to be called forests, like the Meiji Shrine forest, by utilizing currently unused or underused land. Birds of prey will be seen flying slowly around giant trees. Small spaces that allow urban residents including children to easily have contact with different organisms will be created in various parts of the city, by utilizing springs and other natural features. The roadside trees and the green spaces will be contributing to mitigating global warming and the heat-island phenomenon, as well as the creation of pleasant landscape in urban areas.

The following measures will be taken to restore biodiversity: conserving, restoring and creating forests and waterside areas in cities, centering green spaces in hilly areas and areas along terrace cliffs, rivers, spring areas and coasts; securing wind paths and healthy hydrologic cycles; and networking healthy ecosystems. In suburban areas which will have more room thanks to population decreases, rich ecosystems will recover through the natural regeneration of forests and natural restoration of wetlands. Biodiversity will be monitored mainly by citizens.

Green spaces with woodlands and forests will expand over various terrains. There will be biotopes filled with organisms in schools, kindergartens, nurseries, etc. Infants will grow up playing on the soil and explore nature even in urban areas. Ties among local communities including children will strengthen through vigorous cooperation between adult residents in managing the forests and other green spaces. Green spaces will also be secured on land owned by private business operators such as companies, providing hubs for ecological networks.

Conservation activities will be conducted vigorously in small paddy fields in the valleys of suburban areas, where people will enjoy farming on jointly managed agricultural land and children will be shouting for joy as they play in the water and catch fish.

As for food and wood consumed by urban residents, more people will select products produced in consideration of the conservation of biodiversity and the sustainable use of its components or products produced in the environs of their residence. It will become the norm for such products to be sold with added value. They will be extensively promoted at festivals held in large parks, connecting urban consumers and suburban farmers. Cities with rich greenery and water will become vibrant as major tourist sites with their excellent landscapes.

(4) River/wetland areas

[Current status]

Water is vital to numerous organisms living on the earth. Rivers and other water systems including lakes, wetlands and springs are the vital platform of biodiversity. Water systems constitute a core part of the ecological network which covers national land by connecting forests, agricultural land, cities, coastal areas, etc. Soil and nutrients generated in watershed areas, as well as pollutants emitted through various land uses are carried downstream through the network and salmon and eel swim upstream from the sea through the network.

Water systems are vital as habitats for aquatic life (fish, etc.), waterbirds and many other forms of life. In particular, wetlands have rich biodiversity and have the ability to store water, purify water, regulate flood water and mitigate extreme local climatic conditions. They are also vulnerable ecosystems easily affected by human activities.

Wetlands in riverside floodplains and floodplain forests have been developed and used as agricultural land or building land for a long period of time. River ecosystems have been greatly affected by improvements to rivers for the prevention of disasters such as flooding and by changes in land use in watershed areas, which resulted in a lower flow rate, modified or fragmented routes for hydrologic cycles, reduced the supply of sand and gravel, diminished natural disturbances and water contamination. Ecosystems in natural lakes have also been greatly affected by landfilling and draining for land reclamation, the modification of lakeshores, alteration of water levels, water pollution, eutrophication and the invasion by alien species. Many threatened species live in the waterside environment: for example, about one third of water plant species growing in Japan are designated as threatened species. On the other hand, there are cases where the ayu are seen swimming up rivers which had once lost their ayu populations, thanks to the improvement of river environments including water quality.

[Direction to be pursued]

- Conserve and restore the habitats of various forms of life at the watershed level, while also paying attention to the connection with the sea. This will be achieved by conserving/restoring diverse river areas which are safe, secure and in harmony with the natural environment, maintaining a large water volume, restoring the original variability of rivers and by connecting the upstream and downstream parts of rivers as well as connecting waters within each watershed area.
- Establish domestic and international ecological networks centering on river/wetland areas.
- Improve water quality so that people can have contact with a variety of aquatic life and secure healthy hydrologic cycles including groundwater and spring water.
- Restore rivers and lakes that characterize Japan where rich ecosystems and local history, culture and life are in good harmony.

[Descriptions of the desirable future for the areas]

With progress in the conservation of the natural river banks and floodplains around rivers including wetlands and floodplain forests, as well as other efforts to restore nature, the shapes of rivers will be formed through natural disturbances (floods) occurring in river areas, which will lead to the creation of diverse river areas. Diverse river ecosystems will be found in the river areas and floodplain forests made up of willow and plants endemic to dry riverbeds such as *Aster Kantoensis* will grow in the river channels. Estuaries will be inhabited by organisms endemic to brackish waters such as bivalve clams and damselflies. Rapids and deep pools will be formed in the streams and there will

also be river beds suitable for organisms to find food and breed. Thus rivers will provide excellent habitats for fish and other aquatic life. Various technologies will be utilized to maintain river variability.

In backwaters (“wando”) in rivers and in the surrounding wetlands, floating-leaved plants such as the Japanese Spatterdock and the Fringed Water-lily as well as submerged plants such as pondweed will grow thickly, providing crucian carp (*Carassius auratus langsdorfii*) etc. with places to live and lay eggs. Organisms will be able to move between rivers, surrounding wetlands and agricultural land. Many organisms which used to be common in such landscapes including catfish and crucian carp will be seen moving between rivers and paddy fields. The integrated flow of water from the upstream areas of rivers through to the estuaries and coastal areas will be secured, and a large water volume and good water quality will be maintained thanks to healthy hydrologic cycles within each watershed area. This will result in the maintenance of rich water area ecosystems where the ayu and gobies can be seen swimming up rivers.

Thanks to the improvement in the quality of water flowing into rivers due to reduced pollutants in watershed areas, clear water will be flowing all the way from the headwater point through to the estuary. With regard to lakes, there will be improvements to the water quality, progress in the restoration of the water level variability and alien species control measures. Migratory birds will fly over from the Asia-Pacific region to lakes and wetlands with improved water quality, paddy fields filled with water even in winter, and tidal flats in estuaries. Thus the network of stopovers for migratory birds will be secured at home and abroad.

With the increased percolation of rainwater in urban areas and the improved water environment on agricultural land, waterways and springs which used to be a common sight will be restored and sound hydrologic cycles will be secured and integrated into people’s lives. Beautiful watersides and rich nature in each local area will create river area scenery characterizing Japan where local history, culture and life are in good harmony. Native fish nurtured by the healthy hydrologic cycles will provide locally characteristic foodstuffs, which will be used in the daily diet. In the summer, there will be children shouting for joy as they vigorously play in rivers where the water quality has been improved.

(5) Coastal areas

[Current status]

Coastal areas are where the land area and the sea area are in contact and interact with each other. Coastal areas contain brackish waters in estuaries where seawater mixes with fresh water, complex and varied coastlines and neritic sea areas which extend in front of the coasts, including tidal flats, salt marshes, seagrass beds and coral reefs. They are closely related to people’s lives through recreational uses and various industries including fisheries. They are also home to rich biodiversity. On the coasts, there are animals and plants endemic to each type of terrain such as sandy beaches, cliffs and tidal flats. Natural environments in beachside vegetation zones and on shores play a central part in the ecological network which covers the national land.

Tidal flats, salt marshes, seagrass beds and coral reefs are distributed in neritic sea areas. Neritic sea areas have various important functions as habitats for diverse organisms including marine resource species, places which improve water quality and places for people to experience nature. However, neritic sea areas are receiving strong impacts from activities on inland areas such as the inflow of pollutants, nutrient matter and fresh water carried from watershed areas, in addition to direct

impacts from coastal area developments. The rivers' ability to transport earth and sand plays an important role in the formation of sandy beaches and tidal flats. Coastal areas are vulnerable to natural disasters such as tsunamis, high water as well as coastal erosion, as can be seen from the serious damage in the Pacific coastal areas mainly in the Tohoku Region caused by the tsunami which occurred following the Tohoku Region Pacific Coast Earthquake.

In coastal areas, there are areas called "Satoumi" where there have been human interventions while remaining in harmony with natural ecosystems in order to conserve biodiversity and to achieve high bioproductivity. Satoumi areas have historically had close relationships with our life and culture. For example, Satoumi areas contain areas where fishermen have been conserving biodiversity through voluntary joint management and sustainably utilizing components of biodiversity to harvest marine products. They also contain areas where ecosystems have been conserved through collaboration between various parties for the restoration of seagrass beds, collection of marine debris and other activities.

[Direction to be pursued]

- Restore the connection between people and the sea and the rich biotas that are inherent in coastal areas where the land is in contact with the sea.
- Restore coastlines so that people can approach and enjoy them, through prioritizing the conservation of existing neritic sea areas including tidal flats, salt marshes, seagrass beds and coral reefs and the conservation of natural coastlines, as well as through the restoration and creation of habitats for diverse organisms.
- Promote sustainable fisheries based on appropriate resource management.
- Revitalize sustainable fisheries in coastal areas through efforts for forest development in upstream areas, water quality improvement, etc.
- Promote the conservation and restoration as well as the sustainable use of coastal areas which are safe, secure and in harmony with the natural environment, through the restoration of coastal disaster prevention forests, etc.
- Promote the appropriate establishment of marine protected areas and the improvement of their management based on scientific knowledge, in order to work towards the above-described directions.

[Descriptions of the desirable future for the areas]

Although remaining habitats in coastal areas such as important tidal flats, salt marshes, seagrass beds and coral reefs will be greatly affected by increased sea water temperatures and sea levels caused by global warming, coastal ecosystems of tidal flats, seagrass beds and coral reefs will maintain their richness while receiving natural disturbances such as typhoons. This will be achieved through the improvement of habitat environments by making the following efforts: accumulation of data; efforts to conserve healthy ecosystems; efforts to restore coastal ecosystems based on scientific knowledge by fully taking into account environmental conditions such as the depth of water, tidal currents and bottom sediments; the establishment and appropriate management of marine protected areas based on scientific knowledge. In tidal flats throughout the country, there will be various kinds of marine life including shellfish such as the Japanese littleneck and crabs such as the fiddler crab, shore birds will be eating food and many people will be observing the coastal wildlife, participating in surveys about coastal wildlife and enjoying digging for clams. In closed ocean areas such as deeply indented bays, the appropriate balance of nutrients will be ensured and there will be improvements to problems which cause deterioration of coastal environments including accumulated sludge, the generation of anoxic water masses and ocean/beach debris. Rich fishing grounds will be conserved thanks to forests in upstream areas

being maintained properly with support from fishermen and other interested people. Coastal areas which nurture rich life will continuously supply plenty of diverse kinds of seafood to people. In addition, healthy ecosystems will be maintained in coastal areas through humans living in harmony with nature, for example, seals will be seen swimming in the northern sea and dugongs in the southern sea. The inhabitation of the Japanese horseshoe crab will be ensured in Western Japan by securing the continuity of ecosystems starting from sandy beaches, through tidal flats and seagrass beds to the bottom of the sea. The inhabitation of amphidromous organisms such as the Japanese mitten crab will be ensured by securing the continuity of rivers, coastal areas through to the sea. A vision for what Satoumi should look like in each area will be set and efforts will be made to realize the vision through the participation and cooperation of stakeholders.

Although coastlines will be affected by increased sea levels due to global warming, natural coastlines will be conserved and sandy beaches will be maintained with earth and sand carried down through rivers from the mountains with no interruption in between. Sea turtles will come ashore, little terns will breed and coastal plants will grow well on the sandy beaches. With the cooperation of Asian and other countries, people will enjoy bathing in the sea from clean beaches free of litter and waste.

(6) Oceanic areas

[Current status]

Oceanic areas are a backbone structure that supports the biodiversity of Japan, since it has an EEZ (extending from offshore to the broad ocean), etc. which is about 12 times larger than Japan's total land area. The ocean accounts for about 70% of the earth's surface. It is a huge stock of water in the hydrologic cycle, and is closely related to the formation of the global climate with its enormous heat energy. It also functions as a huge carbon sink in the carbon cycle, stabilizing the earth's atmosphere. Japan is an island nation surrounded by the sea and therefore its terrestrial climate, the distribution of land animals and plants as well as ecosystems are greatly influenced by the sea.

The sea near Japan has varied oceanic structures. The Oyashio current flowing in the north and the Kuroshio current flowing in the south carry cold and warm water masses along with organisms from remote areas. The Sea of Japan which used to be isolated at one point in its geohistory and the Japan Trench which has the depth of 8,000 meters are also adding to the complex oceanic structures, which enrich the marine biodiversity of Japan.

[Direction to be pursued]

- Promote the conservation of long-traveling animals while watching the trend for international coordination.
- Organize general marine data including marine resources, secure genetic diversity, and then promote sustainable fisheries on the basis of the ecological approach and appropriate resource management, through international cooperation where necessary.
- Strengthen efforts to remove and prevent marine pollution with international collaboration.
- Establish appropriate marine protected areas and improve the management of the areas based on scientific knowledge in order to achieve the directions mentioned above.

[Descriptions of the desirable future for the areas]

Habitat environments will be improved for marine mammals, sea birds, sea turtles and fish that travel long distances in their life cycles through the following measures: conservation activities and the sustainable use of marine animals with the cooperation of the Pacific nations and other countries

involved; and the establishment and appropriate management of marine protected areas based on scientific knowledge. Techniques to avoid by-catch will also be improved. In oceanic areas where these forms of life thrive, sustainable fishing in conformity with scientifically set rules (for the Total Allowable Catch, etc.) will be actively conducted together with efforts for the conservation of biodiversity in light of the trend in international coordination and through the framework of regional fishery management organizations, etc. where necessary.

International cooperation efforts to remove and prevent marine pollution such as ocean/beach debris, harmful chemical substances and spilled oil, which affect marine ecosystems, will be on going.

(7) Island areas

[Current status]

In addition to the four main islands - Hokkaido, Honshu, Shikoku and Kyushu, Japan is believed to have over 6,800 large and small islands. There are 400 islands that are inhabited by humans. Since islands are surrounded by the sea which limits the traffic of organisms, there are cases where native biota which can no longer be observed in neighboring areas still remains in the limited space of an island. In addition, some of the islands, including the Ogasawara Islands and the Nansei Islands, have developed distinctive biotas over a long period of time being isolated by the sea. Unique finely balanced ecosystems have formed in small areas of these islands. Therefore, island areas are vulnerable areas that are easily affected by destruction of habitats and invasion of alien species. Since there are many endemic species with a very limited distribution range in island areas and they are vulnerable to anthropogenic effects, many of the species living in island areas are designated as threatened species.

[Direction to be pursued]

- Promote the conservation of distinctive ecosystems and endemic biotas through the Conservation Programmes defined by the law for rare species and the control of alien species.
- Promote the creation of well-developed communities making the most of their originality.

[Descriptions of the desirable future for the areas]

In island areas, invasive alien species will be eradicated and endemic animal and plant species as well as native animal and plant species will inhabit comfortably including the Tsushima leopard cat in Tsushima, the Iriomote Cat on Iriomote Island, the Amami rabbit in Amami, the Okinawa rail in Okinawa and *Melastoma tetramerum* var. *tetramerum* in Ogasawara. Their distinctive ecosystems and endemic biotas will be thoroughly examined and recognized as irreplaceable local assets. Some islands will be widely recognized as global assets. The invasion of alien species from outside the islands will be checked at the borders. Ecotours will be conducted actively while taking every care for the environment and while utilizing the characteristic nature and culture of the areas. For example, tourists will be divided into small groups to participate in nighttime surveys of endemic species. Thus there will be ongoing efforts to create well-developed communities that nurture the distinctive nature and culture of the islands.

The habitats and egg-laying/breeding places for sea turtles, sea birds including the short-tailed albatross and common murre, and marine mammals including seals will be conserved without excessive interference by humans as vital areas for the conservation of biodiversity.

Chapter 4 Basic Policies for the Conservation of Biodiversity and the Sustainable Use of Its Components

This chapter provides the basic policies for the measures we should take to achieve the targets and the grand design looking 100 years ahead which were set forth in Chapter 3, in light of the current situation and challenges concerning biodiversity discussed in Chapter 2. Section 1 explains the basic perspectives we should maintain in implementing the measures. With these perspectives in mind, Section 2 sets forth basic directions for priority measures to be taken by around FY 2020 in the basic strategies.

Section 1 Basic perspectives

In implementing measures for the conservation of biodiversity and the sustainable use of its components, the following seven basic perspectives should be maintained as the crucial and common basis for those measures:

- 1 Scientific recognition and a preventive/adaptive attitude
- 2 Community-based efforts
- 3 The wide-area view
- 4 Coordination and collaboration
- 5 Mainstreaming biodiversity in socio-economic systems
- 6 Integrated viewpoint
- 7 The long-term merits of sustainable use

1 Scientific recognition and a preventive/adaptive attitude

The conservation of biodiversity and the sustainable use of its components should be pursued on the basis of scientific data and by understanding the characteristics, mechanisms and history of nature which provides benefits as well as threats, while using the wisdom of coexisting with nature accumulated in the local community. By doing so, many people in the community will better understand the importance of such efforts and the effects they actually produce. For example, it is necessary to make use of data and specimens that were obtained as a result of long-term monitoring of the natural environment in the community. In particular, specimens are precious materials as the proof of the relevant organisms' existence, the basis for taxonomic identification and the key to identifying the distribution of the species and its changes over different eras. Thus, they have an important role to play in increasing scientific knowledge. Activities aiming for conservation and restoration as well as the sustainable use of biodiversity should be promoted by utilizing such data and specimens. Understanding and recognizing the status quo of biodiversity in the community properly on the basis of scientific data will constitute the starting point for policy-making and activities to be implemented.

As basic approaches for realizing the harmonious coexistence of human beings and nature, it is necessary to place great importance on the viewpoints below besides following the concept of the ecosystem approach agreed at the Fifth Meeting of the Conference of the Parties to the CBD:

- (1) Human beings should recognize that they have limited knowledge and understanding about biodiversity including the species of living organisms and the mechanisms of ecosystems. We should always be modest enough to act cautiously. On top of that, we should not defer implementing biodiversity conservation measures for the reason of the incompleteness of the

scientific evidence, but we should take action based on a preventive attitude of always striving to enrich scientific findings so that we can take measures in a timely manner.

- (2) As a principle of biodiversity conservation, we should recognize that the ecosystem of which human beings are a component has a complicated structure which is always changing, and that the management and use of the natural resources it provides should be implemented in an adaptive manner within the limits of its capacity to recover so that it can sustain its structure and function. With this purpose in mind, it is important to monitor changes in the ecosystem accurately, and to flexibly review the method of managing and using it based on the findings of the monitoring.
- (3) It is necessary that all the people concerned should have a wide range of science-based information on nature and society, and that the policies for the management and use of natural resources should be determined by society as a whole.

2 Community-based efforts

The conservation of biodiversity and the sustainable use of its components cannot be achieved only by developing and implementing the National Biodiversity Strategy of Japan, but should be supported by local activities aiming to conserve and utilize the local natural environment with local communities taking the lead in such activities. To this end, a community-based perspective is important. Appropriate and continuous activities in local areas including agriculture, forestry and fisheries will lead to the construction of a community rich in biodiversity, and, through this process, strengthen the relationships between residents ranging from children to the elderly. As a result, a beautiful biodiversity-based landscape unique to the community and a rich culture developed in such an environment will be handed down from generation to generation, thus fostering a feeling of pride in and attachment to the community among the residents and creating local characteristics. This in turn will arouse the interest of people outside the local area, vitalizing it and ensuring its independence.

In developing various systems for the conservation of biodiversity and the sustainable use of its components, it is essential to include the views of the people actually engaged in the work of biodiversity conservation and its sustainable use. For example, as can be seen by the fact that different communities have different methods for Satoyama management and conservation, activities for the conservation of biodiversity and the sustainable use of its components differ from community to community, with each having unique characteristics. It is important to develop human resources by utilizing the wisdom and techniques for properly managing natural resources which were obtained through the accumulated experience of each local community. In addition, it is also important to think from the perspective of constructing a network of humans and sharing information between many communities engaged in activities for biodiversity conservation and its sustainable use, in order to further invigorate and expand such activities, while putting importance on the independent activities of each local community.

3 The wide-area view

Forests are connected to the sea by rivers. Biodiversity in forests, rivers and the sea are closely linked with one another through the flow of water, soil and nutrients as well as by the fish which swim up the rivers. A watershed is an important unit of area in which many materials needed for our life circulate including water resources. Through the mutual support of communities in different

areas relying on each other and covering each other's shortages rather than limiting the scope of activities to one community, it will be possible to promote activities for biodiversity conservation and its sustainable use in such a manner that an activity in one community has beneficial ripple effects on the other communities. These cases can be seen in the following examples: forest development in the upper reaches of a river intended for preserving the fisheries of the sea area into which the river flows; the management of local populations of the Japanese black bear which migrate over a large area; and the wide-area coordinated efforts of appropriately protecting and managing wildlife such as the Sika deer and the Great Cormorant.

Moreover, the socioeconomic activities and biodiversity of Japan are closely connected with those of the world, especially the Asia-Pacific region. For this reason, by taking advantage of our experience in preserving nature on a community basis and what we have done to foster biodiversity in our daily lives, it is possible for us to actively contribute to international activities for the conservation of biodiversity particularly in the Asia-Pacific region. Japan heavily depends on biological resources such as wood, agricultural and marine products as well as other natural resources such as fossil fuels and mineral resources from overseas. Therefore, we are causing substantial impacts on ecosystems abroad through the usage of natural resources. With the recognition that economic activities and consumption in Japan are closely related to global biodiversity, various parties as well as the national government should make efforts to reduce the impacts including individuals who selectively purchase goods and services, and businesses which are engaged in development and the procurement of raw materials. It is necessary for us to recognize the global linkage of biodiversity and advance activities for its conservation and sustainable use from a global perspective. For example, we should collaborate with regions producing such natural resources in realizing the sustainable and biodiversity-friendly use of them while making further efforts domestically to utilize local resources. The hierarchical structure of the issue of biodiversity at the local, national and global levels and the interconnections between each level should be recognized. It is then important to take measures in Japan and abroad towards solving individual specific issues in each local area while maintaining a global view of the geographical hierarchical structure and the interconnections between different hierarchical levels.

4 Coordination and collaboration

Coordination and collaboration between various parties are becoming ever more important for achieving the conservation of biodiversity and the sustainable use of its components. Since the First National Biodiversity Strategy of Japan was formulated, the ministries and agencies concerned have worked in close cooperation with one another to advance their efforts in a comprehensive manner. It is necessary to further enhance coordination and collaboration between the ministries concerned by taking effective steps such as launching a model project and establishing a liaison meeting between the authorities concerned in accordance with the concept of each measure being implemented. Coordination and collaboration need to be strengthened in such fields as nature restoration projects, the management and conservation of forests, the conservation and the use of Satochi-Satoyama areas, the conservation and management of coastal and oceanic areas, environmental education, ecotourism and other activities for experiencing nature, the appropriate conservation of specimens and genetic resources, and the enrichment of data on the natural environment.

In advancing measures based on the national biodiversity strategies, it is also crucial to establish a system that promotes closer coordination and collaboration between a wide range of entities including the national government, local governments, those engaged in agriculture, forestry and fisheries, businesses, private organizations, experts and community residents. In order to enhance

the conservation of biodiversity and the sustainable use of its components on a community basis, it is particularly important for local governments and community residents, who are to be involved in such activities as part of their daily routine, to take the initiative in planning and implementing them in a manner that best suits the characteristics of the community. Recently, there have been an increasing numbers of cases where businesses, private organizations and local governments have cooperated with each other to carry out activities, and such collaborative work should be further enhanced. In addition, the activities should be advanced on the basis of scientific findings and information being shared among all those concerned. Therefore, it is important to encourage expert participation in activities which require scientific findings and information, involve coordinators to link communications between the experts and ordinary residents, and disclose information. Therefore, ensuring coordination and collaboration among all those concerned is a highly necessary perspective for implementing measures for biodiversity conservation and its sustainable use.

5 Mainstreaming biodiversity in socio-economic systems

In order to promote the conservation of biodiversity and the sustainable use of its components as a continuous effort instead of temporary one, it is important that we fully recognize the fact that our life and various economic activities are supported by the natural environment and benefits from biodiversity (ecosystem services) and that consideration for biodiversity is incorporated into socioeconomic systems. Business communities in Japan which rely on global biodiversity have already started taking voluntary action for the conservation of biodiversity and the sustainable use of its components in their business activities, aiming for sustainable business management. In the days when natural resources such as fuels and manure were recycled within the community, there were socioeconomic systems that were developed and continued to be used out of necessity. Although it is difficult to incorporate them into the present framework in their original form, it is important to develop and disseminate new techniques and systems that can be used in present-day circumstances and into the future, by learning from Japanese wisdom and tradition in harmony with nature. For example, the following activities can be expected: the promotion of various activities based on the concept of the *Satoyama* Initiative; technological development for nature restoration, resource and energy conservation and the reduction of environmental impacts; and new technological innovation using biomimicry. Examples of ongoing activities include: the production of brand rice which uses the Oriental stork or the crested ibis as the symbol, and other activities under the “Ikimono Mark” scheme which aims at spreading biodiversity-conscious agriculture, forestry and fisheries; and the certification systems organized by the private sector with a view to promoting the sustainable management and distribution of biological resources that give due consideration to the conservation of biodiversity. Such certification systems include the Marine Stewardship Council (MSC) and Marine Eco-Label (MEL) Japan for fishery management and production, processing and distribution of marine products, the Forest Stewardship Council (FSC) and the Sustainable Green Ecosystem Council (SGEC) for forestry management and the management and distribution of forest products, FairWild (the FairWild Foundation) for the use of wild plants and the Roundtable on Sustainable Palm Oil (RSPO) for the production and distribution of palm oil. There are also systems which quantitatively evaluate and certify activities of businesses and others that contribute to the conservation and restoration of biodiversity, such as the Japan Habitat Evaluation and Certification Program (JHEP). Another type of effort currently being made is ecotourism which aims to preserve the natural environment that is a resource of the community, while utilizing it commercially in the framework of sightseeing. It is important to encourage the use of these types of socioeconomic activities and systems, and also to facilitate the development of systems that can be expanded and continued for a long period of time through involving a large

number of people in the efforts for the conservation of biodiversity and the sustainable use of its components.

It is also necessary to estimate the monetary value of the benefits from biodiversity that cannot be directly converted into money and incorporate it into socioeconomic systems. For example, the forest environment tax adopted in many municipalities aims to allocate part of the costs needed for forest conservation and management to community residents and corporations who benefit from the ecosystem services provided by the forests, by recognizing the water conservation function of the forests. There are other similar systems being implemented where businesses and consumers who benefit from ecosystem services pay the costs for the conservation of the ecosystems as compensation for receiving the services (PES: payment for ecosystem services).

6 Integrated viewpoint

The four crises of biodiversity do not exist independently. The first and second crises, which are seemingly contradictory, work in combination to aggravate the critical situation. For example, in Satochi-Satoyama areas within the environs of a large city, the combination of urbanization which enhances the loss and fragmentation of Satochi-Satoyama areas (the first crisis) and the lack of appropriate management of the areas (the second crisis) has made the situation worse. Further, alien species originally kept for rearing purposes such as raccoons escaped and bred in the wild in neglected Satochi-Satoyama areas (the third crisis), and the distribution range of alien species expanded due to changes in the global environment (the fourth crisis), thus accelerating the destruction of the ecosystem.

In order to achieve for a sustainable society, it is necessary to integrate efforts to establish a society in harmony with nature, a low-carbon society and a recycling-oriented society. For example, we have to take extra care not to carelessly dispose of such resources as bamboo, branches and leaves that come from management activities for conserving biodiversity. It is important to promote the effective and efficient use of such resources. We also need to change our socioeconomic systems and lifestyles to achieve a sustainable society. For that purpose, a society in harmony with nature, a low-carbon society and a recycling-oriented society should be analyzed from economic, social and other multiple aspects so that we can grasp them in an integrated manner.

As shown above, in order to advance the activities for the conservation of biodiversity and the sustainable use of its components, it is important to coordinate and promote various aspects of such activities from an integrated perspective.

7 The long-term merits of sustainable use

In our socioeconomic activities, we are apt to seek short-term productivity and efficiency. However, when looking at the benefits that we can obtain from an ecosystem in the long run, it may in many cases be more economical to continue conserving the ecosystem and utilize the benefits that we can obtain within its capacity to recover than to change it to an unrecoverable extent. In the TEEB example about an Indonesian national park which is being rapidly developed, conservation and selective use scenarios were found to provide the highest benefits for the region (9.1-9.5 billion US dollars) in the long-term while continuous deforestation would reduce ecosystem services and generate economic profits of only seven billion US dollars in the province where the national park is situated. The study also found that logging the tropical forest would only provide small financial benefits to a few companies instead of contributing to the economic development of the province

and would have a negative impact on hundreds of rural forest dwelling communities. When looking at fisheries, overexploitation of aquatic resources may increase profits in the short run, but once they are exhausted, there will not be any more profits. Therefore, it is important to consider the sustainability of fisheries from a long-term standpoint. In addition, some biological resources are being utilized based on traditional knowledge accumulated by humans over a long period of time. Encouraging such form of utilization can contribute to conserving and maintaining traditional knowledge.

According to the UN future population estimates, the world's population is expected to reach 10 billion by the end of the 21st century. In light of the increasing importance of ensuring the sustainability of natural capital, it is more important than ever that we consider the long-term and sustainable benefits for each individual and for mankind, as well as reviewing our lifestyles so that we do not lose the ecosystem's capacity to recover and maintain the perspective of coexisting with healthy ecosystems into the future.

Section 2 Basic strategies

In order to promote activities for the conservation of biodiversity and the sustainable use of its components, it is essential that the various parties concerned become more interested in the activities and proactively participate in planning measures that reflect the characteristics of the nature and society in their community. To secure sound ecosystems that are highly adaptive to environmental change, it is also important to further expand efforts by constructing ecological networks on a nationwide scale and on a global scale.

With these and the challenges summarized in Chapter 2, Section 6 in mind, the basic directions towards fulfilling the measures on which we should focus up to around FY2020 are presented as the five basic strategies for achieving our long-term target with the target year of 2050 and for realizing the grand design for national land that looks ahead 100 years into the future.

- 1 Mainstreaming biodiversity in our daily life
- 2 Reviewing and rebuilding relationships between man and nature in local communities
- 3 Securing linkages between forests, the countryside, rivers and the sea
- 4 Taking action with a global perspective
- 5 Strengthening the scientific foundation and utilizing it in policy making

1 Mainstreaming biodiversity in our daily life

The condition of biodiversity is deteriorating on a global scale, and the biodiversity crisis we face in our country is yet to be resolved. We should strengthen the efforts needed to resolve the biodiversity crisis, and as part of the efforts, it is important for individuals as well as society as a whole to become aware of biodiversity, pay attention to it and take action to protect it as part of our daily lives. Although the word “biodiversity” might have become recognized more widely after COP 10, this trend should not be allowed to fade away. Instead, it is necessary for people to start thinking about biodiversity and taking action to conserve biodiversity in order to create momentum within society as a whole. In this sense, it is important to “mainstream biodiversity within society,” i.e. the importance of the conservation of biodiversity and the sustainable use of its components becomes widely recognized by local governments, businesses and people, who then make decisions and take actions accordingly. In order to achieve such a society, the government will promote coordinated action between different parties through the Japan Committee for the United Nations Decade on Biodiversity as well as conducting PR and awareness raising activities. In addition, the government will promote the formulation of Regional Biodiversity Strategies, the economic valuation of biodiversity, education and hands-on experience regarding biodiversity, as well as proposing changing consumption behavior as measures to integrate the concept of biodiversity into society.

[PR activities on biodiversity]

There is a need to develop programs to deepen people’s understanding of the current condition of biodiversity as well as the importance of biodiversity, and encourage people to take action. Therefore, the government will make focused efforts to provide public information and conduct awareness raising activities to help the people understand the deep relationship between biodiversity and their lives so that they become more interested in it as an issue relevant to them. As part of the PR activities, the risks to biodiversity incurred through the thoughtless conduct of people will be explained lucidly together with what they can do to avoid causing such risks to biodiversity in their daily lives by giving concrete examples such as leaving fishing lines by the river and abandoning pets in the wild. In the PR activities, elaborate and clear information will be provided with the

coordination and cooperation of various types of media so that the information will reach broad sections of the public.

[Promoting coordination between various parties]

In order to promote the activities for the conservation of biodiversity and the sustainable use of its components, it is necessary to strongly promote activities through coordination between various parties including the national government, local governments, the business community, the media, experts and private organizations such as NGOs and NPOs. In response to the proposal put forward by the Japanese government based on a proposal from civil society, the UN decided that 2011-2020 would be declared the United Nations Decade on Biodiversity. Each country will be invited to contribute to the achievement of the Aichi Biodiversity Targets by working to ensure the conservation of biodiversity and the sustainable use of its components while all kinds of entities within society make their own efforts in coordination with others. In Japan, the Japan Committee for the United Nations Decade on Biodiversity made up of various parties was established in September 2011 as a body to promote activities related to the United Nations Decade on Biodiversity, through which the members will work in partnership.

It is important that local governments, businesses, private organizations and community residents conduct activities for the conservation of biodiversity and the sustainable use of its components from each local perspective. It is necessary to strengthen systems to provide economic support for such activities and systems to publicly recognize such activities. To this end, the government will take the following measures: provide support for the creation of Plans for the Promotion of Activities for Biodiversity Conservation through the Cooperation among Regional Diversified Actors to be prepared based on the Act on the Promotion of Regional Cooperation for Biodiversity which came into force in October 2011; identifying and publicly honoring good practices; and promoting cooperation between various local parties for the activities to conserve biodiversity by matching the needs and support of different stakeholders including private organizations, land owners, businesses and local governments. In addition, the government will provide support and technical advice when local communities take the initiative in conducting activities to conserve and restore biodiversity and making comprehensive plans, for the protection and management of wild animals and plants, alien species control measures and measures to protect priority areas, etc. The government will also promote the construction of networks of people and the flow of information between communities engaged in conservation activities in order for communities to be able to share examples of activities conducted in different areas and information about experts. In addition, the government will promote participatory surveys in order to monitor the condition of biodiversity in the community by inviting the participation of people engaged in biodiversity conservation activities in the community. Individuals and private organizations who have expertise in local nature will play the central role. The results of the surveys will be announced publicly in order to deepen the residents' understanding of biodiversity.

[The formulation of Regional Biodiversity Strategies and the promotion of community-based efforts]

Developing the National Biodiversity Strategy of Japan alone will not realize the conservation of biodiversity and the sustainable use of its components. It needs to be materialized as activities on a community basis. To that end, local governments including urban and rural prefectures should develop Regional Biodiversity Strategies, taking into consideration the characteristics of each local community. Such strategies are essential as a bridge between national-level policy and local-level activities and they will encourage local governments, businesses, private organizations and community residents to make various local efforts by deepening their understanding of the

importance of biodiversity conservation and its sustainable use. The Basic Act on Biodiversity requires that local governments must strive to formulate a Regional Biodiversity Strategy. A Regional Biodiversity Strategy is useful in promoting the self-sustaining development of the local area as well as being effective in creating mutual cooperation between local organizations concerned with biodiversity. As in the case of prefectural red data books and red lists made for all prefectures, it is hoped that Regional Biodiversity Strategies will be formulated by all local governments as soon as possible. When the strategies are being formulated, it is desirable for groups of local governments who share watershed areas or mountain areas to formulate joint Regional Biodiversity Strategies. In urban areas, a Regional Biodiversity Strategy should be created in such a way that the content is consistent with the Green Basic Plan which is the comprehensive master plan on greenery and sets forth detailed measures including measures on how to obtain green spaces. Currently, various types of Regional Biodiversity Strategies are being prepared. Some are formulated through collaborations between various parties including residents, businesses and experts from the planning stage. Others provide detailed measures that meet local characteristics, present a road map, or set numerical targets. Therefore, it is a good idea to refer to different types of already established Regional Biodiversity Strategies in order to formulate a Regional Biodiversity Strategy that best suits the local conditions. For this reason, the government will introduce to prefectural and municipal governments examples of activities for the conservation of biodiversity and the sustainable use of its components by various entities in different areas, thereby encouraging the development of effective Regional Biodiversity Strategies and the implementation of practical measures.

[Promoting biodiversity-friendly activities by businesses]

Businesses have an increasingly important role to play in the conservation of biodiversity and the sustainable use of its components. Businesses are becoming more aware that the biodiversity issue could cause business risks and provide business opportunities. In Japan, increasing numbers of businesses are voluntarily conducting business activities which contribute to the conservation of biodiversity and the sustainable use of its components in addition to making efforts as part of their philanthropic activities. Diverse corporate activities are being implemented by more and more companies. Some companies state their policy on activities for the conservation of biodiversity and the sustainable use of its components in their action agenda and disclose their activities in their Environmental Reports. Others incorporate consideration for biodiversity into their environmental management systems. Also, some companies engage in biodiversity-friendly business activities in the procurement of raw materials, in financial markets and in land use. There are also companies which sell biodiversity-friendly products and services or develop and provide biodiversity-friendly technologies. Other corporate activities include the management of company-owned land in a biodiversity-friendly manner (for example by utilizing the Tools for Promoting Business Establishments in Harmony with Living Organisms developed by the Japan Business Initiative for Biodiversity (JBIB)), the implementation of employee education, corporate social services such as the control of alien species, the provision of environmental education and support for activities by private organizations. A poll conducted by the Cabinet Office in June 2009 showed that over 80% of the respondents appreciated biodiversity-friendly corporate activities. Corporate activities are largely influenced by consumer awareness and they are closely related to the consumption behavior of each individual. Therefore, there is an ever increasing need to incorporate consideration for biodiversity into socioeconomic systems by facilitating companies to make efforts for the conservation of biodiversity and the sustainable use of its components through their main business activities and their philanthropic activities. To this end, the government will disseminate Guidelines for Private Sector Engagement in Biodiversity to companies in order to encourage them to take voluntary biodiversity-friendly actions by taking into account their activities including supply

chains. The guidelines, which provide the basic approaches and information needed for diverse companies to take action for the conservation of biodiversity and the sustainable use of its components, were developed through discussions with companies, private organizations and experts and through inviting public comments. In order to facilitate private sector participation in activities for the conservation of biodiversity and the sustainable use of its components, the government will also strengthen coordination and cooperation with the Japan Business and Biodiversity Partnership which is a program voluntarily established by the business community and others. It will also strengthen coordination and cooperation with the Japan Business Initiative for Biodiversity (JBIB) which aims at conducting joint research for biodiversity conservation from the international perspective, incorporating the results into corporate activities and promoting activities that can contribute to biodiversity conservation. The government will also monitor the spread of the Guidelines for Private Sector Engagement in Biodiversity and promote certification systems and labels for biodiversity-friendly goods and services.

[Improving biodiversity education and increasing opportunities to experience biodiversity]

It is necessary that many people share the recognition that biodiversity is an important issue and that this recognition leads to action. To achieve this, education designed for each group of residents should be provided in order for them to deepen their understanding and knowledge about biodiversity and obtain the abilities needed to put the knowledge into action. People should have opportunities to learn about biodiversity, biology, topography and geology through familiarizing themselves with nature in households, in schools, in workplaces and in local communities. In particular, knowing about nature and living beings from experience at an early age is important. To this end, the government will promote environmental education including biology and earth science in the framework of school education. The government will promote training on environmental education and hands-on experience for teachers and those engaged in environmental conservation activities. In addition, opportunities will be arranged with the cooperation of the community where children can learn about nature through experiencing and communing with nature unique to the community after school. In addition, it is important to collect and reevaluate the wisdom found in traditional culture rooted in everyday life and resource utilization techniques possessed by communities, as well as broadly sharing such information with people in different age groups. The government will explore new environmental education approaches for creating a sustainable society and promote human resource development in order to overcome the critical situation that biodiversity faces and to achieve economic development while maintaining environmental sustainability.

Social education for adult residents is also important. Various public facilities in the community such as museums and research institutes will be utilized to promote education that helps residents deepen their understanding about biodiversity in the community. In addition, the government will identify, support and train experts in the field of biodiversity so that they can actively contribute to international activities on biodiversity, as well as supporting human resource development in the field of the environment at universities, etc.

In order to utilize ecotourism as a tool to deepen individuals' understanding of environmental conservation and to provide environmental education, the government will promote ecotourism carried out on the basis of natural environmental conservation and in line with the rules for the appropriate use of nature towards achieving lively and sustainable local communities while conserving biodiversity.

Children these days have fewer opportunities to come into contact with nature, and it is important to afford them more chances to experience nature through their five senses at an early age and to feel nature in their daily lives. Therefore, the government will create social systems in which they can experience nature, in addition to experiencing nature through education at school and in the community. For example, forests, countryside, riversides and beaches will be improved so that children can play there without restraint; spaces for children to come into contact with nature in their neighborhood will be created in urban areas; and long-stay programs in agricultural, mountain and fishing villages will be offered. The government will also encourage relevant parties to utilize the certification system for nature experiencing activities and other first-hand experience opportunities stipulated in Article 20 of the Environmental Education Promotion Act.

In national parks which have excellent natural environments, opportunities for many people to come into contact with nature and experience the richness of nature in Japan will be provided by holding nature study gatherings and conducting awareness raising activities at visitor centers.

[Promoting the economic valuation of biodiversity]

The value of biodiversity and ecosystem services (benefits provided by biodiversity) on which our lives depend are largely divided into “use value” and “non-use value.” Use value refers to the value of biodiversity and ecosystem services that we who live in the present age use directly or indirectly, such as natural resources (food, medical resources, etc.), recreational spaces, the water purification function and other environmental conservation functions. On the other hand, non-use value refers to the value of entities which should be conserved for the global environment and for future generations although people living today may not use them. For example, non-use value includes the value of biodiversity needed to be preserved for future generations such as world natural heritage sites (bequest value) and the intrinsic value of primeval nature and wildlife (existence value).

Use value of biodiversity and ecosystem services which are not traded in the market has been considered to be zero without being fully recognized or appropriately evaluated in the socioeconomic system. Degradation of biodiversity has resulted from the repeated use of natural resources and the repeated development of the natural environment exceeding the carrying capacity due to insufficient recognition of the value of biodiversity and ecosystem services. One effective way to mainstream the issue of biodiversity in today’s society is to “visualize” the diverse types of value that biodiversity has including non-use value through economic valuation (monetary valuation). Therefore, it is important to appropriately evaluate and visualize the value of biodiversity through economic valuation, etc., in order to help people recognize what action can be taken to conserve and use biodiversity sustainably, so that various parties include the value of biodiversity into their decision making and actions. Having said that, it is necessary to note that clarifying the entire value of biodiversity through economic valuation alone is difficult because the whole picture of the value of biodiversity and the function of ecosystem services are yet to be fully studied and technical improvements are still needed to further collect scientific data and to improve evaluation methods.

With these points in mind, the government will promote economic valuation of biodiversity and ecosystem services especially for the domestic natural environment and measures to conserve the natural environment which are generally outside the scope of market transactions. The results of the valuation as well as the results of related surveys and research will be utilized to show members of the public the value of biodiversity, together with the recognition that the sustainable use of natural resources and other ecosystem services require activities for the conservation of biodiversity as well

as expenditure and labor for the activities. The government will also promote economic valuation of biodiversity by various parties, through providing relevant information such as examples of evaluations conducted overseas. The valuation efforts will be promoted with the aim of introducing into society the Beneficiary-Pays Principle (for example, the principle that beneficiaries of ecosystem services should pay for part of the cost in proportion to the benefits they obtained), in addition to the Polluter-Pays Principle (the principle that emitters of pollutants should pay for the damage caused by the pollution) and the Full Cost Recovery Principle (the principle that consumers should pay for all the costs generated up to the stage of use of the product or service). From this standpoint, progress in the following actions will be facilitated: the formulation of biodiversity-friendly development plans and the planning/implementation of biodiversity-friendly policies by the government; evaluations conducted by businesses regarding the impact of their business activities on biodiversity and ecosystem services and the degree of their reliance on biodiversity and ecosystem services; and the selective purchase of biodiversity-friendly goods and services by consumers.

[Shift to biodiversity-friendly patterns of consumption]

Japan imports numerous kinds of natural resources including food, wood and feed from overseas, and our consumption behaviors heavily rely on benefits and loss of biodiversity in the exporting countries. It is necessary for us to recognize this and fulfill our responsibilities for the conservation of biodiversity and the sustainable use of its components on a global scale by each individual taking biodiversity-friendly actions. More specifically, we can make efforts to waste less energy and food. We can use the information provided by certification systems that contribute to the conservation and sustainable use of biodiversity and Environmental Reports to selectively purchase goods and services that take into consideration the conservation of biodiversity and the sustainable use of its components. The information can also be used to invest in businesses that are actively engaged in the production and distribution of biodiversity-friendly goods and services. We can also support local consumption of locally produced products as well as handing down traditional food culture and techniques to our children. As ways to propose to society a shift to biodiversity-friendly patterns of consumption, the government will promote the existing certification systems and actively provide information about businesses which offer certified products and businesses vigorously taking measures for biodiversity conservation, as well as connecting consumers and producers who work on local production for local consumption, in order to raise consumer awareness and promote efforts by businesses.

2 Reviewing and rebuilding relationships between man and nature in local communities

In the long history of agriculture in our country, people used to have a close relationship with nature. As many people moved to live in urban areas, the relationship between people and the nature surrounding them has become much less intimate. In agricultural and mountain villages, continuous use of local natural resources has been reduced due to the mechanization of agriculture and the introduction of chemical fertilizers. Before the Meiji Period, there was vast meadow land in the Kanto Region and southward including the environs of urban areas, which was used to harvest grass for feeding oxen and horses for agriculture and for producing green manure. While such meadows provided the resources needed for people's lives and livelihoods, the vast meadows and the wetlands in the meadows also served as habitats for many insects and other animals. However, as a result of the decreased demand for fodder and green manure from the Taisho Period (1912-1926) to the 30s of the Showa Period (1955-1964), there was a dramatic decrease in the area of meadow land. Even ordinary fields have been decreasing in recent years.

Satochi-Satoyama areas have been left uncontrolled to offer an ideal environment for wildlife such as the Sika deer, the wild boar and bears to live, and frictions between humans and wildlife have become a serious problem. In order to solve the problem in rural areas where local populations are shrinking and aging, building a new relationship between humans and nature in local areas is an urgent issue. In light of the situation, it is necessary to revise the current relationship between urban areas which have mainly been consumers and rural areas which have supplied food, feed and other resources, and consider the two types of communities as one integrated “socio-ecological sphere” where they cover each other’s shortages and live together. The mutually beneficial relationship between different communities should then be maintained or further developed while ensuring the autonomy of each community, and their cooperation and exchange within the sphere should be deepened so that they can continue to supply/receive benefits from biodiversity into the future.

Standing on the idea of the “socio-ecological sphere,” the government will reevaluate traditional, sustainable agriculture, forestry and fisheries which have been practiced in Satochi-Satoyama areas and Satoumi areas. It will also promote the conservation and utilization of Satochi-Satoyama areas and Satoumi areas; the reconstruction of appropriate relationships between humans and wildlife; agriculture, forestry and fisheries conducted in ways that can nurture organisms; and the creation of spaces which nurture diverse wildlife, thereby contributing to the creation of a rich relationship between humans and nature.

In addition to providing food, feed and various materials, organisms generate renewable energy, thereby supporting the creation of a recycling-oriented society where environmental impacts caused by exploitation and the disposal of natural resources are minimized. They also fix carbon in wood, soil, etc., thereby support the creation of a low-carbon society where the concentration of greenhouse gases is stabilized at a low level. As integrated efforts for establishing a society in harmony with nature, a recycling-oriented society and a low-carbon society, the government will improve resource usage efficiency, reduce the final disposal amount of waste and fossil fuel consumption and promote the utilization of biomass obtained through the management of the natural environment.

[Promoting efforts for the conservation and utilization of Satochi-Satoyama areas and Satoumi areas]

Satochi-Satoyama areas account for approximately 40% of Japan’s total land area. They constitute human-influenced natural environments, which were established by replacing natural forests and floodplains. Unique biotas have formed there as a result of modest artificial intervention caused by agricultural and other human activities.

The socioeconomic need to utilize extended areas of Satochi-Satoyama, as happened in the past, has diminished, and considering the decreasing population and the aging of residents, it is not practical to maintain all of the existing Satochi-Satoyama areas. This premise should be kept in mind when considering the future of secondary forests and artificial forests which constitute Satochi-Satoyama areas. It is necessary to take into consideration the various functions of forests including the conservation of biodiversity, water conservation, land conservation and the supply of forest products in order to determine the future management of Satoyama forests comprehensively. For example, some forests may need to be actively managed as secondary forests and artificial forests and others may need to be managed to facilitate conversion into forests which can maintain or enhance various functions mainly through succession, depending on future natural and social conditions in areas near remote mountains and in areas near cities. In particular, secondary forests such as deciduous oak forests (mizunara forests) and coppice forests of evergreen oak (shii or kashi

forests) growing relatively near remote mountain areas tend to turn into natural forests without maintenance work. For these forests, it would be suitable to leave them to succession in principle, while conducting minimal and appropriate conservation management by helping to restore the vegetation only when necessary, although local conditions should be looked at to make the decision. With these considerations in mind, the government will make efforts to efficiently conserve, restore, create and utilize Satochi-Satoyama areas while keeping an eye on future changes to the natural environment and social circumstances. It will also collect, analyze and widely disseminate distinctive examples of sustainable resource utilization from around the country as reference materials for Satochi-Satoyama conservation activities. The conservation and restoration of Satochi-Satoyama areas will also be promoted nationwide by providing advice and the technical know-how needed for activities to be conducted by the community. In order to provide such support, the government will investigate the following issues: reevaluating traditional methods for the use and management of Satochi-Satoyama areas; indicators and methods for verifying the effects of conservation and the utilization of Satochi-Satoyama areas; the introduction of new ways of utilizing Satochi-Satoyama areas which contribute to the conservation and restoration of Satochi-Satoyama areas; the creation of new ways to utilize the natural resources offered by Satochi-Satoyama areas; and measures to facilitate the participation of diverse parties including urban residents and businesses. In order to understand the effects of the conservation and utilization of Satochi-Satoyama areas from a biodiversity standpoint and to take adaptive measures, the government will look into appropriate selection methods for indicator species and appropriate evaluation methods in each local area.

In order to maintain the habitats of wildlife characteristic to Satochi-Satoyama areas, human intervention in the natural environment through modest levels of utilization is essential. For the conservation of biodiversity, it is important that various components of the environment such as secondary forests, artificial forests, agricultural land, grassland and reservoirs are established in mosaic patterns as a result of human intervention. Now that the need for natural resources to be used as fuel or fertilizer has been reduced in the community, the relationship between humans and nature in the community should be reconstructed with the help of various entities besides the community residents. To achieve this, the government will promote the construction of systems for managing Satochi-Satoyama areas as common resources (commons) jointly owned by various entities including urban residents and businesses in addition to the owners of agricultural land and forests. To this end, the government will look into new methods for utilizing Satochi-Satoyama areas such as environmental education, ecotourism and the use of biomass in addition to the promotion of conservation oriented agriculture, as well as clarifying the value of the benefits that come from the biodiversity in and around Satochi-Satoyama areas.

In order to rebuild the coexisting relationship between humans and nature that once existed in communities in Satochi-Satoyama areas, it is important to organize community networks made up of local residents engaged in agriculture, forestry and fisheries and private organizations such as NGOs and NPOs. Local governments, businesses and urban residents should then help the community networks in maintaining Satochi-Satoyama areas and managing forests. Therefore, the government will actively promote exchanges between urban and rural districts and organize a network of communities engaged in conservation activities through which information on appropriate management is shared, thereby establishing a framework for the sustainable use of Satochi-Satoyama areas with the vigorous participation of various types of entities. In this process it is vital that both urban residents lending support and local community residents receiving support have gratitude for each other's work.

For the conservation of areas where the natural environment has been maintained through various human interventions, collaboration between various parties will be needed including the government, local residents, people engaged in agriculture, forestry and fisheries, private organizations such as NGOs and NPOs, land owners and businesses. In order to enable sustainable conservation activities for the natural environment using locally established methods through collaboration between the various parties, the government will utilize the framework provided by the Act on the Promotion of Regional Cooperation for Biodiversity to promote the conservation activities.

Satochi-Satoyama areas in suburbs are important natural environments near to urban areas, and vigorous conservation activities are being conducted by private organizations such as NGOs and NPOs as well as urban residents. The government will enhance the conservation and management of Satochi-Satoyama areas in suburbs by utilizing systems for conserving urban parks and green spaces.

Similarly to Satochi-Satoyama areas, coastal areas where rich biodiversity and high bioproductivity have been conserved through human intervention while remaining in harmony with the natural ecosystem are known as Satoumi areas. Satoumi areas are important sea areas which have supported fisheries, distribution, culture and exchange for generations. It is the equivalent of Satoyama in the sea where high bioproductivity and biodiversity are expected and where people and nature coexist side by side. Healthy Satoumi areas will give us many benefits if the land areas and coastal waters in the Satoumi areas are managed by humans in an integrated manner so that their material cycle function can be appropriately maintained and the rich and diverse ecosystems and natural environments can be conserved.

For example, there are various problems including the deterioration of water quality caused by pollutants emitted from residential areas and industrial activities, a decrease in seagrass beds and tidal flats which are important for water purification and the inhabitation of organisms, as well as increasing amounts of marine debris. Management by people such as efforts to reduce pollutants flowing from land areas, coastal cleaning and the development of seagrass beds and tidal flats can contribute to the prevention of marine environmental degradation and the recovery of good coastal environments. In addition, marine ecosystems close to primeval nature can be protected by restricting specific actions in a specific sea area with a clear explanation of its purpose, such as setting up a marine preserve. In these ways, the government will help to restore fertile Satoumi areas from which people can benefit into the future by exploring the appropriate involvement of people with the sea in different communities in accordance with the conditions of the sea and continuously adding appropriate levels of management.

[Promoting the development of communities that coexist with wildlife]

According to a survey conducted from 2000 to 2003, it was estimated that the range of the Sika deer, the Japanese macaque and the wild boar expanded by 1.7 times, 1.5 times and 1.3 times, respectively, from the range found in a survey conducted 20 years before. This happened partly because of changes in the relationship between humans and nature in local communities. Due to the expansion of habitats, the damage caused to farm produce and vegetation by wildlife has become increasingly serious. In some years, Japanese black bears made frequent appearances in human settlements, leading to an increasing number of accidents resulting in personal injury or death and an increasing number of bears being caught. In order to prevent the damage and injuries, it is important to create human settlements which do not attract bears that are potentially dangerous for humans, and to promote the development of communities which can appropriately manage Sika

deer and other wildlife. In some communities, attempts are being made to improve the relationship between humans and wildlife by installing and properly managing buffer zones between forests inhabited by wildlife and human settlements using native grass resources to graze cattle, or by removing farm produce and fruits from human settlements lest wildlife should enter the settlements in a quest for food particularly in winter. Their efforts have met with some measure of success. Therefore, besides promoting the management of wildlife in accordance with Specified Wildlife Conservation and Management Plans, the government will also promote efforts based on damage prevention plans created by municipalities based on the Act on Special Measures for Prevention of Damage Related to Agriculture, Forestry and Fisheries Caused by Wildlife. These habitat segregation efforts between humans and wildlife in the community will be extensively promoted nationwide.

As the number of people engaged in agriculture and hunting are on the decrease in agricultural and mountain villages, the number of people involved in protection and management of wildlife activities is also decreasing. Therefore, the government will promote the development of frameworks for wildlife population management that can work into the future as well as promoting the recruitment and development of human resources.

Some types of wildlife cannot be managed effectively unless multiple prefectures work together to control them, such as the Japanese black bear and the Sika deer whose local populations are distributed over multiple prefectures and the Great Cormorant which are distributed over an extensive area and migrates even to discontinuous prefectures. For this type of wildlife, the government will strengthen the coordination and cooperation between those concerned with the issue in order to take measures to maintain a stable population for the species which are decreasing locally and measures against damage caused by species whose populations have suddenly increased. For example, the government will cooperate with a wide range of stakeholders including government agencies, other organizations and experts and formulate a set of wide-area wildlife protection and management guidelines which set forth the direction for wildlife protection and management over an extended area. In doing so, the government along with the stakeholders involved will comprehensively take into consideration the size of the wildlife's home range, habitation status, the breeding potential, seasonal migration and the long-term trends for local wildlife populations.

[Promoting agriculture, forestry and fisheries that contribute to the conservation of biodiversity]

In order to meet the demand of Japanese people for the stable supply of good quality food, it is necessary to promote sustainable agriculture, forestry and fisheries which maintain good production environments by taking into consideration biodiversity conservation, and to vitalize rural communities that form the basis of sustainable agriculture, forestry and fisheries. For that purpose, the government will promote sustainable agriculture, forestry and fisheries that upgrade the quality of the habitats of living organisms, as well as helping to revitalize agricultural, mountain and fishing communities, considering the importance of biodiversity conservation in implementing measures related to agriculture, forestry and fisheries.

The establishment process for Satochi-Satoyama areas, where people can come into contact with various species of animals and plants in rich nature, is closely related to agricultural, forestry and fishery activities. It is important to afford different groups of people a better understanding of the roles that these industries have in conserving biodiversity. With this in mind, the government will promote activities to deepen understanding about the relationship between biodiversity and

agriculture, forestry and fisheries through experiencing agriculture, forestry and fisheries in rural districts as well as promoting events for communing with nature and education on foods.

Diverse efforts for the conservation of biodiversity and the sustainable use of its components will be more effective if various entities participate in them and work in cooperation with those engaged in agriculture, forestry and fisheries who will also make conservation efforts in their production activities. From the standpoint of supporting activities conducted by various entities including those engaged in agriculture, forestry and fisheries, community residents, private organizations such as NGOs and NPOs, businesses and local governments, the government will reevaluate and facilitate existing activities which utilize local ideas as well as knowledge and techniques locally developed over the years. Thus, activities for biodiversity conservation will be promoted in a comprehensive manner with broad public support and participation.

The government will also actively pursue the promotion of domestic agriculture, forestry and fisheries as well as biodiversity conservation through the appropriate conservation and management of forests, thereby reducing impacts on biodiversity in other countries and contributing to the conservation of the global environment.

In rural areas and Satochi-Satoyama areas, diverse environments established through appropriate maintenance by humans spread in mosaic patterns. They have become biodiversity-rich areas where various animals and plants inhabit through the sustainable practice of agriculture and forestry. However, there is a concern that biodiversity could be adversely affected by the inappropriate use of agricultural chemicals and fertilizers and development projects using construction methods which only focus on economy and efficiency. In addition, in recent years Satoyama forests have been used less and the area of abandoned farmland has increased due to a shortage of workers engaged in agriculture and forestry. This has led to decreasing populations of medaka and dogtooth violets which were commonly found in biodiversity-rich Satochi-Satoyama areas since long ago. Therefore, the government will promote agricultural production as well as the conservation and improvement of rural areas and Satochi-Satoyama areas, with a high priority being placed on the conservation of biodiversity, so that the people of our country can enjoy safe high-quality food and a natural environment rich in biodiversity. From the viewpoint that agriculture is an activity that brings diversified living organisms into the world besides producing food, the government will promote activities to offer people opportunities to commune with organisms and deepen their awareness of the relationship between agriculture and biodiversity, thus contributing to the vitalization of agricultural and mountain communities.

Forests, which cover two thirds of Japan's total land area, are important components of biodiversity in our country because various types of forests ranging from natural to artificial forests serve as the habitats for a wide range of wildlife. Therefore, forestry, which relies on the productivity of forest ecosystems, will contribute to the multifunctional roles played by forests which include biodiversity conservation, if forest resources are utilized in a sustainable manner. Therefore, the government will promote the appropriate management and conservation of forests in cooperation with those concerned such as promoting thinning by reinvigorating forestry and wood industries through the appropriate operation of the Forest Planning System and through forest certification systems run by private third-party organizations.

As fisheries are an environment-dependent industry that relies on benefits from the rich sea, rivers and lakes, it is important to maintain the sound state of the ecosystems which support fishery productivity. In Japan, coastal areas have had a particularly strong connection with human activities

since long ago, and the areas have been used for fishery activities such as shellfish and seaweed gathering. The sea areas where high productivity and rich biodiversity have been conserved by adding human intervention while remaining in harmony with natural ecosystems are generally known as Satoumi areas, and they need to be appropriately conserved into the future. The government will therefore promote the establishment of vigorous fisheries and revitalized fishing communities through the implementation of activities for the conservation of biodiversity and the sustainable use of its components in sea areas including Satoumi areas, so that people can enjoy a stable supply of marine products which are part of the healthy diet of Japanese people for many years to come.

[Promoting efforts to conserve wildlife endemic to local areas]

Conservation of locally endemic species and ecosystems in order to avoid the extinction of the species is one of the top priorities for preventing the degradation of species diversity. Therefore, the government will formulate a conservation strategy for threatened wildlife in light of the results of conservation progress checks conducted in the past, based on which the conservation of threatened species will be implemented nationwide. In addition, it will gather information about their ecology, the factors contributing to the population decreases and the conservation status, in order to promote at the national level measures to conserve threatened species by effectively utilizing existing systems and projects through cooperation between the national government, local governments, experts and other interested parties.

In order to reduce the risk of species extinction, we must consider taking measures by focusing on specific priority conservation areas rather than only paying attention to individual species. The government will therefore specify priority areas for biodiversity conservation such as island areas where threatened species concentrate and explore systems and methods for conserving and restoring biodiversity in the hotspots as a whole in cooperation with the interested parties in the areas.

In particular, it is important to implement the Conservation Programmes defined by the law for the crested ibis, the Oriental stork, the Tsushima leopard cat and the Okinawa rail and to return them to the wild, as symbolic programs for creating habitats which foster diversified wild organisms. In order to return the Tsushima leopard cat to the wild and such birds as the crested ibis which rely on forests and paddy fields, it is necessary to conduct biodiversity-friendly agriculture and forestry which nurture numerous organisms that become the prey for the animals. Organic agriculture using winter-flooded or early-flooded paddy fields can be seen in many parts of the country these days, and in areas around the Kabukuri Swamp in Miyagi famous as a stopover for the white-fronted goose, such agricultural practices have resulted in diversified wildlife. The government will work with community residents to create habitats not only for organisms which become the prey for rare animals but also habitats for more diversified wildlife. These activities will be modeled on activities on Sado Island in Niigata, where there are ongoing activities for returning the crested ibis to the wild, as well as the activities of the Kanto Local Government Forum for the Conservation of the Oriental Stork and the crested Ibis, where 29 municipalities in the Kanto Region work together to restore environments on the Kanto Plain which can be inhabited by the Oriental stork and the crested ibis.

In order to prevent damage caused by alien species, it is important to first identify invasive alien species and then prevent their introduction. Therefore, the government will list invasive alien species, additionally designate IAS if necessary and identify their introduction routes in an effort to stop their introduction. Established alien species which jeopardize the existence of native wildlife species should be systematically controlled through cooperation between various parties. For

species ranging widely and affecting local ecosystems such as the raccoon and the largemouth bass, the government will support control efforts in many areas through developing and disseminating more effective control methods and sharing results and lessons learnt from individual control cases. On Amami-Oshima Island and in the Yanbaru area on Okinawa, the mongoose brought in by humans have been affecting rare species such as the Amami rabbit and the Okinawa rail, but continuous implementation of control measures has proven to be successful. Continuous efforts will be made aiming for the eradication of the mongoose. For areas particularly important for the conservation of biodiversity such as national parks and forest reserves on national forest, the government will implement measures to prevent alien species from being brought in, including alien species being introduced from other parts of Japan, as well as promoting the thorough practice of appropriate rearing management of pets and efforts to eradicate invasive alien species in conservation priority areas. Further, it will consider preventive measures against the unintended introduction of alien species transported on materials or other organisms.

[Promoting integrated efforts for the establishment of a society in harmony with nature, a recycling-oriented society and a low-carbon society]

Benefits from biodiversity can be obtained through the activities of organisms including photosynthesis using solar energy as the source to produce organic matter, food chains, decomposition and the movement of individual organisms, as well as materials circulating between the atmosphere, water and the soil on earth. Global warming is mitigated through carbon accumulating in forests, grassland, etc. and the appropriate utilization of these biomass resources contributes to less consumption of fossil fuels.

In order to maintain a healthy state of life and material cycling and to mitigate global warming, it is important to take integrated measures towards the establishment of a society in harmony with nature, a recycling-oriented society and a low-carbon society, by understanding the interrelationships between the conservation and the sustainable use of biodiversity, the control of natural resource consumption, the reduction of environmental impacts and measures to curb global warming.

Controlling inputs of fossil resources and mineral resources leads to reduced resource exploitation resulting in a reduced loss of habitats for organisms. The utilization of renewable and recyclable biomass resources obtained from the natural environment can contribute to the conservation of agricultural land and forests as well as the conservation of ecosystems endemic to Satochi-Satoyama areas.

With the full recognition of these facts, the government will promote the efficient use of fossil resources and mineral resources as well as promoting sustainable agriculture, forestry and fisheries in order to secure sound material cycles in nature. It will also promote the utilization of currently unused resources including rainwater and sewage sludge biomass in urban areas, rice straw in agricultural and mountain villages, herbaceous resources and ligneous resources generated through the utilization and management of Satochi-Satoyama areas.

The promotion of such resource utilization should not end with the creation of individual resource circulation systems. The government will, in accordance with local characteristics, promote the establishment of a multilayered Sound Material-Cycle Society where the circulation of resources within the community will be prioritized and the resources that are difficult to circulate within the community will be circulated over wider areas.

With the backdrop of the emerging efforts to restructure the national land use by forecasting future changes in social circumstances such as population decreases and the progress in the aging society,

the government will proceed with discussions about measures to deepen cooperation and exchange between communities that are connected through supply and reception of ecosystem services while prioritizing the development of independent and decentralized local communities. In addition, it is necessary to promote the introduction of independent and decentralized energy systems using renewable energy including solar power, wind power, hydraulic power and geothermal energy in an effort to reduce dependence on nuclear power generation. In this process, it is important to take into consideration the conservation of biodiversity and the sustainable use of its components, by for example conducting environmental impact assessments in order to avoid as much as possible or minimize the impacts on animals, plants and ecosystems. The government will examine ways to promote renewable energy while ensuring biodiversity conservation.

3 Securing linkages between forests, the countryside, rivers and the sea

In order to establish a society where humans can live in harmony with nature, the quality of the natural environment across the country needs to be improved. In particular, in order to conserve and restore ecosystems (that are the basis of human survival) in the process of restructuring the land use in Japan due to population decline, it is necessary to ensure the connection between the core elements of the national ecological network. It is also necessary to ensure the integrity of each ecosystem by taking into consideration the intrinsic features and mechanisms of each ecosystem and its historical significance.

For example, natural mountain areas including mountainous backbones which are home to many natural forests and natural grasslands contain primeval nature, catchment areas and core habitats for large mammals and birds of prey that have a large home range. Therefore, they can be a core element for the development of a national ecological network. Complex and diversified coasts and green belts along roads in urban areas are also core elements constituting the national ecological network. The government will continue its efforts to conserve and restore ecosystems in view of establishing a national ecological network, adding to the current efforts of conserving natural parks and forest reserves on national forest, establishing green corridors which provide migration routes for wild animals and plants, conserving greenery and promoting vegetation planting in cities.

Water systems including rivers, lakes, wetlands and spring-fed ponds are another core element in the national ecological network as they connect forests, agricultural land, cities and coastal areas. For example, forests and the sea are linked by rivers. The transfer of earth and sand through the river forms tidal flats and sandy beaches, and the nutrients supplied from forests foster living organisms including fish in the rivers and the sea, thus enriching the sea. In the countryside, networks have been formed that involve rivers, wetlands, man-made water systems such as paddy fields, reservoirs and waterways, and fish use the networks for migration. In view of ensuring the connection between places that support the inhabitation of organisms, the government will aim to construct an ecological network organically linking the areas which have a natural environment that should be conserved into the future and areas which have excellent natural conditions, while taking into account the intrinsic characteristics and mechanisms of each area's ecosystem and its historical significance. For that purpose, the government will actively promote the conservation and restoration of forests, the countryside, rivers and the sea by ensuring their connection at each geographical level from a viewpoint of ecosystem management of an entire watershed area. Pollution on land should be appropriately controlled by keeping in mind that pollutants from the land will end up in the sea via the rivers.

Each species and ecosystem has a different level of vulnerability to global warming and different abilities to adapt to global warming. Therefore, when considering climate change adaptation measures from the standpoint of biodiversity, it is necessary to adopt measures which can flexibly cope with the fact that it takes time for diverse species and ecosystems to go through changes as global warming progresses. For this reason, the government will promote measures to ensure the integrated conservation of a large area which takes into account the arrangements of biodiversity-rich areas and the connection between them in accordance with local characteristics. It will also work on the development of an ecological network which takes into account the connection and arrangements of biodiversity-rich areas in the horizontal direction (north to south) and in the vertical direction (different altitudes on the same mountain range).

[Promoting the development of ecological networks, conservation and the restoration of nature]

In order to ensure the stable existence of the biota endemic to a local area or to restore a damaged biota, it is important to construct ecological networks for protected areas of ample size in which habitats are appropriately linked and arranged in accordance with the ecological characteristics of each living organism. Through deepening the discussion on the methods for planning and constructing ecological networks, providing relevant information and conducting PR activities, the government will prepare to develop such plans and implement projects for various scales of networks including nationwide, wide-area, prefectural and the municipal levels. As it is particularly important to demonstrate the development of ecological networks at a wide-area level, measures for creating wide-area ecological networks will be examined including fact-finding activities in close cooperation with the ministries and agencies concerned. In addition to networking forests and vegetated areas, it is also important to develop networks by paying attention to hydrologic cycles involving coastal areas and water systems including rivers and floodplains, lakes, wetlands, ground water, spring water and paddy fields. Therefore, the government will consider measures to effectively promote activities for conserving and networking ecosystems in entire watershed areas. Similarly, in urban areas, it is important to network green spaces and waterside spaces through ecological corridors. The government will therefore promote efforts to conserve, create and restore vegetated spaces and to develop networks of water and greenery in cities from the perspective of preventing and reducing disaster damage as well as conserving biodiversity.

Natural mountain areas which have been disturbed less by human activities are important as the framework for a nationwide ecological network. Natural parks including national and quasi-national parks, which are mainly composed of mountainous backbones, cover more than 14% of the Japan's total land area, and serve as the foundation for biodiversity conservation in our country. The government will promote activities to protect excellent natural landscapes in natural parks through collaborations with various entities, while enhancing the areas' role as the foundation of biodiversity conservation. In response to the changes in the natural environment and social circumstances and diversified appreciation of landscapes, a comprehensive check was conducted on the quality of national and quasi-national parks. Based on the results of the check, the government will review and reorganize the designation of national and quasi-national parks nationwide. In this process the expansion of designated areas will be strived for by taking into consideration the construction of ecological networks. Evergreen broad-leaved forests, Satochi-Satoyama areas and sea areas will also be considered as candidates for excellent natural landscape areas wherever possible. In particular, appropriate conservation and management of evergreen broad-leaved forests on the Amami Islands in Kagoshima and in the Yanbaru area on Okinawa will be promoted with an eye to designating them as national parks or forest reserves. National forest accounts for about 30% of the total forest area in Japan and about 20% of Japan's total land area. It is widely distributed

over remote mountain backbones and catchment areas which are important for land conservation and it plays a critical role as the core area supporting ecological networks. National forest will be managed essentially to maintain or enhance their public benefit functions including the function to conserve biodiversity, by turning them into diversified forests and conducting other appropriate improvements and conservation activities. In particular, primeval forest ecosystems and forests inhabited by rare animals and plants will be specified as forest reserves including forest ecosystem reserves which are left to natural processes without adding human intervention in principle. In addition, green corridors will be established to create ecological networks centering on forest reserves, in order to facilitate interaction between populations and to ensure species conservation and genetic diversity by securing migration routes to bridge wildlife habitats.

As for sea areas, the government will promote the expansion of designated areas such as marine park areas in national and quasi-national parks by taking into consideration the distribution of seagrass beds, tidal flats and coral reefs which are core components for wide-area biodiversity conservation while also considering their connection with ocean currents and land areas.

In areas where ecological networks have been fragmented, their connection should be restored. Therefore, the government will strive to increase scientific knowledge and conserve priority areas on the basis of scientific findings. It will also implement various measures suitable for different geographical scales including vigorous activities to restore nature and secure migration routes for wild animals in order to establish ecological networks, in an effort to secure habitats for various organisms as well as establishing ecological corridors through which organisms can go back and forth to different habitats.

Feeding damage by the Sika deer will be controlled by capturing them and installing protective fences in an effort to maintain or recover healthy ecosystems.

Regarding the restoration of nature, the government will take into consideration the promotion of national-level activities including the establishment of a national ecological network when promoting efforts based on the Basic Policy for Nature Restoration revised in 2008, including the effective promotion of nature restoration, the strengthening of wide-area restoration efforts and the promotion of natural environmental learning, surveys and research.

The government will also promote ecosystem management at the watershed level by supporting regional activities, including the formulation of Regional Biodiversity Strategies by local governments, the creation of Plans for the Promotion of Activities for Biodiversity Conservation through the Cooperation among Regional Diversified Actors based on the Act on the Promotion of Regional Cooperation for Biodiversity, the development of regional networks and their efforts for nature restoration.

[Forest management and conservation]

Japan is a country with rich green forests, which cover two thirds of the total land area and constitute an important component of the national ecological network.

The current Japanese forest resources are about to enter the utilization stage with the artificial forests planted after World War II accounting for a major proportion. In such artificial forests, implementing management measures such as thinning at the appropriate stages of growth, and creating diversified forests with trees of different ages through cutting and replanting will lead to sound growth as well as the conservation of biodiversity and the sustainable use of its components.

The effective use of timber, which is friendly to both humans and the environment, at different stages of their growth will contribute to the creation of a recycling-oriented society, the prevention of global warming and the vitalization of mountain communities. Therefore, the use of timber at different ages should be further promoted. As for secondary forests, management and conservation should be conducted appropriately by utilizing them as resources in accordance with the demand in local communities. Natural forests should also be conserved and managed appropriately in response to increasing social demand for the conservation of the natural environment. Therefore, it is important to implement management and conservation suitable for artificial forests, secondary forests and natural forests, and various types of forests should be developed at appropriate locations in accordance with local natural conditions and demand in local communities. In addition, the appropriate distribution of forests should be ensured in important areas for the creation of ecological networks.

As forests constitute an important component of biodiversity, the government will take comprehensive measures to manage and conserve them so that they can play their multifunctional roles including the conservation of biodiversity. For that purpose, the government will promote appropriate thinning in mature artificial forests, the creation of diversified forests by turning coniferous plantations into broad-leaved forests or introducing long rotation management depending on the characteristics of the locations. It will also introduce broad-leaved trees wherever possible in waterside forests near mountain streams on national forest. Through the implementation of these activities, the government will promote the establishment of more extensive and elaborate ecological networks, as well as promoting the utilization of domestically produced timber and the development of relevant human resources and communities, while obtaining the support and cooperation of various parties.

[Conservation and restoration of green spaces in cities]

Human activities are concentrated in cities and natural environments where diverse organisms can live are scarce or quickly diminishing. As half of world's population lives in cities and they have become the centers for economic activity, biodiversity in cities is becoming an increasingly important issue internationally. Therefore, Japan should also focus more efforts on the issue.

Green spaces in cities such as forests and grassland are precious habitats for organisms living in urban areas and also very important for urban residents as places to experience nature that are close to them. Green spaces in cities linked with forests and the sea play a central role in ecological networks in cities where a large proportion of Japanese people live.

In order to ensure rich biodiversity in cities, it is important to secure the habitats of living organisms on a substantial scale by taking into account the characteristics of the original local natural environment so that they can serve as core habitats in the areas. Therefore, the government will promote the conservation and restoration of green spaces and the development of urban parks, aiming to secure large-scale green spaces that deserve to be called forests inside urban areas or seafloor areas, by referring to the example of the Meiji Shrine forest, where the artificially created forest now has rich biodiversity. In urban areas, while giving consideration to local ecosystems, the government will also promote planting vegetation on land including private land, connecting vegetated spaces and waterside spaces by ecological corridors in order to secure green spaces over an extended area. It will also aim to construct networks of water and greenery inclusive of the microtopography inside urban areas, thereby seeking to secure continuous habitats for living organisms.

In order to protect biodiversity in the suburbs, it will be effective to cooperate with urban residents who are highly conscious of the natural environment around them and companies doing business in urban areas. Therefore, the government will support conservation and management activities led by groups of urban residents such as the National Trust, and activities to conserve and manage green spaces conducted by businesses in cooperation with private organizations by utilizing the land they own. In addition, the government will move ahead with considering mitigation systems where the conservation of green spaces on private land such as woodlands around residences and Satoyama areas is ensured when urban development takes place.

In order to encourage businesses to participate in these conservation activities and give incentives to them, the government will promote programs to recognize activities to conserve and restore vegetated spaces conducted by businesses. In addition, various awareness raising activities will be carried out including tree-planting activities involving local residents in order to raise the awareness of urban residents and businesses.

Waterside spaces in urban areas are important as places where urban residents can experience nature. In order to improve waterside biodiversity and natural hydrologic cycles, both of which have deteriorated substantially, the government will implement measures to conserve the quantity and the quality of water in coordination with measures to upgrade green spaces. In order to prevent the eutrophication of lakes and closed ocean areas and nurture rich biodiversity in those waters, it is important to reduce the inflow of pollutants from urban areas. Therefore, the government will promote advanced water treatment systems for sewerage in order to reduce pollutants.

[Conservation and the restoration of rivers and wetlands]

Water is the origin of life, and water systems play a central role in ecological networks linking forests, the countryside and the sea.

Regarding rivers, efforts to improve the environment have been made in such a way that fish can ascend or descend the river more easily. In Shiretoko, which is registered as a world natural heritage site, the structures in the rivers have been improved so that salmon (*Oncorhynchus keta*, *O. gorboscha*) can swim up the rivers. Monitoring is currently being conducted to check how far they can ascend the rivers. In improving the habitats of living organisms in the rivers, the government will continue its efforts to create ecological networks by ensuring river variability and the flow of water from upper to lower reaches as well as ensuring the connection of the entire river through to the sea which allows earth and sand to be transported downstream. The government will make these efforts while also aiming at neo-natural river reconstruction where rivers are managed in a way that allows for the conservation or reconstruction of diverse river landscapes and original environments for organisms to inhabit and breed from the standpoint of conserving the activities of nature in the entire river, while ensuring harmony with local lifestyles, history and culture.

As in the case of crucian carp (*Carassius auratus grandoculis*) which move between Lake Biwa and paddy fields, some organisms use more than one inland water ecosystem, and others move between the sea and the rivers, like the Japanese eel and salmon. In order to secure the continuity of habitats, Shiga Prefecture is conducting the Fish Nursery Paddy Field Project and other activities to restore water environments that extend from Lake Biwa to paddy fields without interruption. Referring to these examples, the government will promote the construction of networks linking rivers, lakes, wetlands, spring water, reservoirs, waterways and paddy fields that allow uninterrupted movement of living organisms between them. In addition, paddy fields flooded for an extended period and

rivers including floodplains which used to occupy large areas of land are important places for various organisms to live on. Such water area ecosystems will be conserved and restored.

Wetlands are important habitats for various organisms including water birds, in addition to playing an important role in mitigating floods, storing underground water and the purification of water, but the ecosystems forming on wetlands are rapidly diminishing. In order to conserve wetlands, the government will review 500 Important Wetlands in Japan and summarize its approaches to the conservation and restoration of watershed areas for wetlands as well as deteriorated wetlands. It will then work to restore wetlands using abandoned farmland and fallow paddies as well as conserving existing wetlands and creating biotopes, by giving consideration to biodiversity endemic to each local area. For a sound hydrologic cycle, ground water as well as water above the land surface is important. The government will promote the conservation of ground water and spring water.

[The conservation and restoration of coastal and oceanic areas]

Japan is surrounded by the sea, having many inland seas and deeply indented bays. Its waters extend from the floating ice area in the north to the coral reef area in the south, and cold and warm currents flow along the coastal areas. Among coastal and oceanic areas, coastal areas are biodiversity-rich areas which consist of beaches, neritic areas containing tidal flats, salt marshes, seagrass beds and coral reefs, as well as deeply indented bays. Oceanic areas contain various environments below the water surface down to the deep sea, and are inhabited by various organisms including sea mammals, sea birds and fish. Japan has the world's sixth largest EEZ and is responsible for the conservation and management of its resources and the prevention of marine pollution. In April 2012, the continental shelf extending over about 310,000 km², which is equivalent to about 80% of Japan's total land area, was newly recognized as part of the Japanese continental shelf. The oceans are connected to each other beyond national boundaries through the ocean currents, and their ecosystems have close relationships with those of the land through the flow of earth and sand and the supply of nutrients. Assuming that the water systems in land areas are the vertical axis of the ecological network, coastal areas correspond to its horizontal axis.

The Basic Plan on Ocean Policy was decided by the Cabinet in March 2008 based on the Basic Act on Ocean Policy which was established in April 2007. The plan and the act specify that the government should take the necessary measures to conserve marine environments including the securing of the biodiversity of oceanic life. In order to develop and implement conservation measures, scientific knowledge on oceanic life and marine environments should be expanded. The government will strengthen the collaborative relationship between the ministries and agencies concerned with the ocean, and consider measures for the integrated conservation and management of marine environments.

Fisheries have long been a major industry in Japan, and it has accumulated knowledge on fishery resources. However, it has not necessarily collected enough data on oceanic life other than fishery-targeted species, although it has been conducting such surveys as the National Survey on the Natural Environment and Monitoring Sites 1000 to obtain data for coastal areas which are important for the conservation of biodiversity such as tidal flats, seagrass beds and coral reefs. Therefore, the government will further promote various surveys including the National Survey on the Natural Environment and Monitoring Sites 1000 as well as promoting information exchanges between relevant ministries and agencies, in order to accumulate more data on coastal organisms and ecosystems. It will also implement evaluation schemes for the scarcity of marine organisms.

In order to conserve and restore extensive coastal and oceanic areas effectively, it is necessary to clarify the characteristics of ecosystems in coastal and oceanic areas and systematically implement

regulations and conservation activities. To this end, the government will conduct zoning for oceanic areas based on the conditions of ocean currents, climate and geography. It will then identify marine priority areas for biodiversity conservation by paying particular attention to areas typical of each zone including tidal flats, seagrass beds, coral reefs and other areas important for the inhabitation and breeding of wildlife. The government will also examine the need for conservation and the methods to be used for each type of ecosystem such as coral reefs and seagrass beds based on the current situation of conservation in marine priority areas, as well as clarifying how many sea areas need more intensive conservation activities. The government will continue implementing these measures and other efforts based on the Marine Biodiversity Conservation Strategy which summarizes the basic policy for comprehensively implementing the conservation of marine biodiversity. With regard to the protection of specific coastal and oceanic areas, the government has designated, for example, marine park areas based on the Natural Parks Law and protected waters based on the Act on the Protection of Fishery Resources in order to restrict specific acts such as land reclamation and the collection of marine animals and plants so that the coastal environment and marine life can be conserved. Marine protected areas will be appropriately set and their management will be strengthened based on scientific findings by incorporating these existing efforts on designated areas.

In coastal areas, where the land and sea areas meet, ecosystems important for the conservation of biodiversity have formed on tidal flats, salt marshes, seagrass beds, coral reefs and sandy beaches. However, they are easily affected by human activities as well as the occurrence of natural disasters such as tsunamis and storm surges as well as coastal erosion. Therefore, those engaging in the conservation and restoration of the areas should consider the connection between the land and the sea as well as the promotion of disaster prevention and mitigation measures which are in harmony with nature, based on a consensus among the local community. Therefore, the government will promote the integrated biodiversity conservation of coastal areas and entire river basins by taking into account the influences exerted by the land area. The government will also promote disaster prevention and mitigation measures which are suitable for the local community and are in harmony with the environment, and the conservation, restoration and creation of tidal flats, seagrass beds, coral reefs and sandy beaches.

When looking at the current designation of tidal flats, seagrass beds and coral reefs as national parks, quasi-national parks and national wildlife protection areas, although 40-50% of seagrass beds and coral reefs have been designated, most of them were designated as ordinary zones of national and quasi-national parks which are under relatively loose regulations. In addition, only about 10% of tidal flats have been designated. The government will promote the appropriate conservation and sustainable use of biodiversity in sea areas in coordination with other relevant agencies, by expanding the sea areas designated as national and quasi-national parks, designating marine priority areas in the parks as marine park areas wherever possible and promoting their appropriate management. The government will also examine the directions for voluntary resource management based on community consensus which aims to enable both conservation and the diversified use of marine resources including fisheries and measures to conserve biodiversity in marine protected areas, by referring to existing informative cases. For example, the Multiple Use Integrated Marine Management Plan for Shiretoko World Natural Heritage Site aims at the conservation of biodiversity in sea areas while fishery resources are maintained principally by fishermen's voluntary restraint in addition to rules imposed by law based on the concept of adaptive management. Another example is the Japanese sand lance fishery in Aichi, where an adaptive no-fishing area has been set to realize a sustainable fishery.

In coastal areas of Japan, local communities have been utilizing and managing the areas as can be seen in the resource management by those engaged in the fishing industry. Even today, in the sandfish fishery in the northern part of the Sea of Japan, resource management is conducted voluntarily by restricting the size of the fishnet meshes. This type of community initiative should be promoted in order to enable sustainable resource management through the conservation of coastal areas. At the same time, the government will promote the conservation of natural coasts, water pollution prevention measures in closed ocean areas and the development of forests around the upper reaches of rivers in order to restore Satoumi areas rich in the benefits of nature that people can enjoy for many years to come.

The government will also strengthen its conservation efforts as part of national and international networks by taking into account the migration of organisms. These efforts will include the conservation of important habitats such as breeding grounds for sea birds and sea turtles, the development and dissemination of techniques to avoid by-catch and surveys of the transboundary migration routes of sea lions. In addition, the government will promote ecotourism with the aim of conserving the natural environment and culture rooted in everyday life in coastal and oceanic areas as well as utilizing these resources sustainably.

It is also important to prevent marine pollution from affecting ecosystems and to prevent animals from swallowing ocean/beach debris. With this purpose in mind, the government will continuously monitor marine pollution in the sea area surrounding Japan and take measures against heavy metals, harmful chemicals and red tides in order to prevent marine pollution from occurring. In order to combat ocean/beach debris, such measures as the monitoring of current conditions, the elimination of the sources of the debris through international action if necessary, and assistance to heavily damaged areas will be implemented, thus contributing to biodiversity conservation in coastal and oceanic areas.

It has become clear that unique ecosystems exist in deep ocean areas such as the chemosynthetic ecosystem which has developed at hydrothermal vents using hydrogen sulfide in hydrothermal solutions as an energy source. It has also become clear that mineral resources exist in deep seabeds which are expected to become precious resources for Japan. Technologies for investigating and exploiting these resources are at the development stage. There is a need to conduct a prior assessment of their environmental impacts, to develop technologies for minimizing the impacts and to create appropriate plans, because these activities may have critical impacts on the habitats of organisms living in deep ocean areas.

[Promoting global warming mitigation and adaptation measures from a biodiversity standpoint]

Global warming has become an unavoidable crisis. The conservation of healthy ecosystems in forests, grasslands, wetlands including peatlands and soil which store large quantities of carbon will contribute to reducing greenhouse gas emitted from ecosystems, thus mitigating global warming. Therefore, the government will promote the conservation of biodiversity and the sustainable use of its components as measures to mitigate global warming. Since the function of forests as carbon sinks is important, forests will be managed and conserved so that they can be fully effective in storing carbon as well as conserving biodiversity. The government will also promote the use of herbaceous and ligneous biomass derived from ecosystem management (such as thinning in artificial forests, secondary forest management, grass cutting in waterside areas and mowing on secondary grassland) as alternative heat energy to fossil fuels, in a manner which will reinvigorate local industries.

It is important to start implementing surveys and research and building a consensus on effective and efficient adaptation methods to cope with the impacts of global warming on biodiversity from this point on, before the impacts start causing more serious problems in various areas. For this reason, the government will strengthen its monitoring activities on the impacts of global warming and examine adaptation measures from the standpoint of conserving biodiversity. For example, it will identify points to remember when conserving and restoring healthy ecosystems and when building ecological networks which can more easily adapt to environmental changes such as climate change, by establishing green corridors that provide mitigation routes connecting the habitats of wild animals and plants on national forest, etc. Progress in global warming may cause irreversible changes in ecosystems on islands and in alpine zones which are vulnerable to global warming. Therefore, the government will strive to ensure healthy ecosystems which can better cope with global warming through setting protected areas, conducting The Conservation Programmes defined by the law for rare species and strengthening alien species control measures, with the aim of removing other factors which could accelerate the impacts of global warming. The government will also promote the creation of ecological networks which can cope with global warming in urban areas through the development of urban parks and the promotion of vegetation planting.

4 Taking action from a global perspective

Biodiversity of our country is linked with those of neighboring countries through the sea and sky. Japan also imports large quantities of natural resources and is causing impacts on global biodiversity. Therefore, it is necessary for us to fully recognize the fact that the daily life of each individual is supported by global biodiversity and to promote the appropriate distribution and sustainable use of natural resources used in Japan from the standpoint of biodiversity conservation on a global scale. In addition, it is also necessary to promote international cooperation for the conservation of global biodiversity and the sustainable use of its components from a global perspective. Japan has participated in international cooperation efforts in the field of biodiversity and supported developing countries through international financial mechanisms, etc. The Japanese government will continue to take action for biodiversity conservation from a global perspective. More specifically, it will assist developing countries with their capacity development efforts towards the achievement of the Aichi Biodiversity Targets, promote sustainable conservation of human-influenced natural environments through the *Satoyama* Initiative and participate in international cooperation centered on the Asia-Pacific region which has a close connection with Japan.

[The contribution to international efforts toward the achievement of the Aichi Biodiversity Targets]

The global community must meet the Aichi Biodiversity Targets not only to stop the loss of biodiversity and avoid biodiversity from reaching a tipping point but also to restore biodiversity and hand it over to future generations in a healthy state. In particular, one of the most important issues is that the Parties should set national targets based on the Aichi Targets and incorporate the national targets into their national biodiversity strategies, thus strengthening their biodiversity-related policies and measures. Therefore, Japan needs to become actively involved in international contributions including assistance for capacity development in developing countries, in addition to making domestic efforts. The government will utilize the Japan Biodiversity Fund established within the Secretariat of the Convention on Biological Diversity in order to support developing countries' capacity development towards the achievement of the Aichi Targets, including assistance with revising their national biodiversity strategies.

At COP 10, the Nagoya Protocol was adopted as the international framework for access to genetic resources and the fair and equitable sharing of the benefits arising from their utilization (ABS: Access and Benefit-Sharing). The Aichi Targets includes ABS as target 16, which invites the Parties to put the Nagoya Protocol into force by 2015 consistent with national legislation. ABS is one of the three objectives of the CBD, and the Nagoya Protocol stipulates measures that provider countries and user countries of genetic resources should take in order to implement ABS. There are needs of developing countries for support to build capacity and raise awareness in order to develop the domestic measures for the Nagoya Protocol, promote participation of indigenous and local communities and relevant stakeholders in the efforts for ABS, and conserve and use sustainably genetic resources. Therefore, the government will implement various supports to the developing countries, including that for the development of domestic ABS systems, through the Nagoya Protocol Implementation Fund to which Japan pledged its contribution during the period of COP 10 as a support measure on ABS for developing countries. At the same time, the government will promote consideration on the domestic measures for the Nagoya Protocol, and aims to ratify the protocol as early as possible and to implement steadily the obligations under the Protocol such as designation of one or more checkpoints for monitoring the use of genetic resources and awareness-raising.

With regard to resource (funds, human resources, technologies, etc.) mobilization strategies for achieving the three objectives of the CBD including the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, the Japanese government will be actively involved in international discussions in order to contribute to their effective implementation through creating and improving reliable indicators and frameworks for reporting.

In March 2012, Japan signed the Nagoya - Kuala Lumpur Supplementary Protocol adopted at the Fifth Meeting of the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety (COP-MOP 5) which was held prior to COP 10. The government will proceed with the work needed for the conclusion of the supplementary protocol including the consideration of the legislation needed to implement the obligations in the supplementary protocol based on future discussions at the meetings of the Parties.

[Promoting the sustainable use and management of natural resources at the international level]

Human-influenced natural environments such as Satochi-Satoyama areas that have formed and been maintained through the influence of human activities including agricultural land and secondary forests being used and managed sustainably for generations are called socio-ecological production landscapes. These human-influenced natural environments are often inhabited by a variety of species adapted to and rely on these landscapes to survive, hence their maintenance and reconstruction play an important role in sustaining and enhancing biodiversity. However, these landscapes and the sustainable practices and knowledge they represent are increasingly threatened in many parts of the world, due for example, to urbanization, industrialization, and rapid rural population increase and decrease. Measures are urgently needed to effectively conserve these sustainable types of human-influenced natural environments through broader global recognition of their value. For this reason, Japan took the initiative in the development of the *Satoyama* Initiative's concept prior to COP 10, and support for the *Satoyama* Initiative was decided upon at COP 10. The *Satoyama* Initiative set the realization of societies in harmony with nature as its long-term goal. It also set a three-fold approach comprised of the following: consolidating wisdom on securing

diverse ecosystem services and values; integrating traditional ecological knowledge and modern science to promote innovations; and exploring new forms of co-management systems or evolving frameworks of “commons” while respecting traditional communal land tenure. Specific activities are being implemented through the International Partnership for the *Satoyama* Initiative (IPSI).

Japan will continue its support for the operation of the IPSI Secretariat and for community efforts in developing countries, thus globally promoting the *Satoyama* Initiative. The government will also encourage organizations involved in sustaining and reconstructing Satochi-Satoyama areas and Satoumi areas in Japan to participate in the IPSI. It will also provide opportunities for vigorous information exchanges and cooperation between Japanese members and overseas members of the IPSI in order to promote their activities.

It is also important to communicate to the world Japan’s style of coexistence with nature in a lucid manner. In particular, the government will share with the world information about the Japanese national park system which has contributed to nurturing local endemic culture by handing down places of natural beauty from generation to generation while also ensuring coexistence with local communities. It will also disseminate to the world advanced practices in Japan such as cases of sustainable agriculture, forestry and fisheries including the development of beautiful forests where various forms of harmony between conservation and the utilization of resources can be seen. The government will also provide support for efforts in Asian countries and other countries depending on demand in local communities.

Japan is importing many biological resources and it is important that these biological resources are utilized in a sustainable manner. In particular, it is important to prevent impacts of international trade on threatened wild animal and plant species. Therefore, the government will continue implementing appropriate distribution management in accordance with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (the Washington Convention) and relevant domestic laws.

[Promoting international cooperation on biodiversity]

In order to conserve the habitats of animals migrating beyond national boundaries, it is necessary to foster international cooperation rather than attempting to achieve it single-handedly. It is also necessary to conserve areas which already have rich biodiversity by promoting conservation measures from the global perspective as international efforts.

As part of the efforts in this context, Japan will take the initiative in the fields of coral reef preservation and the conservation of migratory birds and their habitats using such frameworks as the International Coral Reef Initiative (ICRI), the Partnership for the East Asian-Australian Flyway (EAAFP), bilateral conventions and agreements for the protection of migratory birds and the Ramsar Convention. These efforts will include hosting the International Coral Reef Marine Protected Area Network Meeting centered on the Asia-Pacific region and the establishment of a regional network of important coral reefs centered on East Asia, for coral reef conservation. For the conservation of migratory birds, Japan will promote the development of monitoring methods, as well as the implementation of joint surveys and information sharing. In addition, Japan will establish bilateral and multilateral networks and enhance international cooperation in such fields as the management of protected areas including national parks and the collection of data on the natural environment. In particular, Japan will establish partnerships on protected areas in Asia with the cooperation of other Asian countries, the CBD and the International Union for Conservation of Nature (IUCN), towards the achievement of the Aichi Biodiversity Targets (target 11 in particular)

and the implementation of the CBD Programme of Work on Protected Areas (PoWPA). As part of the efforts, it will host the First Asia Parks Congress in a city in the Tohoku Region in 2013.

In order to support efforts by developing countries on biodiversity conservation, Japan will continue its support for activities by the Global Environmental Facility (GEF) which is a financial mechanism under the CBD where Japan currently participates as a major contributor. Japan will also consider continuing its support for the Critical Ecosystem Partnership Fund (CEPF) which supports NGOs, etc. conducting activities to conserve biodiversity hotspots (areas selected as the most biologically rich yet threatened areas) in developing countries.

The condition of biodiversity is deteriorating globally due to deforestation caused by expanded agricultural land and illegal logging as well as desertification. Recognizing that Japan utilizes biodiversity in other countries through importing a major proportion of resources such as food and wood, we should contribute to the conservation of biodiversity on a global scale. For that purpose, Japan will actively participate in the discussion at the Food and Agriculture Organization of the United Nations (FAO), the United Nations Forum on Forests (UNFF), the International Tropical Timber Organization (ITTO), the United Nations Convention to Combat Desertification (UNCCD) and the Asia Forest Partnership (AFP), and promote international cooperation in connection with sustainable forest management including measures against desertification and illegal logging. It will also actively participate in the discussions on tools for climate change measures such as Reducing Emissions from Deforestation and Forest Degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+), in order to develop measures which can contribute to the improvement of various ecosystem services that forests can offer including the conservation of biodiversity, in addition to contributing to climate change mitigation and adaptation.

[Promoting the conservation and management of globally important priority areas]

In the conservation and management of priority areas for biodiversity conservation, focused efforts should be made to conserve and manage globally important priority areas in particular.

Therefore, the government will select natural areas in Japan which have globally outstanding universal value and strive to have them registered as world natural heritage sites based on the World Heritage Convention, as well as promoting the appropriate conservation and management of these areas. As a project under UNESCO's Man and the Biosphere (MAB) Programme, the government will strive for the registration of areas which have three functions including the biodiversity conservation, economic and social development and logistic support for education, research and monitoring as Biosphere Reserves, which are better known as "UNESCO Eco Park" in Japan, in order to promote activities that present model areas for coexistence between humans and nature. There are also Global Geoparks, which are areas with geological heritage of international significance and where that heritage is being used to promote the sustainable development of the local communities who live there. The Global Geoparks Network (GGN) certifies Global Geoparks with the support of UNESCO. In Japan, the Japan Geopark Committee comprised of experts in geography, geology, etc. has certified 20 areas as Japanese Geoparks, of which five have been certified as Global Geoparks. Biodiversity conservation efforts in cooperation with Geoparks will be promoted because geography and geology play an important role as the "foundation" for the inhabitation of organisms.

5 Strengthening the scientific foundation and utilizing it in policies

In order to conserve biodiversity, it is important to understand the current situation of biodiversity, identify losses and degradation at an early stage, specify causes and take appropriate countermeasures. The improvement of scientific findings is also necessary to deepen understanding about biodiversity. The government has been accumulating natural environmental data through conducting the National Surveys on the Natural Environment, the National Census on River Environments and other surveys, and it needs to continue updating its data, provide information more promptly and promote the mutual utilization and sharing of biodiversity data between interested parties. Therefore, the government will develop indicators for accurately grasping the current situation of the natural environment, its time-series changes and changes in the geographical distribution of its components, as well as implementing surveys, research and monitoring, in order to collect scientific and objective data promptly. The government will then organize the data in a manner that can be used as the basic data for other activities and manage the data in a way that can be shared by interested people.

In order to understand the changes in the conditions of biodiversity and trends of the changes, it is necessary to comprehensively analyze and evaluate scientific and objective information. It is then important to use the results for the effective implementation of policies and measures. For this purpose, preparatory discussions have been taking place since 2008 for establishing an intergovernmental platform for scientifically evaluating trends in biodiversity and ecosystem services in order to enhance the linkage between science and policies. This led to the establishment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) in April 2012 with four pillar functions including scientific assessments, capacity development, creation of scientific knowledge and support for policy formation. Compared to the Intergovernmental Panel on Climate Change (IPCC) which is responsible for obtaining scientific findings, conducting economic analysis and examining policy options in the field of climate change, the IPBES is sometimes referred to as the IPCC in the biodiversity field. Japan will make domestic efforts to strengthen the linkage between science and policy in the field of biodiversity by carrying out comprehensive assessments on biodiversity, developing national systems corresponding to the IPBES activities and actively participating and contributing to the IPBES.

[The collection of basic data]

Accurately understanding the current situation is an important step for the conservation of biodiversity. Therefore, scientific and objective data should be collected by carrying out surveys and monitoring in order to identify the current condition of the natural environment, its time-series changes and changes in the geographical distribution of its components. In particular, knowledge and data on marine species is limited when compared to terrestrial species. Therefore, the first thing to do for oceanic areas would be to increase our knowledge of the ecosystems. It is also important to advance technological development for monitoring in order to improve the scientific findings. If the surveys and monitoring find the loss and degradation of biodiversity, the causes should be identified as early as possible and appropriate countermeasures should be taken. For this purpose, the government will collect biological information and specimens as the basis for scientifically assessing biodiversity. It will then organize the data in such a way that can be utilized by various users for their purposes.

As the foundation for conducting comprehensive assessments continuously, it is necessary to improve the data on the natural environment, update it continuously and improve the promptness of providing data. The government will continue its efforts to keep track of the condition of the natural

environment on a national scale, using the Biodiversity Center of Japan, the Ministry of the Environment as the center for the activities, because it has accumulated information on biodiversity through carrying out the National Surveys on the Natural Environment and Monitoring Sites 1000. It will also strive to collect priority information and biological specimens such as information about the inhabitation of medium and large mammals, information about the inhabitation of threatened wild organisms and their conservation, data on species and ecosystems in oceanic and coastal areas as well as data on the expansion of bamboo forests in Satochi-Satoyama areas. Through the collection of information and specimens, the government will identify changes in ecosystems on national land including the effects of global warming, and use the findings in combination with scientific forecasting methods to take precautionary conservation measures.

It is also expected that Japan should serve as one of the sensors for detecting changes in biodiversity including the effects of global warming, by managing biodiversity information possessed by relevant ministries and agencies, research institutes, civil society and others in such a way that can be shared and used by these parties through coordination between them.

Japan should strengthen cooperation with other countries since biodiversity in our country is linked with countries in Asia and other regions. Therefore, the Japanese government will cooperate with the improvement of existing global frameworks for biodiversity information gathering including the Global Biodiversity Information Facility (GBIF), the Group on Earth Observations Biodiversity Observation Network (GEO BON) and the International Long Term Ecological Research (ILTER).

In order to develop the scientific foundations for biodiversity conservation in cooperation with other countries, basic capacity development on taxonomy and other relevant subjects is also vital. Therefore, the Japanese government will promote the East and Southeast Asia Biodiversity Information Initiative (ESABII) which gathers, compiles and processes data on the habitation status of threatened species and other important information, as well as providing training on taxonomy. Through the efforts, the government will strive to contribute to the decision making for the conservation of biodiversity and the sustainable use of its components in East and Southeast Asian countries in cooperation with these countries and the relevant agencies.

[Comprehensive assessments on biodiversity]

Global Biodiversity Outlook 3 (GBO 3) published by the Secretariat of the Convention on Biological Diversity in May 2010 concluded that the state of global biodiversity continues to decline according to most indicators and that the target provided in the CBD, “to achieve by 2010 a significant reduction of the current rate of biodiversity loss,” has not been met.

Japan needs to, in line with international assessment efforts, scientifically assess its level of achievement for the mission of the Strategic Plan for Biodiversity 2011-2020 which is to halt the loss of biodiversity by 2020. For such an assessment, Japan needs to accurately evaluate the current situation of biodiversity, the progress in its measures on biodiversity and the effects of the measures, through quantification and model construction. To this end, the government will conduct progress checks for the National Biodiversity Strategy to confirm how far the measures have been implemented, as well as revising and improving the indicators which are used to assess the achievement levels for the Japanese national targets towards the achievement of the Aichi Biodiversity Targets set forth in Part 2. In coordination with these efforts, the government will also consider the use of indicators, quantification and model construction in order to comprehensively grasp the current biodiversity situation and the effects of the policies and measures. The government will then comprehensively assess the overall biodiversity situation in Japan on the basis of scientific

findings and in consideration of socioeconomic aspects of biodiversity. In the process of conducting the comprehensive assessment, detailed information on current biodiversity and its critical situation will be mapped and priority areas for biodiversity conservation will be specified, in order to further implement activities in areas which need to be prioritized in conservation and restoration efforts. The government will also support efforts in the Asia-Pacific region technically including cooperation for collecting basic data on the natural environment using earth observation satellites, thus cooperating with efforts to significantly reduce the rate of global biodiversity loss. Further, in view of promoting the conservation of biodiversity and the sustainable use of its components, Japanese biodiversity-related legal systems will be strengthened and the organized coordination between the systems will be enhanced based on the Basic Act on Biodiversity.

[Strengthening the linkage between science and policy]

For appropriate decision making on biodiversity, it is important that experts assess biodiversity using the latest scientific findings and that the results are shared with the world. The government will actively participate in the IPBES established in April 2012 and contribute to their activities so that it will become an effective and efficient framework which operates on a scientific basis. The government will also prepare domestic systems to work with the IPBES.

In order to strengthen the linkage between science and policy, it is important to conduct analysis based on multiple forecast scenarios on the effects of changes in social circumstances and economic activities on biodiversity and the effects of changes to biodiversity on human society, as well as discussing political measures to be taken based on the analysis. Therefore, the government will consider collecting and accumulating the scientific data needed for conducting scenario-based analysis as well as considering methods to be used for the analysis by referring to existing scenarios used in the Millennium Ecosystem Assessment and the Global Biodiversity Outlook.

Section 3 The roles of different entities and coordination/collaboration

This National Biodiversity Strategy is a plan which sets forth government policies and measures for the conservation of biodiversity and the sustainable use of its components as well as the basic ideas behind them. However, as can be seen in the Basic Act on Biodiversity which stipulates the responsibilities of Japanese people including the national government, local governments, businesses and private organizations, the conservation of biodiversity and the sustainable use of its components are closely related to each individual in our society. In today's society, there is a strong need for each entity to take socially responsible actions in consideration of the effects on society and the environment. Therefore, from the standpoint of establishing a sustainable society, diverse entities including local governments, businesses, private organizations such as NGOs and NPOs and citizens are expected to take voluntary action in addition to the national government taking action in accordance with the set plan.

It is also becoming more important to strengthen coordination and collaboration between different entities. For example, such areas as Satochi-Satoyama areas can be conserved and utilized as common resources (commons) for varied entities regardless of ownership of the land and resources through the utilization and management by the varied entities including the national government, local governments, businesses, private organizations and citizens. Such utilization and management can lead to improving the quality of nature across the country and also internationally contribute to the sustainable use and management of natural resources. Therefore, it is necessary to take action with the recognition that solutions to specific, individual issues in the community contribute to resolving issues on a larger scale including the national and global scale.

[Roles of the national government]

The national government will systematically implement policies and measures set forth in the National Biodiversity Strategy, including participation in the development of international frameworks such as conventions and their implementation; the protection and management of areas with particularly outstanding natural environments from the national and international standpoints including national parks, national wildlife protection areas and forest reserves on national forest; and the protection and management of rare wild plant and animal species. In its efforts, the national government will establish close cooperation between the ministries concerned through the committee of the ministries on the National Biodiversity Strategy of Japan as well as working in collaboration with other entities including local governments allocated with appropriate roles. The government will also establish broad domestic and international networks centering on the Biodiversity Center of Japan, the Ministry of the Environment, in order to help various parties share and mutually utilize their information. It will also support various entities in taking action to fulfill their roles by developing systems and guidelines, improving economic assistance, providing accurate information, evaluate and introduce good practices by local communities and different entities as well as providing technical advice when they implement their activities.

[The roles of local governments]

Local governments implementing activities which best suit the natural and social conditions of each local area is crucial for conserving biodiversity and sustainably using its components in Japan. Therefore, it is important that activities suitable for the characteristics of individual local areas are implemented through: the formulation of Regional Biodiversity Strategies based on the Basic Act on Biodiversity; the creation of Plans for the Promotion of Activities for Biodiversity Conservation through the Cooperation among Regional Diversified Actors based on the Act on the Promotion of Regional Cooperation for Biodiversity; establishment and enforcement of regulations related to

the conservation of biodiversity and the sustainable use of its components such as the conservation of the natural environment, the protection of wild animals and plants, alien species control measures and the conservation of Satochi-Satoyama areas. In such efforts, it is important for local governments to strengthen cooperation with various entities including citizens, private organizations, businesses, researchers and curators as well as assisting citizens, private organizations and businesses that are engaged in advanced activities for biodiversity conservation and utilization. For example, they could utilize the framework of Support Centers for Biodiversity Conservation Activities through Regional Cooperation which was created based on the Act on the Promotion of Regional Cooperation for Biodiversity in order to provide places and opportunities that enable diverse entities to cooperate and collaborate with one another. The forest environment tax which aims at conservation of forests and water catchment areas and other similar systems have been introduced in 33 prefectures as of April 2012. Introducing such systems which incorporate ecosystem services into socioeconomic systems is important for mainstreaming biodiversity in society. In addition, explaining about the web of life to local children, teaching the children its importance and letting children have contact with local living organisms through school education helps them understand the connection between local environments and themselves and greatly contributes to developing precious future human resources who will lead the conservation of biodiversity and the sustainable use of its components.

In order to promote the conservation of biodiversity and the sustainable use of its components, it is also necessary that each local community becomes independent by utilizing its characteristics, as well as covering each other's shortages such as human resources, funds and information through exchanges and cooperation between local communities. Therefore, it is expected that local governments will exchange and disseminate information between them through the Local Government Network on Biodiversity established in October 2011. It is also expected that multiple local governments sharing one watershed area will jointly formulate a Plan for the Promotion of Activities for Biodiversity Conservation through the Cooperation among Regional Diversified Actors or a Regional Biodiversity Strategy in cooperation, as in the case of the cooperation between the 14 municipalities in the Shiribeshi area in Hokkaido for the formulation of their Plan for the Promotion of Activities for Biodiversity Conservation through the Cooperation among Regional Diversified Actors.

[The roles of businesses]

Businesses have interactions with biodiversity in various aspects of their activities and it is necessary that they should be engaged in biodiversity conscious business activities. Such efforts are in fact needed to ensure the sustainability of their own activities and consumption. These activities include: production activities which take into consideration biodiversity conservation and its sustainable use; securing biodiversity-friendly raw materials, or procuring, manufacturing, distributing and selling biodiversity-friendly products; disposal, collection and reuse of products after sale, during and after the utilization of the products by consumers; the conservation of rich biodiversity on company-owned land or in the compounds of their factories and offices; developing and disseminating technologies which contribute to the conservation of biodiversity and the sustainable use of its components; training engineers and other human resources; taking into consideration the issue of biodiversity in making investments and making loans; and the disclosure of information on biodiversity conservation. Businesses can also cooperate with various entities in local communities by contributing to biodiversity conservation in the sea, coasts and forests in Japan and elsewhere as part of their philanthropic activities and supporting private organizations which aim at biodiversity conservation using funds run by businesses or public interest corporations. In recent years, biodiversity conservation activities involving a wide range of people including

consumers, employees and their families have become popular as part of the philanthropic activities of business entities. More activities by businesses have become globalized in recent years and the networks created through their activities can be utilized to encourage business entities at home and abroad to make efforts for the conservation of biodiversity and the sustainable use of its components. Such use of the networks and cooperation will enhance more biodiversity-friendly activities by the business community. In addition, innovations in the field of biodiversity through new types of partnerships which transcend existing frameworks of industrial structures, such as business tie-ups and technical cooperation between different industries or sectors, can provide a chance to improve a company's image and provide new business opportunities.

[The roles of the media]

The media is very powerful in communicating the importance and splendor of biodiversity, as well as communicating the critical situation biodiversity is facing and risks posed by the crises to human beings. The media can find and introduce to society advanced or exemplary cases of activities in Japan and elsewhere. The media can also be utilized for PR activities, education and awareness raising activities. These uses of the media can help deepen the understanding and knowledge of biodiversity among various entities including citizens and lead to actions for the conservation of biodiversity and the sustainable use of its components.

[The roles of private organizations]

Private organizations such as NGOs and NPOs can be a driving force in various activities in Japan and overseas for the conservation of biodiversity endemic to each local area including participatory monitoring and education about the natural environment. They can also take the lead in offering programs and developing systems which are designed to invite the participation of a wide range of individuals. Private organizations can also conduct social service activities by utilizing their expertise and experience in providing various groups of local residents with opportunities for hands-on learning programs on biodiversity and in implementing their biodiversity conservation activities, in cooperation with government agencies, businesses and educational institutes such as universities and museums. Private organizations' conservation activities in developing countries and activities for collection and analysis of scientific information conducted from an international perspective play an important role in promoting the conservation of biodiversity and the sustainable use of its components on a global scale. It is hoped that private organizations will continue such efforts and also strengthen dialogues and cooperation with NGOs active in other fields than biodiversity that are covered in the UN Millennium Development Goals, for example. Activities to promote the sustainable use of the components of biodiversity by for example promoting systems for certifying sustainably produced products have an important role in connecting producers who conduct biodiversity-friendly production activities and consumers who seek biodiversity-friendly goods and services.

[The roles of academic organizations and researchers]

Academic organizations and researchers are expected to contribute to society by: conducting research from both the natural scientific and social scientific standpoints, for example conducting biodiversity-related basic and applied surveys and research to unravel phenomena, etc. which have not been clarified, as well as evaluating the value of biodiversity and ecosystem services; sharing the findings with society; making policy proposals from a scientific point of view; and contributing to technological development and other research and development on biodiversity. They can contribute to awareness raising activities and technical cooperation related to the conservation of biodiversity and the sustainable use of its components in cooperation with businesses and private organizations such as NGOs and NPOs. Through such contributions, academia can introduce

scientific findings into our daily life as information that we can easily relate to. Another important role of academic organizations and researchers is to develop personnel including researchers and engineers who can lead future activities with advanced expertise and broad perspectives.

[The roles of citizens]

It is important for citizens to recognize that their daily lives have a close relationship with the conservation of biodiversity and the sustainable use of its components and to take action accordingly. It is also important for them to learn about the richness of biodiversity through experiencing the benefits of nature. They can greatly contribute to the conservation of biodiversity and the sustainable use of its components by participating in biodiversity conservation activities and participatory surveys; selectively purchasing biodiversity-friendly goods and services as users of ecosystem services; and actively supporting businesses engaged in biodiversity conservation activities. In particular, the selective purchase of biodiversity-friendly products and services is significant because such consumer behavior will contribute to mainstreaming biodiversity in socioeconomic systems and indirectly support businesses, individuals and organizations making efforts to conserve biodiversity and sustainably use its components. Individual citizens can also support biodiversity conservation activities by, for example, making investments, financing and donations. Another role that citizens as local residents or as parents can play is to teach children who are the future of society about the richness and harshness of local natural environments and to create opportunities for experiencing and learning about the richness of nature in school education, outdoor activities and in local community activities. In order for citizens and other diverse parties to play the above-mentioned roles, each individual needs to understand the connection that their life has with biodiversity. For example, it is important for them to put into practice in their everyday life the “five actions in the declaration of my actions” (the Japan Committee for the United Nations Decade on Biodiversity), which include “appreciating” foods in season, “having contact” with nature and living organisms, “communicating” the splendor of nature to others, “participating” in conservation activities and “purchasing” environmentally friendly products.

It is also hoped that senior citizens will utilize their experience to teach children, in an easy-to-understand manner, about how people used to live in harmony with nature, lifestyles in the old days, the history and personal experiences of natural disasters as well as the traditional wisdom, culture, plays, customs and techniques nurtured by biodiversity. It is also expected that the middle-aged and the elderly who have retired due to their age, etc. will participate in farming and in other local community activities for biodiversity conservation using their rich experience, knowledge and techniques that they obtained while working in society. Young people have the enthusiasm, energy and creativity to become a driving force for implementing biodiversity conservation activities and for mainstreaming the issue of biodiversity in society. Their involvement as leaders of the future society is expected. The participation of women is also essential for mainstreaming the issue of biodiversity in society.

Therefore, the combination of voluntary efforts by different entities and different age groups as well as their cooperation and collaboration will create synergies and lead to stopping the loss of biodiversity.

Part 2 Roadmap for the Achievement of the Aichi Biodiversity Targets

In order to achieve the Aichi Biodiversity Targets that were adopted at the Tenth Meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10) which was held in Nagoya, Aichi Prefecture in Japan in October 2010, Part 2 will indicate Japan's national targets, key action goals, and related indicators that will serve as the roadmap for the achievement of the Aichi Biodiversity Targets.

1 Strategic Plan for Biodiversity 2011 – 2020 (Aichi Biodiversity Targets)

At COP 6 held in 2002, which marked the tenth year since the adoption of the Convention on Biological Diversity, the 2010 Biodiversity Target was adopted that called for “to achieve by 2010 a significant reduction of the current rate of biodiversity loss.” In 2010, which was the target year, the Secretariat of the Convention on Biological Diversity conducted an evaluation on the achievement status of this target. The Secretariat concluded that, “Important actions to safeguard biodiversity have been promoted on account of the 2010 Biodiversity Target, but these were not enough to stave off the pressure on biodiversity, and so the 2010 Biodiversity Target has not been met.” Moreover, it raised the alarm to mankind of the mounting risk that if the loss of biodiversity continues on its present course, then in the near future the tipping point of the Earth's systems will be exceeded, which will cause a dramatic loss of biodiversity and an accompanying degradation of ecosystem services. Furthermore, a number of challenges have been pointed out when it comes to the 2010 Biodiversity Target, such as the fact that it was abstract and short on clarity, and that it lacked methods for objectively evaluating its achievement status. With respect to global targets for 2011 onwards, clear and measurable targets must be set.

Given such circumstances, when COP 10 was held in Japan in 2010 the Strategic Plan for Biodiversity 2011 – 2020 (Aichi Biodiversity Targets) was adopted as a new set of global targets for 2011 onwards. The Strategic Plan for Biodiversity 2011 – 2020 listed achieving a world “living in harmony with nature” as its vision up through the year 2050. This vision calls for a world in which: “By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.” In addition, it lists taking effective and urgent action to halt the loss of biodiversity as its mission up through the year 2020. This is design to ensure the continued existence of resilient ecosystems and the benefits received from them, thereby ensuring the diversity of life on Earth and contributing to the welfare of mankind and the eradication of poverty by the year 2020.

The Aichi Biodiversity Targets comprise five strategic targets that set out a total of 20 headline targets including specific numerical targets with either 2015 or 2020 as their target years. These strategic targets consist of: A. Mainstreaming biodiversity across society; B. Reduce the direct pressures on biodiversity and promote sustainable use; C. Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity; D. Enhance the benefits to all from biodiversity and ecosystem services; and E. Enhance implementation through participatory planning, knowledge management, and capacity development.

These five strategic targets were prepared and established using a DPSIR model, which is a model that is designed to grasp the dynamic relationship between environmental and other sorts of problems with policies and countermeasures. This model deals with the underlying causes found in human societies (Drivers), the pressure applied by the direct causes of the problems (Pressures), the

state of things like biodiversity (States), the negative effects and benefits produced by environmental degradation and improvements (Impacts/Benefits), and the countermeasures and policies to these from society (Responses). In order to halt the loss of biodiversity it is not enough to just cope with the direct effects brought about by biodiversity crises. It will also be necessary to accurately determine the relationships expressed by the DPSIR model and continue to promote multifaceted initiatives in an integrated manner.

The Aichi Biodiversity Targets have been positioned as a flexible framework for promoting initiatives for the Convention on Biological Diversity as a whole. These obligate state parties to establish national targets in response to factors like each country's state of biodiversity, needs, and priorities by considering the contributions of each country for the achievement of targets globally, and to incorporate these into national biodiversity strategies of each country.

Therefore, this National Biodiversity Strategy of Japan 2012-2020 serves in the role of a national roadmap for the achievement of the Aichi Biodiversity Targets.

2 Establishment of Japan's National Targets for the Achievement of the Aichi Biodiversity Targets

For the creation of a roadmap for the achievement of the Aichi Biodiversity Targets, Japan established its national targets in response to factors like its state of biodiversity, needs, and priorities in a manner that was consistent with the targets of the Aichi Biodiversity Targets for each of the five strategic targets prepared for the DPSIR model in a manner similar to that for the Aichi Biodiversity Targets. In addition, it also established key action goals for the achievement of its national targets, while also stipulating target years for items for which it was feasible to do so. Indicators for determining the achievement status of the national targets were also established.

The key action goals in the roadmap for the achievement of the Aichi Biodiversity Targets indicated in Part 2 will be revised as needed based upon the results of the midterm review of the Aichi Biodiversity Targets at COP 12, which is scheduled to be held in 2014 or early in 2015. Regarding indicators for determining the achievement status of Japan's national targets for the achievement of the Aichi Biodiversity Targets, this National Biodiversity Strategy established for the first time the indicators with various characteristics including indicators for determining the current status of biodiversity and indicators for determining progress in the relevant efforts made. Japan is planning to work to continuously revise and enhance these indicators while giving consideration to their continuity in order to ensure that these indicators accurately reflect the direction aimed for by Japan's national targets, and that they are appropriately suited to conditions such as its natural environment and socioeconomics and the latest scientific findings.

Regarding Strategic Target A:

Have a diverse array of actors such as governments, local municipalities, businesses, private organizations and citizens recognize the importance of the conservation and sustainable use of biodiversity and autonomously reflect this in their respective actions, thereby addressing the underlying causes for the loss of biodiversity.

National Target A-1 (Corresponding targets in the Aichi Biodiversity Targets: 1, 2, 3, 4)

Have a diverse array of actors such as governments, local municipalities, businesses, private organizations and citizens recognize the importance of the conservation and sustainable use of biodiversity and autonomously reflect this in their respective actions, thereby achieving the

“mainstreaming of biodiversity across society” and reducing the fundamental causes of biodiversity loss through actions taken by diverse actors, by 2020 at the latest.

Key action goals

- A-1-1 Flesh out and enhance publicity, education, and public awareness on biodiversity (MOE, MOFA, MEXT, MAFF, METI, MLIT).
- A-1-2 Promote initiatives to visualize economic values of biodiversity and ecosystem services (MOE, MAFF, MLIT).
- A-1-3 Promote the formulation of effective Regional Biodiversity Strategies and practical initiatives by local municipalities. In addition, revise guidelines on formulating Regional Biodiversity Strategies by 2013 (MOE).
- A-1-4 Promote the formulation of strategies and plans by the national and local governments in consideration of biodiversity. In addition, give consideration to the effects on biodiversity from incentive measures and implement incentive measures that take biodiversity into consideration (MOE, MAFF, MLIT).
- A-1-5 Establish and announce policies for biodiversity-conscious and sustainable business activities and encourage their implementation (the introduction of environmental management systems which give consideration to biodiversity, the procurement of raw materials which takes into consideration the supply chains, production activities, sale of goods and services, technological development, waste management, investment and financing activities, land use, employee education and information disclosure on these activities) (MOE).

Related indicator groups

- Awareness concerning the importance of biodiversity (Public Opinion Polls and Surveys by the Cabinet Office, Survey of Environmentally Friendly Corporate Activities)
- The number of municipalities participating in the Local Government Network on Biodiversity
- The number of organizations participating in the Japan Business and Biodiversity Partnership
- The number of conservation areas and their surface area administered through the National Trust
- The number of registrations to the Nijyu-maru Project (Double Circle Campaign)
- The number of organizations participating in Green Wave
- Surface area for which forest management plans have been formulated
- SGECC or FSC certified forest area and number of certifications received from MEL Japan, MSC and JHEP in the country
- The number of times visualizations of biodiversity and ecosystem services have been performed through economic value assessments aimed at nature preserves, projects for conserving the natural environment, and so on
- The number of strategies and plans that have been formulated by the national government and local municipalities that incorporate initiatives to conserve biodiversity and considerations for the conservation (municipal plans such as Regional Biodiversity Strategies and the Plan for the Promotion of Activities for Biodiversity Conservation through the Cooperation among Regional Diversified Actors, etc.)

- The number of basic plans related to promoting the conservation of green spaces and greening that takes the maintenance of biodiversity into consideration (Green Basic Plans) that have been formulated
- The number of municipalities that have introduced taxes that are paid for ecosystem services (forest environment taxes, etc.)
- Amount budgeted for environmental conservation costs (promoting the conservation of the natural environment and contact with nature)
- Establishment of policies related to biodiversity conservation initiatives and the implementation status of such initiatives (surveys on their dissemination status such as the Survey of Environmentally Friendly Corporate Activities and the Guidelines for Private Sector Engagement in Biodiversity)

Regarding Strategic Target B:

Advance initiatives geared towards minimizing human-induced pressures that degrade ecosystems and promote their sustainable use.

National Target B-1 (Corresponding targets in the Aichi Biodiversity Targets: 5)

Significantly reduce the rate of loss of natural habitats, as well as their degradation and fragmentation, by 2020.

Key action goals

- B-1-1 Establish methods and standard values to serve as baselines designed to determine the rate of loss of natural habitats and their state of degradation and fragmentation, as well as sorting out their current status, so that effective action can be launched by the midterm review of the Aichi Biodiversity Targets that is scheduled for 2014 or early in 2015 (MOE, MAFF).
- B-1-2 Reduce the rate of loss of natural habitats by at least half or bring this close to zero in cases where it is possible to do so by 2020. In addition, carry out the initiatives needed to noticeably reduce the degradation and fragmentation of natural habitats, such as the development of ecological networks and the restoration of wetlands and tidal flats (MOE, MAFF, MLIT).
- B-1-3 Enhance conservation and management techniques and promote surveys related to survival state in order to soundly implement policies for the conservation and management of wildlife, including population control for wildlife. In addition, overhaul the enforcement status of the Wildlife Protection and Hunting Management Law by 2015 and create arrangements for securing leaders to take charge of conservation and management and begin utilizing these arrangements by 2020 (MOE).
- B-1-4 Promote initiatives to prevent damage to agricultural crops by wildlife pursuant to the Special Measures Act on Countering Nuisance Wildlife in an integrated manner by aiming for coordination with policies for wildlife conservation and management, including population control. Promote measures to combat damage to forests caused by wildlife widely and effectively, while also moving ahead with countermeasures that take coexistence with wildlife into consideration—such as working to manage and conserve diverse forests—in order to ensure habitat environments for wildlife (MAFF).

Related indicator groups

- Percentage of wetlands restored in particularly important water systems
- Percentage of tidal flats restored
- Percentage of zones that have been improved of those that required improvements in their bottom sediments at Tokyo Bay, Ise Bay and Osaka Bay
- Amount of public spaces with water and greenery secured in urban areas

National Target B-2 (Corresponding targets in the Aichi Biodiversity Targets: 6, 7)

Engage in agriculture, forestry, and fisheries that ensure the conservation of biodiversity in a sustainable manner by 2020.

Key action goals

- B-2-1 Promote initiatives that seek a balance between production-related activities and the conservation of biodiversity such as sustaining agricultural production and managing production bases that can be operated sustainably (MAFF).
- B-2-2 Promote the multiple functional roles of forests, including the conservation of biodiversity, by encouraging management and conservation of diverse and healthy forests, which includes the conservation of biodiversity, based upon forest plans. In addition, move forward with the National Survey on Biodiversity of the Forest Ecosystems (monitoring surveys) that investigate trends in forest biodiversity in line with standards and indicators that has been agreed upon internationally (MAFF).
- B-2-3 Promote initiatives that seek a balance between sustainable fisheries and the conservation of biodiversity. This is to be done by promoting the conservation and regeneration of seagrass beds and tidal flats, the construction and maintenance of fishing ports and fishing grounds with taking biodiversity into consideration, international cooperation for the sustainable use and management of highly migratory species (including tuna), resource management under resource management guidelines and resource management plans and systems, the enhancement of resources with taking biodiversity into consideration, the production by sustainable aquaculture and the conservation of inland waters (MAFF).
- B-2-4 Implement initiatives to create Satoumi areas by means of making appropriate human interventions while living in harmony with nature (MOE).

Related indicator groups

- Total number of participants in regional community activities related to the conservation and management of regional resources, such as agricultural land and water
- Cumulative number of new certifications of eco-farmers
- Maintenance areas geared towards conserving ecological networks
- Area of agricultural lands that are prevented from being abandoned in areas including hilly and mountainous areas
- Surface area conserved by forest plans
- Surface area in which seagrass beds and tidal flats are being conserved and created
- Surface area in which sediments have been removed from fishing grounds
- Surface area of maintained fish reefs and mariculture and aquaculture

- Percentage of the population in fishing settlements with wastewater treatment facilities
- The number of multilateral treaties on fisheries
- Status of resource levels in waters around Japan (the percentage of subpopulations whose resource levels are medium or higher)
- The number of resource management plans by fishermen, etc.
- Production ratio of water areas targeted for the Aquaculture Improvement Plan that constitute the sea areas for seawater culture
- The number of places with initiatives to develop Satoumi areas

National Target B-3 (Corresponding targets in the Aichi Biodiversity Targets: 8)

Maintain the water quality and habitat environments desirable for the conservation of aquatic organisms, increasing biological productivity, and sustainable use while continuing to improve the state of contamination from nitrogen and phosphorous by 2020. When it comes to water areas with a highly closed off nature—such as lakes, and deeply indented bays—(hereinafter referred to as “closed water areas”) in particular, promote policies in mountainous areas, agricultural villages and the outskirts of urban areas, and urban areas that focus on the river basin in their entirety based upon the unique characteristics of each of these regions in a comprehensive and prioritized manner.

Key action goals

- B-3-1 Reduce nutrients and organic pollutants from river basin while implementing the 7th Total Pollutant Load Control by March 2015 (MOE, MAFF, MLIT).
- B-3-2 Carry out initiatives designed to improve the water quality and occurrences of anoxic water masses in closed water areas. In addition, examine environmental standardization with respect to bottom-layer dissolved oxygen for the conservation of aquatic organisms and transparency for the conservation of aquatic plants by 2014 (MOE, MLIT).
- B-3-3 Carry out investigations and studies aimed at establishing management policies in order to balance the conservation of habitats for a diverse array of marine organisms and high biological productivity, as well as maintaining desirable habitat environments with respect to sustainable use (MOE).

Related indicator groups

- Achievement status of the Environmental Quality Standards(EQSs) for water pollution in rivers, lakes, and ocean areas
- Achievement status of EQSs on total nitrogen and total phosphorous concentrations in closed water areas
- The number of red tides and algal blooms that occur
- Achievement status of EQSs on chemical oxygen demand(COD) in closed water areas
- Achievement status of EQSs pertaining to the conservation of marine organisms
- Distribution status of anoxic water areas in Tokyo Bay, Ise Bay, and the Seto Inland Sea
- Inflow load of nitrogen and phosphorous from land areas
- Percentage of tidal flats that have been restored
- Percentage of zones that have been improved of those that required improvements in their bottom sediments at Tokyo Bay, Ise Bay and Osaka Bay
- Achievement status of EQSs for Groundwater Pollution (Nitrate Nitrogen and Nitrite Nitrogen)

National Target B-4 (Corresponding targets in the Aichi Biodiversity Targets: 9)

Identify invasive alien species and organize information pertaining to the routes by which they establish themselves based upon the results of examinations of the enforcement status for the Invasive Alien Species Act by 2020. In addition, lay out the order of priority for eradicating these invasive alien species, and on the basis of this apportion out appropriate roles to each of the major actors regarding their eradication and proceed with eradicating them in a systematic manner. Promote a restoration of the habitation status of rare species and restore ecosystems to their original state by controlling or exterminating high priority species through such efforts. What is more, call the attention of related actors to the management of the routes by which invasive alien species become established in order to prevent their introduction or establishment, and promote countermeasures by examining more effective border control measures.

Key action goals

- B-4-1 Create a list of invasive alien species threatening biodiversity, human health and or economy development in Japan (tentative name) and organize information pertaining to the routes by which species on the list establish themselves by 2014 (MOE, MAFF).
- B-4-2 Arrange the thinking behind the order of priority for controlling alien species and promote efforts such as their systematic eradication by 2014. In addition, formulate “an action plan to prevent damages and risks caused by alien species in Japan (tentative name)” in order to encourage action on countermeasures against alien species and voluntary initiatives at the regional level by the various actors (MOE, MAFF, MLIT).
- B-4-3 Control or eradicate high priority invasive alien species, while also restoring the habitation status of rare species and restoring ecosystems to their original state through such efforts (MOE, MAFF).

Related indicator groups

- The number of species designated as IAS or as being on a list of invasive alien species threatening biodiversity, human health and or economy development in Japan (tentative name) and the number of these species that have yet to establish themselves
- The number of confirmations and certifications for eradication pursuant to the Invasive Alien Species Act
- The number of mongoose that are captured and the number of mongoose captured per unit of capturing effort on Amami Oshima island or the Yanbaru area on Okinawa Island (within the region where eradication was performed (in FY2012)), and the habitat conditions for Amami rabbit and Okinawa rail (habitat confirmation mesh number)
- The development of lists and regulations concerning alien species by local governments (number of cases)

National Target B-5 (Corresponding targets in the Aichi Biodiversity Targets: 10)

Promote initiatives for minimizing human-induced pressures that cause ecosystems to deteriorate in order to maintain the soundness and functionality of ecosystems that are vulnerable to climate change, such as coral reefs, seagrass beds, tidal flats, islands, alpine and subalpine areas by 2015.

Key action goals

- B-5-1 Identify human-induced pressures on Japanese ecosystems that are vulnerable to climate change, such as coral reefs, seagrass beds, tidal flats, islands, alpine and subalpine areas by 2013, define the ecologically acceptable values for these human-induced pressures by 2015, and institute initiatives for achieving these ecologically acceptable values (MOE).

Related indicator groups

- Trends and changes in the state of coral reefs (coral coverage)
- Water quality indicators (total nitrogen, total phosphorous), content of suspended particles in sea sediment (SPSS)
- Surface area for various designated zones in Japanese coral reefs, seagrass beds, and tidal flats, etc.
- The number of places in which human-induced pressures are held in check at or below the ecologically permissible values

Regarding Strategic Target C:

Appropriately conserve and manage ecosystems and halt the extinction and the population decrease of threatened species. Furthermore, achieve and maintain improvements in the conservation status of species which are experiencing particular declines from among those threatened species. In addition, improve the conditions for biodiversity by conserving the genetic diversity of crops, livestock animals, and wild species that are closely related to them, including those species that are valuable in a socioeconomic or cultural sense.

National Target C-1 (Corresponding targets in the Aichi Biodiversity Targets: 11)

Appropriately conserve and manage at least 17% of inland areas and inland water areas, and at least 10% of coastal areas and ocean areas, by 2020.

Key action goals

- C-1-1 Set in place methods and baselines for determining the status of conservation and management, as well as their present status, by the midterm review for the Aichi Biodiversity Targets which are scheduled to be held in 2014 or early in 2015 (MOE, MAFF).
- C-1-2 Move ahead with examinations on identifying regions that contribute to the conservation of biodiversity by giving consideration to their continuity with surrounding areas, while also promoting their appropriate conservation and management (MOE, MEXT, MAFF, MLIT).
- C-1-3 Deepen examinations of the planning and implementation methods for ecological networks and move forward with setting in place conditions for formulating plans and implementing projects at various different spatial levels. In addition, examine policies for ecological networks at the wide-area level and move ahead with forming these (MOE, MAFF, MLIT).
- C-1-4 Select regions that are important from the perspective of biodiversity by focusing on regions that are important when it comes to wildlife habitats and breeding and examine the need and methods for their conservation by 2014. This is to be done in

order to contribute to promoting the enhancement of marine protected areas and their formation into a network (MOE).

Related indicator groups

- Surface area of natural parks (national parks, quasi-national parks, prefectural nature parks)
- Surface area of nature conservation areas, etc. (wilderness areas, nature conservation areas, prefectural nature conservation areas)
- Amount of public spaces with water and greenery secured in urban areas
- Surface area of wildlife protection areas (national wildlife protection areas, prefectural wildlife protection areas)
- Surface area of marine protected areas (natural parks, nature conservation areas, wildlife protection areas, protected waters, common fishery rights areas, designated sea areas, coastal areas for marine resources development, etc.)
- Surface area of forest reserves and green corridors in national forest
- Surface area of protection forests
- Percentage of wetlands restored in particularly important water systems
- Number of rangers engaged in conservation and management at national parks
- Number of volunteers engaged in national park management at national parks

National Target C-2 (Corresponding targets in the Aichi Biodiversity Targets: 12, 13)

Maintain a situation in the 2012 version of the Ministry of the Environment's Red List in which no new extinct species (EX) appear (excluding species that are not found over an extended period of time for which a determination will be made over a span of 50 years or more) among the threatened species that are already known about, as well as preventing the population decrease for the known threatened species. For threatened IA species (CR) or threatened I species (CR + EN), which are the species in the greatest danger of going extinct, increase the number of species that will see their rank fall through a variety of initiatives compared to the Ministry of the Environment's 2012 Red List by 2020. Such initiatives include setting in place habitat bases by means of promoting sustainable agriculture, forestry, and fisheries that take the proactive conservation of species and biodiversity into consideration. In addition, maintain the genetic diversity of crops, livestock animals, and wild species that are closely related to them, including those species that are valuable in a socioeconomic or cultural sense, by 2020.

Key action goals

- C-2-1 Move forward with creating structures for collecting knowledge that is crucial for promoting the conservation of threatened species (current state of threatened species' habitats, reasons for their decline, conservation status, conservation methods and techniques, etc.), sharing information among the various actors, and using this by 2020. In addition, organize Red Lists that accurately reflect the status of threatened species and revise these periodically (MOE).
- C-2-2 Assign priority starting with species for which there is a particularly high risk of extinction and for which good results from countermeasures can be expected through regulations, and then steadily promote the designation of National Endangered Species of Wild Fauna and Flora based upon the Law for the Conservation of Endangered Species of Wild Fauna and Flora by 2020. Promote initiatives for The Conservation Programmes defined by the law through the formulation of plans for

such programs pursuant to this act, while also striving to improve the conservation methods and techniques in accordance with the unique characteristics of each respective species and taxa (MOE, MEXT, MAFF, MLIT).

- C-2-3 Promote the development of habitats by aiming to build consensus among local regions for preventing the extinction or decline of threatened species (MAFF).
- C-2-4 Work to address ex-situ conservation for those species such as the crested ibis and the Tsushima leopard cat that are believed to be at an extremely high risk of extinction and for which their survival will remain in jeopardy if only initiatives for in-situ conservation are carried out, by 2020. The aim will be to restore ecosystems and revitalize regional communities by promoting the return to wildlife of individual animals that were propagated through artificial breeding through such initiatives (MOE, MEXT, MAFF, MLIT).
- C-2-5 For the genetic resources of crops, create coordinated and complementary networks for the conservation of plant genetic resources in order to prevent valuable genetic resources from disappearing from within Japan, while also giving consideration to the establishment of a systematic safety back-up system to guard against disasters. For the genetic resources of livestock animals, move forward with securing and using a diverse array of breeding resources that possess genetic advantages by focusing primarily on varieties that are unique to Japan, such as Wagyu beef, locally raised chicken, and Japanese horse breeds (MAFF).

Related indicator groups

- Ratio of the number of threatened species relative to the species subject to assessment in each taxa for vertebrates, insects, and vascular plants
- The number of species that have fallen in rank in the Ministry of the Environment's Red List
- The number of species for which ex-situ conservation has been carried out in each taxa for vertebrates, insects, and vascular plants
- The number of national endangered species of wild fauna and flora designated
- The number of natural habitat conservation areas and their surface area
- The number of plans for The Conservation Programmes defined by the law formulated
- Population of wild crested ibises, Oriental storks, and Tsushima leopard cats

Regarding Strategic Target D:

Strengthen the benefits obtained from biodiversity and ecosystem services.

National Target D-1 (Corresponding targets in the Aichi Biodiversity Targets: 14)

Strengthen the benefits received from biodiversity and ecosystem services in Japan and elsewhere by giving consideration to the needs of women and local communities through the conservation and restoration of ecosystems by 2020. Carry out initiatives for each species with an awareness of the importance of the sustainable use of natural resources found in Satochi-Satoyama areas in particular.

Key action goals

- D-1-1 Establish sustainable forest management and promote the development and conservation of diverse and healthy forests in the aim of thereby allowing them to exhibit multifunctionality, such as water conservation (MAFF).
- D-1-2 Strive to conserve and use the environment in rural areas and utilize regional resources through the sustainable agriculture (MAFF).
- D-1-3 Promote the *Satoyama* Initiative, which is an initiative that aims to improve biodiversity, ecosystem services, and human welfare, both domestic and overseas (MOE, MEXT, MAFF, MLIT).
- D-1-4 With a view towards reconstruction from the Great East Japan Earthquake, promote the Green Reconstruction Project that is centered around the creation of the Sanriku Fukko (Reconstruction) National Park. This is to be done by passing down the natural environment and local life that has been fostered through the connections between forests, satoyama, rivers, and sea to future generations; learning about both the blessings and threats from nature; and making use of these. Establish the Sanriku Fukko (Reconstruction) National Park and promote the reorganization of national parks by 2013. What is more, promote the restoration of coastal forests through the Green Bonds Regeneration Project, which gives forethought to conserving biodiversity (MOE, MAFF).
- D-1-5 Implement initiatives to create Satoumi areas by means of making appropriate human interventions while living in harmony with nature (MOE).
- D-1-6 Move ahead with considerations for efforts like developing new policies to utilize the arrangements for Biosphere Reserves, which are better known as “UNESCO Eco Park” in Japan (MEXT, MAFF, MOE).

Related indicator groups

- Surface area covered by forest plans
- Total number of participants in regional community activities related to the conservation and management of regional resources, such as agricultural land and water
- The number of cooperative activities for the International Partnership for the *Satoyama* Initiative
- The number of places with initiatives to develop Satoumi areas

National Target D-2 (Corresponding targets in the Aichi Biodiversity Targets: 15)

Strengthen the contributions of biodiversity to resilience of ecosystem and their storage of carbon dioxide by conserving and restoring ecosystems, including restoration of at least 15% or greater for degraded ecosystems, thereby contributing to climate change mitigation and adaptation by 2020.

Key action goals

- D-2-1 Establish methods and standard values to serve as baselines designed to understand the status of conservation and restoration of ecosystems, as well as sorting out their current status, by the midterm review of the Aichi Biodiversity Targets that are scheduled for 2014 or early in 2015 (MOE, MAFF).

- D-2-2 Promote measures for the conservation and restoration of ecosystems, thereby advancing measures that will contribute to climate change mitigation and adaptation (MOE, MAFF, MLIT).
- D-2-3 Contribute to climate change mitigation and adaptation by means of promoting forest sink measures such as properly carrying out forest operations like thinning in forests, as well as establishing green corridors to serve as migration routes for wildlife (MAFF).

Related indicator groups

- Surface area and the number of sites under initiatives for the Law for the Promotion of Nature Restorations
- Surface area and the number of sites of nature restoration projects within national parks
- Percentage of tidal flats restored
- Green house gas removal through urban greening, etc.
- The amount of carbon dioxide absorbed by forests
- Surface area of forest reserves and green corridors in national forest

National Target D-3 (Corresponding targets in the Aichi Biodiversity Targets: 16)

Aim to ratify the Nagoya Protocol on ABS as early as possible and implement the domestic measures for this Protocol by 2015 at the latest.

Key action goals

- D-3-1 Ratify the Nagoya Protocol as early as possible, and implement steadily the obligations under this Protocol such as designation of one or more checkpoints to monitor the use of genetic resources and awareness raising by 2015 at the latest (MOE, MOFA, MOF, MEXT, MHLW, MAFF, METI, MLIT).
- D-3-2 Support developing countries for their ratification of the Protocol through the Global Environment Facility (GEF), the Nagoya Protocol Implementation Fund (NPIF), etc., in order to contribute to the global achievement of Target 16 (MOFA, MOF, MOE).

Regarding Strategic Target E:

Steadily promote policies based upon the National Biodiversity Strategy of Japan, strengthen the scientific grounds as a foundation for such promotion, and promote capacity development in the biodiversity field.

National Target E-1 (Corresponding targets in the Aichi Biodiversity Targets: 17)

Strive to promote policies related to the conservation of biodiversity and sustainable use based on the National Biodiversity Strategy of Japan in a comprehensive and systematic manner. Furthermore, provide support and cooperation to ensure that global initiatives geared towards achieving Target 17 are developed.

Key action goals

- E-1-1 Revise the National Biodiversity Strategy of Japan over 2015 and 2016 as needed based upon the midterm review results related to the achievement status of the Aichi Biodiversity Targets at COP 12, which is scheduled for 2014 or early in 2015 (MOE,

Cabinet Secretariat, Cabinet Office, National Police Agency, MIC, MOFA, MOF, MEXT, MHLW, MAFF, METI, MLIT, MOD).

- E-1-2 Contribute to the global achievement of Target 17 through the Global Environment Facility (GEF), the Japan Biodiversity Fund, and others (MOFA, MOF, MOE).

Related indicator groups

- Implementation status of the key action goals
- The number of Parties to CBD which have received technical support through the Japan Biodiversity Fund that have revised their national biodiversity strategy

National Target E-2 (Corresponding targets in the Aichi Biodiversity Targets: 18, 19, 20)

Have respect for local communities' traditional knowledge related to the conservation and sustainable use of biodiversity mainstreamed by 2020. Moreover, strengthen scientific grounds pertaining to biodiversity as well as the connections between science and policy. Effectively and efficiently mobilize the resources (funds, human resources, technologies, etc.) needed to achieve the Aichi Biodiversity Targets by 2020 at the latest.

Key action goals

- E-2-1 Reevaluate the wisdom on traditional knowledge and techniques for resource usage that have been cultivated in response to the natural characteristics of local regions, and strive to pass them down and promote their use (MOE, MEXT).
- E-2-2 Enhance data collection on the natural environment, such as the National Survey on the Natural Environment, continuously and quickly update it, and improve how quickly information from it is disseminated, while also setting in place structures to collect, provide, and share data through collaborations between various actors by 2020 (MOE, MEXT, MAFF, MLIT).
- E-2-3 Work to round out the scientific knowledge related to marine organisms and ecosystems by 2020 (MEXT, MOE, MLIT).
- E-2-4 Carry out comprehensive assessment of biodiversity in Japan and perform midterm assessment related to Japan's national targets for the achievement of the Aichi Biodiversity Targets (MOE, MOFA, MEXT, MAFF, METI, MLIT).
- E-2-5 Japan will actively participate in and contribute to the IPBES in order to make it an effective and efficient framework that is grounded in scientific evidence, and will set in place a domestic structure for this purpose (MOE, MAFF).
- E-2-6 Set in place a structure to determine the extent to which resources have been mobilized in Japan for the sake of achieving the Aichi Biodiversity Targets and to report this to the Secretariat of the Convention on Biological Diversity based upon the decisions at COP 10 (MOE).

Related indicator groups

- Organizational status for 1/25,000 vegetation maps
- Status for the registration of data to GBIF

Part 3 The Action Plan on Conservation and Sustainable Use of Biodiversity

The relationship between the composition of the action plan and the national targets

Part 3 describes, systematically and exhaustively, specific measures and policies aimed at implementing the conservation of biodiversity and the sustainable use of its components including the implementation of the Roadmap for the Achievement of the Aichi Biodiversity Targets described in Part 2, in the form of the government's action plan for the next five years or so. Since the measures and policies addressed here cover a wide range of subject areas, they are categorized and compiled into subject areas.

The action plan is comprised of three chapters. Chapter 1 "Measures and Policies for National Land" consists of two parts. The first part specifies measures under the title of "Measures and policies based on wide-area coordination," which is divided into four sections: "Ecological networks," "Conservation of priority areas," "Nature restoration" and "Environmental impact assessments and other measures." The second part describes measures in line with the characteristics of individual local areas under the title of "Measures and policies for local areas," which is divided into five sections: "Forests," "Rural and Satoyama areas," "Urban areas," "Rivers, wetlands, etc." and "Coastal and oceanic areas." All together there are nine sections in Chapter 1.

Chapter 2 "Cross-Sectoral and Fundamental Measures and Policies" has ten sections: "Promoting the mainstreaming of biodiversity" as efforts to mainstream and implement the conservation and sustainable use of biodiversity; "Appropriate conservation, management and other measures for wild organisms" and "Measures to control alien species and other factors causing disturbances to ecosystems" as efforts to conserve and manage wild organisms; "Agriculture, forestry and fisheries," "Ecotourism" and "Sustainable use of biological resources" as efforts for the sustainable use of biodiversity; "Promotion of international efforts" as international measures; "Promotion of information management and technological development" as efforts to strengthen the scientific foundation; "Promoting mitigation of and adaptation to global warming" as efforts concerning global warming; and "Integrated efforts towards a society in harmony with nature, a recycling-oriented society and a low-carbon society" as integrated measures.

Chapter 3 "Reconstruction and Restoration after the Great East Japan Earthquake" contains two sections: "Reconstruction and restoration after the Great East Japan Earthquake" and "Efforts to establish a new type of society in harmony with nature."

"The basic concepts" are explained at the beginning of each section. Specific measures and policies are then itemized with the ministries and agencies in charge of implementation* stated at the end as well as explanations about the current status for the measures and policies and the inclusion of numerical targets where possible so as to make descriptions more concrete.

Part 3 shows about 700 specific measures and policies in total as the government's action plan for the next five years or so. These measures and policies will be upgraded and enhanced if necessary, by taking into consideration changes in the circumstances surrounding biodiversity that may occur at home and abroad, including the results of the interim evaluation for the Aichi Biodiversity Targets at the Twelfth meeting of the Conference of the Parties to the Convention on Biological

Diversity (COP 12) which is to be held in 2014 or the beginning of 2015, as well as progress in the implementation of individual measures and policies.

The table below indicates the relationships between Japan's 13 national targets that are set in the "Roadmap for the Achievement of the Aichi Biodiversity Targets" in Part 2 and each section of the "Action Plan" set out in Part 3 (except for Chapter 3).

- * Measures and policies where no decision has been taken at this time about which ministries and agencies will be in charge of implementation are indicated with "Relevant government offices and ministries."

[Relationships between the national targets and each section of the Action Plan]

Chapter 1 Measures and Policies for National Land

[Part 2] National targets [Corresponding Aichi Targets] [Part 3]		A	B					C		D			E	
		A-1 (1 2 3 4)	B-1 (5)	B-2 (6 7)	B-3 (8)	B-4 (9)	B-5 (10)	C-1 (11)	C-2 (12 13)	D-1 (14)	D-2 (15)	D-3 (16)	E-1 (17)	E-2 (18 19 20)
Measures and policies based on wide-area coordination														
Section 1	Ecological networks	○	○	○			○	○	○	○	○		○	
Section 2	Conservation of priority areas	○	○	○	○	○	○	○	○	○	○			○
Section 3	Nature restoration	○	○						○	○	○			○
Section 4	Environmental impact assessments and other measures	○												○
Measures and policies for local areas														
Section 5	Forests	○	○	○			○	○	○	○	○		○	○
Section 6	Rural and Satochi-Satoyma areas	○	○	○	○			○	○	○	○			○
Section 7	Urban areas	○	○		○			○			○			○
Section 8	Rivers, wetlands, etc.	○	○	○	○	○	○	○			○			○
Section 9	Coastal and oceanic areas	○	○	○	○	○	○	○	○	○	○			○

“○” indicates a section which contains measures and policies that are likely to contribute to the achievement of the respective national target.

Chapter 2 Cross-Sectoral and Fundamental Measures and Policies

[Part 2] National targets [Corresponding Aichi Targets]		A	B					C		D			E	
		A-1	B-1	B-2	B-3	B-4	B-5	C-1	C-2	D-1	D-2	D-3	E-1	E-2
		(1 2 3 4)	(5)	(6 7)	(8)	(9)	(10)	(11)	(12 13)	(14)	(15)	(16)	(17)	(18 19 20)
[Part 3]														
The mainstreaming and implementation														
Section 1	Promoting the mainstreaming of biodiversity	○	○		○		○	○		○	○		○	○
Conservation and management of wild organisms														
Section 2	Appropriate conservation, management and other measures for wild organisms	○		○			○	○	○	○	○			○
Section 3	Measures to control alien species and other factors causing disturbances to ecosystems	○		○	○	○	○		○					○
Sustainable use														
Section 4	Agriculture, forestry and fisheries	○	○	○	○	○	○	○	○	○	○		○	○
Section 5	Ecotourism	○						○						
Section 6	Sustainable use of biological resources				○	○			○			○		○
International measures														
Section 7	Promotion of international efforts	○	○	○	○	○	○	○	○	○	○	○	○	○
The strengthening of the scientific foundation														
Section 8	Promotion of information management and technological development	○	○	○			○	○	○	○	○			○
Efforts concerning global warming														
Section 9	Promoting mitigation of and adaptation to global warming from a biodiversity standpoint	○	○	○			○	○	○	○	○			○
Integrated measures														
Section 10	Integrated efforts towards a society in harmony with nature, a recycling-oriented society and a low-carbon society	○	○	○	○					○	○			

“○” indicates a section which contains measures and policies that are likely to contribute to the achievement of the respective national target.

Chapter 1 Measures and Policies for National Land

[Measures and policies based on wide-area coordination]

Section 1 Ecological networks

(Basic concepts)

In order to promote the stable survival of the biota endemic to each local area and the restoration of species with reduced populations, and achieve a country where biodiversity is secured into the future, we will need to secure zones with natural environments subject to conservation or with exceptional natural conditions as core areas, create buffer zones around them so that the core areas and outside the core areas have less impacts on each other and organically link these areas through ecological corridors in order to develop ecological networks.

Ecological networks developed in this way are expected to have multiple functions, including: the protection of habitats for wild organisms; the provision of attractive landscapes and places for people to interact with nature; adaptation to environmental changes caused by climate change; improvement of urban and water environments; and preservation of national land.

Ecological networks will be developed by securing appropriately sized areas for the biota endemic to each local area. Wild organisms' habitats and ranges of movement are very diverse because some species migrate across national borders and prefectural borders, and others shuttle between different types of neighboring ecosystems such as forests and wetlands. Therefore, the government will work to create networks at various geographical levels suitable for different species of wild organisms, including national, wide-area, prefectural and municipal levels.

In the development process, the government will ensure links between habitats through water bodies and greenery such as rivers, green spaces along roads and coasts as well as links between habitats in the sea. It will also take into consideration the hierarchical relationships between different geographical levels including the international level, as well as links within areas that can be geographically considered as one integrated unit such as a watershed area. In addition, the government will give consideration to preventing the spread of alien species and wildlife damage to agriculture, forestry and fisheries.

1 Ecological networks

(Specific measures and policies)

- In order to facilitate the development of ecological networks, the government will work on the provision of information and awareness-raising about the concept of ecological networks as well as methods for planning and achieving ecological networks. It will also assess and examine the effects of existing networking measures and projects. (MLIT, MAFF, MOE)
- Since it is particularly important to take concrete steps to develop ecological networks at the wide-area level, the relevant government ministries and agencies will closely cooperate with each other in clarifying the current situation and in investigating measures towards the development of wide-area ecological networks. (MOE, MAFF, MLIT)
- In order to secure and conserve core areas for ecological networks that are sufficiently large and appropriately distributed, the government will expand such areas and improve their management standards by taking the measures cited in Section 2 “Conservation of priority areas.” As for forests which cover two-thirds of the total area of Japan’s national land, in light

of the fact that many terrestrial animals and plants depend on forests for their habitats, the government will work on their appropriate improvement and conservation as the foundation for ecological networks. It will also work to create more elaborate forest ecological networks by establishing protected forest zones along mountain streams and mountain ridges, including the establishment of “green corridors” which link forest reserves into networks. (MOE, MEXT, MAFF, MLIT)

[Current situation] The area of forest reserves: 903,000 hectares (April 2011)

 The area of green corridors: 586,000 hectares (April 2011)

- The government will stipulate the development of ecological networks and explain its significance in various plans including basic plans on greenery and river improvement plans, in order to enlighten the relevant project operators about the importance of such networks, as well as systematically implementing relevant measures. (MLIT, MAFF, MOE)

[Current situation] The number of municipalities which formulated their basic plan on greenery: 648 (March 2011)

- The government will support advanced activities to conserve and restore local biodiversity by providing a grant for the autonomous regional development strategy (a grant scheme under the control of the Cabinet Office), etc. (MOE)

- Through implementing the measures and policies given in Chapter 1, Section 3 “Nature restoration projects” and Sections 5 to 9 as well as Chapter 2, Section 4, the government will proceed with comprehensive efforts to secure links between habitats with cross-sectoral coordination between relevant organizations. These efforts include the conservation, restoration and creation of habitats in forests, agricultural land, rivers, green spaces along roads and in cities, coasts, ports and harbors, fishing ports and sea areas, by paying attention to links within geographical units such as watershed areas. Another measure is to secure organisms’ migration routes through improving artificial structures. (MOE, MAFF, MLIT)

- The government will proceed with international cooperation in enhancing ecological networks, including: international networks of important habitats for migratory birds under the East Asian-Australasian Flyway Partnership (EAAFP); networks of important coral reefs under the International Coral Reef Initiative (ICRI); and networks of protected areas subject to international discussions regarding the conservation of migration routes for marine mammals, sea turtles and others that migrate long distances across state borders. (MOE)

[Current situation] Since 2008, the Japanese government has been organizing ICRI East Asia Regional Workshops every year in order to formulate (in 2010) and conduct follow-up (from 2011) for a regional strategy which contains the following elements: a regional marine protected area (MPA) database, a regional MPA gap analysis, mapping of coral reefs, systems for assessing MPA management effectiveness and MPA guidelines.

[Target] Achieve the implementation of activities that are in line with the ICRI East Asia Regional Strategy on MPA networks 2010 (with no determined deadline).

Section 2 Conservation of priority areas (Basic concepts)

In order to conserve biodiversity, it is necessary to conserve ecosystems that typify the biological characteristics of each local area in Japan as well as conserving areas that are important as habitats for diverse organisms. They need to be conserved by taking into consideration the sufficient size or scope, the appropriate distribution, the proper regulations, the appropriate management standards and mutual coordination depending on the ecosystem or the area subject to conservation.

Systems for designating priority areas for conservation include those that directly aim at conserving outstanding nature including the ensuring of biodiversity, and those that indirectly contribute to conserving biodiversity while their direct purpose is to protect cultural properties, conserve national land or ensure sound living environments for people. Although these systems have played a major role in conserving biodiversity in Japan, systems for designating priority areas that directly aim at conserving outstanding nature including biodiversity are still insufficient in terms of the current designation situation, regulations and management standards, when looking from a biodiversity standpoint.

In addition, in order to conserve priority areas for the entire human race including world heritage sites, it is our international responsibility to conserve internationally recognized value into the future through cooperation between the relevant organizations.

To this end, the government will proceed with the designation and review of various protected areas and improve their conservation and management in accordance with the type of ecosystem based on scientific data, so that important ecosystems and organisms' habitats at various levels including the national and local levels can better function as core areas for the national ecological network. These areas include National and Quasi-National Parks that form the foundation for biodiversity conservation, Nature Conservation Areas that are key areas for conservation, Wildlife Protection Areas and areas designated as forest reserves and green corridors on national forest which is extensively distributed on remote mountainous backbones and catchment areas. The government will also strive for appropriate conservation and management in areas designated based on other systems for designating priority areas, from the standpoints of biodiversity conservation and the provision of ecosystem services enabled by conserved biodiversity.

As for sea areas, for which government measures have lagged behind those for protected land areas, the government will promote appropriate conservation and the sustainable use of biodiversity by identifying marine priority areas and utilizing systems for conserving sea areas, in coordination with the relevant organizations.

1 Nature Conservation Areas, etc. (Specific measures and policies)

- In order to promote the development of the national ecological network, the government will proceed with efforts to designate or expand Wilderness Areas and Nature Conservation Areas where necessary, in light of scientific findings such as the results of National Surveys on the Natural Environment and various other surveys as well as taking into consideration the current situation in existing designated areas. In particular, the government will move ahead with efforts to designate Nature Conservation Areas in sea areas, in order to enhance marine area protection measures. (MOE)

[Current situation] The existing designated areas: five Wilderness Areas, 5,631 hectares
10 Nature Conservation Areas, 21,593 hectares (one of the areas
contains a sea area) (September 2012)

- In the existing Wilderness Areas and Nature Conservation Areas, the government will conduct fact-finding surveys on ecosystems and check the current utilization status, and promote appropriate conservation and management by installing signs and strengthening patrols where necessary. (MOE)
- Since it is critical to conserve natural environments with relatively high levels of naturalness at the local level in order to secure diverse ecosystems throughout the country, the government will cooperate with prefectural governments to grasp the conservation status for ecosystems in Prefectural Nature Conservation Areas. (MOE)
- Regarding Prefectural Nature Conservation Areas, the government will continue providing advice on prefectural designation and the management of Nature Conservation Areas as necessary. (MOE)
- The government will consider the implementation status for the Natural Parks Law and Nature Conservation Law and if it is deemed necessary, the government will examine the stipulations in the two laws and take the necessary measures based on the results of the examination. (MOE)

2 Natural parks

2.1 Designation and other measures for natural parks

(Specific measures and policies)

- Based on the results of a comprehensive check of the quality of National and Quasi-National Parks which was conducted in response to changes in the natural environment, social circumstances and the diversification in appreciation of landscapes, the government will examine terrestrial ecosystems, inland water ecosystems and coastal ecosystems subject to conservation. The government will then revise the designations and rearrange National and Quasi-National Parks nationwide. (MOE)

[Current situation] The number of National Parks: 30, the number of Quasi-National
Parks: 56 (the end of FY2011)

- As for natural forests and natural grasslands (with a Vegetation Naturalness rank of 9 or 10) with very high naturalness, the government will gradually expand park areas starting from high-priority areas in a bid to ensure that sufficiently large areas become subject to conservation in each region over the long term. For this purpose the government will also utilize other systems for national designation of protected areas that directly aim at conserving the natural environment, in combination with natural park designation systems. (MOE)

[Current situation] The number of National Parks: 30, the number of Quasi-National
Parks: 56 (the end of FY2011)

- As for sea areas, the government will promote their protection by for example designating coastal sea areas with high levels of biodiversity as marine park areas, by giving consideration to the distribution of seagrass beds, tidal flats and coral reefs (which are core elements for wide-area biodiversity conservation) as well as taking into consideration the ocean currents and

the connection between the sea and the land. The government will also review the animal and plant species designated for catch restrictions. (MOE)

[Current situation] The number of marine park areas in National Parks: 110, the number of marine park areas in Quasi-National Parks: 68 (the end of FY2011)

- The government will expand and improve the surveys and monitoring of natural landscapes, wild animals, plants and ecosystems and utilize the survey and monitoring results for reviewing park areas and plans roughly every five years, to promote fine-tuned park management. (MOE)
[Target] Review park areas and plans for National Parks every five years.
- For the purpose of conserving local biodiversity and providing citizens with opportunities to interact with nature in areas near to where citizens live, it is important that prefectural governments designate exceptional natural landscapes that represent the relevant local areas as Prefectural Nature Parks and conduct appropriate management of the parks. The government will continue to give the necessary advice to prefectural governments on the designation and management of Prefectural Nature Parks. (MOE)

2.2 The Protection and management of natural parks

(Specific measures and policies)

- For the protection and management of National Parks, the government has appointed auxiliary rangers (“Active Rangers”) since 2005 in addition to Park Rangers. The government will continue improving and strengthening park management systems including patrolling and monitoring, and proceed with appropriate protection and management. (MOE)
[Current situation] The government has deployed Active Rangers to 62 Ranger Offices (the deployment rate: 71%, as of the end of FY2011). The measure has produced positive results in implementing the conservation and management of National Parks such as the strengthened cooperation with local communities.
[Target] Deploy Active Rangers to Ranger Offices which have not been assigned with Active Rangers, particularly in National Parks to be established or expanded and areas which need to have strengthened conservation and management such as areas with world natural heritage sites.
- The government will promote the efforts of natural park guides and park volunteers by for example increasing their training opportunities, in order to ensure the appropriate use of natural parks and enhance their conservation activities. (MOE)
- Regarding the management of National Parks, with the aim of improving their management standards, the government will implement natural environment conservation activities including patrolling to prevent the illegal taking of alpine plants, vegetation restoration and the removal of alien species under the Special Programs to Engage the Public in Nature Conservation Activities in National Parks (Green Worker Programs). The government will also implement coral conservation activities such as the eradication of the crown-of-thorns starfish and conservation activities for the breeding grounds of sea turtles and seabirds such as coastal cleaning under the programs for strengthening the conservation and management of National and Quasi-National Parks in sea areas (Marine Worker Programs). (MOE)
[Current situation] Green Worker Programs: They are implemented in all National Parks (FY2012).

Marine Worker Programs: They are implemented in 14 National Parks which contain sea areas (FY2012).

- Under the programs for supporting mountain environment conservation measures, the government will work on the improvement of blackwater and effluent treatment facilities used at mountain huts and the like in natural parks. The government will also implement demonstration tests for effective blackwater treatment technologies in mountain areas and provide appropriate information in order to disseminate effective technologies. (MOE)
 - [Current situation] The number of improved blackwater and effluent treatment facilities used at mountain huts, etc.: four (FY2011)
 - [Target] The number of improved blackwater and effluent treatment facilities used at mountain huts, etc.: 100 (in 10 years starting from FY2011)
- In order to appropriately include the views of local governments, etc. in the visions and policies for the management and operation of National Parks and to build attractive National Parks in coordination with local measures and policies on tourism, education and culture, the government will proceed with the establishment of management and operation systems for National Parks which enable collaboration between the national and local governments, local residents, experts, businesses, NGOs and other parties. For this purpose, the government will establish councils where those with decision making powers in various organizations participate, including Regional Environment Offices, other regional offices of the government, local governments and park management organizations, in several National Parks nationwide as model projects. In order to introduce the system nationwide, the government will also investigate the possibility of institutionalizing collaborative management systems and other necessary measures. (MOE)
- In order to promote voluntary natural environment conservation and management activities by local residents and private organizations who are well-versed in local nature, the government will designate organizations with a certain level of management capacity as park management organizations and support fine-tuned management that better meets local realities. For parts of a park where the landscape or ecosystem has deteriorated due to insufficient management by the landowners, the government will encourage park management organizations to conclude Scenic Area Protection Agreements with landowners to increase the area of land they can operate on, in order to promote enhanced landscape conservation and management in natural parks. (MOE)
- In National Parks where the original landscape is changing or likely to change due to the deterioration of biodiversity or changes to ecosystems caused by Sika deer feeding on natural vegetation, etc. or alien species invading and driving out native plant species, the government will formulate the Plannings of Ecosystem Maintenance and Recovery Work with the aim of maintaining and restoring ecosystems in a preventive, adaptive and scientific manner, as its efforts to maintain and restore ecosystems. (MOE, MAFF)
 - [Current situation] The number of areas for which a Planning of Ecosystem Maintenance and Recovery Work has been formulated: six areas (the end of FY2011)
 - [Target] The number of areas for which a Planning of Ecosystem Maintenance and Recovery Work has been formulated: nine areas (FY2020)
- In parts of National Parks where the natural environment has deteriorated or where ecosystems have been fragmented, the government will promote nature restoration projects. (MOE)

- The government will implement capture programs and other programs to remove alien species that adversely affect ecosystems in National Parks. As for alien species that are likely to have adverse effects, the government will formulate species handling guidelines and consider risk assessment methods in order to forestall their invasion or adverse effects, as well as imposing restrictions on the release of alien species at Special Protection Zones and the like. As for greening plant species used for slope-greening and other projects, the government will formulate guidelines for the handling of alien greening plant species, native greening plant species produced overseas and native greening plant species, in order to promote greening projects that give consideration to local biodiversity. (MOE)
- The government will formulate animal and plant conservation policies for National and Quasi-National Parks, and revise the designated animal and plant species subject to collection/catch restrictions based on the policies, in order to conserve ecosystems including the management of habitats. (MOE)
- The government will consider the implementation status for the Natural Parks Law and Nature Conservation Law and if it is deemed necessary, the government will examine the stipulations in the two laws and take the necessary measures based on the results of the examination. (MOE)

2.3 Promoting the use of natural parks (Specific measures and policies)

- Using natural parks that have exceptional natural environments as activity fields, the government will promote the holding of nature observation gatherings and public awareness campaigns on natural environment conservation at visitor centers. The government will utilize brochures and Internet websites to publicize Japan's wonderful natural environment at home and abroad and will develop and provide information to deepen citizens' understanding about the natural environment and their interaction with nature. (MOE)
- The government will promote environmental education, ecotourism and other activities that consider and implement qualitative improvements in natural park usage. (MOE)
- In order to prevent the destruction of vegetation and disturbance of wildlife habitats through the over-concentration of visitors in one place and other forms of overuse in natural parks, the government will consider and implement management methods to reduce the number of people going to overused areas by guiding them to use different parts of natural parks at different time, as well as designating and managing Regulated Utilization Areas based on the Natural Parks Law. (MOE)
[Current situation] The number of Regulated Utilization Areas: two (the end of FY2011)
- In order to prevent the destruction of vegetation and disturbance of wildlife habitats through the over-concentration of visitors in one place and other forms of overuse in natural parks, the government will implement appropriate facility development, including the construction of boardwalks on wetlands and the installation of off-limits fences around alpine plant communities. (MOE)
- Through promoting efforts to restrict private cars in heavily used parts of National and Quasi-National Parks and supporting the introduction of low-carbon vehicles in alternative

transportation systems in order to ease the impact of traffic congestion and curb CO2 emissions by private cars, the government will promote the use of natural parks that give more consideration to the natural environment. (MOE)

2.4 Natural park development (Specific measures and policies)

- For priority conservation areas such as Special Protection Zones and Class I Special Zones as well as priority use areas such as Facility Complex Zones in National Parks, the government will develop mountain trails (through such measures as the installation of signs, scour repair and vegetation restoration) in order to increase safety and promote the appropriate use of the areas, as well as developing activity hub facilities needed to work with local communities to organize ecotourism. The government will also promote the introduction of universal designs at the facilities so that everybody can use them safely and comfortably. The government will also develop view-point facilities, standardized multilingual guide signs and long nature trails along which visitors can experience nature, history and culture, in order to improve the attractiveness and services at National Parks which have exceptional natural environments. (MOE)
- The former Nasu Imperial Villa site in the Nikko National Park, whose control was transferred from the Imperial Household Agency to the Ministry of the Environment in March 2008, was opened to the public as Nasu Heisei-no-mori Forest in FY2011 after the development of garden paths, visitor centers and other facilities. The government will continue promoting the conservation of the natural environment and nature experience activities where people can interact with nature first-hand. (MOE)
- At places where natural ecosystems have disappeared or changed, the government will rejuvenate or restore forests, wetlands, tidal flats, seagrass beds and other natural environments. (MOE)
- For Quasi-National Parks, the government will provide a grant for the autonomous regional development strategy (a grant scheme under the control of the Cabinet Office) to support local government programs that take advantage of local characteristics to develop places for human interaction with nature and to conserve and restore natural environments. (MOE)

3 Wildlife Protection Areas (Specific measures and policies)

- The government will promote the designation of Wildlife Protection Areas and Special Protection Zones, which are core systems for wildlife protection, in order to secure wildlife habitats and contribute to maintaining, restoring and improving local biodiversity that includes all wild animals and plants. The government will promote the designation of priority wildlife conservation areas chosen from a national or international viewpoint as National Wildlife Protection Areas, in coordination with relevant organizations. The government will also reorganize protection areas based on the protection area designation policies to be stipulated in the strategy for the conservation of threatened wild species which will be created at a future date. (MOE)

[Current situation]

The number of National Wildlife Protection Areas: 82 areas, 582,409 hectares (September 2012)

- The government will work on securing ecological networks including international networks of migratory bird habitats by promoting the designation of migration destinations for flocks of birds as Wildlife Protection Areas, while closely coordinating with other relevant protection measures such as measures on natural parks. (MOE)
- The government will check the current implementation status for the Wildlife Protection and Hunting Management Law and revise the relevant systems and operations where necessary. (MOE)
- The government will appropriately manage Wildlife Protection Areas by implementing regular patrols and wildlife inhabitation surveys as well as promoting appropriate guidance for the use of the areas by people, public awareness campaigns on wildlife ecology and conservation and development of suitable environments for wildlife inhabitation. For National Wildlife Protection Areas in particular, the government will strengthen their management based on master plans which give protection and management guidelines for each Wildlife Protection Area. When wildlife habitat environments deteriorate in Wildlife Protection Areas, the government will conduct projects for conserving and improving wildlife habitats as necessary, including the construction of wildlife breeding and feeding facilities, water quality improvement facilities for lakes, etc. and fences to prevent animals which affect wildlife inhabitation from invading the areas. (MOE)

4 Natural Habitat Conservation Areas (Specific measures and policies)

- Since habitats must be secured for the stable survival of threatened wild animal and plant species, the government will promote the designation of Natural Habitat Conservation Areas in such a manner as to give priority to areas where habitats are maintained in good condition for National Endangered Species of Wild Fauna and Flora, while coordinating closely with other relevant protection measures such as the Wildlife Protection Area and the natural park systems where necessary. The government will also reorganize protection areas based on the protection area designation policies to be stipulated in the strategy for the conservation of threatened wild species which will be created at a future date. (MOE)
[Current situation] The number of Natural Habitat Conservation Areas: nine areas, 885 hectares (September 2012)
- The government will implement appropriate management of Natural Habitat Conservation Areas, maintenance and improvement of habitats in accordance with the conservation guidelines laid down for each Natural Habitat Conservation Area. The government will also work on identifying the inhabitation status of species subject to conservation and revise conservation guidelines and areas if necessary. (MOE)

5 Places of scenic beauty, natural monuments and cultural landscapes

5.1 Places of scenic beauty and natural monuments (Specific measures and policies)

- From the perspective of protecting cultural properties that represent human-nature relationships in Japan, the government will promote the designation of natural monuments and places of natural scenic beauty among the characteristic landscapes and natural areas that could become the core areas for local landscape diversity or local biodiversity. (MEXT)

[Current situation] The number of natural monuments designated: 994 (the end of March 2012)
 The number of places of natural scenic beauty: 154 (the end of March 2012)

- For areas which have been designated as places of scenic beauty or natural monuments, the government will cooperate with local governments in their conservation as cultural assets that reflect local nature. The government will provide state subsidies for programs led by local governments and the like who promote the conservation of appropriate landscape diversity and biodiversity, including fact-finding surveys, the formulation of conservation and management plans, maintenance and restoration. (MEXT)

[Current situation] The preservation and improvement of tangible cultural properties, etc. (natural monument urgent studies, the formulation of plans for the preservation and management of historic sites, etc., their preservation and improvement, restoration of natural monuments, measures to control feeding damage to natural monuments)

- The government will cooperate with local governments, researchers, local residents and other parties for the appropriate utilization of natural monuments and places of scenic beauty, and provide state subsidies for programs of local governments and others such as environmental education as well as the development and opening to the public of natural monuments and places of scenic beauty as local resources. (MEXT)

[Current situation] The preservation and improvement of tangible cultural properties, etc. (preservation and improvement, promoting the comprehensive development and utilization of historic sites, etc., restoration of natural monuments)

5.2 Cultural landscapes (Specific measures and policies)

- From the standpoint of protecting cultural landscapes nurtured through human interaction with nature, the government will promote the selection of Important Cultural Landscapes among the appropriately-protected important cultural landscapes. (MEXT)

[Current situation] The number of Important Cultural Landscapes selected: 30 (the end of March 2012)

- In order to promote the conservation and utilization of cultural landscapes, the government will provide state subsidies for survey projects and projects for the formulation of cultural landscape conservation plans. State subsidies will also be provided for improvement projects for landscape restoration, etc. in areas selected as Important Cultural Landscapes. (MEXT)

[Current situation] The preservation and improvement of tangible cultural properties, etc. (related to cultural landscapes)

- In order to raise public awareness about cultural landscapes, the government will provide state subsidies for projects to organize study sessions, open lectures and workshops where local residents participate. (MEXT)

[Current situation] The preservation and improvement of tangible cultural properties, etc. (related to cultural landscapes)

6 Forest reserves and protection forests

(Specific measures and policies)

- National forest contains many primeval forest ecosystems and forests that provide habitats for valuable wild animal and plant species, including Yakushima Island, the Shirakami Mountains, Shiretoko and the Ogasawara Islands, all of which were registered as world natural heritage sites. The government will specify these valuable forests as “forest reserves” (a system established in 1915) and promote their conservation and management. For these types of forests that require special conservation and management measures, the government will promote the establishment of forest reserves in a more detailed manner as well as revising the zones specified as forest reserves on the basis of the distributions of rare wild animal and plant species. The government will classify forest reserves into seven categories in accordance with the objectives for their establishment, which include the conservation of forest ecosystems, the preservation of genetic resources and the conservation of plant communities such as alpine plants. The government will then proceed with their management accordingly, for example leaving them to natural processes in principle. (MAFF)
[Current situation] The area of forest reserves: 903,000 hectares (April 2011)
- In forest reserves, the government will conduct monitoring surveys nationwide in order to correctly understand developments after their establishment and to promote conservation and management which best suit the current situation. As part of the conservation and management efforts, the government will install protection fences to help vegetation recovery and prevent feeding damage by Sika deer as well as taking other measures suitable for the characteristics of each type of species and habitat, in order to protect species subject to conservation and to maintain and conserve habitats. (MAFF)
- On national forest, the government will make more effective forest ecosystem conservation efforts covering larger areas. For example, the government will establish “green corridors” (a system established in 2000) which create networks mainly focusing on forest reserves in order to promote interaction between populations and secure species and genetic diversity by conserving or creating migration routes linking the habitats of wild animals and plants. (MAFF)
[Current situation] The area of green corridors: 586,000 hectares (April 2011)
- In green corridors which create networks mainly focusing on forest reserves, the government will thin out artificial forests in order to develop feeding environments for rare wild animal and plant species and habitats for their prey, and will continue the monitoring surveys in order to understand forest conditions and the inhabitation of wild animals and plants. The government will also promote the establishment of new green corridors in order to further secure the conservation of species and genetic diversity. (MAFF)
- The government will systematically promote the designation of forests that are particularly needed to maintain public benefit functions such as water conservation and soil run-off prevention as protection forests. (MAFF)
[Current situation] The area of protection forests: 12,020,000 hectares (the end of FY2011)
[Target] The area of protection forests: 12,810,000 hectares (the end of FY2023)
- With regard to parts of national forests along mountain streams and other water bodies that are not specified as forest reserves or green corridors, the government will maintain natural forests in their current condition and vigorously introduce broad-leaved trees into artificial forests, so

that they can play their roles in ensuring links between forests and providing migration routes for wild organisms and seed supply sources. (MAFF)

7 Special green space conservation districts, etc.

(Specific measures and policies)

- The government will provide appropriate subsidies for the provision of compensation for losses caused by conduct restrictions, land purchases and the development of landslide prevention facilities and other facilities for the conservation of green spaces. As core habitats for organisms in cities, the government will promote the designation of special green space conservation districts, Suburban Special Green Conservation Areas and other areas which contribute to securing good natural environments in cities from the biodiversity standpoint, in order to secure green spaces. It will also promote the creation of green spaces such as urban park developments. (MLIT)
 [Current situation] Special green space conservation districts: 2,369 hectares, 419 districts
 Suburban Special Green Conservation Areas: 3,517 hectares, 27 areas (March 2011)
- In the Greater Tokyo and Kinki Regions, the government will consider designating areas which should be conserved as Suburban Green Conservation Areas where necessary, based on the information in the Grand Design of Urban Environment Infrastructure for each region, with the aim of renewing the cities using the multiple functions that natural environments have. (MLIT)
 [Current situation] Suburban Green Conservation Areas: 97,330 hectares, 25 areas (March 2011)
- The government will promote the utilization of management agreements and other systems that promote the appropriate management of green spaces in order to ensure sound green space management by diverse parties. (MLIT)
 [Current situation] Management agreements: 1.2 hectares, one area and three agreements (March 2011)

8 Ramsar Sites

(Specific measures and policies)

- The Ramsar Convention (adopted in 1971) aims at promoting the conservation and wise use of wetlands of international importance, as well as their flora and fauna. Japan joined the Ramsar Convention in 1980. The Ramsar Convention requires that member states (Contracting Parties) should have at least one wetland site of international importance registered as a Ramsar Site. Japan had 46 wetland sites registered by August 2012. Japan also selected and published a candidate list of potential Ramsar wetland sites in Japan, that are likely to have met the international criteria for Ramsar Sites. As for developments in the Convention, the goal of “increasing the number of Ramsar Sites to 2,000” set in the Seventh Meeting of the Conference of the Contracting Parties in 1999 was achieved (2,006 sites as of May 2012). The Convention is increasingly focusing on not only increasing the number of registered sites but also further improving the quality of the registered sites. In line with the Convention’s philosophy, Japan will also work on the qualitative improvement of the conservation and the wise use of the registered sites. More specifically, Japan will update the Ramsar Information Sheets (RIS) for all registered sites by 2020 and strive to achieve the necessary expansion of the registered sites after obtaining support and cooperation from local communities. As for sites that have been found to meet the criteria for identifying wetlands of international importance and are likely to promote conservation by local communities through their registration, the government will aim

at having 10 more Ramsar Sites registered in Japan by 2020, in light of the past developments in registration. (MOE, MAFF)

- The government will proceed with conducting monitoring surveys, organizing information and restoring wetlands on Ramsar Sites, in cooperation with relevant local governments, local residents, NGOs, experts and other parties including the Domestic Ramsar Committee for Relevant Municipalities where municipalities with Ramsar Sites voluntarily participate. The government will also promote the conservation and wise use of Ramsar Sites by tapping into the local climate and culture of each Ramsar Site, by supporting the formulation of plans for the conservation and wise use of Ramsar Sites, providing information about successful cases of wise use and raising public awareness. (MOE, MAFF, MLIT)

9 World heritage sites

(Specific measures and policies)

- For Yakushima Island, the Shirakami Mountains, Shiretoko and the Ogasawara Islands, the government will implement monitoring surveys and patrolling based on the world heritage site management plans which were . It made in cooperation and coordination with local governments and other relevant parties. The government will also promote appropriate conservation and management of the world heritage sites under the Natural Parks Law, the Nature Conservation Law, the Forest Ecosystem Reserve system and the Law for the Protection of Cultural Properties. (MOE, MEXT, MAFF)
- The government will move ahead with managing world natural heritage sites by cooperating and coordinating with efforts of relevant organizations, local governments and local groups engaged in conservation and management, and by building consensus among local communities, through Regional Liaison Committees and other frameworks. The government will also further promote management in cooperation with various groups of citizens, for example by developing a system to collect information about forests and wildlife from those visiting world natural heritage sites and use the information for the management of the sites. (MOE, MAFF)
- Based on discussions at the World Heritage Committee, the government will build monitoring setups and programs in order to understand the impact of global warming on world heritage sites. (MOE, MAFF)
- For Yakushima Island, the Shirakami Mountains, Shiretoko and the Ogasawara Islands, the government will continue promoting appropriate conservation and management based on scientific knowledge in line with the recommendations by the World Natural Heritage Site Scientific Councils set up for each site. (MOE, MAFF)
- For Yakushima Island and the Shirakami Mountains, the government will revise the current World Heritage Site Management Plans in light of currently existing issues by obtaining advice from the Scientific Councils. The government will then promote adaptive conservation and management in line with the revised plans based on scientific findings. (MOE, MAFF)
- For Shiretoko, the government will implement activities for achieving the appropriate conservation of the natural environment in the area by working towards the integrated management of the sea and land areas in accordance with the Management Plan for the Shiretoko World Natural Heritage Site formulated in 2009. (MOE, MEXT, MAFF, MLIT)

- With regard to Shiretoko, at the investigation committee on proper use and ecotourism established in 2010, the government will formulate a comprehensive “ecotourism strategy for Shiretoko,” with the basic purposes of conserving the natural environment of the heritage site and improving its value, providing visitors from around the world with a high quality nature experience that represents Shiretoko, and building sustainable local communities and economies. The government will then promote the proper use of the world heritage site and ecotourism on the site. The government will also disseminate rules for the use of the site including the Conduct in the Use of the Shiretoko Peninsula Apical Region formulated in January 2008 and the Conduct in the Use of the Shiretoko Peninsula Central Region formulated in January 2009, as well as imposing restrictions where necessary. The government will also provide information and programs for the utilization of various natural and cultural resources, thus guiding visitors to use various parts of the site, as well as guiding them towards appropriate uses. (MOE, MAFF)
- The Ogasawara Islands was added to the World Heritage List through deliberations at the World Heritage Committee session held in June 2011. The government will follow the management plan for the islands formulated on a scientific basis in light of the recommendations given when the islands were added to the list, and continue promoting efforts by relevant organizations in cooperation and coordination in order to strengthen effective management and conservation. For example, the government will promote measures to control alien animal species such as the black rat in Ogasawara National Park, and rigorously implement control measures and rules for the use of alien plant species such as the bishopwood in Forest Ecosystem Reserves on the Ogasawara Islands. (MOE, MAFF)
- As for the Amami-Ryukyu, Japan needs to expand measures to guarantee the protection of priority areas such as habitats for threatened species. Therefore, the government will analyze and assess the value of the islands as a world natural heritage site and cooperate with local communities in setting up and expanding protected areas. (MOE, MEXT, MAFF)
- The government will promote ecotourism at existing world natural heritage sites and candidate sites. (MOE)
- As for Mt. Fuji which the government nominated for a world cultural heritage site in January 2012, the government will move ahead with forest management and conservation on national forest by giving consideration to the landscape as well as taking measures to promote the conservation and appropriate use of National Parks. Relevant ministries and agencies in cooperation with relevant local governments will thus aim at the inscription of Mt. Fuji on the World Heritage List in 2013. (MEXT, MAFF, MOE)
- It is the obligation of States Parties to recognize valuable nature in their territories as world heritage sites and to protect and conserve the nature. Considering that 2013 marks 10 years since the review by the Committee to Review Candidates of World Natural Heritage in 2003, the government will once again review the presence/absence of areas which have value as world natural heritage sites. (MOE, MAFF)
- As for Yakushima Island and the Shirakami Mountains which were registered as world natural heritage sites in December 1993, the government will revise the “management plans” in order to ensure appropriate conservation and management of their outstanding universal value

provided in the criteria for registration as a world heritage site, and will promote the appropriate conservation and management of the sites. (MAFF, MOE)

10 Biosphere Reserves

(Specific measures and policies)

- As for the four Biosphere Reserves (BRs), which are better known as “UNESCO Eco Park” in Japan, designated in 1980 (namely Yakushima Island, Mount Odaigahara & Mount Omine, Mount Hakusan and Shiga Highland), the Catalogue of UNESCO/MAB (Man and the Biosphere) BRs in Japan, version II published in 2007 describes the present natural environment and biota, the impact of human activities, etc. The government will aim at further promoting the implementation of BR which have three functions including biodiversity conservation, economic and social development and logistic support for education, research and monitoring, and to enable the sustainable coexistence of natural environmental conservation and human activities. As part of its efforts, the government will work on changing zoning in line with the current UNESCO criteria. (MEXT, MAFF, MOE)
- Through taking into consideration global trends, the government will consider developing new measures and policies to take advantage of the BR system which aims at harmony between ecosystem conservation and the sustainable use of the ecosystems (coexistence between nature and human society), in cooperation with local governments and other relevant parties. The government will also provide information and advice to those involved in candidate sites for designation (MEXT, MOE, MAFF)
- As for the Aya area in Miyazaki which was registered as a BR in July 2012, from the standpoint of harmonizing the conservation and sustainable use of ecosystems, the relevant ministries and agencies, local governments, local NPOs and others will cooperate with each other to promote the appropriate conservation and management of forests with the aim of conserving and restoring lucidophyllous forests mainly on national forest, as well as taking local development measures in consideration of the coexistence of nature and humans through coordination with organic farming efforts, etc. (MEXT, MAFF)

11 Geoparks

(Specific measures and policies)

- For National Parks, the government will work on conserving the diversity of geography and geology (geodiversity) which is the “foundation” for biodiversity. It will also move ahead with developing geotours, environmental education programs and education programs for disaster prevention through which people can learn about natural threats such as earthquakes and volcanoes, in cooperation with local governments and other organizations which promote geoparks. (MOE)
- At the potential site for the establishment of Sanriku Reconstruction (Fukko) National Park, where the government is working towards the designation of the area affected by the tsunami in the Great East Japan Earthquake as a national park, the government will cooperate with those working to have the area designated as a Geopark. It will proceed with the conservation of geosites including the evidence of the earthquake and tsunami disasters and the development of mechanisms for learning about the threats and benefits of nature, as well as disseminating the information about the efforts globally. (MOE)

12 Local voluntary management areas (Specific measures and policies)

- Regarding cases where local stakeholders such as NGOs and fishermen's cooperatives set up management areas through consensus and conduct conservation and management, the government will collect their basic information, information about the methods for building consensus and managing the areas, etc. It will then investigate common issues and methods for cooperation and collaboration between the relevant organizations. (MOE)
[Current situation] The government has collected information about a small number of fishermen's cooperatives and NGOs.
[Target] Improve the management of local voluntary management areas as marine protected areas.
- In light of the methods for setting up marine protected areas that were clarified based on the Basic Plan on Ocean Policy, the government will appropriately promote the establishment of marine protected areas and improve their management. (MOE, other relevant government offices and ministries)
[Current situation] Marine protected areas account for about 8.3% of Japan's territorial waters and EEZ (May 2011).
[Target] Make 10% of the waters under Japanese jurisdiction protected areas (by 2020). Consider standards and methods for assessing the effects of marine protected areas from a biodiversity standpoint.

Section 3 Nature restoration (Basic concepts)

Towards the establishment of a society in harmony with nature, it is necessary to renew our appreciation of the value of the natural environment and promote efforts to conserve the natural environment including the flora, fauna and ecosystems endemic to local areas. In addition, it is also necessary that we revive the local natural environment through nature restoration, in an effort to create local communities which can benefit from nature.

Nature restoration means the conservation, restoration or creation, and maintenance of rivers, marshes, tidal flats, seagrass beds, satoyama (community-based woods), satochi (rural landscapes), forests, and other natural environments, with the participation of various actors in the community, including concerned governmental agencies, concerned municipal governments, local residents, NPOs and individuals with specialized knowledge of the natural environment, with the objective of recovering the ecosystems and other natural environments that have been damaged or destroyed in the past.

The Law for the Promotion of Nature Restoration was put in force in January 2003 for the implementation of nature restoration measures. 24 Nature Restoration Committees have been organized across the country as of March 2012. Nine years after the law came into force, an increasing number of areas have moved from the survey and conceptual stages to the stages of creating specific implementation plans and project implementation.

Nature restoration projects need to be implemented steadily from a long-term perspective by following the project processes of surveying, developing concepts and plans, project implementation, monitoring, evaluation and flexible review of the project content. They should also be implemented based on the basic principles of the Law for the Promotion of Nature Restoration including the cooperation of various actors in the community, respecting voluntary efforts by the community, ensuring transparency, implementation based on scientific knowledge, adaptive processes and the utilization of a nature restoration project as a venue for natural environmental learning. Since more areas have moved on to the project implementation stage, it is important to promote effective project implementation through employing adaptive management methods suitable for each local area and conducting continuous monitoring.

Regarding the promotion of nature restoration in the future, the government will take the necessary measures to promote relevant projects more effectively, while tackling the issues of improving and disseminating technologies through demonstrating actual projects, developing nature restoration projects from a wide-area perspective and supporting nature restoration activities by private organizations.

1 The steady implementation of measures for nature restoration (Specific measures and policies)

- The government will steadily promote nature restoration projects, including such ongoing projects as the restoration of forests on Mt. Moriyoshi Heights, the restoration of grasslands in Aso, the restoration of satoyama landscape on Mt. Konoyama, the restoration of lowland forests on Mt. Kunugi, the restoration of wetlands in the Kushiro Wetlands and Sarobetsu, the restoration of tidal flats in the Fushino River estuary, and the restoration of coral reefs in the Sekisei Lagoon. (MOE, MAFF, MLIT)

- Through the steady promotion of nature restoration projects, the government will collect project implementation methods and adaptive management methods, based on the scientific knowledge gained through the implementation of projects in various areas. The government will then organize and systematize these technical methods as a way to accumulate technological knowledge regarding nature restoration. (MOE, MAFF, MLIT)
- In a bid to develop methods for the appropriate assessment of the various effects expected to result from nature restoration projects, the government will consider how to assess nature restoration projects and will establish suitable methods. (MOE)
- In areas where nature restoration efforts are required, the government will implement public awareness campaigns through participatory natural environment surveys, the preparation of nature observation handbooks as well as holding workshops on nature restoration, providing information and promoting environmental education. Through these campaigns, the government will seek to create five more Nature Restoration Committees for nature restoration projects by FY2015. It will also proceed with the preparation of implementation plans for nature restoration projects which specify details of the nature restoration to be implemented, targeting the preparation of nine additional plans by FY2015 (MOE).
 [Current situation] The number of Nature Restoration Committees: 24, the number of implementation plans for nature restoration projects: 26 (the end of FY2011)
 [Target] The number of Nature Restoration Committees: 29, the number of implementation plans for nature restoration projects: 35 (FY2015)
- The government will promote model projects conducted in collaboration with local residents and nature conservation organizations for the conservation of local natural environments and nature restoration. These model projects include: the Akaya Project where the local council made up of local residents, a nature conservation organization and the Forestry Agency signed an agreement to work towards the restoration of biodiversity and the creation of a sustainable local community; the Aya Project which rigorously protects one of the largest primeval evergreen broad-leaved forests in Japan as well as reintegrating the fragmented forest by restoring the original vegetation on the land currently covered by secondary and artificial forests which divide the evergreen broad-leaved forest; the Nopporo Forest Restoration Project which restores forests that have had trees flattened by a typhoon; and the Shimanto Kuroson Project which restores forests on Sika deer damaged ex-forest land and conducts various forest management. (MAFF)
- Through the Forest Environment Conservation Centers, the government will support the activities of people engaged in forest environmental education and citizen groups engaged in nature restoration and biodiversity conservation. (MAFF)

2 The promotion of new measures for nature restoration **(Specific measures and policies)**

- The government, through cooperation between the relevant ministries and agencies, will consider the direction and specific measures for nature restoration from the national and wide-area perspectives, by taking into consideration the findings reported in the Japan Biodiversity Outlook and the progress in the ecological network initiative. The government will then promote the systematic implementation of nature restoration measures. (MOE, MAFF, MLIT)

- In order to implement nature restoration projects from a wide-area standpoint, the government will consider methods that can achieve the following: building a common understanding of goals for nature restoration at the wide-area level using mapped ecological networks; various parties recognizing the significance of nature restoration and implementing the projects towards the goals. (MOE, MAFF, MLIT)
- The government will consider and implement more effective methods to support nature restoration efforts made by private organizations and the like on private land in particular. (MOE)
- 2013 marks five years since the last review of the Basic Policy for Nature Restoration which was created based on the Law for the Promotion of Nature Restoration. Therefore, the government will collect opinions from the public and consider reviewing the policy if necessary in light of the progress made by nature restoration projects. (MOE, MAFF, MLIT)

Section 4 Environmental impact assessments and other measures (Basic concepts)

For the conservation of biodiversity, it is extremely important to give consideration to environmental conservation prior to formulating and implementing large-scale projects that are expected to have significant environmental impacts. Therefore, the Environmental Impact Assessment Act (put into force in June 1999) provides that proponents of such large-scale projects shall survey, predict and assess the likely environmental impacts prior to project implementation and reflect the results of the assessment in the contents of the project, thereby ensuring appropriate consideration for environmental conservation. The law also requires that the project proponents shall report and publish the results of environmental conservation measures, etc. after the project implementation. In addition, almost all prefectures and cabinet-order designated cities (major cities) have their own environmental impact assessment systems stipulated in their regulations, which require that fine-tuned environmental impact assessments should be conducted by taking into account the environmental conditions and other conditions of each local area.

The government established the “Basic Guidelines” based on the law, which are common guidelines for all types of projects subject to the law concerning the methods for carrying out environmental impact assessments. The guidelines ensure biodiversity conservation by setting out the following guidelines. At the project planning stage, the project proponent should in principle create multiple plans concerning the location, etc. of the project, and conduct comparative assessments that are part of the consideration process for the avoidance or reduction of critical environmental impacts. At the stage of considering the detailed contents of the project, items that the project proponent is required to assess include the “protection of biodiversity and systematic conservation of the natural environment” and “rich interaction between people and nature.” In the assessment of these items, the project proponent is required to incorporate better environmental consideration into the project contents by assessing not only the fauna and flora that are important from academic or scarcity-value viewpoints and outstanding natural landscapes, but also places where people can interact with nearby nature and familiar living organisms that characterize the local ecosystems. In addition, with regard to environmental conservation measures, the guidelines provide that the project proponent should first consider avoiding or reducing environmental impacts, and then consider compensation measures for still remaining environmental impacts, such as the creation of the same type of environment as the one that would be lost because of the project.

Since it is important to introduce environmental consideration at an early stage of a project, it is necessary to consider creating a strategic environmental assessment system, which incorporates environmental consideration into the formulation and implementation of superordinate plans and policies that precede the stage of considering the location, size and other details of individual projects.

1 Environmental impact assessments (Specific measures and policies)

- Prior to the implementation of each project, the government will give its opinions at each stage of the environmental impact assessment procedures as necessary, so that the procedures will be followed appropriately and smoothly and appropriate environmental considerations can take place including the “protection of biodiversity and systematic conservation of the natural environment” and “rich interaction between people and nature.” (MOE)

[Current situation] The Minister of the Environment has submitted opinions for 134 out of 203 procedures filed by the end of March 2012.
The Minister of the Environment submitted five opinions in FY2011.

- The government will operate the environmental impact assessment system appropriately and effectively based on the Environmental Impact Assessment Act revised in April 2011, including the procedures for the Primary Environmental Impact Consideration and the Impact Mitigation Reporting that were added in the revision. (MOE)

- For projects where the environmental impact assessment procedures based on the law have been completed, the government will conduct follow-up surveys by checking the projects' progress and conducting on-site surveys, in order to see whether an appropriate consideration for environmental conservation has taken place. (MOE and other relevant government offices and ministries)

[Current situation] Follow-up surveys were conducted at four Regional Environment Offices.
107 progress checking surveys and 16 on-site surveys etc. were conducted (FY2011).

- The government will appropriately operate the environmental impact assessment system for wind power plant installation projects that became subject to the Environmental Impact Assessment Act in October 2012, so as to ensure that the projects will give consideration to biodiversity conservation. (MOE)
- The adequacy of the Basic Guidelines shall be checked roughly every five years. The latest check was conducted in FY2011 and the revisions were announced in April 2012. The government will continue to appropriately keep track of how environmental impact assessments are implemented and conduct regular checks for the Basic Guidelines in light of the latest scientific findings and how environmental impact assessments are implemented, in order to ensure appropriate operation of the system. (MOE)
- Regarding methods to predict and assess environmental impacts and environmental conservation measures including measures to avoid or reduce impacts and compensatory mitigation measures, it is necessary to compile and summarize new trends in relevant technologies in order to review these methods and measures based on the latest scientific findings. The government will improve technical and institutional methods by continuously examining the methods, for example by analyzing the impacts that resulted from the implementation of various projects while taking into consideration factors that were not fully understood in the past. (MOE)
- The government will continuously provide citizens, NGOs, businesses, local governments, etc. with the technical support and information necessary to implement environmental impact assessments via the Internet and other media. (MOE)
- The government will consider methods to promote wide-ranging and effective communication among the people concerned with environmental impact assessments. (MOE)
- Taking into consideration the progress in the development and operation of systems for strategic environmental assessments (assessments at the stages of developing superordinate

plans and policies) at home and abroad, the government will compile and examine the challenges that need to be overcome for the introduction of the system in Japan, while ensuring that consideration for environmental sustainability is included in the system. The government will then work towards the establishment of the system in Japan. (MOE)

- The government will implement appropriate environmental impact assessments and accumulate implementation experience including the Primary Environmental Impact Consideration and Impact Mitigation Reporting that were added to the revised Environmental Impact Assessment Act, through which it will increase its capacity to implement more appropriate assessments. (MOE and other relevant government offices and ministries)

2 Other major efforts to reduce environmental impacts (Specific measures and policies)

- When implementing dam projects, the government will conduct careful examinations in order to fully take into consideration the natural environment from the planning stage. In addition, the government will take environmental conservation measures such as ex-ante environmental surveys and environmental impact assessments, in an effort to avoid or reduce impacts on the habitats of various living organisms. The government will also work to include survey results conducted after facilities have been put into use in plans and impact assessments for future dam projects. (MLIT)
- For the implementation of road projects, the government will continue promoting measures to give consideration to ecosystems, by taking into account the following points. (MLIT)
 - (1) The government will conduct detailed surveys and accumulate data on the natural environment. Based on the data, the government will select routes that can conserve rich natural environments and adopt structures that avoid major alterations to topography and vegetation where necessary.
 - (2) With the aim of preventing animal habitats from being fragmented and conserving plant habitats, the government will take ecosystems into consideration when developing roads, including the construction of structures for animals to cross over/under roads and the installation of signs that call attention to animals.
 - (3) In regard to embankment slopes created by road construction projects and existing slopes created by past projects, the government will cover them with vegetation that best suits the local climate, local soil and other natural conditions, so that the slopes will resemble a natural environment as closely as possible.
 - (4) Depending on the conditions of the local area, the government will make vigorous efforts to create animal and plant habitats when developing roads. This will be done by taking into consideration the current conditions of the surrounding natural environment and carefully selecting the tree species to be planted.
- The government will keep in mind environmental and social considerations at all stages of international cooperation projects ranging from the adoption and implementation to evaluation of projects, and ask beneficiary countries for understanding about Japan's policy to stress environmental and social considerations. (MOFA, MOF, METI, MOE)
- The Japan International Cooperation Agency (JICA) which is an aid implementation agency, will aim at formulating and implementing projects with appropriate environmental and social considerations, based on the new "JICA guidelines for environmental and social considerations" (promulgated in April 2010). (MOFA, MOF, METI, MOE)

[Measures and policies for local areas]

Section 5 Forests (Basic concepts)

Forests account for two thirds of Japan's total land area, consisting of diverse forests ranging from artificial forests to primeval natural forests, and they are a key element for the conservation of biodiversity as habitats of diverse wild animal and plant species. In addition to the role of conserving biodiversity, forests have various other functions, for example they serve as carbon sinks for curbing global warming, prevent soil run-off, conserve water and provide timber, thus serving as the foundation for the environment on which humans depend for their survival. Therefore, it is necessary to maintain the multiple functions of forests comprehensively and continuously.

When conserving biodiversity in forests, it is important that forest conditions continue changing over time through appropriate amounts of disturbance and that forests made up of various tree species suited for local natural conditions at different growth stages should be distributed in good balance, over a sufficiently large area. It is necessary to create this type of forest in such a way that they can comprehensively maintain their multiple functions. Therefore, the government will promote the management and conservation of forests that are diverse in terms of their compositions and development stages. For example, the government will conserve primeval forest ecosystems, conduct thinning in artificial forests, introduce long rotation management and introduce broad-leaved trees, based on the idea of adaptive management which takes into account uncertainties involved in forest ecosystems.

In order to maintain the multiple functions of forests sustainably, the government will also implement comprehensive measures and policies in combination with forest management and conservation, including the restoration of forests, reinvigoration of forestry and the timber industry in Japan, the development of mountain villages which support forests and forestry, as well as promoting forest development activities involving citizens. Thus the government will work towards steady, continuous and appropriate forest management and conservation.

National forest, which accounts for 20% of Japan's total land area and 30% of the forested area, covers remote mountainous backbones and catchment areas, and includes a variety of forests from primeval natural forests to artificial forests, playing an important role in conserving biodiversity and allowing citizens to enjoy comfortable lives. On national forest, the government will further promote its administration and management by focusing on the public benefits of the "Forests for the People." The government will conserve and manage primeval forest ecosystems and the natural environment in forests where rare species live by specifying them as "forest reserves" and "green corridors," while maintaining its policy for the integrated implementation of national forest projects and measures and policies for private forests including the conservation of biodiversity in forests. It will also implement appropriate management and conservation of all national forest.

Furthermore, the government will contribute to biodiversity conservation on a global scale through international cooperation for promoting forest conservation and sustainable forest management.

1 The desirable conditions of forests for maintaining their priority functions and how to develop such conditions

(Specific measures and policies)

- In the Fundamental Plan of Forest and Forestry, the government will explain the various functions of forests (water conservation, disaster prevention on mountains/soil conservation, the creation of pleasant environments, health and recreation, culture, biodiversity conservation and the production of timber, etc.) and will give examples of desirable forest conditions that effectively maintain these forest functions. The government will then promote the management and conservation of forests in order to achieve such desirable conditions, using forest planning and other systems. (MAFF)
- The government will specify policies on how to develop forests that have the specific functions expected of the forests, and promote the management and conservation of forests based on the development policies for each type of forest set forth in the Fundamental Plan of Forest and Forestry, by forest planning and other systems.

The following describes the development policies for single storied plantations. Regarding single storied plantations with relatively fast growth which are located on mildly contoured land, forest owners will be recommended to ensure the maintenance of their state as single storied plantations from which the production of timber, etc. can be expected, in order to increase resource availability in the future. For plantations from which both public benefit functions such as water conservation and the timber production function can be expected, forest owners will be recommended to employ small-scale clear-cutting in dispersed plots instead of clear-cutting a large area of forest so as to reduce the impacts of denuding land through logging, as well as conducting thinning and selective logging as the forests mature, in order to steadily regenerate the forests. As for other plantations that require continuous management in order to ensure the public benefit functions, forest owners will be recommended to develop them into multi-storied mixed forests with coniferous and broad-leaved species, through the introduction broad-leaved trees depending on the conditions at the location.

As for forests that are expected to have a biodiversity conservation function due to their location such as the habitats of rare species, forest owners will be recommended to facilitate regeneration using the abilities of nature and help them develop into multi-storied mixed forests with coniferous and broad-leaved species or natural forests.

As for multi-storied plantations, forest owners will be recommended to maintain them as multi-storied plantations in principle in order to maintain their public benefit functions, but stands that are expected to have a biodiversity conservation function due to their location such as the habitats of rare species will be developed into natural forests using natural regeneration, where necessary.

With regard to natural forests, there are forests that require continuous maintenance to sustain their public benefit functions due to their undergrowth conditions. There are also natural broad-leaved forests that have been established between coniferous single-storied forests and therefore have the potential to be used as resources on a continuous basis. For these forests, forest owners will be recommended to develop them into multi-storied artificial forests through silvicultural operations to help their regeneration. As for primeval ecosystems and natural forests inhabited by rare species, forest owners will be recommended to leave their development to natural processes in principle and maintain them as natural forests. (MAFF)

- With the aim of developing forests made up of various species at different growth stages, which are distributed in a mosaic pattern in an appropriately sized area, it is necessary to promote diverse kinds of forest development including shifting towards multi-storied plantations and the introduction of long rotation management while taking into account the conditions at the location, etc. For this purpose, the government will propose forest operation methods that can serve as guidelines for forest owners, etc. to select appropriate types of forest operations, disseminate efficient operation technologies and promote efforts to build consensus in order to accelerate the speed of diverse forest developments. The government will also work on the conservation and management of primeval forest ecosystems, the habitats of rare species, riverside forests and other forests at waterfronts, as well as ensuring the links between these forests. It will also conserve and manage rare forest ecosystems scattered around the country, in an effort to achieve harmony between conservation and the sustainable use of biodiversity in forests. (MAFF)

2 Promoting the development of diverse forests (Specific measures and policies)

- With regard to road network development, the government will promote appropriate combinations of forest roads and spur roads which are suitable for natural conditions and the operation systems to be employed. For forest roads in particular, the government will strive for the harmonization of the roads with the surrounding environment at all stages of the development including planning, designing and construction. (MAFF)
- The government will support the collection of information about forests and the clarification of borders, that are needed to formulate forest management plans and to achieve more intensive forest operations. It will also support improvement activities for turning the current road networks that provide infrastructure for thinning operations into more durable and simplified road networks. (MAFF)
- In order to ensure people's safety and security, for forests where forest owners and the like have difficulty in implementing appropriate management operations through their own efforts alone, municipal and prefectural governments will promote intensive forest operations and the effective implementation of thinning by forestry cooperatives and other forestry entities. For forests that have failed to be improved in a timely and appropriate manner even with local government support and still require appropriate improvements due to strong demand for the public benefit functions, the government will implement the necessary management operations through its erosion control, etc. In this process, the government will promote the formation of mixed forests with coniferous and broad-leaved species, by taking into account the conditions at the location. (MAFF)
- As for logged areas which have not been replanted with trees, the government will implement the necessary measures to control the occurrence of such land and to ensure prompt and appropriate regeneration, including the appropriate issuing of reforestation orders after unauthorized logging. (MAFF)
- The government will continue promoting appropriate and efficient forest management and conservation towards the restoration of forests and the reinvigoration of forestry, as well as promoting research and technological development towards the expansion of timber usage. (MAFF)

- In order to transfer the results of research and technological development and to facilitate local communities' united efforts for forest development, conservation and forestry production activities, the government will efficiently and effectively promote the dissemination of technologies by focusing on local forestry leaders who are key people for consensus building in communities and forestry entities engaged in intensive forestry operations, through forestry extension projects. (MAFF)
 - In order to ensure the supply of superior seeds and saplings that are suitable for the natural conditions of the land to be planted, the government will implement production and distribution measures including the development of seed sources and improvement of sapling production technologies. (MAFF)
 - In order to appropriately manage and conserve forests in Japan into the future, the government will steadily promote: the development of varieties of species that contribute to the reinvigoration of forestry and the conservation of national land and the environment; the conservation of rare and valuable forest tree genetic resources such as threatened species and the conservation of forest plant genetic resources; the collection of forest tree genetic resources; and the development of technologies for preserving and evaluating genetic resources. The government will also disseminate newly developed varieties of species.
The government will conduct technical cooperation projects on the breeding of forest tree varieties in order to help efforts for sustainable forest management in developing countries, etc. (MAFF)
- | | |
|---------------------|--|
| [Current situation] | The government is promoting: the development of varieties of species that contribute to the reinvigoration of forestry and the conservation of national land and the environment; the conservation of rare and valuable forest tree genetic resources such as threatened species and the conservation of forest plant genetic resources; the collection of forest tree genetic resources; the development and dissemination of preservation and evaluation technologies; and technical cooperation projects on the breeding of forest tree varieties overseas. |
| [Target] | Based on the “strategy for research and technological development in the fields of forests, forestry and the timber industry,” the government will implement the development of new forest tree varieties, the collection of forest tree genetic resources, the development of preservation and evaluation technologies and technical cooperation projects on the breeding of forest tree varieties overseas. |
- The public receive various benefits from forests and the costs of maintaining and enhancing the multiple functions of forests should be paid by society as a whole.

There are various ways for the public to share the social costs that are needed to sustainably maintain the multiple functions of forests, including: the use of the general revenue in the government budget; the utilization of national and local taxes levied to tackle environmental problems; the creation of funds through cooperation between stakeholders in upstream and downstream areas of rivers; the conclusion of profit-sharing forest contracts; the collection of donations from the general public for forest management, etc.; and the utilization of carbon absorption credit systems. In order to restore forests and reinvigorate forestry as part of global warming mitigation measures, the government will consider ways to secure financial sources at the national level and compile ideas on the best combinations of methods to share the cost,

while striving to obtain support from the public, in a bid to contribute to the steady implementation of measures for forest sinks and other various measures. (MAFF)

[Current situation] The following summarizes the current situation for some of the measures for sharing the social costs for sustainably maintaining the multiple functions of forests.

- (1) The number of prefectures which have introduced a tax mainly earmarked for forest development to be conducted by prefectural governments (such as a forest environmental tax): 33 (the beginning of FY2012)
- (2) The area of forests subject to profit-sharing forest contracts: 177 hectares (FY2010)
- (3) Contributions to the Green Fund: 2.3 billion yen (FY2011)
- (4) The number of forest management activities certified for credits under the J-VER Scheme: 55 (December 2011)
- (5) The FY2012 Tax Reform Outline states, “the government will continue considering the securing of financial resources at the national level in the discussions for the formulation of domestic climate change measures for 2013 onwards, in order to contribute to the steady implementation of forest sink measures and other various measures, with a view to achieving international commitments concerning greenhouse gas reduction.”

- In order for Japan to continue making maximum efforts for climate change measures, the government will work to ensure that the amount of CO₂ equivalent to 3.5% of emissions in the base year will be additionally absorbed by forest sinks through forest management. This percentage is the maximum percentage that can be included in the calculation for the target emissions reduction, which was internationally agreed at the seventeenth session of the Conference of the Parties (COP 17) to the UN Framework Convention on Climate Change, etc. To this end, the government will work towards securing the necessary financial resources as well as accelerating its efforts to restore forests and reinvigorate forestry. Through cooperation between national and local governments, those involved in forestry and the timber industry, citizens and other entities, the government will also further promote comprehensive efforts including: the management of healthy forests and the expansion and management of forests whose CO₂ absorption amounts are to be included in the calculation for the target emissions reduction; the appropriate management and conservation of protection forests; maintaining or improving forest sink capacity through reforestation, etc.; maintaining the carbon sink function of forests through promoting the use of wood products; forest development activities involving citizens; and promoting the use of timber and wood biomass. (MAFF)

[Current situation] 3.8% of total emissions in the base year (the first commitment period: 2008-2012)

[Target] 3.5% of total emissions in the base year (2013-2020)

- The government will vigorously participate in the revision work for the IPCC (Intergovernmental Panel on Climate Change) Guidelines (for forests) which provide the technical base for implementing international climate change measures. (MAFF, MOE)

[Current situation] The IPCC scoping meeting was held in May 2012.

[Target] Agree on the revisions at COP 19 (in 2014).

- In order to meet the diverse challenges and needs while coordinating with operations in private forests and national forests in each watershed area, the government will promote efforts to build consensus among the stakeholders and strengthen cooperation between the stakeholders in the upstream and downstream areas of a river.
In order to implement integrated forest development in private and national forests, the government will promote the establishment of cooperative forest management areas on which systematic road network development, thinning and other forest operations are conducted. (MAFF)
[Current situation] The number of the establishment of cooperative forest management areas: 75 (April 2011)
- The government will promote appropriate forest management by the forest owners and parties to whom the forest management was entrusted. The government will also facilitate cooperation between the entities responsible for private forests, the public forests and the national forests in order to promote efficient forest management in each local area. (MAFF)
[Current situation] The forest management planning system was put in force (from FY2012).

3 The National Campaign for the Promotion of “Utsukushii Mori Zukuri (Fostering Beautiful Forests)” **(Specific measures and policies)**

- The government will disseminate and establish proposal-based forestry where forest operation costs, etc. are clearly presented, as well as promoting efforts to build the consensus needed to conduct intensive forest operations. (MAFF and other relevant government offices and ministries)
- The government will promote the utilization of wood in the housing and energy sectors, in public works, and for other uses. The government will also promote the development of new products and technologies that meet consumer demand, consumer-oriented creation and the expansion of new markets and efforts to publicize the advantages of wood. (MAFF and other relevant government offices and ministries)
- The government will work on recruiting and developing human resources who will undertake forest management and conservation activities into the future, by promoting the training of people interested in forest management and conservation, including those who are returning to their hometowns in rural communities and those who are moving to the rural communities for the first time. The government will also recruit and train forest management and conservation workers in coordination with efforts to encourage the retired to return to where they grew up. In addition, the government will take forest management standardization measures including the clarification of borders, along with the promotion of forest management and conservation. (MAFF and other relevant government offices and ministries)
- The government will aim at reinvigorating mountain villages by conserving resources characteristic to mountain villages including excellent natural environments, cultures and traditions, as well as promoting: efforts to create new industries by utilizing forests which are the main resources for mountain villages; increasing work opportunities in mountain villages by promoting local specialties; the utilization of currently unused resources endemic to mountain villages such as Satoyama forests; and efforts to promote the settlement of new

residents in mountain villages through exchanges between cities and villages. (MAFF and other relevant government offices and ministries)

4 Appropriate forest conservation and management (Specific measures and policies)

- The government will systematically implement the designation of forests that especially need to achieve public benefit functions as protection forests. In order to fully conserve the functions of protection forests, the government will develop systems to efficiently manage information about the current conditions of protection forests and regulatory information using digital satellite images and the like to further promote the appropriate management of protection forests. (MAFF)
[Current situation] The area of protection forests: 12.02 million hectares (the end of FY2011)
[Target] The area of conservation forests: 12.81 million hectares (the end of FY2023)
- In order to prevent mountain disasters caused by torrential rain, earthquakes, volcanic eruptions, landslides and driftwood, to minimize the damage caused by such disasters and to contribute to improving the safety of local areas, the government will promote the establishment of erosion control facilities. The government will appropriately conserve the protection forests in important catchment areas for rivers that supply water for dams and in areas which serve as water sources for communities, by promoting the maintenance and management of forests with soil that has high water absorbing and retaining capacity. (MAFF)
- For appropriate forest conservation, the government will further promote forest pest and disease control measures including increasing pine weevil elimination efforts at the edges of damaged areas, the selection of priority pine forests for conservation, coordination and cooperation with voluntary community activities and promotion of measures to prevent Japanese oak wilt. The government will also prevent forest fires. It will also promote the development of varieties resistant to pests and diseases and the dissemination of resistant seeds and saplings. (MAFF)

5 The promotion of measures to control wildlife damage to forests (Specific measures and policies)

- Regarding the forest damage caused by wildlife, the government will promote: the installation of damage prevention facilities and equipment such as guard fences, feeding damage prevention tubes and repellents; capture to regulate population size; the development and dissemination of new wildlife control technologies; the training of wildlife control technicians; and the improvement of wildlife surveillance and control arrangements. (MAFF)
- While ensuring further coordination between wildlife conservation and management measures conducted by the relevant government offices and ministries, the government will implement effective, wide-area measures to stop wildlife damage by taking into account the wildlife inhabitation situation and the damage caused by them. The government will also promote the development of broad-leaved forests by giving consideration to wildlife habitats. (MAFF)
- In order to develop local areas where people can coexist with wildlife through ensuring the separation of wildlife habitats from human settlements, the government will cooperate with local governments, NPOs and the like to take comprehensive measures including conducting

surveys for wildlife inhabitation and damage in remote national forests, as well as cooperating on the improvement of wildlife habitats and wildlife population control. (MAFF)

6 Promoting human resource development, exchange between cities and mountain villages and the settlement of new residents in mountain villages

(Specific measures and policies)

- The government will train the human resources needed for forest conservation and forestry in a strategic and systematic manner, including the training of foresters who lead local forest conservation and forestry, forest operation planners who serve as core personnel for preparing forest management plans and on-site skilled workers who can conduct thinning and construct road networks, etc. appropriately. (MAFF)
[Current situation] (1) The number of certified foresters: zero (certification is planned to start in FY2013)
 (2) The number of certified forest operation planners: zero (certification is planned to start in FY2012)
 (3) The number of on-site managers, etc. trained: 436 (FY2011)
[Target] (1) The number of certified foresters: 2,000-3,000 (FY2020)
 (2) The number of certified forest operation planners: 2,100 (FY2015)
 (3) The number of on-site managers, etc. trained: 5,000 (FY2020)
- In an effort to create diverse employment opportunities, the government will promote the forestry and timber industries as fundamental industries, develop industries utilizing wood biomass and other unused resources, and upgrade production infrastructure for non-wood forest products that are precious revenue sources for mountain villages and forestry households. The government will also promote the stable supply of wood biomass which is expected to have increased energy use demand, the introduction of carbon absorption credit systems and voluntary business start-ups by community residents using the resources found in mountain villages. (MAFF)
- In order to promote the settlement of new residents in mountain villages through exchanges between cities and mountain villages, the government will promote networking between mountain villages as well as between mountain villages and cities to deepen cooperation between them. (MAFF)
- In order to reinvigorate mountain villages and appropriately maintain and manage forest resources, the government will facilitate effective exchange activities between mountain villages and cities, by matching the needs of urban residents, etc. (such as forest management as part of CSR activities, forest environmental education, hands-on experience in mountain villages, health enhancement and nature experiences) and various resources that are different in different villages. (MAFF)

7 Forest operations that take account of biodiversity

(Specific measures and policies)

- In order to sustainably maintain the multiple functions of forests, the government will promote the consideration of biodiversity conservation in forest operations by implementing the forest planning system appropriately and introducing cases of on-site efforts such as the acquisition of forest certification. (MAFF)

- With regard to parts of national forests along mountain streams and other water bodies that are not specified as forest reserves or green corridors, the government will maintain natural forests in their current condition and vigorously introduce broad-leaved trees into artificial forests, in order to ensure links between forests and provide migration routes for wild organisms and seed supply sources. (MAFF)

8 Promoting forest development activities with citizen participation and diverse forest uses

(Specific measures and policies)

- On national forest, the government will promote: the establishment of “Corporation Forests” where companies conduct forest management activities as part of their philanthropy activities; the establishment of “Forests for Voluntary Groups” which provide activity spaces for citizens willing to conduct forest development activities; and “forestation to support the culture of wood” with citizen participation in order to contribute to handing down historic buildings and traditional culture in each local area to future generations. (MAFF)
[Current situation]
 - Corporation Forests newly established: three sites, nine hectares (the results in FY2011). Total: 499 sites, 2,352 hectares
 - “Forests for Voluntary Groups” agreements concluded: 137 sites (the end of FY2010)
 - “Forestation to support the culture of wood” agreements concluded: 22 sites (the end of FY2010)
- The government will work on deepening understanding of forests and forest management among the public including children who are the future of society, through organizing the National Arbor Day and supporting forest development activities by NPOs and other entities. (MAFF)

9 Expanding forest environmental education and human-forest interaction

(Specific measures and policies)

- The government will promote the development of the necessary human resources and the networking of human resources in order to promote forest environmental education. (MAFF)
- On national forest, the government will promote the designation of “Fun Forests” which provide places for nature experience activities organized by schools, as well as promoting forest and forestry experience activities organized by regional and district forest offices, and the provision of relevant information and technical guidance by regional and district forest offices. (MAFF)
[Current situation]
 - The government is implementing the development of activity spaces, education and experience programs in 18 areas nationwide.
 - “Fun Forest” agreements concluded: 172 sites (the end of FY2010)
 - The number of participants in forest environmental education programs achieved through cooperation with education-related organizations, etc.: 120,000 (the results in FY2010)
 - “Forests for Voluntary Groups” agreement concluded: 137 sites (the end of FY2010)
 - The government held the National Children’s Summit on School Forests and Fun Forests.

- The government will widely publicize information about the multiple functions of forests and the current condition of forests through various media in order to deepen citizens' understanding about and interest in forests and forestry. (MAFF)

10 The development of forestry and the timber industry mainly through expansion of domestic timber uses

(Specific measures and policies)

- The government will promote the introduction of larger-scale sawmills and processing systems as well as promoting the development of products that meet consumer demand and the enhancement of supply and sales strategies. (MAFF)
- The government will promote target-specific strategic marketing to companies and consumers for example, as well as promoting the comprehensive utilization of wood biomass. (MAFF)
- In order to meet the diverse challenges and needs while ensuring coordination between private forests and national forests in each watershed area, the government will promote efforts to build consensus among stakeholders and strengthen cooperation between stakeholders in upstream and downstream areas of a river.

In order to implement integrated forest management in private and national forests, the government will promote the establishment of cooperative forest management areas on which systematic road network development, thinning and other forest operations are conducted. (MAFF)

[Current situation] The number of the establishment of cooperative forest management areas: 75 (April 2011)

11 Promoting administration and management of national forest including forest reserves and green corridors

(Specific measures and policies)

- National forest extends over large areas, mainly covering remote mountainous backbones and catchment areas, as well as extending to Satoyama areas. In order to allow national forests to fully achieve their multiple functions, the government will promote diverse forest management and conservation operations based on regional administration and management plans and other plans. These operations include: systematic and efficient thinning; the introduction of long rotation management, the management of coniferous artificial forests into mixed forests with coniferous and broad-leaved species by thinning the forests to introduce broad-leaved trees using the ability of nature to regenerate; and leaving forest management to natural processes. (MAFF)
- Since national forest covers areas important for national land conservation, water conservation and other functions, about 90% of the total area of national forest is designated as protection forest. The government will implement appropriate conservation and management of these forests to achieve the purposes of the designation. (MAFF)
[Current situation] The area of protection forests on national forest: 6.82 million hectares (the end of FY2010)
- For protection forests that are particularly needed because of their public benefit functions including national land conservation, water conservation and the conservation of living

environments for people, the government will promote erosion control projects such as the construction of erosion control facilities and the management of forests that are losing their functions, under the Forest Management and Conservation Works Master Plan. (MAFF)

[Current situation] The number of settlements where the mountain disaster prevention function and the like have been ensured: about 53,000 settlements (as of the end of FY2010)

[Target] The number of settlements where the mountain disaster prevention function and the like have been ensured: increasing to about 56,000 settlements (FY2013)

- The government will promote model projects conducted in collaboration with local residents and nature conservation organizations for the conservation of local natural environments and nature restoration. These model projects include: the Akaya Project where the local council made up of local residents, a nature conservation organization and the Forestry Agency signed an agreement to work towards the restoration of biodiversity and the creation of a sustainable local community; the Aya Laurel Forest Project which rigorously protects one of the largest primeval evergreen broad-leaved forests in Japan as well as reintegrating the fragmented forest by restoring the original vegetation on the land currently covered by secondary and artificial forests which divide the evergreen broad-leaved forest; the Nopporo Forest Restoration Project which restores forests that have had trees flattened by a typhoon; and the Shimanto Kuroson Project which restores forests on Sika deer damaged ex-forest land and conducts various forestmanagement. (MAFF)
- In forest reserves, the government will conduct monitoring surveys nationwide in order to correctly understand managements after their establishment and to promote conservation and management which best suit the current situation. As part of the conservation and management efforts, the government will install protection fences to help vegetation recovery and prevent feeding damage by Sika deer as well as taking other measures suitable for the characteristics of each type of species and habitat, in order to protect species subject to conservation and to maintain and conserve habitats. (MAFF)
- The government will promote the management and conservation of Satoyama forests including Japanese red pine forests that form the backdrop to the world cultural heritage site situated in the Higashiyama area of Kyoto, as well as broad-leaved forests managed as fuel wood forests in Kyushu. (MAFF)
- In order to develop local areas where people can coexist with wildlife by ensuring the separation of wildlife habitats from human settlements, the government will cooperate with local governments, NPOs and the like to take comprehensive measures including conducting surveys of wildlife inhabitation and damage in remote national forests, as well as cooperating for the improvement of wildlife habitats and wildlife population control. (MAFF)
- National forest contains many primeval forest ecosystems and forests that provide habitats for valuable wild animal and plant species, including Yakushima Island, the Shirakami Mountains, Shiretoko Peninsula and the Ogasawara Islands, all of which were registered as world natural heritage sites. The government will specify these valuable forests as “forest reserves” (a system established in 1915) and promote their conservation and management. For these types of forests that require special conservation and management measures, the government will promote the establishment of forest reserves in a more detailed manner as well as revising the zones specified as forest reserves on the basis of the distributions of rare wild animal and plant

species. The government will classify forest reserves into seven categories in accordance with the objectives for their establishment, which include the conservation of forest ecosystems, the preservation of genetic resources and the conservation of plant communities such as alpine plants. The government will then proceed with their management accordingly, for example leaving them to natural processes in principle. (MAFF)

[Current situation] The area specified as forest reserves: 903,000 hectares (April 2011)

- With regard to green corridors, under the policy of developing forests with a balanced species composition of coniferous and broad-leaved trees and diversifying the ages of trees and canopy species, the government will implement operations that give considerations to the habitats of wild animals and plants, for example conserving broad-leaved trees which are naturally growing in artificial forests wherever possible, while maintaining the stands in an excellent condition. The government will also carry out monitoring surveys to understand the relationship between forest conditions and the inhabitation of wild animals and plants and use the findings to improve the conservation and management of the forests. If green corridors of a sufficient size cannot be established with national forests alone, the government will strive to specify green corridors which include neighboring private forests where necessary by obtaining cooperation from their owners. The government will try to create more elaborate forest ecological networks by ensuring links between parts of forests along mountain streams and other water bodies. (MAFF)
 - The government will make more effective forest ecosystem conservation efforts covering larger areas. For example, the government will establish “green corridors” (a system established in 2000) which create networks mainly focusing on forest reserves in order to promote interaction between populations and secure species and genetic diversity by conserving or creating migration routes linking the habitats of wild animals and plants. (MAFF)
- [Current situation] The area of green corridors: 586,000 hectares (April 2011)
- In order to promote the conservation of valuable wild animal and plant species, the government will patrol the habitats for wild species that should be given protection priority in order to understand their inhabitation status, conduct studies into forest conservation and management methods for the maintenance and management of these habitats, set up detailed forest treatment policies and implement maintenance and management for these habitats.

For example, the *Picea koyamae* which grows in the Southern Alps and the Yatsugatake Mountains in Nagano has a particularly small population. In order to facilitate the occurrence and growth of their saplings, the government will conduct surveys to understand the environmental conditions needed for their regeneration and for the growth of their seed trees.

As for the golden eagle and the hawk eagle which are National Endangered Species, the government will conduct habitat surveys and patrols in national forests in various parts of Japan. The government will also improve their habitats where necessary, for example by conducting line thinning and other thinning operations in artificial forests around their nesting grounds in order to provide the appropriate amounts of light and space for feeding.

In Kumamoto and Nara, with the aim of conserving the *Shijimia moorei* which is a National Endangered Species, the government will conduct inhabitation surveys and investigate methods to propagate the *Lysionotus pauciflorus* (which is their larval food plant) using cuttings and methods to propagate them by transplanting their seedlings, as well as implementing

Lysionotus pauciflorus transplanting operations and the restoration of the species in the wild. (MAFF)

- In order to appropriately conserve and manage national forest, the government will cooperate with relevant organizations, volunteer groups, local stakeholders and others to implement patrols, cleaning activities and campaigns to raise public awareness about the rules for the use of the forests.

In addition to routine patrols in forests for preventing forest damage including disease, insect and animal damage and forest fires, the government will implement patrols for protecting valuable animal and plant species, for example preventing hunting and other illegal acts in Wildlife Protection Areas or illegal taking of alpine plants to guide visitors towards appropriate use. (MAFF)

- In the world natural heritage sites, 100 Famous Japanese Mountains and other national forests where vegetation deterioration is a concern due to concentration of visitors, Green Support Staff who are recruited through public invitation will implement effective and fine-tuned conservation and management operations. For example, they will conduct patrols for curbing or preventing the deterioration of vegetation and forest functions caused by human activities and conduct public awareness campaigns about rules for visitors. (MAFF)
- In order to appropriately conserve and manage forests that were registered as world natural heritage sites, the government will establish the “forest information post” system where visitors make reports via cellphone when they detect abnormalities such as damage to or the logging of trees, as an effort to further promote the appropriate management of national forest in cooperation with various public groups. (MAFF)
- As for timber and other forest products, the government will strive to supply them in a sustainable and planned manner while essentially conducting administration and management of national forest aiming at maintaining and enhancing their public benefit functions and by giving full consideration to natural environmental conservation. (MAFF)
 [Current situation] Supplying forest products in a sustainable and planned manner
 Timber yield from national forests: 7.64 million m³ (expected yield in FY2011)
- In national forest management, the government will promote the utilization of timber for government erosion control projects and other civil engineering work in the forests, as well as promoting the utilization of wood-based materials for government buildings and their interiors. The government will also promote the utilization of timber and wood products that have been certified for their legality and sustainability. (MAFF)
 [Current situation] Timber usage per 100 million yen worth of construction work: 169 m³ (FY2010) (about 1.8 times the average results in 2004-2007)
 [Target] Achieve timber usage in public civil engineering work of about 1.5 times the average usage in 2004-2006 (FY2015).
- In order to meet citizen demand for experiencing forest management activities, the government will promote the establishment of “Forests for Voluntary Groups” which provide parts of national forest as citizen activity spaces. (MAFF)

- [Current situation] “Forests for Voluntary Groups” agreements concluded: 137 sites (the end of FY2010)
- The government will promote the establishment of “Corporation Forests” where companies utilize the profit-sharing forest system to conduct forest development in order to contribute to society, provide employee education and create opportunities to interact with their customers. (MAFF)
[Current situation] Newly established Corporation Forests: three sites, nine hectares (FY2011). Total: 499 sites, 2,352 hectares
 - In order to protect historically important wooden structures and wood cultures such as traditional handicrafts that should be handed down to the next generation, the government will promote “forestation to support the culture of wood” with citizen participation. (MAFF)
[Current situation] “Forestation to support the culture of wood” agreements concluded: 22 sites (the end of FY2010)
 - The government will promote the establishment of “Fun Forests” where schools conclude agreements with the relevant district forest offices to organize various nature experience and learning programs. (MAFF)
[Current situation]
 - Development of activity spaces and the creation of nature experience and learning programs are being implemented in 18 areas nationwide.
 - “Fun Forest” agreements concluded: 172 sites (the end of FY2010)
 - The government will take improvement measures for “recreational forests” so that they can continue to be used as attractive activity spaces that meet user needs. (MAFF)
[Current situation] Taking improvement measures that meet user needs
 - Through the Forest Environmental Conservation Centers, the government will support the activities of people engaged in forest environmental education and citizen groups engaged in nature restoration and biodiversity conservation. (MAFF)
 - With a view to further implementing types of administration and management of national forest that citizens wish to see such as biodiversity conservation, the government will collect views and comments from the public prior to the drafting of plans such as regional administration and management plans, as well as disclosing wherever possible the results of assessments for past activities, the achievements and the current situation, the relevant numerical values and other reference information. For each program conducted based on the plans, the government will consider systems to quantitatively assess their effectiveness in each forest plan area using multiple indicators, from the standpoint of biodiversity conservation and sustainable use of its components. (MAFF)
 - When formulating the basic plan for the administration and management of national forest, the government will keep in mind the integrated implementation of national forest projects such as forest biodiversity conservation and measures and policies for private forests. The government will also take into consideration the natural characteristics of each watershed area when implementing forest management and conservation. (MAFF)

- In order to meet the diverse challenges and needs while ensuring coordination between operations in private forests and national forests in each watershed area, the government will promote efforts to build consensus among the stakeholders and strengthen cooperation between the stakeholders in the upstream and downstream areas of a river.

In order to implement integrated forest management in private and national forests, the government will promote the establishment of cooperative forest management areas on which systematic road network development, thinning and other forest operations are conducted. (MAFF)

[Current situation] The number of the establishment of cooperative forest management areas: 75 (April 2011)

12 Promoting forest resource monitoring (Specific measures and policies)

- At about 15,700 fixed observation plots throughout the nation, the government will continuously survey site conditions, vegetation, dead trees, wildlife inhabitation traces, disease, insect and animal damage, etc. The government will also implement monitoring surveys for the smooth and appropriate preparation of regional forest plans through the collection and analyzing of information about the ecological characteristics of trees such as growth forecasts and natural regeneration. (MAFF)
[Current situation] The third cycle of the national survey has been implemented since FY2009.
- Based on data obtained from the first, second and third cycles of the National Survey on Biodiversity of the Forest Ecosystems (including the Forest Resource Monitoring Survey), the government will prepare the Global Forest Resources Assessment 2015 Country Report using the “criteria and indicators” of the Food and Agriculture Organization of the United Nations (FAO), in an effort to promote sustainable forest management in Japan and around the world. (MAFF)
- The government will develop methods for forest dynamics analysis which use the results of the National Survey on Biodiversity of the Forest Ecosystems and other data. (MAFF)
- The government will work on the effective utilization of forest resource data including forest spatial data, the results of the National Survey on Biodiversity of the Forest Ecosystems and digital aerial photographs, by for example integrating them in the forest geographic information system (GIS). (MAFF)
- The government will monitor natural environments including forests across the country through the implementation of the National Survey on the Natural Environment and Monitoring Sites 1000. (MOE)

13 Promoting sustainable forest management on a global scale (Specific measures and policies)

- The government will vigorously take part in international discussions including those in the United Nations Forum on Forests (UNFF) established with the aim of promoting the sustainable management of all types of forest. (MAFF, MOFA, MOE)

- [Current situation] The government attended the UNFF “unofficial meeting on measures to implement sustainable forest management” held in September 2010 and the Ninth UNFF Session held in January and February 2011. It also had discussions about measures to implement sustainable forest management. The government also co-hosted the International Seminar on Challenges of Sustainable Forest Management with the Republic of Indonesia in Tokyo in March 2011 in support of UNFF processes.
- With regard to the problem of illegal logging which is one of the major causes of deforestation and forest degradation, the government will stress the significance of the problem at international forums in order to stimulate international efforts to stop the problem. (MAFF, MOFA, MOE)
 - The government will promote bilateral technical and financial cooperation and multilateral assistance through international organizations for forest conservation and afforestation in developing countries. (MOFA, MOE, MAFF)
- [Current situation] Regarding bilateral cooperation, the government is implementing “technical cooperation projects” which organically combine the dispatch of experts, the hosting of training participants and the provision of hardware through the Japan International Cooperation Agency (JICA), as well as implementing development studies and training. With regard to multilateral cooperation, the government is voluntarily making financial contributions through trust funds to projects conducted by FAO and the International Tropical Timber Organization (ITTO). It also sends staff to technical cooperation projects and FAO.
- As for the Montreal Process, Japan has been hosting the secretariat since 2007. Japan will demonstrate its leadership in establishing sustainable forest management around the world and promote efforts to formulate and utilize the “criteria and indicators” to identify, analyze, and assess the sustainability of forest management, through coordination within and outside the Montreal Process and with other international processes (ITTO and Forest Europe). (MAFF)
- [Current situation] As the secretariat of the Montreal Process, the Japanese government planned and coordinated the revision of indicators for the Process (up to 2008), preparation of the second country reports by each member country (2009), the Montreal Process Working Group Meetings (five times, from 2007 to 2011), among other activities. It also planned and organized an international seminar in Japan in cooperation with UNFF, other international processes (ITTO and Forest Europe), international organizations, etc. (2011).
- Based on the Joint Statement adopted at the Fifth Japan-China-ROK Trilateral Summit in May 2012 which decided on the strengthening of cooperation between the three countries in the fields of sustainable forest management, combating desertification and wildlife conservation, the Japanese government will engage in trilateral discussions for the promotion of sustainable forest management. (MAFF)

Section 6 Rural and Satochi-Satoyama areas (Basic concepts)

Rural and Satochi-Satoyama areas have paddy fields, waterways, reservoirs as well as coppices, groves surrounding shrines, protective groves around residences, hedges, etc. Those diverse environments appropriately maintained and managed by humans form networks and provide biologically rich spaces with the help of continuous agricultural or forestry operations, allowing diverse wild animal and plant species to inhabit those spaces. There are many organisms in these areas such as red dragonflies which fly in the autumn evening sky and schools of Japanese medaka which swim in the streams, in addition to organisms directly useful for production, all of which have been subject to direct human interaction. With regard to paddy fields in particular, various festivals and rituals developed for each important seasonal period related to rice farming such as rice planting and harvesting. The Ramsar Convention and a decision at the Tenth Meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10) recognize paddy fields as wetlands inhabited by organisms. Satoyama forests which extend around residences have been continuously used by local residents through the harvesting of fuelwood, the collection of fallen leaves, etc. Since rural and Satochi-Satoyama areas are natural environments close to people's settlements which were created through human-nature interactions, the reduced human intervention is causing a reduction in the number of species which used to be familiar to people, and the habitat expansion of specific wildlife species, which is causing increasing wildlife damage to agricultural crops and forests. Therefore, it is necessary to promote agricultural production that has an enhanced focus on biodiversity conservation, as well as the development and conservation of rural and Satochi-Satoyama areas, so as to ensure biodiversity conservation, the stable supply of food to people, and the provision of biodiversity-rich natural environments, through efforts to conserve or restore natural environments that were formed through human activities such as agriculture and forestry.

Therefore, based on the Ministry of Agriculture, Forestry and Fisheries' Biodiversity Strategy (revised in February 2012), the government will implement the following measures: integrated efforts to prevent wildlife damage; supporting the activities of various entities in rural and Satochi-Satoyama areas; and the reinvigoration of rural areas by utilizing systems to evaluate local biodiversity conservation efforts such as the Globally Important Agricultural Heritage Systems (GIAHS) recognized by FAO. With the aim of encouraging nationwide campaigns where activities for the conservation and utilization of rural and Satochi-Satoyama areas are conducted in various parts of Japan, the government, through cooperation between the relevant ministries, agencies, etc., will promote such efforts based on the "action plan for Satochi-Satoyama conservation activities (September 2010)."

1 Promoting agricultural production that has an enhanced focus on biodiversity conservation (Specific measures and policies)

- It is important to ensure the appropriate use of agricultural production tools such as agricultural chemicals and fertilizers, and the government will promote education and ensure farmers' compliance with a minimum code for environmental consideration in agriculture that each person engaged in agriculture should follow in order to ensure environmental conservation. (MAFF)
- Agricultural chemicals are registered after evaluation of their toxicity, residue, ecotoxicity, environmental fate, and adverse effects on humans and aquatic animals and plants, etc. The

government sets standards for Good Agricultural Practice (GAP) for respective registered agricultural chemicals to avoid adverse effects on the environment, and ensures the appropriate use of agricultural chemicals by requiring users to follow the GAP. (MAFF)

- In accordance with the Agricultural Chemicals Regulation Law, the government will establish the registration withholding standards for the prevention of damage to aquatic animals and plants for individual agricultural chemicals. (MOE)
 [Current situation] The number of agricultural chemicals for which standards have been set: 201, and the number of agricultural chemicals which were found to be safe enough not to set standards: 543 (as of May 1, 2012).
 [Target] Evaluate all agricultural chemicals and set registration withholding standards for all agricultural chemicals which need the standards (2020).
- The government will promote measures for risk management for environmentally conscious agricultural chemicals use including the formulation and dissemination of a manual for methods to assess and manage the risks of agricultural chemicals to birds. (MOE)
 [Current situation] Formulating a provisional manual (May 1, 2012)
 [Target] Formulation of the manual (FY2013)
- The government will develop methods to assess the impacts of agricultural chemicals on biodiversity as part of the preparation for conserving and ensuring biodiversity on agricultural land and in its surrounding environments. (MOE)
- The government will consider developing science-based indicators and impact assessment methods that enable the assessment of biodiversity in the rural environment as a whole, in order to clarify the roles of agriculture in conserving biodiversity. (MAFF)
- The government will promote the introduction of highly sustainable agricultural production systems that intend to promote in an integrated manner composting-based soil cultivation and the reduction of the use of chemical fertilizers and agricultural chemicals. The government will promote advanced practices, for example farming practices which seek to reduce the use of chemical fertilizers and agricultural chemicals to less than half of the amount typically used in local farming practices, combined with efforts to conduct farming practices that are highly effective in curbing global warming and conserving biodiversity. (MAFF)
- The government will promote organic farming, which makes it a rule to avoid the use of any chemical fertilizer or agricultural chemical and aims to significantly reduce the environmental impacts attributed to agricultural production activities and facilitate the growth of diverse living organisms. As part of this effort, the government will promote the establishment of technological systems for organic farming, improvement in the frameworks for education and guidance on these systems for farmers, and will seek to deepen understanding about organic farming among processing industries and distributors. Thus, the government will promote the creation of conditions which encourage farmers to engage in organic farming. (MAFF)
- With regard to the system to certify eco-farmers who make integrated efforts to improve the soil and reduce the use of chemical fertilizers and agricultural chemicals, the government will continue encouraging farmers to become certified as eco-farmers. In order to support the activities of eco-farmers, the government will expand networks of eco-farmers where eco-farmers from around the country exchange their advanced technologies and experiences to

improve their practices and work together to deepen consumer understanding about ecological farming. (MAFF)

[Current situation] The cumulative number of eco-farmers certified: 266,896 (the end of March 2012)

[Target] The cumulative number of eco-farmers certified: 340,000 (FY2014)

- The government will promote the wide use of Good Agricultural Practices (GAP) which contain codes for environmental consideration in agriculture. (MAFF)

[Current situation] The number of production areas which have introduced GAP: 2,194 areas (as of the end of March 2011, excluding Fukushima)

[Target] The number of production areas which have introduced GAP: 3,000 areas (FY2015)

- The government will collect existing cases of farming methods and management methods for creating and maintaining the good condition of paddy fields as habitats for wildlife. The government will then share the collected information with the general public as well as at international venues such as meetings of the Convention on Biological Diversity (CBD) and the Ramsar Convention, in an effort to disseminate the methods and ensure that the methods will take root. (MAFF, MOE)

- The government will promote better understanding by citizens about biodiversity-friendly production by utilizing “Ikimono Marks” which indicate that the agricultural, forestry and fishery products are produced with an emphasis on biodiversity conservation and will give farmers information about the organism inhabitation situation, the surrounding environment and farming history in existing cases of paddy rice cultivation that have achieved both food production and biodiversity conservation, in order to make the farmers better understood about such farming methods and to increase their motivation. The government will also domestically and internationally disseminate information about the contribution to biodiversity conservation by agriculture, forestry and fisheries in Japan. (MAFF)

- The government will promote continuous and diverse uses of Satoyama resources in cooperation with various parties including community residents. (MAFF)

[Current situation] The number of organizations engaged in sustainable activities using resources from Satoyama forests: 466 (FY2010)

[Target] Increase the number of organizations engaged in sustainable activities using resources from Satoyama forests by 20% by FY2014.

2 Promoting soil cultivation, fertilization and pest/weed control with an enhanced focus on biodiversity conservation

(Specific measures and policies)

- As part of efforts to promote appropriate soil cultivation and fertilization, the government will promote the use of compost derived from livestock excreta or food refuse through enhanced cooperation between farming and livestock raising businesses. The government will also promote rational fertilization, based on soil assessments, while paying attention to fertilizing elements contained in organic materials such as compost, with the aim of maintaining or improving soil fertility through the maintenance or improvement of the biological properties of soil such as the population and diversity of soil microbes. (MAFF)

- With regard to soil microbes which have a strong association with soil fertility, the outbreak or control of soil-borne diseases and the material cycle, the government will promote the development of fundamental technologies for clarifying the functions of soil microbes, in order to utilize their functions in agricultural production. (MAFF)
[Target] Develop the above-mentioned fundamental technologies (2020).
- As for the control of diseases and insect pests, the government will promote Integrated Pest Management (IPM), which works on developing environments that reduce the occurrence of diseases, insect pests and weeds, and employs various control methods based on a determination of the appropriate timing for taking control measures by utilizing forecasts of pest outbreaks and monitoring agricultural fields. The government will also encourage farmers to use agricultural chemicals that have less impact on natural enemies. Through those measures, the government will promote pest control practices that put more emphasis on biodiversity conservation in agricultural production environments, including soil microbes and natural enemies indigenous to local areas. (MAFF)
[Current situation] The number of prefectural governments which have created IPM implementation indicators: 36 prefectures (May 2012)
[Target] The number of prefectural governments which have created IPM implementation indicators: 47 prefectures
- There are a variety of other agricultural techniques friendly to living organisms such as the winter flooding of paddy fields. The government will collect information on those techniques as well as successful local efforts and make such information available to farmers. (MAFF)

3 Promoting the management and conservation of Satochi-Satoyama areas with the aim of reducing wildlife damage **(Specific measures and policies)**

- As part of efforts to improve and conserve Satochi-Satoyama areas, the government will promote bush cutting in areas neighboring agricultural land. The government will also promote the management and conservation of forests such as the development of mixed forests with coniferous and broad-leaved species and the replacement of coniferous plantations with broad-leaved trees, by taking into consideration habitats for organisms. (MAFF, MOE)
- Based on damage prevention plans prepared by municipal governments based on the Act on Special Measures for Prevention of Damage Related to Agriculture, Forestry and Fisheries Caused by Wildlife, the government will comprehensively support: measures to manage habitats through the improvement of Satochi-Satoyama areas with the aim of separating wildlife habitats from human settlements; measures to regulate wildlife population sizes by capturing wildlife and developing facilities to treat and process captured animals; and measures to prevent damage including the installation of guard fences. (MAFF)

4 Promoting the conservation of networks of ecosystems and water environments including paddy fields, waterways and reservoirs **(Special measures and policies)**

- It is important to conserve networks of water and ecosystems that not only link forests and the ocean through rivers, but also seamlessly link rivers, paddy fields, waterways, reservoirs and settlements. To this end, the government will take into consideration the entire area which should be covered by each network and specify the species to be conserved in order to conserve

local endemic ecosystems. Through obtaining the understanding and participation of local residents, the government will systematically promote infrastructure improvement in a way that pays close attention to the life cycle and migration routes of respective specified species. It will also provide assistance for maintenance activities as well as production activities with enhanced biodiversity consideration. It will also assist with efforts to secure water for conserving ecosystems such as water for the winter-flooding of paddy fields. (MAFF)

5 The conservation and utilization of rural environments and agricultural development using local resources

(Specific measures and policies)

- The government will provide assistance for hilly and mountainous areas, etc. with the aim of supporting continuous agricultural production activities, to prevent any further increase in abandoned farmland and ensure the multiple functions of those rural areas. It is becoming difficult to appropriately conserve and maintain agricultural land and irrigation water systems because rural communities are losing the functions they had in the past as a result of population decline and the aging of the population. In light of this situation, the government will support communities where the entire community including diverse entities rather than just local farmers work together to conserve and manage these resources, and to improve rural environments such as the conservation of water quality and ecosystems. The government will also support collaborative activities to utilize rural environments conducted by communities, private corporations, government, etc. as can be seen in the examples of “groundwork” activities. (MAFF)

[Current situation] The estimated area of agricultural land that was prevented from being abandoned in hilly and mountainous areas, etc.: 77,000 hectares (the end of FY2011)

The total number of participants in joint community activities: 1.91 million individuals and groups (the end of FY2011)

[Target] The estimated area of agricultural land that is prevented from being abandoned in hilly and mountainous areas, etc.: 77,000 hectares (FY 2010-2014)

The total number of participants in joint community activities: about 10 million individuals and groups (FY 2012-2016)

6 Promoting the creation of spaces where people can experience rich natural environments

(Specific measures and policies)

- In infrastructure development such as farmland consolidation, it is important to conserve networks of ecosystems and water environments such as paddy fields, waterways and reservoirs. To this end, the government will take into consideration the entire area which should be covered by each network and specify the species to be conserved in order to conserve local endemic ecosystems. Through obtaining the understanding and participation of local residents, the government will systematically promote infrastructure improvement in a way that pays close attention to the life cycle and migration routes of respective specified species. (MAFF)

[Current situation] Projects are ongoing in nine districts (FY2012).

- In order to further facilitate biodiversity conservation efforts, the government will promote the introduction of conservation oriented agriculture such as organic farming, as well as providing assistance to farmers for the introduction of biodiversity-conscious cultivation technologies. (MAFF)

- Through conserving green spaces by using the special green space conservation district system, etc. and developing city parks, the government will promote the securing of green spaces that can become the habitats of organisms and sources which supply various species to urban areas. (MLIT)
- In order to provide reference information for those involved in Satochi-Satoyama conservation activities nationwide, the government will study and analyze Satochi-Satoyama areas where characteristic activities are taking place, and will disseminate the information about them as Satochi-Satoyama areas that should be handed down to future generations. With the aim of solving problems that those working on Satochi-Satoyama conservation activities face in local areas, the government will provide technical support by holding training sessions and dispatching lecturers in order to give advice and know-how, as well as promoting the utilization of the “manual for the formulation of a Satochi-Satoyama conservation and restoration plan” by concerned parties. (MOE, MEXT, MAFF)
- The government will seek new effective methods of utilizing Satochi-Satoyama areas, through the implementation of local experimental programs such as the provision of spaces for environmental education and ecotourism, and the use of Japanese plume grass and timber obtained from forest-thinning as biomass. The government will also establish a framework through which diverse stakeholders including urban residents and companies manage and sustainably utilize Satochi-Satoyama areas as resources shared by them (“commons”). (MOE, MEXT, MAFF, MLIT)
- As measures to facilitate the participation of citizens in Satochi-Satoyama conservation and restoration activities and to support the development of human resources dedicated to such activities, the government will register and provide information about groups engaged in such activities and places where their activities take place, as well as registering and dispatching experts in the management of Satochi-Satoyama ecosystems. (MOE)
- The government will promote the Monitoring Sites 1000 activities (surveys of Satochi areas) by local NPOs, research institutes and the like in order to understand the inhabitation of indicator animal and plant species for Satochi-Satoyama environments. The government will also consider setting conservation and utilization targets as well as considering methods for verifying the effects of activities for conserving and utilizing the areas. (MOE)
- With the aim of encouraging Satochi-Satoyama conservation activities, the government will collect and analyze a wide range of characteristic examples of conservation efforts taking place in various parts of Japan, including the reevaluation of the wisdom and techniques used in traditional lifestyles, efforts to hand them down to future generations, and their utilization as local resources. The government will then disseminate the information so that these examples can be used in other parts of Japan. (MOE, MEXT)
- The government will select terraced paddy fields, terraced fields, settlements and other landscapes that have cultural value as Important Cultural Landscapes, and facilitate their preservation and utilization. (MEXT, MOE)
- In order to promote activities to conserve natural environments in Satochi-Satoyama areas using appropriate maintenance methods that are well-established in local communities, the

government will support the formulation of plans to implement cooperative activities between various parties including government, local residents, those engaged in agriculture, forestry and fisheries, NGOs, land users and businesses, through the utilization of the Act on the Promotion of Activities for Biodiversity Conservation through the Cooperation among Regional Diversified Actors (Act on the Promotion of Regional Cooperation for Biodiversity). (MOE)

- In the process of nationwide education activities on how to conserve and utilize Satochi-Satoyama areas, the government will make efforts to raise public awareness about the prevention of illegal dumping and other acts which damage organisms' habitats. The government will also strengthen networks with local governments and other entities for information exchanges and mutual cooperation for the prevention of illegal dumping. (MOE)
- [Current situation] In order to strengthen measures to prevent illegal dumping, etc. or to prevent the expansion of illegal dumping, etc., the government is implementing in cooperation with prefectural governments, citizens and other parties measures to eradicate illegal dumping, etc., for example establishing a Nationwide Illegal Dumping Monitoring Week.

7 Promoting the improvement, conservation and utilization of grasslands (Specific measures and policies)

- The government will assist with the efforts of producers and community-wide efforts to promote grazing in order to maintain productivity and the other functions of grasslands and will also assist with activities to improve and conserve grasslands. (MAFF)
- Through conserving green spaces by using the special green space conservation district system, etc. and developing city parks, the government will promote the securing of green spaces that can become the habitats of organisms and sources which supply various species to urban areas. (MLIT)
- For the protection and management activities for natural parks, the government will promote the conservation of the satoyama landscape such as the grassland landscape in Aso. (MOE)
- The government will promote the conservation and utilization of grasslands by establishing and disseminating methods to effectively utilize the grass and wood biomass generated from Satochi-Satoyama conservation activities. (MOE)

8 Promoting activities to improve, conserve and utilize Satoyama forests (Specific measures and policies)

- The government will conserve habitats for diverse organisms in the course of promoting forestry. (MAFF)
- The government will facilitate activities to familiarize people with forests, such as forest development activities conducted by NPOs, etc. (MAFF)
- Through conserving green spaces by using the special green space conservation district system and developing city parks, etc., the government will promote the securing of green spaces that can become the habitats of organisms and sources which supply various species to urban areas. (MLIT)

Section 7 Urban areas (Basic concepts)

At the Tenth Meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10), the Decision X/22 “Plan of Action on Subnational Governments, Cities and Other Local Authorities for Biodiversity” was adopted. Examples of actions include encouraging subnational governments and local authorities to integrate biodiversity considerations into urban infrastructure investments, etc. Therefore, the government will need to appropriately work on urban development which gives consideration to biodiversity.

In urban areas where land is intensively used and large environmental impacts are concentrated, the habitats of organisms are limited to spaces which have natural environments with water and ample greenery. Therefore, we need to implement more appropriate conservation, restoration, creation and management of these spaces in order to conserve biodiversity in cities. For this purpose, it is necessary to develop ecological networks by creating appropriately-distributed green spaces by taking into consideration the quality, the size and the links between green spaces, in addition to the quantity of green spaces.

In the coming super-aging society with progressing population decline, it is desirable to have eco-compact cities developed through concentrating urban functions in the city center, achieving convenience centering on traffic hubs, improving energy use efficiency, etc. From this standpoint, in order to achieve the conservation, restoration, creation and management of natural environments that contribute to biodiversity conservation, the government will implement comprehensive and systematic measures in accordance with the type of urban area and the condition of the natural environment concerned, in line with the Master Plans for City Planning Areas and the Green Basic Plans, both of which are comprehensive city plans describing future visions for water and greenery. In order to conserve biodiversity in urban areas, it is necessary to promote various measures and policies related to the conservation, restoration, creation and management of green spaces and waterfront spaces, based on the above-mentioned plans and the like. More specifically, the government will promote the development of networks of water bodies and greenery covering broad areas by conserving green spaces and creating natural environments through coordination between development projects for city parks, roads, sewer systems, etc. In addition, the government will encourage the greening of private building plots including the rooftops and walls of buildings. In the process of implementing these measures and policies, the government will assist local governments in understanding the current situation of biodiversity in urban areas and keep track of the progress for measures and policies, in order to support local governments’ biodiversity conservation efforts in urban areas.

In order to make sure that the conserved, restored or created natural environments contribute to biodiversity conservation, it is important to maintain or improve the quality of the natural environments. Therefore, the government will utilize and encourage others to use greening plant species native to each local area and promote efforts for community-based appropriate management.

Since the participation of various entities is important to continuously implement the conservation, restoration, creation and management of natural environments, the government will conduct public awareness campaigns to encourage various entities to take part in such activities.

1 The development of ecological networks in urban areas

(Specific measures and policies)

- The government will promote the development of ecological networks linking green spaces in urban areas such as city parks. (MLIT)
[Current situation] The area of city parks, etc. developed: 118,056 hectares, 99,874 sites (March 2011)
Special green space conservation districts: the area designated: 2,369 hectares, 419 districts (March 2011)
Suburban Special Green Conservation Areas: the area designated: 3,517 hectares, 27 areas (March 2011)
Suburban Green Conservation Areas: the area designated: 97,330 hectares, 25 areas (March 2011)
Special historic landscape preservation areas: the area designated: 6,428 hectares, 60 areas (March 2011)
Historic landscape preservation areas: the area designated: 20,083 hectares, 32 areas (March 2011)
The area subject to civic green space agreements concluded: 904,899 hectares, 162 sites (March 2011)
Greening Area System: 60,425 hectares, three areas (March 2011)

2 The formulation of comprehensive plans on the conservation, restoration, creation and management of green spaces

(Specific measures and policies)

- Based on the “technical matters to be considered regarding biodiversity conservation in Green Basic Plans” formulated in 2011, the government will promote the formulation of Green Basic Plans that give consideration to biodiversity conservation. (MLIT)
- The government will promote the formulation of Green Basic Plans by municipal governments that have not already created the plans. As for municipal governments which have already created the plans, the government will promote the revision of the plans if a certain number of years have passed since they were formulated in order to adjust the content in accordance with changes in social circumstances, etc. (MLIT)
[Current situation] The number of local governments which have formulated a Green Basic Plan: 648 (March 2011)
- The government will continue promoting the conservation of green spaces and the greening of urban areas towards the fulfillment of the Green Basic Plans. (MLIT)
- The government will assist local governments in understanding the current biodiversity situation in urban areas and assist in keeping track of the progress of the measures and policies by for example proposing the biodiversity indicators to be used in urban areas, in order to support local governments’ biodiversity conservation efforts in urban areas. (MLIT)

3 Promoting measures and policies for the conservation, restoration, creation and management of green spaces and waterside areas

3.1 The development of city parks

(Specific measures and policies)

- In order to promote the development of networks of water bodies and greenery in urban areas, the government will support the development of city parks and the conservation of green spaces by local governments. (MLIT)
[Current situation] The area of city parks, etc. developed: 118,056 hectares, 99,874 sites (March 2011)
- In areas where natural environments should be vigorously created such as reclaimed land to be used as housing sites and large areas of land to be converted from factory sites, etc. to other uses, the government will promote the development of sound natural environments which will contribute to biodiversity conservation, such as the restoration and creation of tidal flats, wetlands and forests. (MLIT)
[Current situation] The area of city parks, etc. developed: 118,056 hectares, 99,874 sites (March 2011)

3.2 Consideration for biodiversity conservation in road development (Specific measures and policies)

- The government will conduct detailed surveys and accumulate data on the natural environment. Based on the data, the government will select routes that can conserve rich natural environments and adopt structures that avoid major alterations to topography and vegetation where necessary. (MLIT)
- With the aim of preventing animal habitats from being fragmented and conserving plant habitats, the government will take ecosystems into consideration when developing roads, including the construction of structures for animals to cross over/under roads and the installation of signs that call attention to animals. (MLIT)
- In regard to embankment slopes created by road construction projects and existing slopes created by past projects, the government will cover them with vegetation that best suits the local climate, local soil and other natural conditions, so that the slopes will resemble a natural environment as closely as possible. (MLIT)
- Depending on the conditions of the local area, the government will make vigorous efforts to create animal and plant habitats when developing roads. This will be done by taking into consideration the current conditions of the surrounding natural environment and carefully selecting the tree species to be planted. (MLIT)

3.3 The conservation of biodiversity in sewage systems (Specific measures and policies)

- The government will conserve and create waterfronts by establishing shallow waterways and by reusing treated sewage water in above-ground areas of the sewage treatment facilities, in storm sewers and other facilities that provide important open spaces in densely built-up urban areas, thereby providing habitats for living organisms in urban areas in cooperation with the relevant parties. (MLIT)
- For water areas where consideration for the ecosystem is necessary, the government will promote “friendly discharging.” Friendly discharging is a form of treated sewage water discharge that uses natural purification, reservoirs or percolation depending on the ecology of

the discharge destination. A suitable method is chosen by taking into consideration the water quality, the water temperature and the need to prevent foaming. (MLIT)

- In addition to conserving water quality in public water areas through the construction of sewage facilities, the government will also promote the introduction of advanced treatment facilities in sewage treatment plants that contributes to the prevention of the eutrophication of lakes and closed ocean areas, as well as the improvement of combined sewer systems, and measures to control non-point pollution sources. (MLIT)
- The government will promote projects for establishing sound water circulation systems from a wide-area viewpoint, including the reuse of treated sewage water and rainwater and discharge control by employing rainwater storage and percolation systems. (MLIT)
- The government will promote international cooperation which aims at disseminating sustainable sewage systems overseas, from the planning and construction of sewers to the management and operation of the facilities, by bringing together all the know-how possessed by Japanese industry, academia and the government. (MLIT)

3.4 Special green space conservation districts and green space conservation districts (Special measures and policies)

- The government will provide support for the provision of compensation for losses caused by conduct restrictions, land purchases and the development of landslide prevention facilities and other facilities for the conservation of green spaces. From the standpoint of conserving biodiversity, the government will promote the designation of special green space conservation districts. (MLIT)
- In order to conserve natural environments in suburban Satochi-Satoyama areas that contribute to biodiversity conservation, the government will promote the designation of green space conservation districts. (MLIT)
- The government will promote the utilization of management agreements and other systems that promote the appropriate management of green spaces in order to ensure sound green space management by diverse parties. (MLIT)
[Current situation] Management agreements: 1.2 hectares, one area and three agreements (March 2011)
- In order to promote the development of networks of water bodies and greenery in urban areas, the government will support the development of city parks and the conservation of green spaces by local governments. (MLIT)

3.5 Suburban Special Green Conservation Areas and Suburban Green Conservation Areas (Special measures and policies)

- The government will provide appropriate subsidies for the provision of compensation for losses caused by conduct restrictions, land purchases and the development of landslide prevention facilities and other facilities for the conservation of green spaces. From the standpoint of conserving biodiversity, the government will promote the designation of Suburban Green Conservation Areas, etc. (MLIT)

- In the Greater Tokyo and Kinki Regions, the government will consider designating areas which should be conserved as Suburban Green Conservation Areas, etc. where necessary, based on the information in the Grand Design of Urban Environment Infrastructure for each region, with the aim of renewing the cities using the multiple functions of natural environments. (MLIT)
- In Suburban Green Conservation Areas, biodiversity conservation activities and activities with various other objectives are taking place. The government will work on the appropriate management and conservation of green spaces in suburbs not only through conduct restrictions but also through the utilization of the management agreement system and by cooperating with various entities. (MLIT)
[Current situation] Suburban Green Conservation Areas: 97,330 hectares, 25 areas (March 2011)

3.6 Special historic landscape preservation areas and historic landscape preservation areas

(Special measures and policies)

- In order to preserve historic landscapes which contribute to biodiversity, the government will support local governments in providing compensation for losses caused by conduct restrictions, purchases of land and the development of facilities. (MLIT)
[Current situation] Special historic landscape preservation areas: the area designated: 6,428 hectares, 60 areas
Historic landscape preservation areas: the area designated: 20,083 hectares, 32 areas (March 2011)
- In order to promote the development of networks of water bodies and greenery in urban areas, the government will support local governments in the development of city parks and the preservation of historic landscapes in ancient capitals. (MLIT)

3.7 Scenic districts

(Special measures and policies)

- Scenic districts maintain and create sound natural environments such as forests and waterside areas and are providing habitats for living organisms in urban areas. Therefore, the government will continue working on appropriately implementing the system. (MLIT)
[Current situation] The area of scenic districts: 169,599 hectares (March 2010)

3.8 Civic green spaces

(Specific measures and policies)

- The government will vigorously utilize the civic green space system not only for the conservation of existing green spaces such as lowland forests and protective groves around residences but also for artificially constructed ground and building plots, in order to promote the conservation, restoration and creation of habitats for living organisms in urban areas. (MLIT)
[Current situation] The area of land subject to civic green space agreements concluded: 904,899 hectares, 162 sites
The number of designated trees to be preserved: 70,917
The number of forests to be preserved: 8,594 (March 2011)

3.9 Productive green zones (Specific measures and policies)

- Agricultural land in urban areas can be considered as important habitats for living organisms, and therefore the government will continue working on appropriately implementing the productive green zone system. (MLIT)
[Current situation] The number of productive green zones: 64,787, the area of productive green zones: 14,248 hectares (March 2010)

3.10 The conservation of protective groves around residences, coppices, etc. (Specific measures and policies)

- The government will promote the use of the special green space conservation district system and the civic green space system for relatively small-scale green spaces remaining in urban districts such as protective groves around residences. Thus the government will promote their conservation while appropriately responding to the intentions of the land owners. (MLIT)
[Current situation] Green space agreements: 5,755 hectares, 1,886 sites
 Special green space conservation districts: the area designated: 2,369 hectares, 419 districts
 The area of land subject to civic green space agreements concluded: 904,899 hectares, 162 sites
 The number of designated trees to be preserved: 70,917
 The number of forests to be preserved: 8,594 (March 2011)

3.11 Promoting the creation of greenery on private land, the greening of rooftops and walls (Specific measures and policies)

- Since the Greening Area System, the Authorization System for Greening Facility Development Plans and the like are effective for promoting the greening of private land, the government will further promote the wide use of the systems. (MLIT)
[Current situation] Greening Area System: 60,425 hectares, three areas
 Authorization System for Greening Facility Development Plans: 280,472 m², 28 plans (March 2011)
- With regard to the greening of rooftops and walls, the government will collect empirical data on the degree to which it contributes to curbing global warming by measuring how much impact it has on alleviating the heat island phenomenon in cities, as well as collecting empirical data on its living organism habitat creation abilities. Through understanding the effects of the measures, the government will further promote the greening of rooftops and walls. (MLIT)
[Current situation] The area of rooftops where greening work has been conducted: 304 hectares, the area of walls where greening work has been conducted: 39 hectares (March 2011)

3.12 The securing of green spaces on factory sites (Specific measures and policies)

- Regarding factory sites, the government will promote the securing of green spaces based on the Factory Location Act, in order to harmonize the sites with people's living environments around the sites. (METI)

4 Raising public awareness about greenery conservation, restoration, creation and management

4.1 Promoting public awareness campaigns on greenery

(Specific measures and policies)

- The government will organize Greenery Protection meetings nationwide using national government parks and city parks nationwide as the venues, in order to further raise public awareness on greenery. (MLIT)
- The government will promote the utilization of the green space evaluation system in urban development which evaluates greenery-related measures in development projects and recognize and commend excellent practices, in order to encourage businesses to make greenery creation efforts. (MLIT)
[Current situation] The number of registered sites in the Social and Environmental Green Evaluation System (SEGES): 21 (May 2012)
- In an effort to create greenery that contributes to the creation of habitats for living organisms in urban areas, the government will provide vigorous support for private sector projects that give subsidies related to seedlings and the equipment needed to create greenery to community groups that conduct greening activities. (MLIT)

4.2 Raising public awareness about biodiversity conservation in sewage systems

(Specific measures and policies)

- In cooperation with local residents, those involved in education, NPOs, etc., the government will vigorously disseminate information and attempt to deepen the understanding of citizens about the role of sewage systems as places to create habitats which form part of diverse ecosystems. (MLIT)

Section 8 Rivers, wetlands, etc.

(Basic concepts)

Rivers, wetlands and the like provide habitats for diverse organisms and create rich ecosystems. Materials including nutrients circulate between land and sea areas through rivers, wetlands, etc. Thus, rivers, wetlands and the like play a core role in ecological networks by linking and integrating various types of land in upstream through to downstream areas including forests, cities, coasts, etc. Therefore, it is important to take measures to achieve biodiversity conservation and the sustainable use of its components in rivers, wetland areas, etc.

In the postwar period when Japan experienced rapid economic growth and urbanization, river improvement projects were implemented with the main objectives of urgently and efficiently stopping flooding, in response to demands in society at the time for the protection of life and property from frequent disasters. However, it cannot be denied that insufficient consideration was given to the habitats of living organisms in rivers, wetland areas and the like.

In addition to the above-mentioned historical background to the river administration, in response to increasing citizen interest in the environment in recent years, the River Act was revised in 1997 and the conservation and improvement of river environments was added to its objectives. Currently, river improvement and management is conducted by taking into consideration nature's activities in the entire river, harmony between rivers and community lifestyles, history and culture, and based on the idea of developing rivers for the conservation and creation of diverse river landscapes as well as organisms' living and breeding environments that natural rivers normally have.

In rivers, wetland areas and the like, it is important to work on the conservation and restoration of habitats for living organisms and the improvement of water environments, for example ensuring the appropriate quantity and quality of water, while also ensuring the safety of residents regarding windstorms and flooding. In addition, it is necessary to work on cooperation and collaboration with residents, environmental education and nature experience activities using rivers, as well as surveys of and research into river environments.

1 The conservation and restoration of habitats for living organisms

1.1 Nature-oriented river works

(Specific measures and policies)

- “Nature-oriented river works” is a type of river administration which aims at conserving or creating diverse river landscapes and habitats for living organisms that natural rivers normally have by taking into consideration nature's activities in the entire river and harmony between rivers and community lifestyles as well as the history and culture. This is the basic idea for all river developments, covering all the activities needed for river administration including surveys, planning, designing, construction and maintenance in all Class A rivers, Class B rivers and locally designated rivers. The government will continue promoting nature-oriented river works. (MLIT)

1.2 The conservation and restoration of ecosystems in rivers, wetland areas, etc.

(Specific measures and policies)

- In order to restore sound natural environments that have been lost in rivers, etc., the government will work on the development of ecological networks, focusing on the conservation and restoration of rivers, wetlands and the like. (MLIT)

- When planning and implementing projects, the government will formulate implementation plans through wide-ranging and vigorous collaboration with local NGOs, relevant organizations, experts and other parties, thereby implementing the projects based on consensus among a wide range of people in the community and on the basis of scientific knowledge to the maximum extent possible. (MLIT)
- The government will incorporate adaptive management into many projects, which checks how nature responds and implements feedback measures where necessary. (MLIT)
- In order to develop ecological networks, the government will enhance its efforts to establish fish ladders at facilities that disconnect the upstream and downstream parts of a river. The government will also conduct projects to develop rivers where fish can comfortably live by developing or improving organisms' habitats including places for fish to spawn, grow and feed over extensive parts of rivers including the parts where the river is divided by facilities. (MLIT)
- The government will collaborate with relevant organizations to improve the continuity of each watershed area (i.e. ecological networks), by securing links between rivers and other water bodies in the watershed area including waterways, ponds, swamps and paddy fields, through the mitigation of height differences at the junctions between rivers and waterways by establishing fish ladders and notches and through the restoration of natural conditions in small tributaries by lowering the beds of the flood channels. (MLIT, MAFF, MOE)

1.3 Environmental consideration in dam construction (Specific measures and policies)

- When implementing a dam project, the government will conduct a careful examination in order to fully take into consideration the natural environment from the planning stage. In addition, the government will continue taking environmental conservation measures such as ex-ante environmental surveys and environmental impact assessments, in an effort to avoid or reduce impacts on the habitats of various living organisms to the maximum extent possible. The government will also work to include the results of surveys conducted after facilities have been put into use in plans and impact assessments for future dam projects. (MLIT)

1.4 Environmental consideration in landslide disaster prevention measures for mountain streams and slopes (Specific measures and policies)

- The government will promote greening projects including the establishment of green belts (strings of forest zones) on mountain slopes around urban areas and the establishment of green belts on wasteland, and thereby enhancing safety regarding landslides, in parallel with contributing to the conservation of good landscapes by preventing unrestricted urbanization and conserving, restoring and creating biotopes around urban areas. In Satochi-Satoyama areas, deteriorating slopes in watershed areas are increasing and the risk of landslides and driftwood disasters is increasing due to changes in social circumstances that resulted in insufficient management activities which used to be an integral part of local residents' lives. Through collaborating with local communities, the government will implement slope improvements using locally harvested thinned wood and remove wind-thrown trees, in order to recover land in watershed areas from a deteriorated state and control soil run-off on slopes. The government

will thereby make the local areas more disaster-resistant and contribute to the conservation of the natural environment and biodiversity. (MLIT)

- The government will promote erosion control projects for the creation of mountain stream areas with abundant water and greenery, in areas with excellent natural and social environments. The aims of the projects are to improve the residents' living environment, enhance the landscape and accessibility to water areas as well as restoring ecosystems, by harmonizing mountain streams with the surrounding natural environment and securing greenery and waterside spaces, thus restoring good mountain stream conditions which are suitable for the surrounding community environments. (MLIT)
- The government will develop permeable erosion control dams and replace existing erosion control dams with the permeable ones, while taking the prevention of bank erosion into consideration. The aims are to control excess soil run-off in order to protect human life and property from landslide disasters at times of torrential rain, and in non-disaster times to conserve the continuity of mountain streams and the habitats of living organisms that are developed through soil movement. (MLIT)

1.5 Integrated soil management from the mountain to the seashore (Special measures and policies)

- The government will promote technological development concerning the movement of soil through rivers and mountain streams, the supply of soil through rivers as well as the use of drift sand in coastal areas and dredged soil. While taking into account the condition of rivers and coastal areas and the use of the areas, the government will implement integrated and comprehensive soil management from mountain to seashore in cooperation with the relevant organizations. (MLIT, MAFF)
- Permeable erosion control dams can discharge soil downstream appropriately in terms of quantity and quality, while also controlling excess soil run-off in order to protect human life and property from landslide disasters at times of torrential rain. The government will construct permeable erosion control dams and replace existing erosion control dams with permeable dams, while taking the prevention of bank erosion into consideration. The government will also maintain sound river environments by continuously implementing appropriate soil management through a combination of various measures, including: controlling the quantity of soil flowing into dam reservoirs using the green belt system, the establishment of sediment dams immediately upstream of reservoirs in order to capture inflowing soil, the mechanical removal of sediment from reservoirs, and the installation of sand discharge pipes and sand discharge gates. (MLIT)
- The government will gather existing data on past soil movements, conduct soil dynamics monitoring surveys for the quantity and quality of soil, conduct soundness assessments on the movement of soil through mountain streams, rivers and the seashore by analyzing the survey results, and make forecasts using drift sand simulation models that can track soil movements and predict topographic changes. In addition, the government will examine and evaluate more effective technologies. (MLIT)

1.6 The designation and conservation of wetlands

(Specific measures and policies)

- For the wetlands in Kushiro, etc. where aridification by the inflow of soil and invasions of alien species are exerting serious impacts on the National Parks, the government will conserve and restore wetland ecosystems through nature restoration projects, etc. (MOE, MAFF, MLIT)
- For characteristic wetlands with excellent landscapes in areas where groups of springs, reservoirs and limpid streams form integrated natural environments, the government will revise the designations of National and Quasi-National Parks and rearrange them based on the results of the Comprehensive Check of National and Quasi-National Parks. The government will check the current situation of 500 Important Wetlands in Japan which were selected in 2002 and then revise the sites. It will then collect more information for the conservation of areas which need be specified as protected areas. The government will promote the conservation of these areas by designating them as Wildlife Protection Areas after obtaining support from local residents or having them registered as Ramsar Sites. It will also propose ideas for the conservation and restoration of the entire watershed area of important wetlands and deteriorating important wetlands. (MOE)
[Current situation] Collecting information for revising the 500 Important Wetlands in Japan
 The area of National Wildlife Protection Areas: 582,409 hectares (September 2012)
 The area of Ramsar Sites: 137,968 hectares (September 2012)
 The area of National Parks: 2,093,363 hectares, the area of Quasi-National Parks: 1,362,613 hectares (September 2012)
[Target] Revise the 500 Important Wetlands in Japan (by the end of FY2014).
- For wetlands that are important habitats for migratory water birds, the government will work on their conservation and awareness raising among local residents through building and maintaining networks of wetlands. (MOE)
- The government will keep track of changes in the ecosystems of important wetlands and their conservation status using Monitoring Sites 1000, etc. (MOE)

1.7 The conservation of fishing grounds in inland waters (Specific measures and policies)

- Through the tilling of the fishing grounds and the use of paddy fields and irrigation channels, the government will improve the habitats of aquatic animals and plants such as crucian carp, Japanese eels and reeds. (MAFF)
- Taking a wide-area perspective as well as the viewpoint of biodiversity conservation, the government will promote effective measures to eradicate invasive alien fish species such as the Largemouth bass and the protection and management of the Great Cormorant in order to prevent feeding damage, as well as measures for controlling outbreaks of aquatic animal diseases such as bacterial cold-water disease in Ayu and koi herpesvirus disease. (MAFF)
- Through the development of spawning grounds, the construction of fry nurseries and releasing fry, the government will promote the efforts made by fishermen and other local people to propagate resources while taking into consideration biodiversity, thus promoting biodiversity conservation for inland waters. (MAFF)

1.8 Alien species control measures in rivers, wetland areas, etc. (Special measures and policies)

- The distribution of alien species in rivers has expanded rapidly in recent years and this has become a major problem in some rivers. The government will continue implementing alien species control measures in rivers as well as implementing surveys of and research into alien vegetation, alien fish species, etc. and investigate effective measures. (MLIT, MOE)
- The government will develop assessment methods using species sensitivity distributions (SSDs) in order to enable risk management for impacts on ecosystems based on quantitative assessments. (MOE)

2 The improvement of water environments

2.1 The improvement of water quality in rivers, lakes, etc.

2.1.1 Setting water quality targets with consideration for the conservation of aquatic life and the achievement of the targets

(Specific measures and policies)

- Regarding water areas which have not yet been categorized by the government, the government will collect and organize information on them, submit it for deliberation by the Committee of Experts for the Designation of Categories for Environmental Standards for the Conservation of Aquatic Life, in order for the committee to consider category designation as soon as the information is available for each water area. (MOE)
- Category designation for water quality standards for the conservation of aquatic life has been completed for 37 water areas as of the end of FY2011. The government will consider category designation for the rest of the sea areas as soon as the information needed for deliberation for each sea area is prepared. The government aims to complete category designation for 40 water areas by the end of FY2012. (MOE)
[Current situation] 37 water areas (the end of FY2011)
[Target] 40 water areas (the end of FY2012)
- The government will educate prefectural governments about category designation for water areas by prefectural governments, based on the notification “The processing standards for category designation for water areas by prefectural governments” issued in June 2006. (MOE)
- The government will conduct review of scientific findings regarding substances that are considered to be highly toxic and implement toxicity assessments. (MOE)
- In accordance with the environmental standards for water quality for the conservation of aquatic life, the government will appropriately implement environmental management measures such as the effluent control measures needed to maintain or achieve the standards, as well as continuously monitoring the achievement levels for the environmental standards for the water quality of public waters. (MOE)
- Based on “The indicators for future river water quality management (draft)” (revised in March 2009) and “The indicators for future lake water quality management (draft)” (June 2010), the government will conduct surveys by looking at the “securing of rich ecosystems,” which is an

indicator for habitats and breeding environments for living organisms in rivers and lakes. (MLIT)

2.1.2 Water purification measures

(Specific measures and policies)

- Regarding effluent control measures and the lakeside environment protection zone system, the government will conduct fact-finding surveys, compile water quality data and conduct interviews with each prefectural government in order to identify the effects of the measures. (MOE, MAFF)
[Target] Compile the results in FY2012.
- The government will conduct surveys and examinations of persistent organic matter and organic matter produced within lakes for which the pollution mechanisms have not been quantitatively clarified.
The government will also clarify the relationship between water quality and the nitrogen to phosphorus ratio which induces water quality problems and causes changes to ecosystems, as well as conducting surveys and examinations of the control methods. (MOE)
[Target] Compile the results in FY2013.
- The government will continue implementing water purification measures for rivers. As for rivers and the like where the water environments have deteriorated considerably, the government will formulate the 2nd Water Environment Improvement Emergency Action Plan (Pure Water Renaissance II) together with local municipal governments that are making vigorous efforts to improve water environments, river administrators, sewer system administrators and other relevant parties. The government along with the relevant parties will then make focused efforts to improve water quality in these rivers. (MLIT)
- As measures to reduce the pollutants discharged from agricultural drainage to rivers, lakes and the like, the government will continue promoting the construction of water purification systems within the channels as well as the construction of cyclic irrigation systems. Cyclic irrigation systems are systems to reuse agricultural drainage in order to reduce the amount of pollutants via absorption of excess nutrients by paddy-rice plants and denitrification by paddy fields. (MAFF)
- The government will work on water quality improvements through the conservation and restoration of ecosystems in lakes, by referring to “A collection of materials on new water quality improvement methods that use natural purification capacities (draft)” (March 2010) and other materials. (MLIT)
- The government will continue implementing groundwater conservation measures including restrictions on the permeation of effluents into the ground, restrictions on pumping up groundwater, monitoring as well as promoting the installation of rainwater seepage pits. The government will also take measures to promote local efforts to conserve and restore groundwater and springs. (MLIT, MOE)

2.1.3 Measures to conserve the water quality in dam reservoirs

(Specific measures and policies)

- As a measure against cold water discharge, the government will install systems which enable the selection of water at different depths in the reservoir, so that the layer of water with a temperature similar to the inflowing water temperature can be chosen when discharging water downstream. (MLIT)
- When there is an occurrence of muddy water for an extended period of time, the government will utilize systems which enable the selection of a layer of water which has a sufficiently low turbidity and discharge the water from the layer, as well as installing and utilizing clear water bypasses through which the inflowing water with a low turbidity can be discharged directly downstream after the flooding has stopped, bypassing the reservoirs. Thus the government will attempt to shorten the period of time that muddy water is discharged. (MLIT)
- As eutrophication control measures, the government will install and operate the relevant facilities such as aeration circulation devices which blow air up from within reservoirs to mix water at the bottom and surface layers and lower the water temperature as well as generating water convection, in order to control the proliferation of plankton. (MLIT, MAFF)

2.2 Ensuring clear water in rivers

2.2.1 Setting the normal flow rate

(Specific measures and policies)

- The normal flow rate is the flow rate needed to maintain the normal functions of rivers. The government will set the normal flow rate in the basic policy on river improvement. It will also consider the effective utilization of existing facilities such as dams and water use rationalization, as measures to ensure the normal flow rate. (MLIT)

2.2.2 The restoration of clear river water through the elimination of low water zones created by hydropower generation

(Specific measures and policies)

- As an example of clear river water restoration, water discharges which attempt to prevent rises in water temperature during the summer and to take into consideration the upstream migration of salmon during the autumn were conducted on a trial basis in the mid-reaches of the Shinano River. This proved successful and the recovery of the upstream migration of salmon was confirmed. Taking advantage of opportunities such as the renewal of water rights, the government will continue taking measures to restore clear river water in low water zones created by hydropower generation. (MLIT)

2.2.3 The restoration of clear water in waterways through the use of “environmental water”

(Specific measures and policies)

- The introduction of water for purification purposes has been considered and implemented in various parts of Japan. Since 2005, the government conducted surveys on water sources such as treated sewage water, stored rainwater and groundwater as well as their quality in seven model areas nationwide. Based on the survey results, the government considered the recovery of flow rate to the rate under normal conditions, the development of waterways for water quality improvement and methods to maintain and utilize the waterways. The government then

prepared the “Guidebook for waterside development in urban areas” (February 2009). In addition, “Guidelines for the permission to use water as environmental water” (March 2006) clarifies standards which need to be followed under the River Act when channeling and utilizing river water as environmental water (water to be used for many purposes including maintenance or improvement of the living or natural environments including but not limited to the water quality, water amenity space and landscaping). The government will continue promoting clear river water restoration in ways that suit the local characteristics. (MLIT)

- The government will support efforts to restore clear streams in local areas by utilizing agricultural irrigation facilities and channeling environmental water, etc. (MAFF)

2.3 The improvement of river environments through conducting tests on “flexible dam management”

(Specific measures and policies)

- The government will conduct tests on flexible dam management (storing inflowing water using a part of the capacity for flood control without affecting its functions of the dams, and then appropriately discharging the stored water), in order to take measures to improve river environments. The government will also continue to investigate water discharge methods in order to improve the effectiveness of the management methods. (MLIT)

3 Cooperation and collaboration with residents

(Specific measures and policies)

- The government will continue its environmental conservation activities such as nature restoration and town development that use rivers through cooperation and collaboration with residents. (MLIT)

4 Environmental education and nature experience activities using rivers

4.1 The “Children’s Waterfront” rediscovery project

(Specific measures and policies)

- In order to increase the opportunities for children to participate in nature experience activities and environmental education using rivers, and to improve nature experience activities for children in local communities, the government will continue promoting the “Children’s Waterfront” rediscovery project as well as training instructors who can explain the natural environments of rivers and the dangers associated with rivers. (MLIT, MEXT, MOE)

4.2 Promoting nature experience river activities conducted by citizen groups

(Specific measures and policies)

- In cooperation with citizen groups and councils nationwide, the government has been comprehensively implementing all kinds of activities to support and promote nature experience river activities in ways that meet the demands of the time. The government will continue providing support particularly for the training of instructors in order for them to gain knowledge about the dangers of rivers and gain the skills needed to teach the subject. It will also promote awareness raising activities which provide opportunities for people to reconfirm the importance of nature experience and learning activities that take place in river areas and opportunities for those involved in river activities nationwide to deepen exchanges. (MLIT)

- The Ministry of Land, Infrastructure, Transport and Tourism is providing real time information about rainfall, water levels in rivers, etc. which is available via the Internet and on mobile devices. In order to prevent river water accidents caused by a sharp rise in water levels, the government has urgently prepared an action plan which sets forth the measures to be taken. It will also prepare a report which compiles the specific measures to be taken in response to water accidents that occurred after the action plan was prepared, and implement the measures in cooperation with the relevant organizations. The government will also raise public awareness through disseminating flyers on the safe use of rivers. (MLIT)

4.3 Kodomo Hotarangers (Kid Firefly Rangers) **(Specific measures and policies)**

- As opportunities for children, who are the future of society, to become more interested in water environments close to their homes, the government will continue promoting the Kodomo Hotarangers' activities by commending outstanding activities and holding briefing sessions on their activities so that examples of their activities can stimulate further interest and motivation for the water environment conservation activities conducted in various parts of Japan. (MOE)

5. Surveys and research into river environments

5.1 National Census on River Environment **(Specific measures and policies)**

- The government will promote the creation of river environmental information maps based on the results of the National Census on River Environment, so that the general characteristics of the environments, characteristic areas and important habitats for living organisms can easily be identified. The government will then utilize the maps for the improvement and administration of rivers. (MLIT)
- The government will implement the digitization of the survey results and the integration of the information onto GIS, in order to be able to organize, analyze and utilize the huge volume of data obtained from the National Census on River Environment more efficiently, for example: to make it possible to quickly browse all the information obtained from the National Census on River Environment nationwide, to dramatically increase the speed of analyzing national distributions and identifying chronological trends, to enable multifaceted analysis of river environments, and to enable prompt information disclosure. Digitization and the use of GIS also make it possible to provide the information to numerous members of the public. The government will also promote the mutual use of the Census data and other nationwide survey data such as the National Survey on the Natural Environment. (MLIT, MAFF, MOE)
- The government revised in March 2007 the implementation manual for the National Census on River Environment. Based on the revised manual, the government will implement the basic census so that one cycle of the fish survey and the benthic animal survey can be completed in five years in principle and one cycle of the plant survey, the bird survey, the survey of amphibians, reptiles and mammals and the terrestrial insect survey can be completed in 10 years in principle. The government will promote further utilization of the manual. (MLIT)

5.2 Academic research on river ecology **(Specific measures and policies)**

- The government will continue joint research based on on-site surveys for the following six rivers: the Tama River where the flow conditions are relatively stable; the Chikuma River

which has a large variation in flow rate; the Kizu River which carries large quantities of soil and forms beautiful sandbanks; the Kita River where major improvements were made through a special emergency project for the control of severe river disasters; the Shibetsu River where the meandering of the river channel is being restored through nature-restoration type river reconstruction; and the Iwaki River which has a vast area of reeds and brackish water in the estuary. (MLIT)

5.3 Aqua Restoration Research Center (Special measures and policies)

- The government has conducted many surveys and studies on fish habitats and the results are being used to develop river channel plans and riverbank design methods when conducting nature-oriented river works. In surveys and research into flow rate and the amount of soil supply, the government conducted fundamental studies including looking into the inhabitation of attached algae and benthic animals. The obtained results are being used as basic information for setting normal flow rates and for considering specific measures such as the restoration of soil. The government is also attempting to disseminate research results in an easy-to-understand manner, as part of its focused efforts to train river engineers and provide environmental education. (MLIT)

5.4 Aquatic life survey (Specific measures and policies)

- As an opportunity for raising citizen interest in river environments, the government will continue the aquatic life survey in collaboration with citizens. (MLIT, MOE)

Section 9 Coastal and oceanic areas

(Basic concepts)

The deterioration of coastal and oceanic ecosystems is recognized globally as well as domestically, including decreases in the number of tidal flats, seagrass beds and coral reefs, fragile island ecosystems and parts of marine fishery resources. They are likely to have been caused by the physical alteration of the habitats of living organisms, marine pollution, overexploitation of marine organisms and the introduction of alien species. There is a concern that changes in the global environment such as global warming and ocean acidification are also affecting coastal and oceanic environments. There is a lack of the basic information needed to develop conservation measures, including the inhabitation of marine organisms.

In order to solve these problems, the government will conserve biodiversity which supports the healthy structures and functions of marine ecosystems and promote the sustainable use of marine ecosystem services (benefits of the sea), based on the Marine Biodiversity Conservation Strategy (2011) which was formulated as a basic policy for comprehensively promoting the conservation of marine biodiversity in Japan.

More specifically, it is necessary for us to recognize and appropriately evaluate the importance of marine biodiversity and the various ecosystem services it provides. It is also necessary to implement integrated management measures that take into consideration the links between the land and the sea in coastal areas including Satoumi areas, the continuity of ecosystems in the open sea and the migration of marine organisms over extended areas. In this process, it is necessary to implement measures which best suit the characteristics of environments that vary depending on the sea area, and to recognize the activities of local residents which use local wisdom and techniques, as well as encouraging the participation of and cooperation between diverse entities in local communities. As for marine protected areas which are one tool for achieving biodiversity conservation, the conservation of marine resources and their sustainable use the Headquarters for Ocean Policy has approved the policy to appropriately promote their establishment and improve their management, based on scientific findings.

In order to appropriately implement these policies, it is important to continue organizing basic information, clarifying the factors affecting marine biodiversity and taking measures to reduce the effects. It is also becoming increasingly important to conserve existing sandy beaches, tidal flats, seagrass beds and the like, to take measures to restore and repair already lost sandy beaches, tidal flats, seagrass beds and the like. It is also becoming increasingly important to ensure safety and conserve biodiversity at the same time when taking disaster prevention measures against tsunamis, etc. on coastlines which have hinterlands where human populations and properties are concentrated.

1 The comprehensive conservation of biodiversity in coastal and oceanic areas

1.1 The conservation of marine biodiversity based on scientific findings

(Specific measures and policies)

- The government will continuously conduct monitoring surveys on the biotas of neritic ecosystems such as seagrass beds, tidal flats and coral reefs in order to increase the amount of natural environmental data. It will also consider methods to evaluate the rarity of marine organisms and collect information about rare marine species. (MOE, MAFF)
- The government will conduct zoning for oceanic areas based on ocean currents, climate and geography. It will then identify marine priority areas for biodiversity conservation by paying

particular attention to areas typical of each zone including tidal flats, seagrass beds, coral reefs and other areas important for the inhabitation and breeding of wild organisms. The government will also clarify how many sea areas need more intensive conservation activities, based on the current situation concerning the conservation in marine priority areas. (MOE)

[Current situation] The government launched the identification of marine priority areas in FY2011 and it is planned to be completed in FY2013.

[Target] Complete the identification of marine priority areas by FY2013.

- Based on the Marine Biodiversity Conservation Strategy, the government will analyze the factors causing crises in marine priority areas for biodiversity conservation and consider the measures that need to be taken. (MOE)

[Current situation] The government launched the identification of marine priority areas in FY2011 and it is planned to be completed in FY2013.

[Target] Analyze the factors causing crises in marine priority areas and consider countermeasures by FY2015.

- In order to comprehensively promote biodiversity conservation in coastal areas and oceanic areas in general, the government will organize basic scientific data on important marine ecosystems and marine organisms in cooperation with the relevant ministries. (MOE, MLIT, the relevant government offices and ministries)

[Current situation] The ocean policy support information tool was released.

1.2 Protected areas for the conservation of marine biodiversity (Specific measures and policies)

- Based on the Basic Plan on Ocean Policy and in light of the Convention on Biological Diversity (CBD) and other international commitments, the government will promote the establishment of marine protected areas and the improvement of their management with the aim of conserving marine biodiversity and the sustainable use of marine ecosystem services. The government will implement this policy in line with the guidelines for establishing marine protected areas in Japan which were clarified through coordinated efforts between the relevant government offices and ministries. In this process, the government will take into consideration the importance of networking the protected areas. It will also facilitate consensus building among the various stakeholders including fishermen, by referring to useful examples such as the Multiple Use Integrated Marine Management Plan for Shiretoko World Natural Heritage Site which aims at the conservation of biodiversity in sea areas while fishery resources are maintained principally by fishermen's voluntary restraint in addition to rules imposed by law based on the concept of adaptive management. (MOE and other relevant government offices and ministries)

[Current situation] Marine protected areas account for about 8.3% of Japan's territorial waters and EEZ (May 2011).

[Target] Make 10% of the waters under Japanese jurisdiction protected areas (by 2020).

- Based on the results of the Comprehensive Check of National and Quasi-National Parks and in coordination with the relevant organizations, the government will implement the designation and rearrangement of National and Quasi-National Parks in sea areas and the designation of marine park areas. In the process the government will take into consideration the distribution of seagrass beds, tidal flats and coral reefs which are core components for wide-area biodiversity conservation while also considering their connection with ocean currents and land areas. In

marine park areas, the government will specify species subject to control and promote their conservation where necessary. (MOE)

[Current situation] The number of marine park areas in National Parks: 110, the number of marine park areas in Quasi-National Parks: 68 (the end of FY2011)

- In sea areas in National Parks where coral reef ecosystems are deteriorating due to coral bleaching and the occurrence of crown-of-thorns starfish, the government will work on the eradication of crown-of-thorns starfish and the restoration of coral communities. The government will also vigorously conduct other activities for the conservation and restoration of marine ecosystems in National Parks, including coastal cleaning, the monitoring of spawning and patrolling sandy beaches where sea turtles come to lay eggs. (MOE)
[Current situation] The Marine Worker Programs are implemented in 14 National Parks which contain sea areas (FY2012).
- The government will vigorously implement nature study gatherings and other programs in coastal areas in National Parks. It will also consider appropriate ways to conserve and utilize sea areas in National Parks and provide the necessary information via pamphlets, websites, etc. in an effort to raise public awareness about how to use the sea areas. (MOE)
- In order to control the sources of soil and pollutants which have negative effects on the natural landscape and biodiversity conservation in sea areas in National Parks, the government will consider necessary measures in coordination and cooperation with the relevant organizations. (MOE and other relevant government offices and ministries)
- The government will promote the designation of priority wildlife conservation areas chosen from a national or international viewpoint as National Wildlife Protection Areas, in coordination with relevant organizations. The government will also reorganize protection areas based on the protection area designation policies to be stipulated in the strategy for the conservation of threatened wild species which will be created at a future date. (MOE)
- The government will appropriately promote the establishment of marine protected areas as well as improving their management by utilizing existing systems, etc., in order to ensure marine biodiversity conservation and the sustainable use of marine ecosystem services. Based on the fundamental perception that marine areas which are autonomously co-managed by fishermen for conservation of biodiversity and sustainable use of its components can also be effective protected areas, the government will disseminate this type of protected area as one type of Japanese marine protected area. (MAFF)

1.3 The conservation and restoration of seagrass beds and tidal flats (Specific measures and policies)

- The government will organize information about seagrass beds and tidal flats using the National Survey on the Natural Environment and Monitoring Sites 1000, and utilize the information for conservation measures and policies. (MOE)
- The government will conserve seagrass beds and tidal flats by implementing measures and policies set out in part 1.2 “Protected areas for the conservation of marine biodiversity” in this section. (MOE)

- The government will promote the conservation and development of seagrass beds and tidal flats using methods that suit the environments of the sea areas. It will also promote maintenance activities by various parties including fishermen, such as the eradication of organisms that cause feeding damage, the proliferation and transplantation of seaweeds and bivalves while ensuring genetic diversity and local endemism, and the tilling of fishing grounds. (MAFF)
 [Current situation] Seagrass beds and tidal flats conserved or developed: 4,800 hectares (achievements in FY 2007-2010)
 [Target] Seagrass beds and tidal flats conserved or developed: 5,500 hectares (FY 2012-2016)
- The government will promote the restoration of tidal flats, seagrass beds, etc. and the backfilling of depressions by utilizing dredged materials generated through the maintenance of ports and harbors. (MLIT)
 [Current situation] The percentage of tidal flats restored: about 37.8% (the end of FY2011)
 [Target] The percentage of tidal flats restored: about 40% (the end of FY2016)
- As countermeasures to the deterioration of habitats for marine animals and plants caused by domestic effluent, the government will develop community effluent treatment systems, etc. in order to reduce the amount of water pollutants discharged from the land. (MAFF)
 [Current situation] The percentage of agricultural community population covered by agricultural community effluent treatment systems: 68% (FY2009)
 [Target] The percentage of agricultural community population covered with agricultural community effluent treatment systems: 76% (FY2016)
- The government will promote the development and dissemination of recycling technologies for fishery materials, in an effort to reduce the adverse effects of increases in marine debris on fishery activities. (MAFF)
- The government will promote efforts to strengthen monitoring systems for the occurrence of red tides and anoxic water masses in a bid to prevent fishery damage. (MAFF)
- The government will promote the removal of sediment to help fishing grounds to recover. (MAFF)
 [Current situation] The removal of sediment from fishing grounds: the improved area: 313,000 hectares (achievements from FY2007 to FY2010)
 [Target] The removal of sediment from fishing grounds: 230,000 hectares (FY 2012-2016)

1.4 The conservation and restoration of coral reefs (Specific measures and policies)

- The government will implement the Action Plan to Conserve Coral Reef Ecosystem in Japan which was formulated with the aim of promoting the conservation, restoration and sustainable use of coral reef ecosystems and the sustainable development of local communities. (MOE)
 [Current situation] Conducting progress checks every year
 [Target] Implement the action plan up to FY2015 and then revise the plan.
- The government will hold the Follow-up Meeting for the Action Plan to Conserve Coral Reef Ecosystem in Japan. At the meeting, the government will consider the appropriate evaluation

indicators for understanding changes in coral reef ecosystems and the socio-economic changes related to them, as well as conducting progress checks for the implementation of the Action Plan to Conserve Coral Reef Ecosystem in Japan and sharing the information with relevant ministries, agencies, local governments, etc. (MOE)

[Current situation] Conducting progress checks every year

[Target] Implement the action plan up to FY2015 and then revise the plan.

- The government will promote the preparation of information on coral reefs using Monitoring Sites 1000, etc. (MOE)
- The government will conserve coral reefs by implementing the measures and policies set out in part 1.2 “Protected areas for the conservation of marine biodiversity” in this section. (MOE)
- The government is implementing nature restoration projects for coral communities in the Sekisei Lagoon in Okinawa, the Tatsukushi coast in Kochi and around Takegashima Island in Tokushima. The government will continue promoting nature restoration projects for coral reefs in natural parks including the above-mentioned three projects. (MOE)
- In Okinawa and on the Amami Islands, the government will promote the relaxation of farm inclines and the development of sand basins in order to prevent red soil run-off from agricultural land, etc. (MAFF)
- In light of the ICRI (International Coral Reef Initiative) resolution on coral reefs & climate change, the government will conduct studies into improving coral reef resilience in order to consider climate change adaptation measures. It will also support the implementation of relevant activities as well as conducting studies concerning ocean acidification. (MOE)
- For Okinotori Island, where coral decline is a concern due to the difficult coral growing conditions, the government will check the current situation on-site and consider larval culture techniques. The government will then prepare guidelines for coral mariculture and aquaculture methods, thereby developing coral mariculture and aquaculture techniques that can be widely utilized in other sea areas. (MAFF)

1.5 The conservation of island ecosystems

(Specific measures and policies)

- Regarding species for which plans for the Conservation Programmes have been prepared based on the Law for the Conservation of Endangered Species of Wild Fauna and Flora, the government will continue improving and strengthening the programs. As part of the efforts, based on the characteristics of each species, their inhabitation status and the factors causing their decline, the government will remove or reduce the factors affecting their survival and improve their habitats through promoting agriculture, forestry, etc. that give consideration to biodiversity conservation, while examining the effects of various conservation measures. (MOE, MAFF)
- With regard to remote islands particularly important as breeding grounds for seabirds such as Rishiri Island and Teuri Island in Hokkaido and the Nanatsujima Islands in Ishikawa, the government will continue conserving these habitats. (MOE)

- On the Ogasawara Islands, the government is implementing the conservation of endemic species, rare species and the distinctive ecosystems remaining on the oceanic islands and rehabilitating ecosystems disturbed by alien species in order to restore healthy ecosystems. The government will continue promoting nature restoration projects for island ecosystems distinctive to oceanic islands in National Parks, including the above-mentioned projects ongoing on the Ogasawara Islands. (MOE)
- The government is implementing nature restoration projects for coral communities in the Sekisei Lagoon in Okinawa. The government will continue promoting nature restoration projects for coral communities in natural parks. (MOE)
- Regarding the mongoose which is a threat to rare species on Amami-oshima Island, the government will establish more effective methods for capturing them in areas with a low mongoose population density in order to capture the mongoose until they are eradicated. The government will also consider the target year for eradication on a scientific basis. It will also consider more efficient control methods based on cost-effectiveness, with the aim of achieving early eradication. The government will also implement alien species control projects mainly in priority conservation areas including the habitats of rare species, National Parks and forest reserves. (MOE, MAFF)
 - [Current situation] The total number of mongooses captured and the number of mongooses captured per 1,000 trap-days (C/1000TD) on Amami-oshima Island: 272 mongooses and 0.13 C/1000TD, respectively (FY2011)
 - [Target] The total number of mongooses captured and the number of mongooses captured 1,000 trap-days (C/1000TD) on Amami-oshima Island: zero for both (Time frame: The government plans to set the target year by the end of FY2012, on a scientific basis.)
- The government will continue implementing the removal of alien species such as the cutleaf coneflower on Rishiri Island and Rebun Island. (MOE)
 - [Current situation] Rishiri Island: 27,000 cutleaf coneflower plants were removed (FY2011).
Rebun Island: 3,150 liters of the common dandelion, the white clover, etc. were removed (FY2011).
 - [Target] The government will formulate control policies such as the selection of priority species which need to be removed from National Parks. It will then systematically implement control measures.
- The government will consider and implement measures to prevent the impacts of alien species on areas which have characteristic ecosystems such as the island ecosystems on the Ogasawara Islands and the Nansei Islands. In this process, the government will also implement in an integrated manner measures on private forests that neighbor national forests or exist in between national forests, by utilizing agreement systems for the maintenance and the enhancement of public benefit functions. (MOE, MAFF)
 - [Current situation] The total number of mongooses captured and the number of mongooses captured per 1,000 trap-days (C/1000TD) on Amami-oshima Island: 272 mongooses and 0.13 C/1000TD, respectively (FY2011)

[Target] The total number of mongooses captured and the number of mongooses captured 1,000 trap-days (C/1000TD) on Amami-oshima Island: zero for both
(Time frame: The government plans to set the target year by the end of FY2012, on a scientific basis.)

- As for the Amami-Ryukyu, it is necessary to expand measures to guarantee the protection of priority areas such as habitats for threatened species. Therefore, the government will analyze and assess the value of the islands as a world natural heritage site and cooperate with local communities in setting up and expanding protected areas. (MOE, MEXT, MAFF)

1.6 The protection and management of marine life

(Specific measures and policies)

- The government will continue collecting a wide range of information about marine ecosystems including the inhabitation of sea turtles, seabirds, marine mammals, etc. through the implementation of Monitoring Sites 1000 and various other surveys. It will also implement measures to appropriately conserve marine life based on the scientific data. (MOE, MAFF)
- The government will work on the accumulation and improvement of scientific knowledge on rare aquatic wild species and consider how they should be conserved and sustainably used. (MAFF)
- With regard to by-catches such as sharks, seabirds and sea turtles, the government will conduct impact assessments on by-catches, as well as developing and improving appropriate technologies to avoid by-catches and raising awareness about the issue among fishermen, in order to reduce by-catches. (MAFF)
- Regarding the Steller's sea lion, which is a rare species that also causes fishery damage, the government will promote damage prevention measures based on scientific knowledge such as the number of Steller's sea lions visiting relevant areas, while taking biodiversity into consideration. (MAFF)
- The government will assess the predation situation for useful fishery resources by large organisms such as whales, and promote efforts to mitigate the impacts based on scientific findings. (MAFF)

2 Fisheries in Satoumi and the Ocean

2.1 Promoting the conservation of important fishery environments such as seagrass beds, tidal flats, etc.

(Specific measures and policies)

- The government will promote the conservation and development of seagrass beds and tidal flats using methods that suit the environments of the sea areas. It will also promote maintenance activities by various parties including fishermen, such as the eradication of organisms that cause feeding damage, the proliferation and transplantation of seaweeds and bivalves while ensuring genetic diversity and local endemism, and the tilling of fishing grounds. (MAFF)

[Current situation] Seagrass beds and tidal flats conserved or developed: 4,800 hectares (achievements in FY 2007-2010)

[Target] Seagrass beds and tidal flats conserved or developed: 5,500 hectares (FY 2012-2016)

- As countermeasures to the deterioration of habitats for marine animals and plants caused by domestic effluent, the government will develop community effluent treatment systems, etc. in order to reduce the amount of water pollutants discharged from the land. (MAFF)
 [Current situation] The percentage of agricultural community population covered by agricultural community effluent treatment systems: 68% (FY2009)
 [Target] The percentage of agricultural community population covered by agricultural community effluent treatment systems: 76% (FY2016)
- The government will promote the development and dissemination of recycling technologies for fishery materials, in an effort to reduce the adverse effects of increases in marine debris on fishery activities. (MAFF)
- The government will promote efforts to strengthen monitoring systems for the occurrence of red tides and anoxic water masses in a bid to prevent fishery damage. (MAFF)
- The government will promote the removal of sediment to help fishing grounds to recover. (MAFF)
 [Current situation] The removal of sediment from fishing grounds: the improved area: 313,000 hectares (achievements from FY2007 to FY2010)
 [Target] The removal of sediment from fishing grounds: 230,000 hectares (FY 2012-2016)

2.2 Promoting fishery infrastructure projects that take biodiversity into consideration (Specific measures and policies)

- When developing fishing ports and fishing grounds, the government will fully take into consideration the impacts on the natural environment at the relevant sites at the planning stage, the designing stage and the construction stage. It will consider the use of various natural materials and strive to identify impacts through monitoring, to the maximum extent possible. Thus the government will promote fishery infrastructure projects that take into consideration the natural environment including biodiversity, and create sound habitats for marine organisms that suit their life cycles. (MAFF)
 [Current situation] Artificial fish reefs and the mariculture and aquaculture farms developed: 41,000 hectares (achievements from FY2007 to FY2010)
 The removal of sediment from fishing grounds: the improved area: 313,000 hectares (achievements from FY2007 to FY2010)
 [Target] The development of artificial fish reefs as well as mariculture and aquaculture farms: 60,000 hectares (FY 2012-2016)
 The removal of sediment from fishing grounds: 230,000 hectares (FY 2012-2016)
- The government will strengthen measures to conserve water quality in water areas around fishing ports, by: developing wastewater treatment facilities in fishery settlements, as measures to reduce pollutants in effluents flowing into water areas around fishing ports; and removing sludge from fishing ports. (MAFF)
 [Current situation] The percentage of the population of fishing villages covered by fishery settlement wastewater treatment facilities: 49% (achievements as of the end of FY2009)

[Target] The percentage of the population of fishing villages covered by fishery settlement wastewater treatment facilities: 65% (by FY2016)

2.3 Promoting the conservation and utilization of fishing village environments by tapping into local resources

(Specific measures and policies)

- The government will promote fishing village development that taps into attractive local resources including rich levels of biodiversity. It will also promote the conservation and development of good fishing village landscapes that are friendly to citizens, as well as promoting efforts to hand down historical and cultural assets to future generations. (MAFF)
- The government will develop the facilities, etc. needed to revitalize fishing villages by deepening understanding of and interest in fisheries and fishing villages among citizens through the promotion of exchanges between cities and fishing villages such as hands-on experience programs and nature experience programs, as well as promoting the settlement of new residents in fishing villages. (MAFF)

2.4 Promoting the conservation and management of marine resources that takes biodiversity into consideration

(Specific measures and policies)

- The government will conduct various surveys of marine resources using survey vessels, etc. and promote activities to identify the trends for marine resources and to assess the resources. (MAFF)
- Concerning the management and sustainable use of highly migratory fish species including tuna, whose declining stocks are a source of concern, the government will establish conservation and management measures on a scientific basis and strive to eliminate illegal, unreported and unregulated (IUU) fishing through local fishery management organizations, while fully taking into consideration the importance of these species for fishery production and consumption in Japan. (MAFF)
- Regarding whales, the government will work to establish the conservation and sustainable use of the resources internationally based on scientific research results. (MAFF)
- The government will implement efforts to conduct fishery management which takes ecosystems into consideration such as the setting of the fishing prohibition periods and the Protected Waters for resource protection, as well as efforts to avoid by-catches such as the use of tori-poles (bird scaring lines on poles) and circle hooks. The government will also scientifically demonstrate that these types of fishing activities will make it possible to conserve and sustainably use marine biodiversity, in order to contribute to building international consensus on appropriate fishing activities. (MAFF)

[Target] Multilateral treaties on fisheries: 47 treaties or more (The number should be maintained at this level or should exceed this level every fiscal year.)

- The government will maintain the number of bilateral and multilateral treaties on fisheries (which aim at ensuring the operation by Japanese fishing vessels, the sustainable use and the appropriate management of resources) at 47 treaties or more every fiscal year. Thus the

government will play an active role in the sustainable use of fishery resources and the reduction of by-catches. (MAFF)

[Target] Multilateral treaties on fisheries: 47 treaties or more (The number should be maintained at this level or should exceed this level every fiscal year.)

2.5 The continuing promotion of resource management under the framework for implementing the resource management guidelines and the resource management plans

(Specific measures and policies)

- In addition to resource management under the fishing permit system, the Total Allowable Catch (TAC) system, etc., the government introduced resource management and fishery income compensation measures in FY2011. Under these systems and measures, it is necessary to further promote appropriate and systematic voluntary resource management in accordance with the resource situation, such as the suspension of fishing activities, the control of the “fishing effort” (the amount of fishing inputs such as capital, labor, etc.) through regulating fishing gear and fishing methods, the release of eggs and fry and the improvement of fishing grounds. Therefore, the government will develop a framework for implementing the resource management guidelines and the resource management plans as a united effort by fishermen, research institutes and the government. It will also try to encourage all fishermen to participate in resource management that is implemented based on the resource management plans. (MAFF)
- The government will promote Marine Eco-Label which shows that the fishery products were caught using methods that take into account ecosystems and resource sustainability, through the White Paper on Fisheries and pamphlets for consumers. (MAFF)

2.6 Propagation that takes biodiversity into consideration and sustainable aquaculture production

(Specific measures and policies)

- With regard to formulating release plans, producing and releasing eggs and fry, the government will promote propagation activities in harmony with the environment and ecosystems, by taking into consideration the impacts on genetic diversity and the impacts on each type of stock. (MAFF)
- As for aquaculture, the government will promote the formulation of Aquaculture Improvement Plans in order to encourage community-led improvements to aquaculture areas in order to achieve sustainable aquaculture production that does not degrade aquaculture areas. (MAFF)
- Regarding fish aquaculture, the government will promote the development of low environmental impact feed in order to reduce environmental impacts caused by residual feed. (MAFF)
- The government will implement salmon and trout propagation projects by ensuring harmony with ecosystems in the North Pacific and by taking into consideration the maintenance of the species characteristics and diversity between and within the species. It will also strive to develop advanced techniques for releasing artificially propagated eggs and fry in a way which enables coexistence with wild fish. Thus the government will promote salmon and trout

propagation projects that take into consideration ecosystems in rivers and their surroundings. (MAFF)

- The government will aim at increasing the percentage of products produced in sea areas subject to Aquaculture Improvement Plans out of total seawater culture production, from less than 80% in 2010 to 90% by 2022. (MAFF)
[Current situation] The percentage of products produced in the sea areas subject to Aquaculture Improvement Plans out of the total seawater culture production: less than 80% (2010)
[Target] The percentage of products produced in the sea areas subject to Aquaculture Improvement Plans out of the total seawater culture production: 90% (by 2022)

2.7 Promoting biodiversity conservation while considering the protection and management of rare species

(Specific measures and policies)

- Regarding rare aquatic wild species, the government will consider how entire ecosystems which contain them should be conserved and sustainably used, based on scientific knowledge. (MAFF)
- With regard to by-catches including sharks, seabirds and sea turtles, the government will conduct impact assessments on by-catches, as well as developing and improving appropriate technologies to avoid by-catches and raising awareness among fishermen, in order to reduce by-catches. (MAFF)

2.8 Promoting measures to prevent fishery damage caused by wildlife

(Specific measures and policies)

- The government will avoid the adverse effects of environmental changes on fisheries and take appropriate measures to prevent feeding damage while keeping in mind the conservation of biodiversity, including the effective removal of alien fish species and the conservation and management of the Great Cormorant. (MAFF)
- Regarding the Steller's sea lion, which is a rare species and also causes fishery damage, the government will promote damage prevention measures based on scientific knowledge such as the number of Steller's sea lions visiting relevant areas, while taking biodiversity conservation into consideration. (MAFF)
- The government will assess the predation situation for useful fishery resources by large organisms such as whales, and promote efforts to mitigate the impacts based on scientific findings. (MAFF)

3. Coastal environments

(Specific measures and policies)

- Aiming at harmony between the protection of the seacoast from damage, the conservation of the coastal environment and the proper use of the coast, which are the purposes of the Seacoast Law, the government will promote in coordination with river administration activities the “development of seacoasts in harmony with nature” which aims to conserve and restore coastal environments based on the characteristics of local coasts, through building consensus among stakeholders including local communities. (MLIT)

- The government will take measures to control coastal erosion by replenishing the sand on beaches, constructing submerged breakwaters and artificial reefs. It will also conserve and restore sandy beaches in order to create pleasant spaces where people can have contact with nature. (MAFF, MLIT)
- Through the “beach creation” projects, the government will restore beautiful sandy beaches using recycling-based methods that minimize the impacts of structures on the environment, for example by replenishing coasts where erosion is progressing with soil which has collected in estuaries, river channels and dams, soil which has collected at erosion control facilities to an abnormal level, soil which has accumulated in fishing ports and other ports and harbors, as well as soil which has collected on other beaches (“sand bypass”). In addition, the government will implement efficient and effective coastal erosion control measures, as well as working to conserve the natural environment and landscape. (MAFF, MLIT)
- For beaches that are important habitats for marine life such as sea turtles and the Japanese horseshoe crab and wild birds such as the little tern and plovers, as well as beaches where harmonization with the surrounding natural environment is particularly needed, the government will carefully decide on the placing and the designing of structures for facilities to be constructed as well as promoting sandy beach conservation. (MAFF, MLIT)
- For beaches which are the spawning grounds for sea turtles and beach plant communities with high naturalness, the government will consider expanding protected areas by designating them as National or Quasi-National Parks. The government will also strive to protect the areas by, where necessary, designating them as zones where vehicles and horses are not allowed to enter without permission, if they are in Special Zones specified under the Natural Parks Law. (MOE)
 [Current situation] The number of zones in National Parks where access by vehicles and horses is controlled: 35 zones in 19 parks (the end of FY2011)
 The number of zones in Quasi-National Parks where access by vehicles and horses is controlled: 17 zones in 10 parks (the end of FY2011)
- With regard to the development of coastal conservation facilities, the government will further promote a shift from the “line-based protection method” where coastlines are protected using seawalls and breakwaters alone to the “area-based protection method” where line-based protection facilities are combined with offshore facilities and sandy beaches. The latter improves the environment and the usability of coasts in addition to improving the protection because it also aims to restore sandy beaches and improve access to the coasts. (MAFF, MLIT)
- In order to develop easily usable coasts where all citizens can enjoy nature experiences, the government will improve access to the beaches and promote further coordination between various measures and policies targeting coasts and their surrounding areas. (MAFF, MLIT)
- Based on the Act for the Promotion of the disposal of Coastal Drifting Debris established in July 2009, the government will implement coastal drifting debris control measures comprehensively and effectively. Through the Meeting for Promoting Coastal Drifting Debris Control Measures, etc., the government will further promote measures to control coastal drifting debris in cooperation between relevant ministries and agencies. (MOE)

- The government will implement litter control measures and cleaning on coasts with the cooperation of local residents, volunteers, NGOs and others. It will also improve its awareness raising campaigns for improving public morals in order to avoid the degradation of coastal environments caused by disorderly use and garbage dumping. In addition, the government will implement beach protection activities and enhance environmental education in cooperation with local residents. More specifically, in the eco-coast projects, the government will implement public-private environmental conservation activities that tackle environmental issues endemic to each local area, through the participation of residents and NGOs from the planning stage. (MAFF, MLIT)
- Large pieces of beach debris disrupt the functioning of coastal conservation facilities by for example reducing the wave-damping function of sandy beaches, seawalls, etc. and preventing tide gates from functioning. Therefore, the government will implement treatment operations through the emergency projects for the treatment of large pieces of driftwood and waste generated by disasters. (MAFF, MLIT)
- With regard to beach debris, the government will conduct continuous monitoring in order to understand its nationwide distribution, the changes over time, etc. It will also support effective measures that suit local realities such as measures to control the generation of debris through regional cooperation transcending prefectural borders. The government will also continue its fact-finding efforts for ocean debris and seafloor debris and consider the measures necessary through cooperation between the relevant ministries and agencies. It will also work on fact-finding for debris derived from Japan including ocean debris generated in the Great East Japan Earthquake and strive to build cooperation with other countries concerned. (MOE)
- The government will support efforts by prefectural governments, etc. such as the collection and disposal of coastal drifting debris and measures to control the generation of debris which they conduct based on regional plans. (MOE)
- Regarding coasts in National Parks, the government will implement cleaning operations and beach debris removal operations, with the cooperation of local residents, through the programs for strengthening the conservation and management of National and Quasi-National Parks in sea areas (Marine Worker Programs). (MOE)
 [Current situation] The Marine Worker Programs are implemented in 14 National Parks which contain sea areas (FY2012).
- In order to achieve high quality coasts that are safe and in harmony with nature, the government will collect and organize basic information about the coasts. It will also promote surveys and research into coastal erosion over extended areas as well as surveys and research concerning the development of coastal conservation facilities that take into consideration the natural environment including ecosystems, by working with relevant research institutes. In addition, the government will work to build consensus among relevant parties about the coastal environments that should be conserved. For example, the ministries and agencies involved in coastal administration will identify the impacts and effects that coastal conservation facilities have on the natural environment including ecosystems, as well as conducting surveys and investigations into ecosystem-friendly coastal developments based on the idea of the “development of seacoasts in harmony with nature.” (MAFF, MLIT)

- There is a concern that global warming will cause changes in weather conditions and hydrographic conditions as well as causing a long-term rise in sea levels. There is a concern that there will be serious impacts on coasts including the progress of coastal erosion, an increase in below-sea-level areas, the escalation of damage by storm surges, and changes in the territories of organisms. For this reason, the government will monitor tide levels, ocean waves, etc. as well as considering the measures needed to cope with these changes. (MAFF, MLIT)
- The government will continue making efforts to ensure biodiversity on seacoasts through the above-mentioned various measures and policies. (MAFF, MLIT, MOE)

4 Port and harbor environments (Specific measures and policies)

- The government will promote the dredging of organic sludge which has been accumulated at the bottom of the sea. (MLIT)
- The government will effectively utilize the dredged materials generated through the maintenance of ports and harbors, and promote the creation of tidal flats and seagrass beds as well as backfilling depressions. (MLIT)
 [Current situation] The percentage of tidal flats restored: about 37.8% (the end of FY2011)
 [Target] The percentage of tidal flats restored: about 40% (the end of FY2016)
- The government will implement on-site demonstration tests for the utilization of recycled materials for the construction of tidal flats. (MLIT)
 [Current situation] The percentage of tidal flats restored: about 37.8% (the end of FY2011)
 [Target] The percentage of tidal flats restored: about 40% (the end of FY2016)
- The government will consider methods for regional-level dredged soil quality adjustment and its supply and demand adjustment. (MLIT)
- The government will promote the development of green spaces around ports and harbors which are inhabited by various organisms and where local residents can enjoy nature. (MLIT)
- When replacing obsolete structures, the government will promote the installation of port and harbor structures that have the function of habitats. (MLIT)

5 Marine pollution control measures

5.1 Measures to control pollution caused by marine activities (Specific measures and policies)

- The government will continue to actively participate in the discussions of the International Maritime Organization (IMO) towards the entry into force of the International Convention for the Control and Management of Ships' Ballast Water and Sediments. (MLIT, MOFA, MOE)
 [Current situation] The number of ratifying countries: 35, which equals 27.95% of the world's merchant fleet in terms of total tonnage (May 28, 2012).
 (Japan has not ratified the convention.)
- Towards the conclusion of the convention, the government will collect information about environmental impacts caused by ballast water, as well as collecting and analyzing basic

information about ballast water treatment technologies, etc., in order to consider preparation for accepting the convention at an early stage. (MOE, MLIT)

- With regard to Environmental Sensitivity Index Maps that show information needed to respond to the spillage of oil and hazardous and noxious substances, the government will update the information about biological resources (fish and benthos) as well as topography and ecology (tidal flats, seagrass beds, etc.) by taking into consideration changes in land use in coastal areas. (MOE)
 [Current situation] The maps are available on the website of the Ministry of the Environment. http://www.env.go.jp/water/esi/esi_title.html

5.2 Water purification measures in sea areas

(Specific measures and policies)

- In sea areas where there is considerable pollution, the government will promote water purification measures such as the removal of sludge which is affecting water quality, capping it with sand, and the removal of abandoned stranded ships. (MLIT)
 [Current situation] Out of the total area of seafloor which needs bottom material improvement in Tokyo Bay, Ise Bay and Osaka Bay, about 46.2% has been improved (the end of FY2011).
 [Target] Out of the total area of seafloor which needs bottom material improvement in Tokyo Bay, Ise Bay and Osaka Bay, about 50% will be improved (the end of FY2016).

5.3 The conservation of water environments in closed ocean areas

(Specific measures and policies)

- The government will disseminate and promote the ideas of Satoumi development and specific activities by utilizing the Sato-umi Net and the manual for developing Satoumi. The government will also conduct surveys and formulate action plans for reconstructing the sea areas which were severely affected by the Great East Japan Earthquake as fertile Satoumi. In addition, the government will disseminate the concept of “Satoumi” domestically and to other parts of Asia through symposia, etc. (MOE)
 [Current situation] Conducting surveys on the environment (water quality, bottom materials, seagrass beds, etc.) in five closed ocean areas in the Tohoku Region
 [Target] Formulate Satoumi reconstruction plans in local areas (up to 2013).
- With regard to Tokyo Bay, Ise Bay and the Seto Inland Sea, the government will steadily implement the 7th Total Pollutant Load Control with the target year of FY2014. With the recognition that there are still some sea areas that need further water environment improvements while there are other sea areas where Environmental Quality Standards (EQSs) have mostly been met, the government will consider fine-tuned measures in consideration of the location and the season. It will also make efforts to increase dissolved oxygen (DO) concentration in bottom layers. (MOE)
 [Current situation] The chemical oxygen demand (COD): Tokyo Bay: 183 tons/day, Ise Bay: 158 tons/day, the Seto Inland Sea: 468 tons/day (achievements in FY2009)
 [Target] The targets set in the 7th Total Pollutant Load Control (the target year of FY2014)

COD: Tokyo Bay: 177 tons/day, Ise Bay: 146 tons/day, the Seto Inland Sea: 472 tons/day

- In order to improve water quality in closed ocean areas, the government will promote measures and policy implementation including the reduction of inflowing pollutants and the conservation and restoration of tidal flats. (MLIT)
[Current situation] The percentage of tidal flats restored: about 37.8% (the end of FY2011)
[Target] The percentage of tidal flats restored: about 40% (the end of FY2016)
- With the aim of achieving the “Bay Renaissance” included in the third decision for the Urban Renaissance Projects, the government will promote various measures and policy implementation based on the Action Plan for Tokyo Bay Renaissance, the Osaka Bay Renaissance Action Plan and the Ise Bay Renaissance Action Plan. The government will also promote various measures and policy implementation based on the Hiroshima Bay Renaissance Action Plan, as well as implementing the Bay Renaissance Project in enclosed sea areas that need water environment improvements. The government will then conduct follow-ups in order to assess the achievement of the action plans, make efforts for their adaptive and effective implementation and revise the action plans if necessary. (MLIT, the Cabinet Secretariat, MAFF, METI, MOE)
- With regard to the conservation and restoration of the environment and ecosystems of sea areas such as the Ariake Sea and the Yatsushiro Sea, based on the committee report formulated by the Ariake Sea and Yatsushiro Sea Comprehensive Investigation and Evaluation Committee in December 2006, the government will implement surveys and studies on the proposed issues that need to be clarified as soon as it is ready to conduct each survey and study. More specifically, the government will identify the behavior of sediment and suspended solid in sea areas, develop comprehensive ecosystem evaluation models, and consider environmental improvement methods that utilize the functions that ecosystems have such as the water purification abilities of bivalves. (MOE)
[Current situation] It is likely that environmental degradation is continuing to occur such as the increasing size of red tides (the current situation in the Ariake Sea, the Yatsushiro Sea, etc. is determined by the evaluation committee).
[Target] The restoration of the Ariake Sea, the Yatsushiro Sea, etc. (specific targets for the restoration, time frames for the restoration, etc. will be discussed and decided upon by the evaluation committee).

Chapter 2 Cross-Sectoral and Fundamental Measures and Policies

[The mainstreaming and implementation]

Section 1 Promoting the mainstreaming of biodiversity

(Basic concepts)

The lifestyles based on mass-production and mass-consumption that we enjoy are a major factor threatening biodiversity. In order to hand down a rich level of biodiversity to future generations, the national government needs to provide opportunities for the citizens to obtain basic knowledge about biodiversity in cooperation with local governments, businesses, etc. It also needs to implement activities to let citizens understand that our life is supported by the benefits of biodiversity and to encourage each individual to take voluntary action.

It is necessary that the importance of the conservation of biodiversity and the sustainable use of its components should be widely recognized by diverse entities including national and local governments, businesses, NPOs, NGOs, citizens and that this recognition leads to each entity taking action accordingly. We call this “the mainstreaming of biodiversity.”

In order to promote the mainstreaming of biodiversity, it is necessary to raise public awareness by vigorously providing people with opportunities to have contact with nature, increasing opportunities for people to experience the benefits of biodiversity and expanding opportunities for education on biodiversity. Therefore, the government will develop spaces for nature experiences in National and Quasi-National Parks where rich natural environments can be found as well as rural districts, river areas and city parks where nature can be found close to where people live. The government will also promote participatory surveys of living organisms, ecotourism and green tourism as well as supporting environmental education and learning activities conducted by schools, private organizations, etc. The government will thus increase opportunities for people to experience first-hand the benefits obtained from biodiversity and ecosystems (ecosystem services) and local cultures which coexist with local natural environments.

The government will also show in a clear manner the importance of the conservation and sustainable use of biodiversity by conducting economic valuations of the various types of value that biodiversity contains. It will thus encourage diverse entities to take into account the value of biodiversity in their decision making. In addition, the government will raise public awareness about certification systems for biodiversity-friendly products and services and the economic measures for biodiversity conservation.

In order to conserve biodiversity, it is essential for various entities including national and local governments, businesses, nationally and locally active NPOs and NGOs and citizens to cooperate and collaborate with each other rather than just implementing their individual activities. The Tenth Meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10) which was held in Nagoya City, Aichi in Japan in October 2010 produced various outcomes that encourage the participation of and cooperation between various entities, including the promotion of the early establishment of the Global Platform for Business and Biodiversity and recommending the adoption of the United Nations Decade on Biodiversity. The government will promote the mainstreaming of biodiversity in Japan by facilitating cooperation between various entities through the Japan Committee for the United Nations Decade on Biodiversity established in September 2011 and by utilizing the framework for conservation activities through the cooperation among regional diversified actors, etc. based on the Act on the Promotion of Regional Cooperation for Biodiversity put into force in October 2011.

1 Promoting communication and public involvement (Specific measures and policies)

- In order to strongly promote cooperative efforts between various parties including the national government, local governments, the business community, the media, NGOs, NPOs, young people and experts, the government will continue activities conducted in partnership between various parties through the Japan Committee for the United Nations Decade on Biodiversity (UNDB-J) which is made up of various parties. (MOE)
- The government will work with UNDB-J to hold the National Meeting on Biodiversity roughly once a year, as a venue for people from various sectors nationwide to gather together and exchange views and information while presenting their activities on biodiversity. (MOE)
- The government will work with UNDB-J to conduct special projects on specific topics relevant to each year, such as holding side events for COP 11. (MOE)
- The government will work with UNDB-J to hold regional seminars and workshops in various parts of Japan, in coordination and cooperation with the Environmental Partnership Offices (EPOs) in different parts of Japan, youth organizations, universities, natural history museums, zoos, aquariums, botanical gardens, etc. (MOE)
- The government will work with UNDB-J to select and recognize cooperative projects that UNDB-J will recommend out of the projects registered in the Nijyu-maru Project (Double Circle campaign) which is conducted by the Japan Committee for International Union for Conservation of Nature (IUCN-J), from the standpoints of “cooperation between diverse parties,” “the importance of their efforts,” “the effect of the PR activities about their efforts,” etc. (MOE)
- In order to implement effective Communication, Education & Public Awareness (CEPA), the government will work with UNDB-J to raise awareness among various entities through implementing various programs such as “Chikyu-Ikimono-Oendan (the earth’s organisms support team),” the “Declaration of My Actions” and the “Green Wave,” publish PR brochures, as well as identifying, evaluating, developing and utilizing various tools and items (such as UNDB-J recommended books). (MOE)
- In an effort to disseminate an understanding of biodiversity among a wide range of people, the government will publicize the communication phrase and its logo “Chikyu-no-Inochi, Tsunaide-iko (linking life on the earth)” which expresses biodiversity using more simple and easy-to-understand words. The government will also effectively utilize the logo of UNDB-J symbolizing the activities of UNDB-J which was established with the aim of promoting specific actions through participation with and cooperation between various sectors towards the achievement of the Aichi Biodiversity Targets. It will also effectively utilize “Tayo, Sato and their friends” which are the PR characters for children. (MOE)
- In order to inform the general public about the importance of biodiversity and promote business and consumption activities that take into consideration biodiversity, the government will implement PR campaigns through tie-ups with various activities, hold events on biodiversity and participate in environment-related exhibitions held in various parts of Japan. (MOE)

- According to a poll conducted by the Cabinet Office in FY2012, those who knew the meaning of the word “biodiversity” and those who do not know the meaning but had heard of it, accounted for 56% of those polled. The government will conduct awareness raising campaigns with the aim of increasing the number to 75% or more by the end of FY2019. (MOE)
 [Current situation] The degree of recognition for the word “biodiversity”: 56% (2012)
 [Target] The degree of recognition for the word “biodiversity”: 75% or more (the end of FY2019)
- According to a poll conducted by the Cabinet Office in FY2012, those who knew the content of the “National Biodiversity Strategy of Japan” and those who do not know the content but had heard of it accounted for 34%. The government will conduct awareness raising campaigns with the aim of increasing the number to 50% or more by the end of FY2019. (MOE)
 [Current situation] The degree of recognition for the “National Biodiversity Strategy of Japan” title: 34% (FY2012)
 [Target] The degree of recognition for the “National Biodiversity Strategy of Japan” title: 50% or more (the end of FY2019)
- The number of times the term “biodiversity” was used in major newspapers (Asahi, Mainichi and Yomiuri) was 736 times in total in FY2008. The government will conduct PR and awareness raising campaigns with the aim of increasing the number to 1,500 times by FY2019. (MOE)
 [Current situation] The number of times the term “biodiversity” was used in major newspapers: 736 times (FY2008)
 [Target] The number of times the term “biodiversity” was used in major newspapers: 1,500 times (FY2019)
- The government will support voluntary community activities for biodiversity conservation and restoration such as the conservation of rare wild animal and plant species, the conservation and management of wildlife, measures to control alien species and the conservation and restoration in priority areas that serve as hubs for ecological networks. It will also support the formulation of statutory plans based on the Basic Act on Biodiversity, the Act on the Promotion of Regional Cooperation for Biodiversity and other laws. (MOE)
- In order to help and encourage local governments to formulate Regional Biodiversity Strategies, the government will support their formulation through the support project for regional biodiversity conservation activities. It will also introduce to local governments examples of existing strategies as well as revising and disseminating “The Guide for the Formulation of Regional Biodiversity Strategies.” (MOE)
 [Current situation] The number of prefectural governments which have formulated their Regional Biodiversity Strategy: 18 (the end of March 2012)
 [Target] The number of prefectural governments which have formulated their Regional Biodiversity Strategy: 47 (FY2020)
- The government will support biodiversity conservation and restoration projects conducted by local governments in areas that are found to be important for biodiversity conservation, by providing a grant for the autonomous regional development strategy (a grant scheme under the control of the Cabinet Office). (MOE)

- In order to facilitate the formulation of plans for conservation activities through the cooperation among regional diversified actors based on the Act on the Promotion of Regional Cooperation for Biodiversity, the government will hold local seminars with the participation of diverse entities including local governments, local NPOs and NGOs. The government will thus promote the deepening of understanding about the law and the system, the sharing of problems and good practices and the building of momentum for cooperation between the relevant parties. (MOE, MAFF, MLIT)
- The government will prepare materials which explain the system stipulated in the Act on the Promotion of Regional Cooperation for Biodiversity in an easy-to-understand manner as well as collecting examples of biodiversity conservation activities taking place in various parts of Japan and analyzing any problems. The government will then create a website for the promotion of regional cooperation and disseminate the information nationwide. (MOE, MAFF, MLIT)
- Based on the “technical matters to be considered regarding biodiversity conservation in Green Basic Plans” formulated in 2011, the government will promote the formulation of Green Basic Plans that give consideration to biodiversity conservation. The government will also promote the participation of residents and the disclosure of information in the formulation of the plans, in order to improve transparency. (MLIT)
- The government will implement public awareness measures and policies so that goodwill donations from citizens and business operators such as companies will be more effectively utilized for biodiversity conservation activities. These activities include: National Trust activities which aim at nature conservation through acquiring and conserving private land with rich natural environments using donations, etc. from citizens and other parties; greening projects by Greenery by Golf Group; and the Keidanren Nature Conservation Fund which gives subsidies for natural environment conservation projects at home and abroad. (MOE)
- The government will prepare an Annual Report on Biodiversity in Japan which describes the biodiversity situation and the measures and policies implemented by the government for the conservation and sustainable use of biodiversity. It will submit the report to the Diet (the Japanese parliament) and hold meetings to read the report in various parts of Japan, in order to widely disseminate the report. (MOE)
- The government will promote better understanding by citizens about biodiversity-friendly production by utilizing “Ikimono Marks” which indicate that the agricultural, forestry and fishery products are produced with an emphasis on biodiversity conservation and will give farmers information about the organism inhabitation situation, the surrounding environment and farming history in existing cases of paddy rice cultivation that have achieved both food production and biodiversity conservation, in order to make the farmers better understood about such farming methods and to increase their motivation. The government will also domestically and internationally disseminate information about the contribution to biodiversity conservation by agriculture, forestry and fisheries in Japan. (MAFF)
- In order to support activities in partnership with various entities, the government will collect and provide information as well as providing venues for exchanges, using the Global Environment Outreach Centre and regional Environmental Partnership Offices as the hubs for such activities. (MOE)

- In order to raise interest in biodiversity and deepen understanding about biodiversity among the general public, the government will implement participatory surveys in cooperation with various relevant organizations and experts, where citizens will participate in the collection of a wide range of information about changes in the natural phenomena close to where they live and the distributions of wild species. The government will then disseminate the survey results widely. (MOE)
- In order to make rivers more attractive as habitats for diverse living organisms, the government will coordinate and cooperate with citizen groups in various fields such as the development of biotopes, the restoration of waterside vegetation and town development activities using rivers, as well as formulating river improvement plans by including residents' opinions. (MLIT)
- With a view to further implementing the types of administration and management of national forest that citizens wish to see such as biodiversity conservation, the government will collect views and comments from the public prior to the drafting of plans such as regional administration and management plans, as well as disclosing wherever possible the results of assessments for past activities, the achievements and the current situation, the relevant numerical values and other reference information. For each program conducted based on the plans, the government will consider systems to quantitatively assess their effectiveness in each forest plan area using multiple indicators, from the standpoint of biodiversity conservation and sustainable use of its components. (MAFF)
- Through the measures and policies set out in “2. Interaction with nature”, “3. Education, learning and experience”, “4. Human resource development”, “5. Economic valuation”, and “6. Promoting efforts by businesses and consumers” shown below, the government will not only take action but also facilitate voluntary action and cooperation between diverse parties including local governments, companies and other business operators, NGOs and the citizens. (MOE, MEXT, MAFF, MLIT)

2 Interaction with nature

2.1 The promotion of nature interaction activities (Specific measures and policies)

- The government will implement awareness raising campaigns to deepen understanding about the importance of nature experience activities among communities, companies, etc. The government will also promote nature experience activities for young people by facilitating improvements in the quality of nature experience activity instructors who teach young people. (MEXT)
- Through the National Institution for Youth Education, the government will promote nature experience activities for young people by providing opportunities and places for young people to take part in nature experience activities, etc. at national youth education facilities, training instructors and improving their quality, as well as supporting nature experience activities, etc. conducted by private organizations. (MEXT)
- Using natural parks that have exceptional natural environments as activity fields, the government will promote public awareness campaigns on biodiversity conservation. The government will publicize Japan's wonderful natural environment at home and abroad and will

develop and provide information to deepen citizens' understanding about the natural environment and their interaction with nature. (MOE)

- The government will promote environmental education, ecotourism and other activities that consider and implement qualitative improvements in natural park usage. (MOE)
- In order to prevent the destruction of vegetation and disturbance of wildlife habitats through the over-concentration of visitors in one place and other forms of overuse in natural parks, the government will consider and implement management methods to reduce the number of people going to overused areas by guiding them to use different parts of natural parks at different time, as well as designating and managing Regulated Utilization Areas based on the Natural Parks Law. (MOE)
[Current situation] The number of Regulated Utilization Areas: two (the end of FY2011)
- The government will provide programs for children to interact with various natural environments ranging from accessible nature to primeval nature, by utilizing after school hours, by experiencing long-term stays in rural districts and by having a go at the duties of Park Rangers in National Parks. Through these nature experience activities using the five senses, the government will help children to learn about various topics including the benefits of nature and the relationships between humans and nature as well as helping them to mature as human beings. (MOE, MEXT)
- The government will promote the efforts of natural park guides and park volunteers, in order to ensure the appropriate use of natural parks and enhance their conservation activities. (MOE)
- The government will organize various events for interaction with nature such as nature observation gatherings in various parts of Japan particularly during Greenery Month (from April 15 to May 14), the Get-to-Know Nature Campaign (from July 21 to August 20) and the National Nature Trails Walking Month (October). The government will also aim at increasing opportunities for people to interact with nature by posting event information about facilities for interactions with nature and nature experience activities on the website of the Ministry of the Environment called "Love the Nature Club." (MOE, MLIT)
- Regarding the website "Internet Nature Information System" which provides a wide range of nature information such as information about National Parks, the government will add content, revise information and conduct other necessary upgrading, in order to contribute to promoting people's interaction with nature. (MOE)
- In order to deepen citizens' understanding about and raise their interest in the functions of forests and the importance of using wood, the government will implement the following measures: promoting the "Forest Kids Club Activities" which provide children with opportunities for introductory forest experience activities; developing forests and forest-related facilities that provide venues for forest experience activities and providing information about them; developing human resources; creating systems for hosting forest and forestry experience activities; and conducting public awareness campaigns. (MAFF, MEXT)
- Junior Green Clubs conduct activities through which children commune with greenery, cherish greenery, protect and bring up greenery, so that children can mature as spiritually rich human beings who cherish their hometown and care for others. The government will support

exchanges between Junior Green Clubs and their efforts to improve their activities through the exchanges. (MAFF)

- The government will promote forest environmental education activities by utilizing the “Fun Forest” system and other systems on national forest. (MAFF)
 [Current situation]
 - Development of activity spaces and the creation of nature experience and learning programs are being implemented in 18 areas nationwide.
 - “Fun Forest” agreements concluded: 172 sites (as of the end of FY2010)
- In national government parks that have biodiversity-rich Satochi-Satoyama environments, the government will continue with efforts to improve and conserve the environment with the participation of citizens. It will also provide hands-on experience programs to learn about precious natural environments and local history and culture in these areas. Thus the government will promote the utilization of areas with Satochi-Satoyama environments as hub areas for citizens to take environmentally-conscious actions towards the establishment of sustainable recycling-oriented societies with low environmental impacts at the community level. (MLIT)
- In city parks, etc., local governments are implementing many environmental education programs where people learn about the ecology of organisms and the mechanisms of nature through hands-on experience, using rich and characteristic local natural environments, in cooperation with local NPOs, schools, etc. The government will continue to promote the training of environmental education volunteers and the provision of new programs. (MLIT)
 [Current situation] The area of city parks developed: 118,056 hectares, the number of sites: 99,874 (March 2011)
- In order to widely disseminate information about the important roles that sewage systems play including water circulation in cities and the control of pollutants discharged into public waters, the government will promote information sharing between sewage system administrators and local residents. It will also clarify through environmental education the roles of sewage systems including their contribution to conserving diverse ecosystems, so that children will correctly learn about the mechanisms of sewage systems and the roles of sewage systems in watershed areas. The government will also vigorously utilize sewage facilities as educational venues for example by organizing visits to treatment plants. (MLIT)
- Vast green areas in National Gardens situated in inner cities (Kokyo Gaien National Garden, Shinjuku Gyoen National Garden and Kyoto Gyoen National Garden) are perfect places for environmental education. All these gardens have many historical remnants and cultural assets and they are suitable as places to learn about history as well as the environment. Therefore, the government will promote environmental learning using nature and environmental education that teaches the relationship between culture and nature. In particular, the government will promote new environmental education programs which tap into natural resources using “Mother and Child Forests,” etc. (MOE)
- In order to improve hands-on river experience programs for children, the government will register waterside areas that are suitable for children to play and promote their utilization, through coordination between the Ministry of Land, Infrastructure, Transport and Tourism, the Ministry of Education, Culture, Sports, Science and Technology and the Ministry of the

Environment, and in cooperation with those involved in education in local areas, local governments and private organizations (the “Children’s Waterfront” rediscovery project). (MLIT, MEXT, MOE)

- In order to promote environmental education activities for children, the government will provide vigorous support such as releasing educational materials on the Internet for environmental learning using rivers. (MLIT)
- Water quality surveys which use aquatic life in rivers as indicators provide good opportunities to raise awareness of citizens about environmental problems through them having contact with their immediate natural environments while conducting the surveys. Therefore, the government will continue implementing participatory surveys of aquatic life. (MOE, MLIT)
- The government will promote fishing village development that taps into attractive local resources including rich levels of biodiversity. It will also promote the conservation and development of good fishing village landscapes that are friendly to citizens, as well as promoting efforts to hand down historical and cultural assets to future generations. (MAFF)
- The government will cooperate with local governments and NPOs to implement “Seaside Nature School” programs in various parts of Japan which provide nature experiences and environmental education programs using seaside natural environments. (MLIT)
[Current situation] Seaside Nature Schools: 17 sites (FY2011)

2.2 Providing places for interaction with nature

(Specific measures and policies)

- In places where natural ecosystems have disappeared or changed in National Parks, the government will restore wetlands, tidal flats, seagrass beds, forests with high naturalness and other natural environments that have been lost. (MOE)
- For Quasi-National Parks, the government will provide a grant for the autonomous regional development strategy (a grant scheme under the control of the Cabinet Office) to support local government programs that take advantage of local characteristics to develop places for human interaction with nature and to conserve and restore natural environments. (MOE)
- In order to prevent the destruction of vegetation and disturbance of wildlife habitats through the over-concentration of visitors in one place and other forms of overuse in National Parks, the government will implement appropriate facility development, including the construction of boardwalks on wetlands and the installation of off-limits fences around alpine plant communities. (MOE)
- The government will develop forests and forest-related facilities that provide venues for forest experience activities, provide information about them, and create systems for hosting forest and forestry experience activities. (MAFF)
[Current situation]
 - The government is implementing the development of activity spaces, education and experience programs in 18 areas nationwide.
 - The government held the National Children’s Summit on School Forests and Fun Forests.

- In infrastructure development such as farmland consolidation, it is important to conserve networks of ecosystems and water environments such as paddy fields, waterways and reservoirs. To this end, the government will take into consideration the entire area which should be covered by each network and specify the species to be conserved in order to conserve local endemic ecosystems. Through obtaining the understanding and participation of local residents, the government will systematically promote infrastructure improvement in a way that pays close attention to the life cycle and migration routes of respective specified species. (MAFF)
[Current situation] Projects are ongoing in nine districts (FY2012).
- The government will promote the development of spaces where people can interact with living organisms close to where they live, through the development of urban agriculture. (MAFF)
- The government will promote the development of city parks that have hub facilities for environmental learning activities such as hands-on experience facilities, natural ecology gardens and facilities for protection and propagation of animals and plants. (MLIT)
- Regarding green spaces other than city parks, the government will support the creation of opportunities for environmental education by vigorously utilizing civic green spaces and green spaces that have been established and are open to the public based on local government regulations. (MLIT)
- The government will develop the facilities, etc. needed to revitalize fishing villages by deepening understanding of and interest in fisheries and fishing villages among citizens through the promotion of exchanges between cities and fishing villages such as hands-on experience programs and nature experience programs, as well as promoting the settlement of new residents in fishing villages. (MAFF)
- The government will conduct nature-oriented river works. In this method, while ensuring safety by taking the necessary flood control measures, the alteration of rivers is avoided to the maximum extent possible and alterations are minimized if alterations are needed, for the purpose of conservation and the creation of diverse river landscapes, sound habitats and breeding grounds for living organisms. This method therefore aims at enabling the restoration of sound natural environments by utilizing the characteristics and mechanisms of nature to the maximum extent possible. (MLIT)
- The government will establish councils made up of river administrators, local governments, those involved in education, citizen groups, etc. and work with local communities to implement waterside developments including riverbank improvements to make riverside areas accessible, the creation of rapids, pools and shallows, so that river areas can be used as locally available places for children's recreation and education (the "Waterfront Fun School Project"). (MLIT)
- The government will implement river improvements that are incorporated into local area developments, by harmonizing the river facilities with the natural environment of the rivers and with the surrounding natural, historical and social environments, in order to develop sound waterside spaces which become landmarks in the local towns. (MLIT)
- The government will implement river improvements that take into consideration the improvement of waterside environments and biodiversity, for rivers that meet the following criteria: they run through the centers of large cities and their environs; they need improvements

urgently; the development of sound waterside spaces is particularly needed; and it is necessary and effective to conduct a river improvement project combined with riverside urban district development in light of conditions in the surrounding urban districts. (MLIT)

- The government will promote erosion control projects for the creation of mountain stream areas with abundant water and greenery, in areas with excellent natural and social environments. The aims of the projects are to improve the residents' living environment, enhance the landscape and accessibility to water areas as well as restoring ecosystems, by harmonizing mountain streams with the surrounding natural environment and securing greenery and waterside spaces, thus restoring good mountain stream conditions which are suitable for the surrounding community environments. (MLIT)
- Regarding green belts that contribute to maintaining and enhancing the flood control function of banks, the government will develop them by taking into consideration the conservation and creation of natural ecosystems and in a way that allows them to be used for recreation purposes such as strolling, nature appreciation and hands-on nature experiences. (MLIT)
- In order to promote the utilization of rich natural environments around ports and harbors by citizens and to increase the opportunities for them to learn about the importance of natural environments, the government is restoring tidal flats, etc. which can be used by local governments and NPOs to conduct natural and social education activities. (MLIT)
 [Current situation] The percentage of tidal flats restored: about 37.8% (the end of FY2011)
 [Target] The percentage of tidal flats restored: about 40% (the end of FY2016)
- When developing coastal conservation facilities, the government will consider the use of "area-based protection method" which develops gently sloping coastal dikes and sandy beaches where necessary in addition to the development of seawalls and breakwaters, while taking into consideration the living organism inhabitation situation in the relevant areas. Thus the government will promote the development of user-friendly coasts that are easily accessible by all citizens to interact with nature. (MAFF, MLIT)
- Regarding long nature trails, the government will revise the plans for routes that are no longer suitable for use due to changes in social circumstances, etc. because a long period of time has passed since the project plan for each route was formulated. The government will also support the projects through public work projects under the direct control of the national government and by providing a grant for the autonomous regional development strategy (a grant scheme under the control of the Cabinet Office). The government will thus steadily implement environmental improvements to make the trails more attractive for users. (MOE)
 [Current situation] The length of trails subject to improvement plans: 26,726 km (the end of December 2010)
- For priority conservation areas such as Special Protection Zones and Class I Special Zones as well as priority use areas such as Facility Complex Zones in National Parks, the government will develop mountain trails (through such measures as the installation of signs, scour repair and vegetation restoration) in order to increase safety and promote the appropriate use of the areas, as well as developing activity hub facilities needed to work with local communities to organize ecotourism. The government will also promote the introduction of universal designs at the facilities so that everybody can use them safely and comfortably. The government will also

develop view-point facilities, standardized multilingual guide signs and long nature trails along which visitors can experience nature, history and culture, in order to improve the attractiveness and services at National Parks which have exceptional natural environments. (MOE)

3. Education, learning and experience

3.1 School education

(Specific measures and policies)

- The Japanese government will participate in the Global Learning and Observations to Benefit the Environment (GLOBE) program initiated by the United States and designate GLOBE participating schools. (MEXT)
[Current situation] The number of GLOBE participating schools: 15 (FY2012)
- The government will hold Environmental Learning Fairs and other events for participants from around the country to present excellent examples of environmental education practices and exchange information. (MEXT)
[Current situation] The number of registered participants for the Environmental Learning Fair: 307 (FY2010)
- The government will promote various hands-on experiences including long-stay nature programs. (MEXT)
[Current situation] The percentage of elementary schools in Japan which conduct nature experience activities involving an overnight or longer stay: 85% (FY2010)
- The government will improve school facilities by taking into consideration harmony with nature and the reduction of environmental impacts, and utilize the improved facilities for environmental education. (MEXT, MAFF, METI, MLIT)
[Current situation] Under the Eco-School Pilot Model Program, the government certified 1,340 schools which installed photovoltaic systems, planted grass on their playgrounds, developed biotopes, etc. (April 2012)
- The government will hold an introductory training course for environmental education instructors targeting community members involved in environmental conservation activities and teachers. (MEXT, MOE)
[Current situation] The number of registered participants for the course: 70 (FY2011)

3.2 Out-of-school activities and lifelong education

(Specific measures and policies)

- The government will continue supporting efforts to promote learning activities that use natural monuments by cooperating with local governments, by for example developing facilities for the utilization of natural monuments, in order to increase environmental learning opportunities. (MEXT)
[Current situation] The number of facilities for the utilization of natural monuments: nine (the end of March 2012)
- The government will support efforts to solve various local problems including environmental problems as part of social education activities. (MEXT)

- The government will continue to improve zoos, botanical gardens, aquariums, natural history museums, etc. in order to support various learning activities for people. It will also improve activities conducted at museums so that they will stimulate the visitors intellectual curiosity and inquiring minds. (MEXT)
- The government will provide programs for children to interact with various natural environments ranging from accessible nature to primeval nature, by utilizing after school hours, by experiencing long-term stays in rural districts and by having a go at the duties of Park Rangers in National Parks. Through these nature experience activities using the five senses, the government will help children to learn about various topics including the benefits of nature and the relationships between humans and nature as well as helping them to mature as human beings. (MOE, MEXT, MAFF)
- The government will continue to implement the Children and Rural Communities Interaction Project which promotes long-stay experiences in rural communities for elementary school students, in an effort to deepen their understanding of biodiversity through agricultural experiences and nature experiences. (MIC, MEXT, MAFF)
- The government will promote “Junior Eco-Club” which supports children’s voluntary environmental learning and conservation activities, in coordination and cooperation with companies, private organizations, etc. (MOE)
- The government will develop a database on environmental education, which collects information on environmental education-related knowledge, venues, teaching materials, modelcases, etc. and disseminate it widely. (MOE)
- The government will identify cases of Education for Sustainable Development (ESD) activities conducted in various parts of Japan, and will visualize, share and disseminate them as good practices, as well as training personnel to be a coordinator to promote collaboration on ESD, in order to establish community-based ESD across the country. (MOE)
- The government will register projects conducted by businesses, citizens and private organizations which develop and provide teaching materials for environmental education or environmental conservation on condition that they meet specific criteria. The government will then promote the wide use of the registered projects. (MOE)
- In order to support activities in partnership with various parties, the government will collect and provide information as well as providing opportunities for exchanges, using the Global Environmental Outreach Centre and regional Environmental Partnership Offices as the hubs for such activities. (MOE)
- In order to improve hands-on river experience programs for children, the government will register waterside areas that are suitable for children to play and promote their utilization, through coordination between the Ministry of Land, Infrastructure, Transport and Tourism, the Ministry of Education, Culture, Sports, Science and Technology and the Ministry of the Environment, and in cooperation with those involved in education in local areas, local governments and private organizations (the “Children’s Waterfront” rediscovery project). (MLIT, MEXT, MOE)

- In order to ensure that environmental conservation activities and environmental education are effectively conducted by citizens, private organizations and others, the government will designate private organizations that meet specific criteria, which provide information and advice on the activities, recommend or introduce instructors, etc. The government will then promote the wide use of services provided by the designated organizations. (MOE)
- The government will appropriately implement the system where prefectural governors certify land and buildings provided by the owners as venues for hands-on experience opportunities such as nature experience activities. (MOE)

4 Recruiting and developing human resources (Specific measures and policies)

- In order to disseminate the idea of nature conservation, the government will train park volunteers in National Parks, etc. nationwide. (MOE)
- The government will implement training programs at nature schools, etc. nationwide in order to develop human resources who can serve as instructors and guides for nature schools, ecotours, etc. (MOE)
- In cooperation with local governments, educational institutions, NPOs and others, the government will support nationwide activities of the “coastal expert training course (training seminars for instructors of coastal nature experience programs)” which targets men and women aged 18 or older. The course aims to train instructors in coastal hands-on experience and environmental education. (MLIT)
- The government will hold an introductory training course for environmental education instructors targeting community members involved in environmental conservation activities and teachers. (MEXT, MOE)
[Current situation] The number of registered participants for the course: 70 (FY2011)
- The government will register personnel who have expertise and experience in environmental conservation as “Environmental Counselors” and promote the wide use of their services. (MOE)
- The government will register programs conducted by businesses, citizens and private organizations on condition that they meet specific criteria, which develop or certify human resources who can conduct environmental education or environmental conservation. The government will then promote the wide use of the registered programs. (MOE)
[Current situation] The number of registered programs: 38 (April 2012)
- The government will connect environmental conservation activities and environmental education individually conducted by universities, companies, NPOs, etc., through the Environmental Consortium for Leadership Development (EcoLeaD) which was established based on the Environmental Leadership Initiatives for Asian Sustainability. The government will thus promote the development of environmental human resources through collaboration between these actors. (MOE)
[Current situation] Membership: 83 members (April 2012)

- In order to contribute to international discussions on biodiversity, the government will identify, support and train experts in the field of biodiversity in Japan and dispatch them to meetings related to the Convention on Biological Diversity (CBD). (MOE, MOFA and other relevant government offices and ministries)

5 Economic valuation (Specific measures and policies)

- Regarding Nature Conservation Areas and natural environment conservation measures in Japan, the government will promote the economic valuation of biodiversity as well as the evaluation of economic losses derived from the loss of biodiversity and the costs of effectively conserving biodiversity. The government will also publicize the evaluation results and consider ways to utilize the evaluation results. (MOE)
- Through collecting and disseminating existing valuation cases and methods and other information about the economic valuation of biodiversity, the government will raise public awareness about the value that biodiversity contains and encourage various entities to voluntarily conduct economic valuations of biodiversity. (MOE)
- The government will provide information about examples of PES (Payment for Ecosystem Services) systems through which beneficiaries of ecosystem services pay for the benefits, including the “forest environment tax” being implemented by some prefectural governments. The government will thus promote the introduction of such systems in Japan. (MOE, MAFF)
- The government will promote efforts to develop a type of market where various relevant parties including investors recognize and highly value sound and environment-conscious real estate properties developed in consideration of energy conservation, carbon emission reductions, biodiversity, etc. and a type of market where continuous investments are made in this type of real estate. (MLIT)

6 Promoting efforts by businesses and consumers (Specific measures and policies)

- Through disseminating and publicizing the Guidelines for Private Sector Engagement in Biodiversity to businesses, the government will encourage them to set and disclose policies for sustainable business activities, in order to facilitate their action for biodiversity conservation and the sustainable use of its components. (MOE)
- The government will collect and disseminate information about environmental certification systems which certify environmentally friendly products and services, indicators for assessing the relationship between business activities and biodiversity, commendation systems for good practices that contribute to biodiversity conservation, etc. The government will thus promote private sector engagement in biodiversity. (MOE)
- The government will coordinate and cooperate with frameworks for collaborations between businesses including the Japan Business and Biodiversity Partnership voluntarily established by the business community. (MOE)
- In order to increase the number of biodiversity-conscious “smart consumers,” the government will raise awareness among consumers by promoting existing environmental certification

systems and vigorously providing information about businesses that deal with certified products and businesses that are committed to biodiversity conservation. (MOE)

- Under the laws concerning systems that contribute to biodiversity conservation such as the Natural Parks Law and the City Green Zone Conservation Law, there are systems to compensate land owners for losses generated by restrictions. There are also systems for the government to purchase private land in natural parks, special green space conservation districts and the like. The government will continue to appropriately utilize these systems. (MOE, MLIT)
- The government will implement public awareness measures and policies so that goodwill donations from citizens and business operators such as companies will be more effectively utilized for biodiversity conservation activities. These activities include: National Trust activities which aim at nature conservation through acquiring and conserving private land with rich natural environments using donations, etc. from citizens and other parties; greening projects by Greenery by Golf Group; and the Keidanren Nature Conservation Fund which gives subsidies for natural environment conservation projects at home and abroad. (MOE)
- The government will support environmental conservation activities by private organizations through the Japan Fund for Global Environment, the River Environment Fund and the Forest Fund for Green and Water. (MOE, MAFF, MLIT)
- The government will promote forest management and greening using donations collected by the Green Fund based on the Act on Advancement of Forest Maintenance Backed by Green Fund. (MAFF)
- The government will support the development of city parks and the conservation of green spaces, as well as subsidizing greening projects. (MLIT, MAFF)
[Current situation] The area of city parks developed: 118,056 hectares, the number of sites: 99,874 (March 2011)
 The area of special green space conservation districts: 2,369 hectares, the number of sites: 419 (March 2011)
- There are tax incentives such as preferential treatment for financial contributions made to specific public-interest promotion corporations engaged in natural environment conservation activities including biodiversity conservation. There are also tax exemptions applied to income tax, corporate tax or local tax concerning land in areas designated as natural parks, protection forests, etc. (MOE, MAFF)
[Current situation] The special tax exemption is applied to capital gains from selling land in Special Zones in National or Quasi-National Parks or in special areas in Nature Conservation Areas to the national government or local governments.
 Achievements: About 8,700 hectares of private land have been turned into national or other public land so far.

[Conservation and management of wild organisms]

Section 2 Appropriate conservation, management and other measures for wild organisms

(Basic concepts)

Over 90,000 wild species are known to live in Japan. Wild organisms are an important element of biodiversity, which is a common asset for human beings. In order to build a desirable relationship between humans and wild organisms where diverse wild species ranging from familiar local species to rare species can survive into the future, it is important to implement appropriate conservation and management of wild organisms.

In order to conserve threatened species, it is essential to accumulate knowledge about the species including information about their ecology, the inhabitation situation, the factors contributing to declines, the conservation situation and conservation techniques. It is then important to appropriately take measures in accordance with each species characteristics and the factors contributing to their decline, etc. by effectively utilizing various existing relevant systems, through cooperation between the national government, local governments, experts and other parties.

Regarding the conservation of threatened wild organisms, the government regulates their capture, transfer, etc. by designating National Endangered Species based on the Law for the Conservation of Endangered Species of Wild Fauna and Flora. The government is also formulating plans for the Conservation Programmes defined by the law and implementing projects to propagate threatened species and conserve their habitats. In particular, there are highly endangered species which have a small population such as the Japanese crested ibis, the Tsushima leopard cat and rare plant species on the Ogasawara Islands. For these species, it is necessary to steadily implement ex-situ conservation measures where the species are artificially raised and propagated with a view to returning them to the wild, in addition to conserving sound natural environments in their habitats so that various wild organisms can coexist.

With regard to threatened species that are affected by international trade, it is important to appropriately control their trade under the framework of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and by using relevant domestic laws.

On the other hand, there are also wildlife species whose population and distribution is expanding, including the Sika deer and the wild boar. This has led to conflicts between humans and wildlife such as the increasing damage to agriculture, forestry and fisheries in addition to increasing the impacts on ecosystems. Although various measures have been taken, there are many problems that still need to be solved. For example, there is a continuing decline in the number of hunters, who are the main actors in the conservation and management of wildlife. It is necessary to develop management systems and establish methods which can cover for the decline in the number of hunters, as well as tackling the management of wildlife species that are distributed over large areas.

Therefore, the challenge for the future is to develop systems that enable efficient capture by recruiting the necessary workforce and promoting community-wide capture activities, as well as taking other various measures to reduce conflicts between humans and wildlife in an integrated manner, and further promoting scientific systematic conservation and management through cooperation between the relevant parties.

Outbreaks of highly pathogenic avian influenza among wild birds and poultry have been identified in various parts of Japan in recent years, therefore the impacts of the disease on wild bird populations as well as humans and poultry are becoming a concern. In order to appropriately respond to infectious diseases carried and spread by wildlife, it is important to ensure the early detection of the infectious diseases as well as strengthening information sharing and other cooperation between the relevant ministries, agencies, prefectural governments, neighboring countries, etc.

When looking at the relationship between domestic animals and biodiversity, they can cause problems such as having impacts on native ecosystems when they are introduced to natural ecosystems. Therefore, it is important to appropriately conduct rearing management for domestic animals. With regard to rearing wild animal species, it is generally difficult to ensure appropriate rearing environments suitable for the animals' instincts, habits, physiology and ecology. Therefore, the rearing of such animals should be limited.

The basic idea of animal welfare is that, in light of the fact that animals are living beings, no person should kill, injure, or inflict cruelty on animals without due cause, and every person should treat animals properly by taking into account their natural habits. It is necessary to keep this idea in mind in order to achieve harmony between humans and animals and to conserve biodiversity.

1 The conservation of threatened species and their habitats

1.1 The Red List

(Specific measures and policies)

- With regard to the Red List which was revised in 2012, the government will raise public awareness about the list and prepare for the next revision. For the next revision, the government will conduct surveys in order to understand the inhabitation situation for species included in the Red List and the candidate species where necessary. (MOE)
- As for the Red Data Book (which is a compilation of information such as the inhabitation situation based on the Red List), the government will prepare a revised version which contains the latest inhabitation situation, etc. for each species in FY2013. It will then publish it in FY2014, disseminate and publicize it. (MOE)
- As basic information for nationwide conservation of threatened species, the government will collect information about the factors currently preventing the recovery of the species included in the Red List, the conservation measures implemented by various entities and effective conservation methods. The government will also consider developing systems to share and utilize relevant information more effectively, including the distribution data collected over the years by national and local governments, etc. (MOE)

1.2 The conservation of Endangered Species of Wild Fauna and Flora

(Specific measures and policies)

- The government conducted progress checks for the conservation of threatened wild organisms in Japan in FY2011. Based on the results, the government will prepare the “strategy for the conservation of threatened wild species (tentative name)” which sets out how conservation for nationally threatened species should be implemented and the priority order for species to be conserved. The government will then review the Law for the Conservation of Endangered Species of Wild Fauna and Flora and take necessary measures, based on the implementation

status for the law examined during the progress checks and the results of discussions in the process of preparing the conservation strategy. (MOE)

- The Red List prepared by the Ministry of the Environment evaluates the risk of extinction for individual species based on their inhabitation situation in Japan. Among Threatened species Category IA (CR) and Threatened species Category I (CR+EN) listed on the Red List, there are species which have a particularly high possibility of extinction where control measures are likely to be effective. For these species, the government will designate them as National Endangered Species based on the Law for the Conservation of Endangered Species of Wild Fauna and Flora, by taking into consideration the priority order for conservation to be stipulated in the conservation strategy which will be created at a future date. In particular, for species that could be marketed nationwide and therefore are particularly prone to capture and gathering pressures, the government will consider prioritizing their designation. It will aim to designate 25 new species or so by FY2020. (MOE)
[Current situation] The number of National Endangered Species: 90 (September 2012)
[Target] Designate 25 more species as National Endangered Species (by FY2020).
- Among the National Endangered Species, there are species which need more vigorous measures to maintain and restore the populations in addition to removing or mitigating factors affecting the species, for example maintaining and improving their habitats, propagating the species in zoos or botanical gardens and returning them to the wild. For these species, the government will formulate and implement the plans for the Conservation Programmes defined by the law. (MOE, MEXT, MAFF, MLIT)
- With regard to controlling the trade of rare wild species, the government will continue to work on the prevention and exposure of illegal acts, consider and implement effective domestic distribution controls, through coordination and collaboration between the relevant ministries, agencies and other organizations. (MOE and other relevant government offices and ministries)
- Since habitats must be secured for the stable survival of threatened wild animal and plant species, the government will promote the designation of Natural Habitat Conservation Areas in such a manner as to give priority to areas where habitats are maintained in good condition for National Endangered Species of Wild Fauna and Flora, while coordinating closely with other relevant protection measures such as the Wildlife Protection Area and the natural park systems where necessary. The government will also reorganize protection areas based on the protection area designation policies to be stipulated in the strategy for the conservation of threatened wild species which will be created at a future date. (MOE)
- The government will implement appropriate management of Natural Habitat Conservation Areas, maintenance and improvement of habitats in accordance with the conservation guidelines laid down for each Natural Habitat Conservation Area. The government will also work on identifying the inhabitation status of species subject to conservation and revise conservation guidelines and areas if necessary. (MOE)
- Regarding changes in the inhabitation situation for Endangered Species of Wild Fauna and Flora in areas likely to be vulnerable to the impacts of global warming such as alpine areas and coastal areas, the government will continue focused monitoring using Monitoring Sites 1000, etc. (MOE)

- The government will conserve the habitats for rare wild animal and plant species in “forest reserves.” It will also thin artificial forests in “green corridors” in order to develop feeding environments for rare wild animal and plant species and habitats for their prey, as well as conducting monitoring surveys in order to understand forest conditions and the inhabitation of wild animals and plants. As for wild species that need particularly focused conservation, the government will identify their inhabitation status and maintain or improve their habitats. (MAFF)
 [Current situation] The area of forest reserves: 903,000 hectares (April 2011)
 The area of green corridors: 586,000 hectares (April 2011)
- Regarding the conservation of rare plant species, a review of the progress for the conservation of plant species in Japan was conducted in response to the adoption of the Global Strategy for Plant Conservation at the Sixth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity in FY2002. The review was led by an NGO made up of various parties including citizens and researchers. The government will implement conservation activities by referring to the results of the review. (MOE)
- As for threatened birds of prey, in order to maintain their habitats in good condition, the government will revise the “guidelines for the conservation of birds of prey” which lay down the guidelines for the conservation of the golden eagle, the hawk eagle and the goshawk. It will also work to increase the number of birds of prey species subject to the guidelines. (MOE)
- As for the dugong, the government will continue implementing surveys of their habitats and ecology as well as taking measures to enable coexistence between fishermen and the dugong. It will also collect information with a view to designating the dugong as a National Endangered Species under the Law for the Conservation of Endangered Species of Wild Fauna and Flora. (MOE)

1.3 Ex-situ conservation (Specific measures and policies)

- Based on the Basic Policy for Ex-situ Conservation of Endangered Species of Wild Fauna and Flora in Japan, the government will deepen cooperation with implementation bodies and other relevant organizations including zoos, botanical gardens, aquariums, insectariums and research institutes, and identify the current ex-situ conservation situation as well as promoting ex-situ conservation efforts for threatened species. (MOE and other relevant government offices and ministries)
- With regard to the Japanese crested ibis, the government has been working to increase the artificially reared population by breeding them in captivity using a pair given by China in 1999. Since it has become possible to sustain the population size at a certain level, after preparing an environment suitable for the inhabitation of the birds, the government started to implement the systematic release of the birds on Sado Island in Niigata which used to be a habitat of the species, in order to establish a wild population. There have been some major steps towards the establishment of the population in the wild, including the births of ibis chicks in April 2012 from some of the released pairs as well as young birds fledging in the wild. The government will continue these activities with the aim of increasing the number of birds established in the wild on Sado Island including the eastern part of Kosado to 60 individuals by around 2015. The government will also continue cooperative efforts for the conservation of the Japanese crested ibis with China based on the Japan-China Joint Crested Ibis Preservation Plan signed in 2010. It

will also prepare for receiving two more birds in order to conserve the genetic diversity of the species. (MOE, MAFF, MLIT)

[Current situation] The wild population size: about 50 birds (July 2012)

[Target] The wild population size: Establish about 60 birds in parts of Sado Island including the eastern part of Kosado (by around 2015).

- With regard to the Tsushima leopard cat, the government will promote the dispersion and increase of artificially reared populations in cooperation with the Japanese Association of Zoos and Aquariums and various zoos in an effort to establish sustainable artificially reared populations while taking into consideration genetic diversity. It will also strengthen efforts to return them to the wild, with the aim of starting training programs for their adaptation to the wild by 2014. (MOE)
- Threatened plant species are cultivated using greenhouses and other facilities in Shinjuku Gyoen National Garden. The government will enhance this project and promote the genealogical conservation of threatened species, the implementation of the Conservation Programmes defined by the law, as well as exhibiting the threatened species mainly using the new greenhouse. (MOE)
- As for plants, the collection and preservation of seeds is an effective way to avoid the risk of decreases in the number of species and genetic diversity within species. Therefore, the government will construct a system for seed preservation centered on Shinjuku Gyoen National Garden and promote seed preservation for threatened plant species in cooperation with the Japan Association of Botanical Gardens and various botanical gardens. (MOE)
[Target] Preserve seeds and spores for which the natural growth area is known, for 15% of Japanese threatened plant species (253 species) (by 2020).

2 The conservation and management of wildlife

2.1 The designation and management of Wildlife Protection Areas (Specific measures and policies)

- The government will promote the designation of Wildlife Protection Areas and Special Protection Zones, which are core systems for wildlife protection, in order to secure wildlife habitats and contribute to maintaining, restoring and improving local biodiversity that includes all animals and plants. The government will promote the designation of priority wildlife conservation areas chosen from a national or international viewpoint as National Wildlife Protection Areas, in coordination with relevant organizations. The government will also reorganize protection areas based on the protection area designation policies to be stipulated in the strategy for the conservation of threatened wild species which will be created at a future date. (MOE)
- The government will work on securing ecological networks including international networks of migratory bird habitats by promoting the designation of migration destinations for flocks of birds as Wildlife Protection Areas, while closely coordinating with other relevant protection measures such as measures on natural parks. (MOE)
- The government will appropriately manage Wildlife Protection Areas by implementing regular patrols and wildlife inhabitation surveys as well as promoting appropriate guidance for the use of the areas by people, public awareness campaigns on wildlife ecology and conservation and development of suitable environments for wildlife inhabitation. For National Wildlife

Protection Areas in particular, the government will strengthen their management based on master plans which give protection and management guidelines for each Wildlife Protection Area. When wildlife habitat environments deteriorate in Wildlife Protection Areas, the government will conduct projects for conserving and improving wildlife habitats as necessary, including the construction of wildlife breeding and feeding facilities, water quality improvement facilities for lakes, etc. and fences to prevent animals which affect wildlife inhabitation from invading the areas. (MOE)

2.2 Regulations on the capture of wildlife (Specific measures and policies)

- Through ensuring compliance with hunting regulations, the government will promote the appropriate use of traps to prevent mistaken capture and ensure the prevention of the dangers associated with hunting. It will also collect information to understand the current mistaken capture situation. (MOE)
- Through the monitoring of the inhabitation status of game species, the government will revise the designated game species and the capturing restrictions on a regular basis. It will also consider the basic policy on game species and how information should be gathered. As for game species for which monitoring methods have not been established, the government will consider suitable monitoring methods and share the information with local governments, etc. (MOE)

2.3 Scientific and systematic conservation and management (Specific measures and policies)

- The government will implement the following measures including providing support for community efforts: the effective and efficient monitoring of wildlife inhabitation, recruiting and training core personnel for wildlife protection and management, regulating the population size, managing habitats such as the development of buffer zones, and the prevention of damage by installing guard fences and removing crop refuse. (MOE, MAFF)
- With regard to species whose population and distribution have significantly expanded and cause damage to ecosystems, agriculture, forestry and fisheries such as the Sika deer and the wild boar, the government will systematically implement measures on a scientific basis in accordance with the Specified Wildlife Conservation and Management Plans, including the control of the population size through capture, the installation of damage prevention facilities and habitat improvements. The government will also support the development of facilities to treat and process captured animals in order to promote their utilization as local resources. The government will also consider methods to estimate the population size of these species nationwide in an effort to improve the accuracy of the estimations. (MOE, MAFF)
- As for wildlife species that migrate over large areas across prefectural borders such as the Great Cormorant and bears, the government will promote cooperation between the relevant ministries, agencies and prefectural governments by establishing councils, in order to promote the preparation of guidelines for regional conservation and management based on which the national government and relevant prefectural governments will create the Specified Wildlife Conservation and Management Plans. The government will also identify the inhabitation status for local populations and implement damage control measures accordingly. Through these

measures the government will ensure the consistency of the conservation and management measures implemented by the relevant organizations. (MOE, MAFF, MLIT)

- Fishery damage caused by the harbor seal, which is a rare wild animal species, is becoming more serious. Therefore, the government will promote comprehensive protection and management measures while fully taking into consideration the conservation of the species. (MOE)
- As for wildlife species whose population and distribution has significantly expanded such as the Sika deer, the challenge is to increase the number captured. Therefore, the government will work to popularize efficient capturing techniques and develop frameworks for capture. (MOE)
- In order to develop local areas where people can coexist with wildlife through ensuring the separation of wildlife habitats from human settlements, the government will cooperate with local governments, NPOs and the like to take comprehensive measures including conducting surveys for wildlife inhabitation and damage in remote national forests, as well as cooperating on the improvement of wildlife habitats and wildlife population control. (MAFF)
- In Shiretoko National Park, Minami Alps National Park and Yakushima National Park, Sika deer are having adverse effects on ecosystems and the landscape such as the degeneration of natural vegetation. The government will therefore formulate Plannings of Ecosystem Maintenance and Recovery Work with the aim of taking preventive, adaptive and scientific measures, and will implement measures such as the installation of vegetation guard fences and population control based on the plans. (MOE, MAFF)
- The government will raise public awareness about the measures to stop damage to the human living environment caused by crows, such as the use of garbage containers with lids. (MOE)
- As of April 2012, 120 Specified Wildlife Conservation and Management Plans in 46 prefectures have been formulated and are being implemented by prefectural governors, targeting Sika deer, bears, wild boar, etc. Information about their inhabitation and the damage caused by them is continuously monitored and adaptive management is being implemented. In order to support the effective implementation of the plans, the government will supplement or revise the guidelines for the creation of Specified Wildlife Conservation and Management Plans where necessary, based on the latest findings. (MOE)
 [Current situation] The guidelines for four species were revised (2010).
 [Target] Supplementing or revising the guidelines: the guidelines for six species, about 12 times in total (by 2020)
- In order to secure and train the workforce for wildlife conservation and management, the government will promote technical training projects targeting local government officials, hunters, etc., personnel registration projects to register and utilize personnel who have expertise and techniques that can be used in the conservation and management of wildlife, and projects to hold seminars to help participants obtain hunting licenses. (MOE, MAFF)
 [Current situation] 15 times (FY2012)
 [Target] The total number of training sessions, seminars, etc. held: 120 times (by FY2020)

- Hunting plays a role in regulating wildlife populations. Therefore, the government will try to ensure and utilize hunters who can contribute to wildlife conservation and management. It will also appropriately manage hunting practices such as the prevention of any dangers associated with hunting and the effective utilization of captured animals. (MOE, MAFF)
- The government will encourage farmers who have been affected by wildlife damage to use traps to capture wildlife. Since those who have no license can now assist with the capturing work, the government will promote community-wide efforts for wildlife conservation and management, through implementing model projects to develop community-wide capturing frameworks. (MOE, MAFF)
- Due to the aging of those engaged in agriculture, forestry and fisheries and the decreasing number of hunters, the government will promote the establishment of wildlife damage control measure implementation teams for community-wide damage prevention efforts. (MOE, MAFF)
- Regarding forest damage caused by wildlife, the government will promote: the installation of damage prevention facilities and equipment such as guard fences and feeding damage prevention tubes; capture to regulate population size; the development and dissemination of new wildlife control technologies; the training of wildlife control technicians; and the improvement of wildlife surveillance and control arrangements. (MAFF)
- While ensuring further coordination between wildlife conservation and management measures conducted by the relevant ministries and agencies, the government will implement effective, wide-area measures to stop wildlife damage by taking into account the wildlife inhabitation situation and the damage caused by them. The government will also promote the development of broad-leaved forests by giving consideration to wildlife habitats. (MAFF)
- The government will implement the above-mentioned measures and policies in coordination with other relevant measures and policies, so that synergies can be obtained. (MOE, MAFF)

2.4 Surveys and research into wildlife habitats (Specific measures and policies)

- The government will continue to conduct the National Survey on the Natural Environment. As part of the survey, it will collect and organize information about the inhabitation of major wildlife species nationwide. In particular, in order to conduct meticulous conservation and management measures and policies for birds and mammals that greatly affect ecosystems, agriculture, forestry and fisheries in Japan, such as the Sika deer and bears, the government will promote prioritized surveys of these specified wild animals to estimate the population size nationwide focusing on quick reporting as well as promoting surveys to identify changes over time. (MOE)
- Regarding information about captured wildlife reported by hunters or those who have permits to capture wildlife, the government will collect the information and organize it as mesh-based positional information. (MOE)
- The government will improve database systems that utilize geographic information systems (GIS). (MOE)

- Regarding wildlife that is particularly causing damage to agricultural produce and ecosystems, the government will conduct surveys and research into population control methods, methods to identify the size and the density of the populations, damage prevention technologies, etc., in order to prevent damage and appropriately manage the wildlife. (MOE, MAFF)
- As part of efforts to promote the protection of migratory birds, the government will continue to conduct banding surveys at bird observation stations and the national census on geese, ducks and swans to identify the current status of their habitats in tidal flats, lakes, etc. As part of the Monitoring Sites 1000 project, the government will conduct monitoring surveys on the inhabitation of geese, ducks and shore birds in major stopover areas. Those surveys and research concerning wildlife conservation and management will be implemented effectively through cooperation with private organizations and other relevant parties. (MOE)
- In order to develop local areas where people can coexist with wildlife through ensuring the separation of wildlife habitats from human settlements, the government will cooperate with local governments, NPOs and the like to take comprehensive measures including conducting surveys for wildlife inhabitation and damage in remote national forests, as well as cooperating on the improvement of wildlife habitats and wildlife population control. (MAFF)

2.5 The prevention of illegal capture (Specific measures and policies)

- The 2011 revision of the Basic Guidelines for Wildlife Protection Projects stipulated that the capture of wildlife to keep as pets is banned with some exceptions approved by prefectural governors. The government will let people know about the change and promote appropriate rearing. The government will work towards banning any capture of wildlife to keep as pets and let the relevant parties know about the changes. (MOE)
- With the effective utilization of wildlife protection officers as well as cooperation with the police, local governments and nature conservation groups, the government will strengthen controls on illegal capture and rearing. (MOE)

2.6 Wildlife relief systems, etc. (Specific measures and policies)

- The government will strive to correctly understand the causes of infectious diseases and the impacts of lead and other hazardous substances released into the natural environment, by examining sick or wounded wild animals that have been rescued. The government will also promote the designation of areas where hunting using lead shot is banned under the Designated Hunting Prohibited Area system, based on the Wildlife Protection and Hunting Management Law, in an effort to protect waterbirds and large birds of prey from lead poisoning. The government will rigorously implement the ban on leaving the carcasses of wildlife killed through hunting or other ways. (MOE)
- In cooperation with local governments and private organizations, the government will develop systems for accommodating rescued sick or wounded wildlife, set up systems for their rehabilitation, as well as considering target wildlife species, while taking into consideration the control of infectious diseases. It will also consider the future policy for rescuing sick and wounded wildlife in light of the current rescue situation. (MOE)

- The Training Center for Waterfowl Rescue will continue to provide training to local government officials, etc. in order to be prepared for any oil pollution accident that temporarily generates a large number of oil-contaminated waterbirds and to be ready for quick action in affected areas. (MOE)

2.7 Raising public awareness (Specific measures and policies)

- The understanding and cooperation of local residents are essential to ensure appropriate conservation and management of wildlife, and the voluntary participation of local residents in conservation and management measures is also needed. Therefore, the government will make vigorous efforts to raise public awareness, give advice and guidance for the purpose of deepening understanding among the public about the appropriate relationship between humans and wildlife. Those efforts include the creation of opportunities for people to interact with wildlife, the implementation of education on the natural environment, informing people about the adverse impacts of inappropriate feeding and providing facts on the damage caused by wildlife to ecosystems, agriculture, forestry and fisheries. (MOE, MAFF)
- Cooperation between national and local governments, research institutes, private organizations and other relevant parties is important for the promotion of appropriate conservation and management of wildlife, and the government will improve and strengthen the cooperation. (MOE, MAFF)

2.8 Avian influenza, etc. (Specific measures and policies)

- In Japan, there have been outbreaks of highly pathogenic avian influenza (HPAI) among poultry and wild birds (such as the whooper swan) since FY2004. In particular, in 2010 and 2011, HPAI was detected consecutively in the carcasses of poultry and wild birds (15 species including the tufted duck and the hooded crane in various parts of Japan. Based on the possibility that migratory birds and other wild birds are spreading the viruses, the government will monitor the carriers of HPAI viruses by checking dead wild birds and the droppings of migratory birds nationwide in cooperation with prefectural governments, with the aim of contributing to the conservation and management of wildlife in Japan and the understanding infection routes. The monitoring will be conducted based on the Technical Manual on Wild Bird Highly Pathogenic Avian Influenza Surveillance. (MOE)
- In the event of an outbreak of HPAI, the government will send public workers and experts to the affected site immediately to conduct an inspection of the site, give guidance and advice and conduct environmental sampling, in order to check whether the virus is widely spread in wild bird populations including migratory birds. (MOE)
- In order to contribute to an early response to outbreaks in Japan, the government will strengthen cooperation with neighboring countries that are on the migration routes for migratory birds and share information about outbreaks of avian influenza with them. (MOE)
- The government will strive to clarify the migration routes of migratory birds. (MOE)
- In order to enable a prompt response to outbreaks of zoonoses such as HPAI, the government will regularly provide information to citizens and relevant organizations, as well as cooperating

and sharing information with prefectural governments, the relevant ministries and agencies. (MOE, MHLW, MAFF)

- Regarding other infectious diseases that can be carried or spread by wild animals such as foot-and-mouth disease and West Nile fever, the government will strive to collect information in order to enable an early response to the spread of the diseases in wild animal populations. (MOE)

3 Welfare and proper management of animals

3.1 Promoting the appropriate management of animals (Specific measures and policies)

- In light of the fact that animals are living beings, the government will let the general public know about the need for appropriate rearing management for animals based on each species' physiology, habits and ecology as well as informing people about prohibited acts such as the abandonment of animals and cruelty to animals. The government will also steadily implement measures involving animal handling businesses who will be required to install signboards and give customers information about the characteristics and the condition of the animals for sale prior to selling them, with the aim of improving their business operations. As for artificially reared animals including laboratory animals, the government will appropriately implement relevant laws and raise awareness of those involved in order to prevent the animals from escaping. (MOE)
- The government will seek to reduce the number of dogs and cats taken to prefectural facilities, etc. from 420,000 in FY2004 to half of that number by FY2017, through efforts to promote spaying and neutering to prevent uncontrolled breeding, raise public awareness about collective community efforts to take care of stray cats, encourage people to take lifelong care of their pet and not to make a snap decision to get a pet. The government will also seek to reduce the ratio of seized animals that are put to sleep, by encouraging efforts to find new owners for them. (MOE)
[Target] Halve the number of dogs and cats taken to prefectural facilities, etc. from the FY2004 level to 210,000 (by FY2017).

3.2 Promoting the use of identification devices (Specific measures and policies)

- The government plans to increase the percentage of dogs and cats with ownership identifications from 33% for dogs and 18% for cats in FY2003 to 66% for dogs and 36% for cats by FY2017, through raising public awareness about the need of ownership identification. Through cooperation with local governments and relevant organizations, the government will improve the infrastructure for popularizing ownership identification methods, by developing a centralized data management system, disseminating identification technologies and deploying microchip readers. (MOE)
[Target] The percentage of dogs and cats with ownership identification: Increase the percentage from 33% in FY2003 to 66% for dogs and from 18% to 36% for cats (by FY2017).

3.3 Comprehensive public awareness measures

(Specific measures and policies)

- The national and local governments will cooperate with relevant organizations to carry out various educational and publicity activities concerning the welfare and management of animals, their health and the safety of pet food, including events during the Be Kind to Animals Week, seminars for appropriate animal rearing, the creation and distribution of various awareness raising materials, etc. The government will also promote the development of local human resources such as Animal Welfare Promoters. In addition, the government will continue conducting various fact-finding surveys on animal rearing and use the results to develop measures and conduct public awareness activities for appropriate animal rearing. (MOE)
- [Current situation] The number of Animal Welfare Promoters: 2,801 (April 1, 2011)

Section 3 Measures to control alien species and other factors causing disturbances to ecosystems

(Basic concepts)

Due to progress in economic and social globalization, the movement of humans and goods have increased and organisms are now artificially moved beyond their traveling range. This has led to increasingly serious impacts on ecosystems, etc. caused by invasive alien species in recent years.

Regarding alien species control measures, the Invasive Alien Species Act has produced positive results by regulating the import and rearing of IAS and invigorating control efforts in each local area, which has led to local eradication or lower population densities for the mongoose, for example on Amami-oshima Island. However, progress can only be seen in a limited number of cases. For example, the expansion of the raccoons distribution has not been successfully stopped and further efforts are needed. There are also an increasing number of cases of alien species establishing themselves after being brought into Japan unintentionally on imported materials, etc. There are also concerns about the impacts of alien species introduced from other parts of Japan on local ecosystems, and genetic disturbances among native species caused by the introduction of the same species with different genetic traits, through for example the release of medaka and fireflies.

As the first step in preventing damage caused by alien species, it is important to specify the invasive alien species and prevent their introduction and establishment. For artificially reared alien species, it is necessary to appropriately manage them and prevent them from escaping. As for already established alien species, the systematic and efficient implementation of measures is needed to achieve targets such as eradication and containment based on scientific knowledge and cost-effectiveness, in accordance with the priority orders for measures set for different stages including the initial stage of establishment, the distribution expansion stage, and the infestation stage. In particular, alien species at the initial establishment stage should be controlled quickly before damage begins surfacing because early control is more effective. Since the problems of alien species are closely related to our daily lives, it is important to obtain support and cooperation of local residents and other relevant parties in order to implement countermeasures in coordination.

As for the use of genetically modified organisms, it is necessary to continue implementing appropriate impact assessments based on the Law concerning the Conservation and Sustainable Use of Biological Diversity through Regulation on the Use of Living Modified Organisms (Cartagena Law), in order to prevent genetically modified organisms impacting on biodiversity.

Abiotic factors such as chemical substances and artificial lights can also affect ecosystems. It is important to implement measures for appropriate surveys, the evaluation and management of impacts on ecosystems, including toxicity and the endocrine-disrupting effects of chemical substances on animals and plants.

1 Alien species control measures

(Specific measures and policies)

- Five years have passed since the Invasive Alien Species Act was put into force. Therefore the government will examine the implementation status for the law, review the law and take necessary measures in light of the outcomes from COP 10. (MOE, MAFF)
- Through the appropriate enforcement of the Invasive Alien Species Act including restrictions on the import or rearing of IAS, the government will ensure the prevention of their adverse

effects on agriculture, forestry and fisheries and on ecosystems. It will also strengthen public awareness activities in cooperation with various sectors to deepen people's understanding about the problems caused by alien species and the measures to control them. (MOE, MEXT, MAFF)

[Current situation] The percentage of people who know the meaning of the word "alien species": 64.7%

The percentage of people who understand the content of the Invasive Alien Species Act: 11.8%

[Target] Increase the percentage of people who know the meaning of the term "alien species" to 75% and the percentage of people who understand the content of the Invasive Alien Species Act to 25% (by 2017).

- Through the formulation of "an action plan to prevent damages and risks caused by alien species in Japan (tentative name)", the government will promote systematic controls based on the priority order for the controls, clarify the division of roles between different entities and encourage them to take action to control alien species. (MOE, MAFF)

[Current situation] Considering the formulation of "an action plan to prevent damages and risks caused by alien species in Japan (tentative name)"

[Target] Formulate "an action plan to prevent damages and risks caused by alien species in Japan (tentative name)" (FY2013).

- The government will create an Alien Species Blacklist (tentative name) which lists particularly invasive alien species including species that are not subject to statutory regulations, that are causing damage to ecosystems, etc. in Japan or are likely to cause damage in the future. It will then compile information about their distribution, their establishment routes and the policy direction for control measures. Thus the government will promote alien species control measures including awareness raising and systematic controls. (MOE, MAFF)

- Regarding the mongoose which is a threat to rare species on Amami-oshima Island, the government will establish more effective methods for capturing them in areas with a low mongoose population density in order to capture the mongoose until they are eradicated. The government will also consider the target year for eradication on a scientific basis. It will also consider more efficient and effective control methods, with the aim of achieving early eradication. The government will also implement alien species control projects mainly in priority conservation areas including the habitats of rare species, National Parks and forest reserves. It will also consider effective control methods for various species including the raccoon and the largemouth bass and encourage local governments to use them in their control activities. (MOE, MAFF)

[Current situation] The total number of mongooses captured and the number of mongooses captured per 1,000 trap-days (C/1000TD) on Amami-oshima Island: 272 mongooses and 0.13 C/1000TD, respectively (FY2011)

[Target] The total number of mongooses captured and the number of mongooses captured per 1,000 trap-days (C/1000TD) on Amami-oshima Island: zero for both (Time frame: The government plans to set the target year by the end of FY2012, on a scientific basis.)

- The government will promote effective alien species control measures mainly implemented by local residents by supporting community efforts through the support program for the promotion of biodiversity conservation and by implementing activities in National Parks through the

Special Programs to Engage the Public in Nature Conservation Activities in National Parks (Green Worker Programs). (MOE)

[Current situation] Implementing alien species control measures through the Green Worker Programs in 18 National Parks nationwide (FY2011)

- The government will develop effective methods to eradicate invasive alien fish species with the aim of preventing feeding damage. (MAFF)
- The government will consider and implement measures to prevent the impacts of alien species in areas which have characteristic ecosystems such as the island ecosystems on the Ogasawara Islands and the Nansei Islands. In this process, the government will also implement in an integrated manner measures on private forests that neighbor national forests or exist in between national forests, by utilizing agreement systems for the maintenance and the enhancement of the public benefit functions. (MOE, MAFF)
[Current situation] The total number of mongooses captured and the number of mongooses captured per 1,000 trap-days (C/1000TD) on Amami-oshima Island: 272 mongooses and 0.13 C/1000TD, respectively (FY2011)
[Target] The total number of mongooses captured and the number of mongooses captured per 1,000 trap-days (C/1000TD) on Amami-oshima Island: zero for both
(Time frame: The government plans to set the target year by the end of FY2012, on a scientific basis.)
- The government will clarify the basic policy on the use of alien greening plant species and native greening plant species produced overseas, for the greening of National Parks, city parks and on roadside slopes. It will also examine how alien greening plant species and native greening plant species produced overseas should be appropriately managed. (MOE, MAFF, MLIT)
- The government will collect and analyze the impacts on ecosystems of alien greening plant species (such as alien pasture species) and native greening plant species produced overseas. It will also work on fact finding for the genetic diversity of native greening plant species in order to promote the use of locally produced native species for greening. (MOE)
- The distribution of alien species in rivers has expanded rapidly in recent years and this has become a major problem in some rivers. The government will continue implementing alien species control measures in rivers as well as implementing surveys of and research into alien vegetation, alien fish species and investigate effective measures. (MLIT)
- The government will study and consider more effective control measures at points of entry to prevent the introduction and establishment of alien species, including their unintentional introduction. (MOE)
- As for problems caused by alien species brought in from other parts of Japan and native species which have different genetic traits, the government will create “an action plan to prevent damages and risks caused by alien species in Japan (tentative name)” and an Alien Species Blacklist (tentative name) in order to clarify the basic policy on their control and to call various parties’ attention to the species. The government will also take control measures and promote

the proper management of artificially reared animals in priority areas for biodiversity conservation, by appropriately implementing the Natural Parks Law, the Nature Conservation Law, etc. (MOE)

- The government will continue to actively participate in the discussions of the International Maritime Organization (IMO) towards the entry into force of the International Convention for the Control and Management of Ships' Ballast Water and Sediments. (MLIT, MOFA, MOE)
[Current situation] The number of ratifying countries: 35, which equals 27.95% of the world's merchant fleet in terms of total tonnage (May 28, 2012).
(Japan has not ratified the convention.)

2 Genetically modified organisms, etc.

(Specific measures and policies)

- Through the appropriate implementation of the Cartagena Law, the government will prevent impacts from the use of genetically modified organisms, etc. on biodiversity, thus conserving biodiversity. (MOE, MOF, MEXT, MHLW, MAFF, METI)
- The government will accumulate scientific knowledge that contributes to the appropriate operation of the Cartagena Law, including the consideration of appropriate methods to assess the impacts on biodiversity based on the latest findings. (MOE, MOF, MEXT, MHLW, MAFF, METI)
- The government will release information about the Cartagena Law, its enforcement status and the scientific findings through websites, etc. in order to raise public awareness about the law and genetically modified organisms, etc. (MOE, MOF, MEXT, MHLW, MAFF, METI)

3 Abiotic factors including chemical substances

(Specific measures and policies)

- Based on the revised Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. promulgated in May 2009, the government will require business operators who manufacture or import more than a specific quantity of any chemical substance to report the previous year's quantity every year. It will also require that they submit toxicity information where necessary. Thus the government will steadily implement safety assessments by taking into consideration the impacts on ecosystems, etc. The government will also develop and conduct trials on pretest methods for determining whether there is long-term toxicity for birds that are at the top of the food chain. It will also develop and conduct trials on Quantitative Structure Activity Relationship (QSAR) models which predict ecological toxicity from chemical structural formulas and physical and chemical properties. (MOE, METI)
[Current situation] 95 substances have been designated as priority assessment chemical substances (the end of March 2012).
[Target] For all chemical substances including those on the market before 1973 when the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. was established, the government will look through the content of reports and existing findings on toxicity. Based on the information, it will designate "priority assessment chemical substances" which need to be given priority to assess the safety. The government will then conduct risk assessments for the designated substances.

- The government will encourage businesses to voluntarily make improvements to their management of chemical substances. It will aggregate and disclose data on the quantities of chemical substances hazardous to human health and ecosystems released into the environment or moved outside of business establishments, for the purpose of preventing any environmental conservation problems. (MOE, METI)
 - [Current situation] Based on the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof, the government aggregated and disclosed in March 2012 data on the quantities of chemical substances subject to the law emitted or moved in FY2010 that were reported by businesses. The total reported amount of chemical substances emitted or moved was 381,000 tons and the total unreported amount estimated by the government was 270,000 tons.
 - [Target] Every year, the government will aggregate and disclose the quantities of chemical substances subject to the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof released into the environment or moved to outside business establishments.
- The government will conduct surveys for identifying the persistence of chemical substances in various media including water, bottom materials, organisms (shellfish, fish and birds) and the atmosphere. It will also continue to conduct initial environmental risk assessments which screen chemical substances with a relatively high environmental risk by taking into consideration their ecological impacts. (MOE, MAFF)
 - [Current situation] The government identified the persistence levels of 1,222 substances in the period between FY1974 and FY2010 through the Environmental Surveys of Chemical Substances. It has also conducted initial risk assessments from the standpoint of the ecological impacts, for 291 substances as of May 2012.
- In response to the problems caused by the endocrine-disrupting effects of chemical substances, in 2010 the government prepared the “MOE’s Further Actions on Endocrine Disrupting Effects of Chemical Substances: EXTEND (Extended Tasks on Endocrine Disruption) 2010.” Based on this framework, the government will implement field surveys by experts, fundamental research to understand mechanisms and the development of test methods. It will also accelerate the speed of establishing methods to assess endocrine-disrupting effects and the speed of conducting assessments. (MOE)
 - [Current situation] The government is considering assessment methods and implementing assessments of the impacts caused by endocrine-disrupting effects through testing of individual chemical substances.
- Category designation for water quality standards for the conservation of aquatic life has been completed for 37 water areas as of the end of FY2011. The government will consider category designation for the rest of the sea areas as soon as the information needed for deliberation for each sea area is prepared. The government aims to complete category designation for 40 water areas by the end of FY2012. (MOE)
 - [Current situation] 37 water areas (the end of FY2011)
 - [Target] 40 water areas (the end of FY2012)

- The government will educate prefectural governments about category designation for water areas by prefectural governments, based on the notification “The processing standards for category designation for water areas by prefectural governments” issued in June 2006. (MOE)
- The government will conduct a review of the scientific findings regarding substances that are considered to be highly toxic and implement toxicity assessments. (MOE)
- In accordance with the environmental standards for water quality for the conservation of aquatic life, the government will appropriately implement environmental management measures such as the effluent control measures needed to maintain or achieve the standards, as well as continuously monitoring the achievement levels for the environmental standards for the water quality of public waters. (MOE)
- Based on the “Manual for Constant Monitoring of Dioxins in Rivers, Lakes, etc. (Draft)” (March 2005) and the “Policy on Surveys of Endocrine-Disrupting Chemicals (Draft)” (May 2012), the government will monitor dioxins and endocrine-disrupting chemicals in rivers, lakes, etc. Through the utilization of the “Basic Policy on Control Measures for Dioxins in Bottom Sediment” (July 2007), the “Technical Materials on Control Measures for Dioxins in Bottom Sediment (Draft)” (April 2007) and the “Manual for Control Measures for Dioxins in Bottom Sediment in Rivers, Lakes, etc. (Draft)” (revised in April 2008), the government will promote measures for bottom sediment in polluted rivers, lakes, etc. (MLIT)
- In accordance with the Agricultural Chemicals Regulation Law, the government will establish the Registration Withholding Standards of Agricultural Chemicals concerning Prevention of Damage to Aquatic Animals and Plants. (MOE)

[Current situation]	The number of agricultural chemicals for which standards have been set: 201, and the number of agricultural chemicals which were found to be safe enough not to set standards: 543 (as of May 1, 2012).
[Target]	Evaluate all agricultural chemicals and set registration withholding standards for all agricultural chemicals which need the standards.
- The government will promote measures for risk management for environmentally conscious agricultural chemicals use including the formulation and dissemination of a manual for methods to assess and manage the risks of agricultural chemicals to birds. (MOE)

[Current situation]	Formulating a provisional manual (May 1, 2012)
[Target]	Formulation of the manual
- The government will develop methods to assess the impacts of agricultural chemicals on biodiversity as part of the preparation for conserving and ensuring biodiversity on agricultural land and in its surrounding environments. (MOE)
- In order to ensure that measures are taken in line with the “Guidelines for Light Pollution Control Measures,” the government will raise awareness about the guidelines. (MOE)
- Since the content of the Guidelines for Light Pollution Control Measures should be revised to reflect any progress of lighting technologies, the government will from time to time revise the guidelines if necessary in order to improve the guidelines. (MOE)

- The government will develop assessment methods using species sensitivity distributions (SSDs) in order to enable risk management for impacts on ecosystems based on quantitative assessments. (MOE)

[Sustainable use]

Section 4 Agriculture, forestry and fisheries (Basic concepts)

The Japanese archipelago extends over a wide range of climatic zones from the subtropical zone to the subarctic zone. Diverse agriculture, forestry and fisheries as well as local biodiversity have developed in each area, adapting to the local climate and characteristics. Agriculture, forestry and fisheries are essential activities for supplying the food and materials required for human survival. In addition, in Japan, agricultural, forestry and fishery activities have played an important role for generations in the creation of natural environments close to where people live, which enabled the inhabitation of diverse species. Areas where agricultural, forestry and fishery activities take place have developed into diverse rural districts with diverse cultures characteristic to local areas by coexisting with diverse organisms, while serving as production and living spaces for people. In order to maintain or develop the biodiversity-rich rural districts created by human interaction with nature and to hand down a biodiversity-rich Japan to future generations, it is essential to conserve biodiversity and sustainably use its components through conducting sustainable agricultural, forestry, fishery activities as well as activities related to these industries. Forests, rural areas, Satochi-Satoyama areas and Satoumi are connected to each other and people live in and around these areas as well as engaging in the agricultural, forestry and fishery industries. In light of the links between forests, rivers and the sea, it is necessary to take conservation measures for biodiversity throughout the ecosystem containing these components.

Therefore, based on the Ministry of Agriculture, Forestry and Fisheries' Biodiversity Strategy, the government will implement measures to support biodiversity-oriented agricultural, forestry and fishery activities as well as revitalizing rural communities which support such activities, including: the development of the necessary conditions for farmers to be able to vigorously engage in organic farming which enables the inhabitation of various organisms; direct support for farming activities that are effective in biodiversity conservation; and the facilitation of diverse and continuous utilization of Satoyama forests. The government will also promote understanding among various groups of citizens about biodiversity in agriculture, forestry and fisheries through the quantitative evaluation of biodiversity sustained by agriculture, forestry and fisheries. In addition, it will promote local innovative efforts made by various entities, as well as promoting contributions to the conservation of the global environment through agricultural, forestry and fishery activities.

1 Biodiversity in agriculture, forestry and fisheries (Specific measures and policies)

- In order to take appropriate measures in accordance with the circumstances surrounding biodiversity in agriculture, forestry, fisheries and rural districts, the government will comprehensively promote the following measures for biodiversity conservation. (MAFF)
 - (1) The conservation of rural and Satochi-Satoyama areas (detailed in Chapter 1, Section 6)
 - (2) The conservation of forests (detailed in Chapter 1, Section 5)
 - (3) The conservation of Satoumi and oceanic areas (detailed in Chapter 1, Section 9)
- The government will vigorously promote efforts to conserve biodiversity in forests, rivers and the sea, by: supporting agricultural production with an enhanced focus on biodiversity in rural and Satochi-Satoyama areas and afforestation by fishermen, etc. using broad-leaved species; designating and conserving protection forests that have positive effects on fish habitats; and managing forests for the purpose of conserving fishing grounds. (MAFF, MLIT)

- Promoting the conservation and sustainable use of genetic resources (detailed in Chapter 2, Section 6)
The government will promote the conservation and sustainable use of genetic resources which are useful for agriculture, forestry and fisheries. It will also regulate genetically modified agricultural products in order to conserve biodiversity in Japan. (MAFF)
- The government will promote international cooperation for sustainable agriculture, forestry and fisheries through the utilization of Japan's experience and knowledge accumulated in Japan and abroad, and make vigorous contributions to conservation of global environment including prevention of desertification, sustainable use of water resources and climate change measures. (MAFF)
- The development of biodiversity indicators in agriculture, forestry and fisheries (detailed in Chapter 2, Section 8)
The conservation of biodiversity, on which agriculture, forestry and fisheries rely, is indispensable for the stable supply of good quality agricultural, forestry and fishery products to people.
The government has been taking measures related to agriculture, forestry and fisheries including the promotion of conservation oriented agriculture, by taking biodiversity into consideration. For example, in the agricultural sector, the government developed indicators and evaluation methods with which the effectiveness of conservation oriented agriculture, etc. can be assessed, and prepared a manual for biodiversity assessment methods at the individual farm field level. However, scientifically-backed indicators for assessing biodiversity in the rural environment as a whole have not been developed. The development of such indicators is needed to effectively promote measures related to agriculture, forestry and fisheries. Therefore, the government will consider the development of biodiversity indicators and clarify the role of agriculture, forestry and fisheries in biodiversity conservation. It will also promote efforts to deepen national and international understanding about the role of agriculture, forestry and fisheries. (MAFF)
- The government will promote better understanding by citizens about biodiversity-friendly production by utilizing “Ikimono Marks” which indicate that the agricultural, forestry and fishery products are produced with an emphasis on biodiversity conservation, and will give farmers information about the organism inhabitation situation, the surrounding environment and farming history in existing cases of paddy rice cultivation that have achieved both food production and biodiversity conservation, in order to make the farmers better understood about such farming methods and to increase their motivation. The government will also domestically and internationally disseminate information about the contribution to biodiversity conservation by agriculture, forestry and fisheries in Japan. (MAFF)
- In addition to the economic value of agricultural, forestry and fishery products, the government will conduct economic valuations of biodiversity conserved through agriculture, forestry and fisheries. Through clarifying its value, the government will promote people’s understanding about the role of agriculture, forestry and fisheries in biodiversity conservation. The government will also consider how to utilize various evaluation methods including economic valuation in order to promote activities to conserve and sustainably use biodiversity. (MAFF)

Section 5 Ecotourism

(Basic concepts)

Ecotourism is a type of tourism where tourists are taken around by guides who have knowledge of local nature and culture. The eco-tourists interact with local nature and culture while considering nature conservation and deepening their knowledge and understanding of local nature and culture. Ecotourism is thus a very effective tool for promoting the conservation and sustainable use of biodiversity.

In Japan, the Act on the Promotion of Ecotourism was put into force in April 2008 and the Basic Policy on the Promotion of Ecotourism was decided by the Cabinet in June of the same year. The government has promoted the appropriate implementation of the policy including consideration of biodiversity conservation, natural environment monitoring, the conservation of natural tourism resources and the development of rules for the use of the resources. The government has also conducted the duties stipulated in the Act on the Promotion of Ecotourism, including the approval and dissemination of “overall schemes” for the promotion of ecotourism, the provision of technical advice, information gathering and PR activities through cooperation between relevant ministries and agencies.

However, there are many problems in the promotion of ecotourism. For example, there is insufficient understanding about the significance and positive effects of ecotourism. There are many areas where ecotourism projects hit a roadblock at the initial stage of the project and the project stagnates. There are also cases where impacts on the natural environment are increased by ecotourism which aims at interactions with nature. It cannot be said that the idea of the sustainable use of the natural environment, which is the principle of ecotourism, is sufficiently understood by all the parties involved.

Therefore, it is necessary to implement comprehensive measures including support for local communities in the initial stage of ecotourism projects, the provision of technical advice, awareness raising, the implementation of model projects, strategic publicity for tourists and activities that contribute to reconstruction after the Great East Japan Earthquake. In order to revitalize local communities through ecotourism, it is also necessary to support communities that take the initiative in ecotourism programs using local coordinators and those taking the initiative in creating networks, as well as developing human resources that support local ecotourism such as ecotourism guides and coordinators.

1 Ecotourism

(Specific measures and policies)

- In order to reevaluate the allure unique to each local area and develop vital and sustainable local communities, the government will support the formulation of “overall schemes” for ecotourism promotion based on the Act on the Promotion of Ecotourism put into force in April 2008. (MOE, MEXT, MAFF, MLIT)
- Based on the Act on the Promotion of Ecotourism, liaison and coordination will be facilitated by the liaison council for the promotion of ecotourism made up of the relevant ministries and agencies in order to promote ecotourism in an integrated and effective manner. (MOE, MEXT, MAFF, MLIT)
- The government will give awards to excellent ecotourism programs. It will also collect methods for the utilization of local resources and conservation-related know-how for each type of area

including mountainous areas, Satoyama areas, islands and sea areas, as well as sharing the information. It will also carry out PR activities through websites and other media. (MOE)

- The government will promote environmental education, ecotourism and other activities that consider and implement qualitative improvements in natural park usage. (MOE)
- In order to prevent the destruction of vegetation and disturbance of wildlife habitats through the over-concentration of visitors in one place and other forms of overuse in natural parks, the government will consider and implement management methods to reduce the number of people going to overused areas by guiding them to use different parts of natural parks at different times, as well as designating and managing access control districts based on the Natural Parks Law. (MOE)
[Current situation] The number of access control districts: two (the end of FY2011)
- The government will promote ecotourism at existing world natural heritage sites and candidate sites. (MOE)
- In order to reevaluate the unique allure of each local area and develop vital and sustainable local communities, the government will assist communities that are committed to ecotourism in developing human resources such as guides and coordinators who can give explanations about local natural resources and cultures and communicate their allure, as well as assisting in developing programs by tapping into local characteristics. The government will also develop the activity hub facilities needed to work with local communities in order to organize ecotourism in National Parks. (MOE)

Section 6 Sustainable use of biological resources

(Basic concepts)

For everyday living, we depend on various biological resources in diverse ways, through the collection of wild animals and plants and through agriculture, forestry and fisheries production. These biological resources include foods such as agricultural crops and marine products, timber for buildings or furniture, clothing fibers such as cotton and wool, as well as pharmaceutical products such as natural medicines, industrial raw materials such as natural pigments and fuels such as charcoal.

These biological resources have the potential to be used in the development of medicines and foods for human survival in the future and for solving environmental problems, through advancements in science and technology, for example, gene recombination technology and other biotechnologies.

Biodiversity is being lost on a global scale through climate change, environmental degradation caused by development activities, rapid deforestation in tropical rain forests and progress in desertification. In order to maximize the possibility of utilizing biological resources (which are the benefits from biodiversity) into the future, it is necessary to maintain Japanese and global biodiversity at the ecosystem level, the species level and the genetic level, while striving for the conservation and sustainable use of biological resources and the collection and preservation of genetic resources. At the same time, the utilizing of biotechnology in a sustainable manner while taking into account its safety and its impact on biodiversity is essential.

When considering the diversity of genetic resources, it is important to remember that genetic biodiversity is not only useful economically but also creates diverse local characteristics. For example, with regard to food culture, locally unique *koji* bacteria is used to produce locally unique *miso* in various parts of Japan. Through conserving not only economically useful genetic resources but also various other genetic resources, it will be possible to hand down to future generations the possibility of using genetic resources for various purposes.

At the Tenth Meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10) held in Japan in October 2010, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS: Access and Benefit-sharing) was adopted. This Protocol aims at sharing the benefits arising from the utilization of genetic resources in a fair and equitable way, which is one of the objectives of the Convention on Biological Diversity (CBD), thereby contributing to the conservation of biodiversity and the sustainable use of its components. Expected achievements of the Nagoya Protocol are to ensure access to genetic resources, to contribute to human well-being through the products such as pharmaceuticals developed based on the use of genetic resources, to ensure the fair and equitable sharing of the benefits arising from the use of genetic resources with the provider countries, and thereby to create their incentives to conserve ecosystems which nurture genetic diversity. As the country of COP 10 Presidency, Japan is expected to contribute to the early entry into force and the effective implementation of the Nagoya Protocol, and therefore the government aims to ratify the Protocol as early as possible and to implement it steadily in Japan.

1 The use and preservation of genetic resources

1.1 The use of genetic resources

1.1.1 The use of genetic resources in the field of medicine

(Specific measures and policies)

- The government will continue to make efforts to prevent the spread of genetically modified organisms into the environment. It will also ensure the quality, effectiveness and safety of pharmaceutical products developed using gene recombination technology. (MHLW)
[Current situation] The Law concerning the Conservation and Sustainable Use of Biological Diversity through Regulation on the Use of Living Modified Organisms (Cartagena Law) is being implemented appropriately in the field of medicine.
- The Research Center for Medicinal Plant Resources, the National Institute of Biomedical Innovation, which is an organization affiliated to the Ministry of Health, Labour and Welfare, actively collects and preserves medicinal plants, etc. It also implements various research projects, including: research into the technologies needed for the cultivation and selective breeding of medicinal plants; research into chemical and biological evaluation of effective ingredients in medicinal plants; research into untapped plant genetic resources produced overseas; and research into tissue culture techniques for medicinal plants. (MHLW)

1.1.2 The use of genetic resources in the fields of agriculture, forestry and fisheries

(Specific measures and policies)

- The government will implement projects for isolating specific genes that could be used to solve existing problems in the fields of food, the environment and energy, as well as projects for identifying the locations of the genes on genetic maps and analyzing the properties of the genes. (MAFF)
- The government will implement technology development to achieve the maximum utilization of the properties of isolated genes by manipulating them. For example, the government will seek to develop technologies that would make it possible to inject a gene into the desired part of a chromosome, control the expression of injected genes or modify specific parts of genes. It will also aim to develop complex disease resistant transgenic crops. (MAFF)
- The government will implement projects to identify and analyze agriculturally useful genetic traits, in order to use such traits to develop crops that have high yields or crops that can thrive in unfavorable environments for instance, which would contribute to solving existing problems in the fields of food, the environment and energy. The government will also aim to create new industries by establishing technologies for producing useful substances by utilizing genomic information of animals or insects. (MAFF)
- Regarding genetic resources which are useful for agricultural, forestry and fishery activities, the government will promote the utilization of these resources for research or technology development by strengthening industry-academy-government cooperation. (MAFF)
- Through ratifying the Nagoya Protocol on ABS and the International Treaty on Plant Genetic Resources (ITPGR), the government will promote the use and conservation of plant genetic resources for food and agriculture in line with international agreements. (MAFF)

1.1.3 The use of genetic resources for food

(Specific measures and policies)

- In order to ensure the safety of genetically modified food, the government will continue to work to establish testing methods for the detection of genetically modified food, study the results of safety assessments on genetically modified organisms being developed overseas, and collect information about newly developed technologies. (MHLW)

1.1.4 The use of genetic resources for industry

(Specific measures and policies)

- The government will develop basic technologies to manufacture useful substances such as phytogetic industrial materials and high value added proteins. It will also establish infrastructure for manufacturing technologies that utilize phytogetic properties. (METI)
- The government will develop a high-efficiency manufacturing process for useful substances using microorganisms as well as developing basic technologies for biological reactions. At the same time, the government will seek to advance environmental biological treatment technologies for effluent and waste using microorganisms. (METI)

1.1.5 The use of genetic resources for research

(Specific measures and policies)

- Through the National BioResource Project which started in FY2002 with the aim of establishing a collection of various bioresources for the advancement of life science research, the government will continue to collect, preserve and provide resources that are important intellectual infrastructure for the life sciences, that need to be established strategically. The government will also continue to develop backup systems for the resources. (MEXT)

1.1.6 The use of genetically modified organisms, etc.

(Specific measures and policies)

- The government will accumulate scientific knowledge that contributes to the appropriate operation of the Cartagena Law, including the consideration of appropriate methods to assess the impacts on biodiversity based on the latest findings. (MOE, MOF, MEXT, MHLW, MAFF, METI)
- The government will release information about the Cartagena Law, its enforcement status and the scientific findings through websites, etc. in order to raise public awareness about the law and genetically modified organisms, etc. (MOE, MOF, MEXT, MHLW, MAFF, METI)
- Through the Meeting of the Parties to the Cartagena Protocol on Biosafety and the like, the government will take part in discussions on the measures needed to promote the effective implementation of the protocol. As for the “Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety” which was adopted at the COP-MOP 5 (Fifth Meeting of the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety) and signed by Japan in March 2012, the government will take the necessary steps in order to conclude the protocol, with an eye to other countries’ actions and discussions at future Meetings of the Parties to the Cartagena Protocol on Biosafety. (MOE, MOFA, MOF, MEXT, MHLW, MAFF, METI)

[Current situation]	The government has signed the Supplementary Protocol and is having discussions towards its conclusion.
[Target]	Conclude the Supplementary Protocol as quickly as possible.

1.2 The preservation of genetic resources

1.2.1 The preservation of genetic resources in the field of medicine

(Specific measures and policies)

- The National Institute of Biomedical Innovation (NIBIO) has the Rare Disease Bank, the Small Experimental Animal Bank, the Research Center for Medicinal Plant Resources and the Tsukuba Primate Research Center. NIBIO will continue to conduct projects to collect and provide bioresources to researchers.
Regarding the Cell Bank, the government will develop a centralized system where NIBIO will control the supply of qualified cells from FY2013. In the meantime, the government will continue to implement the project to supply bioresources to researchers in cooperation with the Japan Health Sciences Foundation (HS Foundation). (MHLW)
- NIBIO's Rare Disease Bank collects and provides rare disease biospecimens to researchers. The NIBIO's Small Experimental Animal Bank actively collects and preserves experimental animals including animal models for new human diseases, maintains their strains, ensures the stable supply of animals and disseminates information. NIBIO's Tsukuba Primate Research Center breeds, rears and provides high quality experimental cynomolgus monkeys to researchers.
Regarding the Cell Bank, the government will develop a centralized system where NIBIO will control the supply of qualified cells from FY2013. In the meantime, the government will continue to implement the project to supply bioresources to researchers in cooperation with the Japan Health Sciences Foundation (HS Foundation).
The government will continue to provide the above-mentioned bioresources to researchers. (MHLW)
- In order to ensure the sustainable use of medicinal plants, NIBIO's Research Center for Medicinal Plant Resources is dedicated to the preservation of genetic resources by means of the cryopreservation of their seeds. In order to collect and secure the genetic resources of medicinal plants, the Research Center will continue to send the list of seeds and exchange seeds where necessary with botanical gardens and research institutes in other parts of the world (397 organizations in 62 countries worldwide as of FY2011). (MHLW)
- The National Institute of Infectious Diseases (NIID) will continue to collect and preserve pathogenic microbes as well as conducting research exchanges and information exchanges with relevant research institutes inside and outside the country. (MHLW)

1.2.2 The preservation of genetic resources in the fields of agriculture, forestry and fisheries

(Specific measures and policies)

- Through the Genebank Project, the government will continue to breed new varieties, collect, preserve and evaluate the properties of genetic resources in each category including plants, animals, microorganisms, DNA, forest trees and marine organisms, in order to be able to supply them for research purposes. For the collection, conservation and utilization of plant genetic resources for food and agriculture in particular, the government will focus on their

conservation from the standpoint of their sustainable use, while also introducing cryopreservation technology to improve preservation efficiency and strengthen assistance for research activities through the distribution of research materials. (MAFF)

- In order to prevent the loss of valuable genetic resources and to utilize them for the development of new forest tree varieties and the development of advanced technologies, the government will promote the search for, the collection, the preservation, the distribution and the property evaluation of forest tree genetic resources and fungal genetic resources. (MAFF)
[Current situation] The government continues to promote the search for, the collection, the preservation, the distribution and the property evaluation of forest tree genetic resources and fungal genetic resources.
[Target] Implement the Genebank Project for forests and forestry.
- As part of the Genebank project, the government will conduct international joint research projects for the conservation and use of genetic diversity in developing countries where the risk of losing valuable genetic resources is high. It will also financially support the Food and Agriculture Organization of the United Nations (FAO) with the aim of contributing to the conservation of biodiversity. (MAFF, MOFA)
- On national forest, the government will specify forest reserves including “forest tree genetic resource conservation forests” which aim at conserving the genetic resources of forestry tree species and rare tree species in cooperation with research institutes, in order to promote their appropriate conservation and management. (MAFF)
[Current situation] The area of forest reserves: 903,000 hectares (April 2011)

1.2.3 Efforts in the fields of science and technology

(Specific measures and policies)

- Through the National BioResource Project which started in FY2002 with the aim of establishing a collection of various bioresources for the advancement of life science research, the government will continue to collect, preserve and provide resources that are important intellectual infrastructure for the life sciences that need to be established strategically. The government will also continue developing backup systems for the resources. (MEXT)

1.2.4 The preservation of genetic resources in the environmental field

(Specific measures and policies)

- The government will promote the preservation of threatened plant species seeds at Shinjuku Gyoen National Garden. The government will also preserve historically valuable plant species. It will also consider and operate systems to compile and provide knowledge and cultivation techniques collected over the years, in order to enable the utilization of information in Japan and elsewhere. (MOE)

2 The use and preservation of microbial resources

2.1 The use of microbial resources

(Specific measures and policies)

- The National Institute of Technology and Evaluation will, through the implementation of joint international programs with resource-possessing countries, promote the transfer of technology to those countries and provide Japanese companies with opportunities to utilize overseas microbial resources, for the purpose of promoting the sustainable use of the resources. (METI)

- The National Institute of Technology and Evaluation has been implementing bilateral programs for the conservation and sustainable use of microbial resources in six countries, including Indonesia, Vietnam, Myanmar, Thailand, China and Mongolia. The programs aim to build a relationship of trust with not only government agencies but also the national research institutes of the respective countries and promote the documentation for the conservation and use of microbial resources. Through these programs, Japan will continue to transfer technologies for conservation, the collection and utilization of genetic resources to resource-possessing countries. The Japanese government will also continue to provide Japanese companies with opportunities to utilize genetic resources, by securing access routes to overseas resources and by promoting the transfer and the use of resources based on agreements with resource-possessing countries. (METI)
- As part of the multilateral cooperation programs pursued by the National Institute of Technology and Evaluation, the Asian consortium consisting of 12 countries, including Japan, the Republic of Korea, China, Indonesia, etc. was established (2004) for the purpose of promoting the conservation and utilization of microbial resources. Through the network of genetic resource centers in these countries, the government will continue to implement human resource development and the sharing of rules for the transfer of preserved microbes, technical information and genetic resources. The government will also expand and strengthen the network of genetic resource centers in Asian countries by seeking to increase the number of participating countries and centers. (METI)
- Through the National BioResource Project which started in 2002 with the aim of establishing a collection of various bioresources for the advancement of life sciences research, the government will develop core centers and promote projects to collect, preserve and provide microbial resources that are important for fundamental research. The government will also promote projects to make backups for the resources. In addition, the government will continue developing the database and organizing associated information to help in the use of the resources. (MEXT)

2.2 The preservation of microbial resources (Specific measures and policies)

- The government will develop efficient methods for preserving microbial resources which are useful for agriculture, forestry, fisheries or industrial activities, and conduct scientific analysis of them for the purpose of classification and identification. Through strengthening the efforts to collect, preserve and evaluate the properties of genetic resources to be provided for research and industry, as well as distributing research materials and organizing information, the government will improve the intellectual infrastructure for research and development activities and for the industrial use of the resources. (METI, MAFF)
- For the purpose of developing a system to enable easy access to domestic and overseas microbes, major microbial genetic resource centers in Japan have jointly created an online catalogue. The government will promote cooperation within the network of centers. (METI, MEXT, MAFF)
- The National Institute of Technology and Evaluation, the National Institute of Agrobiological Sciences, the Forestry and Forest Products Research Institute and the Fisheries Research Agency will continue preserving microbial resources which are useful for agriculture, forestry,

fisheries and industrial activities that are collected in Japan and overseas, as well as providing them for research, development and industrial uses. (METI, MAFF)

3 Access and Benefit-sharing of genetic resources (ABS) **(Specific measures and policies)**

- The government will consider domestic measures through collaboration of the relevant ministries and agencies, taking into account the opinions of relevant industries and academia, and will ratify the Nagoya Protocol on ABS as early as possible. According to the Nagoya Protocol, the government will promote compliance with ABS-related legislation and regulatory requirements of the provider countries, designate one or more checkpoints to monitor the use of genetic resources in Japan, and conduct awareness-raising activities. Through the realization of the fair and equitable sharing of the benefits arising from the use of genetic resources, the government will contribute to the conservation and sustainable use of biodiversity. (MOE, MOFA, MOF, MEXT, MHLW, MAFF, METI, MLIT)
- For the purpose of early enactment and effective implementation of the Nagoya Protocol on ABS, the government will promote the development of domestic systems for ABS in developing countries, private sector participation and investment in the conservation and sustainable use of genetic resources, as well as capacity development in indigenous communities in order to ensure appropriate access to traditional knowledge related to genetic resources through the Global Environment Facility (GEF) and the Nagoya Protocol Implementation Fund (NPIF). (MOFA, MOF, MOE)

[International measures]

Section 7 Promotion of international efforts (Basic concepts)

The conservation and sustainable use of biodiversity is not an issue for just one country but a common issue for humanity. In addition, as explained in Part 1, Chapter 2, Section 2, Japan relies on imports for much of the resources we consume, thus affecting biodiversity overseas. Therefore, Japan needs to use its ability to actively promote measures for the conservation and sustainable use of biodiversity, as a major country in the international community.

Many developing countries have priority areas in terms of biodiversity conservation. Since many people rely on biodiversity (biological resources) for their livelihoods, the loss of biodiversity in developing countries is more closely related to poverty than in developed countries. Promoting the conservation and sustainable use of biodiversity in developing countries and improving human well-being is an important issue for the entire international community.

In order to effectively promote the conservation and sustainable use of biodiversity, the first step should be to actively become involved in efforts to implement various biodiversity-related agreements more effectively, while promoting the sharing of information on the monitoring and conservation of global biodiversity. It is then necessary to implement programs and initiatives for each issue or theme through various cooperative frameworks including bilateral and multilateral frameworks as well as frameworks between developed countries or between developing countries. In order to seamlessly implement these international measures, it is necessary to develop a domestic basis for cooperation and promote activities by local governments and private organizations in Japan. In developing countries, it is particularly necessary to develop human resources such as policy makers and experts as well as promoting research and development, by considering the possibility of using Official Development Assistance (ODA). When implementing cooperation projects or promoting corporate activities overseas using government or other public funds, it is necessary to ensure that appropriate environmental consideration takes place.

Discussions for international agreements and other frameworks often take place at the regional level. Regional cooperation is emphasized for biodiversity conservation in particular, due to the regional continuity of habitats and regional migratory animals. Japan is expected to play a leading role in various programs in the Asia-Pacific region. In regional cooperation, it is necessary to develop and implement systems for cooperation and coordination by taking into consideration the diverse socio-economic conditions in different countries.

1 Japan's international contribution based on the outcomes of COP 10

1.1 Japan's international leadership and international coordination (Specific measures and policies)

- Through participation in meetings related to the Convention on Biological Diversity (CBD), the government will contribute to achieving the conservation and sustainable use of biodiversity on a global scale, by promoting the effective implementation of the convention and sharing Japan's knowledge and activities. (MOE, the Cabinet Secretariat, MOFA, MOF, MAFF, METI and other relevant government offices and ministries)
- The government will inform the people about biodiversity and the CBD including the discussions, the main decisions and recommendations made at the Conferences of the Parties

and the CBD's Subsidiary Bodies for Scientific, Technical and Technological Advice (SBSTTA), and seek to obtain their support for the implementation of the CBD. (MOE)

- In order to contribute to international discussions on biodiversity, the government will identify, support and train experts in the field of biodiversity in Japan and dispatch them to meetings related to the CBD. (MOE, MOFA and other relevant government offices and ministries)
- In order to promote efforts for biodiversity conservation in the Asia-Pacific region more effectively, the government will exchange information about the current status of biodiversity in each country and strengthen regional coordination. (MOE, MOFA)
- The government will disseminate information within Japan and abroad about advanced activities taking place in Japan, including the conservation and management system for National Parks enabled through coordination and cooperation between various local entities as well as sustainable agricultural, forestry and fishery activities. (MOE, MAFF)
- The government will promote international cooperation with the aim of enabling developing countries to achieve the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets adopted at COP 10. (MOE, MOFA)
- The government will make active contributions to the evaluation of the Aichi Biodiversity Targets achievement levels including the submission of the fifth national report. (MOE, MOFA and other relevant government offices and ministries)
 [Target] Submit the fifth national report (by the end of March 2014).

1.2 Promoting the *Satoyama* Initiative (Specific measures and policies)

- Based on the decision made at the COP 10, the government will globally promote the *Satoyama* Initiative which aims at the conservation and sustainable use of biodiversity in human-influenced natural environments, using the International Partnership for the *Satoyama* Initiative (IPSI) as an effective tool. (MOE)
- In order to further promote the *Satoyama* Initiative, the government will invite more organizations to join the IPSI which was established during the period of COP 10, and promote information sharing and cooperative activities between the participating organizations. (MOE)
 [Current situation] IPSI membership: 123 organizations from 37 countries including government organizations, NGOs, indigenous or local community organizations, research institutes, companies and international organizations (September 2012)
- Through the Global Environment Facility (GEF), the Critical Ecosystem Partnership Fund (CEPF), etc., the government will increase support for *Satoyama* Initiative-related activities. (MOE, MOF, MOFA)
- The government will collect existing cases of farming methods and management methods for creating and maintaining the good condition of paddy fields as habitats for wildlife. The government will then share the collected information with the general public as well as at international venues, in an effort to disseminate the methods and ensure that the methods take root. (MAFF, MOE)

1.3 Cooperation related to information on biodiversity conservation in the Asia-Pacific region (Specific measures and policies)

- The government will develop the “Partnership for Protected Areas in Asia (tentative name)” as a cooperative framework in Asia for the achievement of the Aichi Biodiversity Targets (related to protected areas) and the implementation of the Programme of Work on Protected Areas (PoWPA), in cooperation with other Asian countries, the Secretariat of the Convention on Biological Diversity, the International Union for Conservation of Nature and Natural Resources (IUCN), etc. In this process, the government will compile information about a) Japanese-style National Park management measures, which are enabled through collaboration between the national government, local governments and local residents; b) efforts to establish the Sanriku Reconstruction (Fukko) National Park; and c) other good practices in Asian countries. The government will thus promote the sharing and dissemination of information between Asian countries and improve conservation and management standards for national parks in Asian countries. As part of these efforts, the government will host the First Asia Parks Congress in a city in the Tohoku Region in 2013. (MOE)
- The government will cooperate in the improvement of existing global biodiversity information infrastructure, including the Global Biodiversity Information Facility (GBIF) which is international scientific information infrastructure for biodiversity, the Group on Earth Observations Biodiversity Observation Network (GEO BON) and International Long Term Ecological Research (ILTER). (MOE)
- The government will provide focused support for activities by biodiversity monitoring networks in the Asia-Pacific region while coordinating and cooperating with existing international programs such as GBIF and GEO BON. (MOE)
- As a domestic effort, the government will support the networking of biodiversity information in Japan through coordination and cooperation with the Japanese Biodiversity Observation Network (JBON) established by leading researchers in May 2009. (MOE)
- The government will collect and organize biodiversity information in East and Southeast Asia and promote the East and Southeast Asia Biodiversity Information Initiative (ESABII) which conducts training on taxonomy, in cooperation with the relevant countries and organizations, in order to contribute to decision making on the conservation and sustainable use of biodiversity in the region. (MOE)
[Current situation] ESABII membership: 14 countries, three organizations and three networks (the end of March 2012)

2 The implementation of biodiversity-related agreements

2.1 Cartagena Protocol on Biosafety (Specific measures and policies)

- Through the appropriate enforcement of the Cartagena Law, the government will promote the appropriate and seamless implementation of the Cartagena Protocol on Biosafety. (MOE, MOF, MEXT, MHLW, MAFF, METI)

- Through meetings such as the Meeting of the Parties to the Cartagena Protocol on Biosafety, the government will take part in discussions on the measures, including the Supplementary Protocol, needed to promote the effective implementation of the protocol. As for the “Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety” which was adopted at the Fifth Meeting of the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety (COP-MOP5) and signed by Japan in March 2012, the government will take the necessary steps in order to accede the supplementary protocol, with an eye to other countries’ actions and discussions at future Meetings of the Parties to the Cartagena Protocol on Biosafety. (MOE, MOFA, MOF, MEXT, MHLW, MAFF, METI)
 [Current situation] The government has signed the Supplementary Protocol and is having discussions towards its accession.
 [Target] Accede the Supplementary Protocol as quickly as possible.

2.2 Ramsar Convention

(Specific measures and policies)

- The Ramsar Convention (adopted in 1971) aims at promoting the conservation and wise use of wetlands of international importance, as well as their flora and fauna. Japan joined the Ramsar Convention in 1980. The Ramsar Convention requires that member states (Contracting Parties) should have at least one wetland site of international importance registered as a Ramsar Site. Japan had 46 wetland sites registered by August 2012. Japan also selected and published a candidate list of potential Ramsar wetland sites in Japan, that are likely to have met the international criteria for Ramsar Sites. As for developments in the Convention, the goal of “increasing the number of Ramsar Sites to 2,000” set in the Seventh Meeting of the Conference of the Contracting Parties in 1999 was achieved (2,006 sites as of May 2012). The Convention is increasingly focusing on not only increasing the number of registered sites but also further improving the quality of the registered sites. In line with the Convention’s philosophy, Japan will also work on the qualitative improvement of the conservation and the wise use of the registered sites. More specifically, Japan will update the Ramsar Information Sheets (RIS) for all registered sites by 2020 and strive to achieve the necessary expansion of the registered sites after obtaining support and cooperation from local communities. As for sites that have been found to meet the criteria for identifying wetlands of international importance and are likely to promote conservation by local communities through their registration without setbacks, the government will aim at having 10 more Ramsar Sites registered in Japan by 2020, in light of the past developments in registration. (MOE, MAFF)
- The government will proceed with conducting monitoring surveys, organizing information and restoring wetlands on Ramsar Sites, in cooperation with relevant local governments, local residents, NGOs, experts and other parties including the Domestic Ramsar Committee for Relevant Municipalities where municipalities with Ramsar Sites voluntarily participate. The government will also promote the conservation and wise use of Ramsar Sites by tapping into the local climate and culture of each Ramsar Site, by supporting the formulation of plans for the conservation and wise use of Ramsar Sites, providing information about successful cases of wise use and raising public awareness. (MOE, MAFF, MLIT)
- As part of its international efforts, the government will conduct cooperation by surveys of current wetland conditions and the selection of Ramsar candidate Sites as well as promoting awareness raising particularly in the Asia-Pacific region that are on the migration routes of waterbirds visiting Japan. The government will thereby promote the implementation of the

Ramsar Convention and cooperate in the conservation of migratory birds and wetlands in the Asia-Pacific region. (MOE, MOFA)

[Current situation] The government is implementing projects in Thailand and Myanmar. It is also promoting awareness raising activities in local communities in Japan.

[Target] Add three more sites to the list of Ramsar sites in the Asia-Pacific region by 2015.

2.3 The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

(Specific measures and policies)

- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (adopted in 1973) targets the protection of threatened wild animal and plant species by regulating their international trade, and Japan became a party to the Convention in 1980. Based on the Convention, Japan controls the importation and exportation of species listed in the Appendices of the convention, in accordance with the Foreign Exchange and Foreign Trade Act, etc. In addition, it controls domestic transfer of ownership of species listed in Appendix I of the convention in accordance with the Law for the Conservation of Endangered Species of Wild Fauna and Flora.

The government will appropriately operate these laws and regulations. It will also continue to work to prevent or uncover illegal action through coordination and cooperation between the relevant ministries, agencies and organizations. In addition, the government will collect the information needed to regulate importation, exportation and internal distribution, and cooperate with efforts made under CITES to reduce all types of illegal trade. (MOE, the National Police Agency, MOFA, MOF, MAFF, METI)

- The “results of the progress checks on the domestic distribution management of rare wild organisms” pointed out the need to inform the public about the systems established under the Law for the Conservation of Endangered Species of Wild Fauna and Flora, etc. and the need to strengthen penalties for illegal domestic distribution. Based on these comments and other results from the progress checks, the government will consider and implement the most effective measures to reduce the negative impacts of distribution. (MOE and other relevant government offices and ministries)
- In order to ensure that measures for the conservation of wild fauna and flora are taken based on the concept of the sustainable use of resources in harmony with the conservation of ecosystems and the environment, the government will actively participate in meetings related to CITES. It will also vigorously exchange information with the relevant parties to the convention where necessary, as well as appropriately implementing the convention. (MOFA, MAFF, METI, MOE)

2.4 World Heritage Convention

(Specific measures and policies)

- Regarding the Amami-Ryukyu, Japan needs to expand measures to guarantee the protection of priority areas such as habitats for threatened species. Therefore, the government will analyze and assess the value of the islands to identify the possible sites which deserve a world natural heritage designation and cooperate with local communities in setting up and expanding protected areas. (MOE, MEXT, MAFF)

- Through periodic reporting on world heritage sites, the government will share Japan's experiences in the conservation of world heritage sites with States Parties, particularly Asia-Pacific countries. Japan will thereby contribute to improvements in the quality of conservation and management practices for world heritage sites in these countries. (MOE, MOFA, MEXT, MAFF)
- 2012 marks the 40th anniversary of the UNESCO World Heritage Convention. As an important year for reviewing world heritage sites and considering the future for the Convention, events to commemorate the World Heritage Convention 40th anniversary are being held in various parts of the world. To conclude the 40th anniversary celebrations, Japan will co-organize with the UNESCO World Heritage Centre the Closing Event in Kyoto in November 2012. The government will use this opportunity to promote vigorous international contributions and to deepen citizens' understanding on the significance of the Convention. (MOFA, MEXT, MAFF, MOE)
- At the opportunity of the World Heritage Convention 40th anniversary, the government will prepare proposals on the achievements and challenges of the Japanese World Nature Heritage sites after their inscription, the efforts for adaptive conservation and management as well as the sustainable use of the sites, and roles of the sites in local communities. The government will then make use of such proposals for effective conservation and management of world natural heritage sites in the future. (MOE, MAFF)

2.5 The International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC Convention)

(Specific measures and policies)

- With regard to Environmental Sensitivity Index Maps that show information needed to respond to the spillage of oil and hazardous noxious substances, the government will update the information about biological resources (fish and benthos) as well as on the topography and ecology (tidal flats, seagrass beds, etc.) by taking into consideration changes in land use in coastal areas. (MOE)
[Current situation] The maps are available on the website of the Ministry of the Environment. http://www.env.go.jp/water/esi/esi_title.html
- The Training Center for Waterfowl Rescue will continue to provide training to local government officials, etc. in order to be prepared for any oil pollution accident that temporarily generates a large number of oil-contaminated waterbirds and to be ready for quick action in affected areas. (MOE)

2.6 Antarctic Treaty

(Specific measures and policies)

- Through such activities as the Antarctica environmental monitoring project, the government will consider monitoring methods to be used at the Syowa Base so that the Japanese Antarctic Research Expedition will conduct periodical environmental monitoring. (MOE, MEXT)
- Japanese Antarctic research programs, which started in 1956, will continue studying the Antarctic marine and land ecosystem and biota through marine research using Antarctic research vessels, submersible surveys in lakes and surveys at glacial edges. The programs will seek to gain understanding of extreme environments and genetic characteristics through genetic

analysis and other methods. The results of these programs will be released through the Antarctic biodiversity database. (MEXT)

[Current situation] The quantity of data released through the Antarctic biodiversity database: 65,535 (as of the end of FY2010), the access count: 40,230 (May 21, 2012)

2.7 The United Nations Convention to Combat Desertification (UNCCD)

(Specific measures and policies)

- The government will support efforts to combat desertification made by developing countries affected by desertification, through ODA, etc. (MOFA, MAFF, MOE)
- The government will examine methods for comprehensively conserving and managing natural resources in arid regions, etc. and implement research and surveys. The government will provide the scientific knowledge gained through these activities to the Conference of the Parties to the UNCCD and to the meetings of subsidiary bodies, and vigorously tackle the global desertification problem. (MOE, MOFA, MAFF)

2.8 Bilateral treaties and agreements for the protection of migratory birds

(Specific measures and policies)

- Japan has concluded bilateral treaties and agreements for conservation, etc. of migratory birds with the United States, China, Australia and Russia. Based on these frameworks, the government will implement bilateral joint studies on species that need to be given priority for conservation and ecological studies, including rare species such as the short-tailed albatross and the Saunders's gull. The government will also consider joint studies with Russia. (MOE)
[Current situation] Continuing to track the short-tailed albatross and the Saunders's gull using satellites
- Japan is cooperating with the Republic of Korea in the protection of migratory birds, etc., based on the Agreement between the Government of Japan and the Government of the Republic of Korea on Cooperation in the Field of Environmental Protection (put into force in 1993). The government will prepare for negotiations on the conclusion of a bilateral convention/agreement for the protection of migratory birds with the Republic of Korea. (MOE, MOFA)
[Current situation] Preparing for negotiations on the conclusion of a bilateral convention/agreement for the protection of migratory birds

2.9 The International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM)

(Specific measures and policies)

- Towards the conclusion of the convention, the government will collect information about environmental impacts caused by ballast water, as well as collecting and analyzing basic information about ballast water treatment technologies, etc., in order to consider preparations for accepting the convention at an early stage. (MOE, MLIT)
[Current situation] The number of ratifying countries: 35, which equals 27.95% of the world's merchant fleet in terms of total tonnage (May 28, 2012).
(Japan has not ratified the convention.)

- Japan will continue to vigorously participate in discussions at the International Maritime Organization (IMO) including the formulation of guidelines for the implementation of the convention. (MLIT, MOFA, MOE)
- In preparation for the entry into force of the convention, the government will promote the approval of ballast water management systems that meet the criteria set out in the convention. (MLIT)

2.10 The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)

(Specific measures and policies)

- Under the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) (adopted in 1979), the capture of threatened migratory wild animal species listed in the appendices of the convention is prohibited, and agreements and memorandums have been concluded for the respective species, with the aim of conserving the species.

Japan has not ratified the convention, since we have different views on the animals for which capture is prohibited by the convention. However, Japan is striving to conserve threatened migratory species of wild animals through various relevant conventions, etc. and by concluding bilateral conventions and agreements for the protection of migratory birds with neighboring countries.

The government will continue the steady implementation of current efforts. As for the Bonn Convention, the government will continue collecting information and consider whether to become a signatory to the convention or related agreements/memorandums if necessary. (MOE, MOFA)

2.11 The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR) (tentative name)

(Specific measures and policies)

- The government will have discussions towards the accession of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR) (tentative name). (MOFA, MEXT, MAFF, METI, MOE)

2.12 The United Nations Framework Convention on Climate Change (UNFCCC)

(Specific measures and policies)

- Based on the outcomes of the 17th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 17) which took place in December 2011, the government will make active contributions to the development of a new future framework applicable to all parties. Based on the proposal “Japan's Vision and Actions toward Low-Carbon Growth and Climate-Resilient World” announced at COP 17, the government will play a leading role in efforts to achieve global low-carbon growth through the East Asia Low-Carbon Growth Partnership, as well as promoting to develop a strategy for green growth in Africa. (MOFA, METI, MOE)

2.13 The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention)

(Specific measures and policies)

- Based on the 1996 Protocol of the London Convention, the government has banned in principle the disposal of waste by throwing it into the sea and introduced a permit system for specific types of waste, in order to protect the marine environment. The government will continue to appropriately implement the system. The government will also appropriately implement the permit system for storing CO₂ under the seafloor (carbon dioxide capture and storage in sub-seafloor) which was introduced when the protocol was revised, in order to implement appropriate projects that take into consideration impacts on the marine environment. (MOE)

3 The implementation of international programs

3.1 Conservation of migratory waterbirds in the Asia-Pacific region

(Specific measures and policies)

- The East Asian-Australasian Flyway Partnership (EAAFP) is a framework to promote coordination and cooperation between various entities including national government agencies, international organizations and NGOs in areas on the flyways of migratory birds in East Asia and Australia, including Japan, in order to conserve migratory waterbirds and their important habitats. In Japan, 29 sites became part of the Flyway Site Network. The government will promote awareness raising activities, surveys and research, training and information exchanges at the Flyway Sites. (MOE)
[Current situation] Creating pamphlets for the general public
[Target] Hold four exchange meetings between people from the Flyway Sites and improve awareness raising tools (by 2020).
- The government will identify potential candidate Flyway Sites, based on which it will increase the number of Flyway Sites. (MOE)
- The government will promote the sharing of information among China, the Republic of Korea and Japan on species that migrate over the Yellow Sea to Japan, which particularly need conservation measures, including the Saunders's gull and other rare species. (MOE)

3.2 The International Coral Reef Initiative (ICRI)

(Specific measures and policies)

- Japan will continue contributing to international efforts to conserve coral reef ecosystems through participating in the International Coral Reef Initiative (ICRI) and the International Tropical Marine Ecosystems Management Symposium (ITMEMS). (MOE)
[Current situation] Leading efforts in East Asia
[Target] Host the ICRI Secretariat for two years starting from 2014.
- The Japanese government will organize ICRI East Asia Regional Workshops and promote the strengthening and improvement of the networks of coral reef protected areas in cooperation with relevant countries, based on the ICRI East Asia Regional Strategy on MPA networks formulated in 2010. (MOE)
[Current situation] Leading efforts in East Asia
[Target] Host the ICRI Secretariat for two years starting from 2014.
- Through the International Coral Reef Research and Monitoring Center (Ishigaki City, Okinawa) and others, the government will disseminate information about Japanese research and conservation activities on coral reefs, etc. The government will also cooperate with the Palau

International Coral Reef Center (PICRC) in promoting their research activities and improving their educational functions. The PICRC was established with Japanese assistance as the center for coral reef research and monitoring in Micronesia. (MOE, MOFA)

[Current situation] Since the technical cooperation project for the PICRC by the Japan International Cooperation Agency (JICA) ended in July 2012, the government is planning to implement academic exchanges through the Japan Science and Technology Agency (JST).

[Target] Promote the utilization of the International Coral Reef Research and Monitoring Center.

3.3 The Man and the Biosphere Programme (MAB Programme) (Specific measures and policies)

- Japan has been vigorously supporting activities to form a network of Biosphere Reserves (BRs) in the Asia-Pacific region by making financial contributions to UNESCO through the UNESCO/Japanese Funds-in-Trust for the Promotion of Scientific Programme for Sustainable Development since FY2002 (it was renamed the UNESCO/Japanese Funds-in-Trust for the Scientific Programme on Global Challenges in Asia and the Pacific Region in FY2007). (MEXT, MOFA)
- Through taking into consideration global trends, the government will consider developing new measures and policies to take advantage of the Biosphere Reserve system which aims at harmony between ecosystem conservation and the sustainable use of the ecosystems (coexistence between nature and human society). (MEXT, MAFF, MOE)

3.4 Sustainable forest management and measures to prevent illegal logging (Specific measures and policies)

- Based on the Guideline for Verification on Legality and Sustainability of Wood and Wood Products formulated in 2006, the government will choose wood and wood products for government procurement which has had its legality and sustainability verified by forest certification systems, etc. The government will also promote the use of verified wood and wood products by local governments, private companies and general consumers. (MAFF, MOE)
- The Asia Forest Partnership (AFP) was proposed by Japan and Indonesia and established as a framework for regional-level discussions at the World Summit on Sustainable Development. Through AFP and other initiatives, the government will work to reduce deforestation and forest degradation, increase the forested area and take illegal logging prevention measures, and promote sustainable forest management in Asia. (MAFF, MOFA, MOE)
 [Current situation] Japan is actively involved in AFP meetings where national governments, international organizations, NGOs, etc. participate, with the aim of promoting sustainable forest management in the Asia-Pacific region.
- Through active involvement in international policy discussions at the United Nations Forum on Forests (UNFF) and other forums and initiatives, the government will play an active role in the international community for the promotion of sustainable forest management including illegal logging prevention in cooperation with the relevant countries, in order to conserve biodiversity nurtured by the world's forest resources and to curb global warming. (MAFF, MOFA, MOE)

[Current situation] In order to promote efforts for sustainable forest management around the world, the Japanese government participated in and contributed to international discussions at UNFF, etc. and promoted international activities in cooperation with relevant countries, international organizations and others. In particular, for the Montreal Process, Japan coordinated 12 member countries and assisted in the organization of Working Group Meetings and Technical Advisory Committee Meetings (TAC Meetings) as the secretariat. Japan also contributed to promoting cooperation and coordination with other international processes for the establishment of criteria and indicators. Japan is also hosting international meetings involving a wide range of participants on forests and forestry every year with a view to continuously taking the initiative in solving problems in order to promote sustainable forest management around the world.

- As for the Montreal Process, Japan has been hosting the secretariat since 2007. Japan will demonstrate its leadership in establishing sustainable forest management around the world and promote efforts to formulate and utilize the “criteria and indicators” to identify, analyze, and assess the sustainability of forest management, through coordination within the Montreal Process and with other international processes (the International Tropical Timber Organization (ITTO) and Forest Europe). (MAFF)

[Current situation] As the secretariat of the Montreal Process, the Japanese government planned and coordinated various activities including the revision of indicators for the Process (up to 2008), the preparation of the second country reports by each member country (2009) and the Montreal Process Working Group Meetings (five times, from 2007 to 2011). It also planned and organized an international seminar in Japan in cooperation with UNFF, other international processes (including ITTO and Forest Europe) and other international organizations (2011).

- The government will continue promoting sustainable government procurement based on the Basic Policy created based on the Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities (Green Purchasing Act). (MOE)
- The government will promote the dissemination and utilization of the “Guidelines for the conservation and sustainable use of biodiversity in tropical timber production forests” formulated by ITTO in 2008 and support the implementation of the forest biodiversity working plan under the CBD through the ITTO project. (MOFA, MAFF)
- Japan has made financial contributions of 14 million dollars (10 million dollars in FY2008 and four million dollars in FY2011) to the Forest Carbon Partnership Facility (FCPF) established by the World Bank to support developing countries working to reduce deforestation through forest conservation activities. The Japanese government will actively support developing countries’ capacity building projects for the implementation of REDD national strategies and contribute to the development of monitoring technologies for controlling deforestation in developing countries. (MOF, MOFA, MAFF, MOE)
- In order to promote sustainable forest management and climate change measures in developing countries including REDD+ (Reducing Emissions from Deforestation and forest Degradation in

developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries), the government will work on basic surveys, technology development and human resource development. (MAFF, MOFA, MOE)

3.5 The Critical Ecosystem Partnership Fund (CEPF) (Specific measures and policies)

- By the end of 2010, conservation strategies for 19 biodiversity hotspots had been implemented and the number of supported organizations had reached 1,588. The government will consider continuing its support for biodiversity hotspot conservation efforts made by CEPF in developing countries. (MOF, MOE)

3.6 The intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (Specific measures and policies)

- In order to promote the utilization of scientific findings in the policy decision process and strengthen the interface between science and policy, the government will actively participate in the IPBES and contribute to their activities so that it will become an effective and efficient framework which operates on a scientific basis. The government will also prepare domestic systems to work with the IPBES. (MOE, MOFA, MAFF)

3.7 The development of information systems for biodiversity **3.7.1 The Global Taxonomy Initiative (GTI)**

(Specific measures and policies)

- Through contributing to regional projects in the Asia and Oceania region, the government will promote taxonomic research. It will also seek to improve access to a variety of data on taxonomy through developing a taxonomic database and improving the management of species samples, thereby contributing to understanding species globally. Through research activities in particular, the government will help with organizational capacity building for taxonomic research in developing countries in the Asia and Oceania region. (MOE, MEXT)

3.7.2 The Clearing-House Mechanism (CHM) for biodiversity information (Specific measures and policies)

- With regard to the Clearing-House Mechanism (CHM) for biodiversity, the government will promote information exchanges and cooperation nationally and internationally, in a way that allows the Ministry of the Environment to function as the National Focal Point in Japan. (MOE)
[Current situation] The number of metadata records registered: 3,140 (the end of March 2012)
- The government will improve systems that provide information about the natural environment domestically and internationally, by making it easier to find information and providing information in a format that can be used by overseas users, in order to improve usability for all users. (MOE)
- Based on the Strategic Plan of the Clearing-House Mechanism, the government will attempt to accumulate information through the promotion of research and surveys in Japan, and actively

exchange information with other countries with a view to supporting developing countries. The government will let researchers know about the Japan Integrated Biodiversity Information System, promote its usage, and increase the number of data providers. In addition, the government will enable coordination between various information systems in order to increase the quantity of information available to users. (MOE)

- At various international conferences held by international organizations including the United Nations Environment Programme (UNEP), the Food and Agriculture Organization of the United Nations (FAO), the United Nations Educational, Scientific and Cultural Organization (UNESCO), and the Organisation for Economic Co-operation and Development (OECD), the government will continue to vigorously exchange information and promote exchanges of research and survey information based on multilateral treaties, bilateral science and technology cooperation. (MOE, MOFA, MEXT, MAFF, METI)

3.8 The Acid Deposition Monitoring Network in East Asia (EANET) (Specific measures and policies)

- The Acid Deposition Monitoring Network in East Asia (EANET) has 13 participating East Asian countries. As of 2009, EANET was monitoring soil in 19 areas, forest vegetation in 18 areas and 17 lakes and rivers, in order to detect the impacts of acid rain on ecosystems at an early stage and to clarify the impacts. The government will continue promoting the EANET activities in order to prevent acid rain impacts in East Asia. (MOE)

3.9 Measures for the Northwest Pacific region (Specific measures and policies)

- Through active involvement in and support for activities based on the Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP, the Northwest Pacific Action Plan), the Japanese government will strive to contribute to the collection of marine environment-related data, scientific clarification of the causes for marine pollution, as well as promoting the establishment of international cooperation systems for the Northwest Pacific ocean. The government will thereby work to enhance biodiversity conservation through the prevention of marine environment pollution. With regard to marine protected areas, the government will clarify each country's policy on the establishment of marine protected areas and how they should be managed, by assisting the Special Monitoring & Coastal Environmental Assessment Regional Activity Centre (CEARAC), in order to promote the establishment of appropriate protected areas and improve their management. (MOE)
- Through the NOWPAP Regional Action Plan on Marine Litter (RAP MALI), the government will promote cooperation such as information exchanges for investigating the sources, policy dialogues, etc. and strengthen measures to solve ocean/beach debris from abroad. (MOE)

3.10 The Global Invasive Species Programme (GISP) (Specific measures and policies)

- The government will consider cooperation with the Global Invasive Species Programme (GISP). (MOE)

3.11 The Group on Earth Observations (GEO)

(Specific measures and policies)

- The government will continue its vigorous support for the Group on Earth Observations (GEO) with an eye towards the future of international frameworks for earth observations, and will promote earth observations in order to contribute to the establishment of the Global Earth Observation System of Systems (GEOSS). (MEXT)
- The government will provide focused support for activities by biodiversity monitoring networks in the Asia-Pacific region while coordinating and cooperating with the Group on Earth Observations Biodiversity Observation Network (GEO BON). (MOE)

4 Support for and cooperation with developing countries

4.1 Promoting cooperation under comprehensive frameworks

(Specific measures and policies)

- By taking into consideration the needs of developing countries, international trends surrounding biodiversity and global issues such as climate change, the government will promote international cooperation in environmental fields including biodiversity more effectively and efficiently. (MOFA)
- The government promotes the Science and Technology Research Partnership for Sustainable Development (SATREPS). Its objectives are to obtain new findings that will contribute to solving global problems and improving scientific and technological standards in such fields as environment and bioresources which include biodiversity-related research, based on the needs of developing countries. It also aims to develop human resources in developing countries and improve their problem-solving abilities. To achieve these aims, SATREPS implements international joint research projects with a concept of applying research outcomes to future utilization, in combination with ODA technical cooperation. (MEXT, MOFA)
[Current situation] The number of biodiversity-related projects implemented: 12 (May 24, 2012)

4.2 Japan's contribution to the conservation of the global environment in the fields of agriculture, forestry and fisheries

(Specific measures and policies)

- The government will promote international cooperation for sustainable agriculture, forestry and fisheries through the utilization of Japan's experience and knowledge accumulated in Japan and abroad, and make vigorous contributions to conservation of global environment including prevention of desertification, sustainable use of water resources and climate change measures. (MAFF)
- As for bilateral cooperation, the government will conduct technical cooperation through the Japan International Cooperation Agency (JICA) and promote sustainable forest management in developing countries. (MOFA, MAFF)
- As for multilateral cooperation, the government will promote projects that aim at promoting sustainable forest management including illegal logging prevention measures in developing countries, through the Food and Agriculture Organization of the United Nations (FAO), the International Tropical Timber Organization (ITTO) and other organizations. (MOFA, MAFF)

- With regard to multilateral cooperation for fisheries, the government will promote projects that aim at promoting international resource management and fishing village development for sustainable fisheries, through financial contributions to FAO, the Southeast Asian Fisheries Development Center (SEAFDEC), etc. (MAFF)

[The strengthening of the scientific foundation]

Section 8 Promotion of information management and technological development (Basic concepts)

For the conservation and sustainable use of biodiversity, it is important to correctly understand the current status of biodiversity as the first step. Therefore, it is necessary to collect scientific and objective data by conducting surveys and monitoring in order to identify the current conditions of the natural environment and time-series changes and spatial changes in the natural environment. When surveys or monitoring reveal that biodiversity is being lost or degrading, it is important to find the causes as quickly as possible and take the appropriate measures. Therefore, it is necessary to collect biological information and samples that provide a basis for scientifically evaluating the current status of biodiversity, and organize the data so that various users can utilize it for a variety of purposes. In order to effectively implement these measures, it is necessary to develop a broad network covering Japan and the rest of the world, centering on the Biodiversity Center of Japan, with the aim of promoting the mutual utilization and sharing of biodiversity information.

In order to increase the information gathering efficiency and to share information, it is necessary to build or strengthen networks with experts in various fields and to promote information exchanges and cooperation between the relevant ministries, agencies, prefectural governments, NGOs and others appropriately, as well as letting local residents and volunteers participate in the biodiversity information collection. In addition, the collected and organized information needs to be provided to the public in a way that is easy to understand using technologies and systems that aid the distribution of information. The Convention on Biological Diversity (CBD) states the importance of international information exchange. From the standpoint of global biodiversity conservation, international information exchange is essential in addition to domestic information exchange.

The government will actively contribute to strengthening the link between science and policy in the biodiversity field by for example, developing domestic structures for the full-scale operation of IPBES which was established in April 2012.

It is also important to implement policies based on scientific knowledge, as well as conducting various studies and developing the technology needed to promote biodiversity conservation activities in local areas.

1 The comprehensive assessment of biodiversity

1.1 The comprehensive assessment of biodiversity (Specific measures and policies)

- In order to correctly understand the current status and the trends for biodiversity in Japan and to promote citizen understanding about biodiversity, the government will set appropriate indicators to be used to identify changes in biodiversity and the effects of various measures, as well as comprehensively assessing the current status of biodiversity in Japan. The government will summarize the assessment results in an easy-to-understand manner by mapping the results, etc. and periodically updating the information. (MOE and other relevant government offices and ministries)

[Target] Set the indicators to be used to identify the current status of biodiversity and the effects of various measures. Comprehensively assess the current status of biodiversity in Japan (by 2015).

1.2 The development of biodiversity indicators in the field of agriculture, forestry and fisheries

(Specific measures and policies)

- The government will promote the development of scientifically-backed indicators that enable the identification of the positive and negative impacts of agriculture, forestry and fisheries on biodiversity, with the aim of effectively promoting the relevant measures and policies. For this purpose, the government will discover the types of organisms that inhabit farmland, forests, seagrass beds and tidal flats, and utilize the basic information and data obtained in the past, such as the characteristics of biota in the ecosystems developed through agriculture, forestry and fishery activities and the methods for studying such ecosystems. The government will then use the indicators to clarify the roles of agriculture, forestry and fisheries in biodiversity conservation and promote efforts to deepen national and international understanding about the roles of agriculture, forestry and fisheries. (MAFF)

2 The promotion of surveys and information management

2.1 The promotion of the National Survey on the Natural Environment and other surveys

(Specific measures and policies)

- The National Survey on the Natural Environment has been conducted since FY1973. The government will continue implementing the survey in order to understand the current status of biodiversity in Japan and monitor changes in biodiversity, while also working to increase the speed of reporting. The 1:25,000 vegetation map which provides basic information about the natural environment on national land, has been developed for about 60% of national land (as of 2012). The government will develop the map for the largest area possible by 2020 and aim at the early completion of the map for all of Japan. (MOE)
[Current situation] The development of the 1:25,000 vegetation map: about 60% of national land (the end of March 2012)
- The government will conduct continuous information gathering on the distribution of animal and plant species inhabiting Japan's land area. Relevant ministries and agencies will cooperate with each other to collect and organize natural environmental data on Japan's sea area. (MOE and other relevant government offices and ministries)
- In order to raise interest in biodiversity and deepen understanding about biodiversity among the general public, the government will implement participatory surveys in cooperation with various relevant organizations and experts, where citizens will participate in the collection of a wide range of information about changes in the natural phenomena close to where they live and the distributions of wild species. The government will then disseminate the survey results widely. (MOE)
- In order to conduct meticulous conservation and management measures and policies for birds and mammals that greatly affect ecosystems, agriculture, forestry and fisheries in Japan, such as the Sika deer and bears, the government will make focused efforts to collect information about the inhabitation of the specified wild animals. (MOE)

2.2 Integrated ecosystem monitoring systems

(Specific measures and policies)

- Through the Monitoring Sites 1000 project, the government will continue implementing surveys to correctly understand changes in various ecosystems that are typically found in Japan, including alpine zones where the impact of global warming can be seen more clearly than in other types of ecosystems. (MOE)
- The government will conduct ecosystem monitoring in various parts of Japan. It will also strengthen cooperation between various ministries, etc. for data sharing and mutual usage, and improve the promptness of data provision, thereby promoting the development of integrated monitoring systems for Japan's natural environment. (MOE)
- When conducting monitoring, the government will seek the participation and cooperation of various entities including experts, NGOs, volunteers and local governments in order to conduct effective and continuous surveys. The government will release the survey results, organize and provide natural environmental information as needed, and utilize the information to develop biodiversity conservation measures. (MOE)
- In addition to domestic cooperation, the government will also coordinate, cooperate and share information with overseas parties including relevant countries and organizations, and contribute to the development of global biodiversity information infrastructure such as the Group on Earth Observations Biodiversity Observation Network (GEO BON). (MOE)

2.3 The preparation of wildlife inventories and information on samples

(Specific measures and policies)

- The government will promote the preparation and publication of inventories of wild animal and plant species and other information by strengthening government-academia cooperation and in cooperation with international projects such as the Global Taxonomy Initiative (GTI) established with the aim of implementing CBD, Species 2000 and the Global Biodiversity Information Facility (GBIF). The government will also systematically collect samples of wild animals and plants and other materials based on which the inventories will be developed, as well as sharing the information with other relevant parties. (MOE, MEXT)
- The government will promote the collection of samples of organisms and other materials and strengthen the maintenance and management systems at the Biodiversity Center of Japan. (MOE)

2.4 The provision and publication of natural environment information

(Specific measures and policies)

- The government will continue to digitize natural environment information obtained through the implementation of various surveys, improve and strengthen methods for providing information through the Japan Integrated Biodiversity Information System (J-IBIS) aiming at a larger hit count. The government will thereby promote the release of information at home and abroad via the Internet. In particular, the government will work on the establishment and provision of data using WebGIS, which allows users to superimpose and analyze natural environment data sets prepared by various entities on the website. The government will also work to enhance J-IBIS's functions that enable various types of analyses using different statistics and other data. (MOE and other relevant government offices and ministries)

- With regard to the Clearing-House Mechanism (CHM) for biodiversity, the government will promote information exchanges and cooperation nationally and internationally, in a way that allows the Ministry of the Environment to function as the National Focal Point in Japan. (MOE)
 [Current situation] The number of metadata records registered: 3,140 (the end of March 2012)
- The government will improve systems that provide information about the natural environment domestically and internationally, by making it easier to find information and providing information in a format that can be used by overseas users, in order to improve usability for all users. (MOE)

2.5 The development of centers and the establishment of systems for biodiversity information

(Specific measures and policies)

- In order to promote surveys, information management, awareness-raising and the collection of samples and other materials related to biodiversity in Japan, the government will improve and strengthen the organization and functions of the Biodiversity Center of Japan as the core center. In particular, in order to evaluate qualitatively and quantitatively the impacts of global warming on biodiversity and the ecosystem in Japan and to take appropriate measures, the government will promote Monitoring Sites 1000 in addition to the National Survey on the Natural Environment. The government will promote the establishment of a network centering on the Biodiversity Center of Japan for the mutual use and the sharing of biodiversity information possessed by various entities including the relevant ministries and agencies, local governments, research institutes, museums, NGOs, experts and citizens, in order for them to be able to use the information in their policies and activities. The government will contribute to international projects that promote biodiversity conservation on a global scale, and coordinate, cooperate and share information with relevant countries and organizations abroad, as well as enhancing the necessary systems for these measures. (MOE)
- The government will strengthen efforts to promote digitization, mutual usage and the publication of information on biodiversity that has been obtained by various entities, including the relevant ministries and agencies, local governments, universities, private organizations, other research institutes, museums, etc. In particular, the government will strengthen information exchanges, cooperation, exchanges and networks related to natural environment information, through the Working Group on Cooperation for Natural Environment Information between Ministries and Agencies established in 2004, the Network of Organizations for Research on Nature Conservation (NORNAC) and other liaison bodies. (MOE, MEXT, MAFF, MLIT)
- About 24,000 data records have been registered in the library database at the Biodiversity Center of Japan as of March 2012. The government will continue to make efforts to increase the number of registered data records and improve the content. (MOE)
 [Current situation] The number of data records registered in the library database: about 24,000 (the end of March 2012)

2.6 Promoting forest monitoring

(Specific measures and policies)

- At about 15,700 fixed observation plots throughout the nation, the government will continuously survey site conditions, vegetation, dead trees, wildlife inhabitation traces, disease, insect and animal damage, etc. The government will also implement monitoring surveys for the smooth and appropriate preparation of regional forest plans through the collection and analyzing of information about the ecological characteristics of trees such as growth forecasts and natural regeneration. (MAFF)
[Current situation] The third cycle of the national survey has been implemented since FY2009.
- Based on data obtained from the first, second and third cycles of the National Survey on Biodiversity of the Forest Ecosystems (including the Forest Resource Monitoring Survey), the government will prepare the Global Forest Resources Assessment 2015 Country Report using the “criteria and indicators” of the Food and Agriculture Organization of the United Nations (FAO), in an effort to promote sustainable forest management in Japan and around the world. (MAFF)
- The government will work on the effective utilization of forest resource data including forest spatial data, the results of the National Survey on Biodiversity of the Forest Ecosystems and digital aerial photographs, by for example integrating them in the forest geographic information system (GIS). (MAFF)
- With regard to forest reserves on national forest, the government will conduct monitoring surveys in accordance with the type of each forest reserve, on the current status of the forests and vegetation, the inhabitation of wildlife and the use of the areas by mountain walkers, in order to understand the situation in each area specified as a forest reserve, and to promote the conservation and management that suits the current conditions in the area. The government will then take appropriate measures such as vegetation restoration in accordance with the identified conditions. (MAFF)
[Current situation] The area of forest reserves: 903,000 hectares (April 2011)
- Regarding green corridors on national forest, in order to understand the condition of the forests and the inhabitation of wild fauna and flora, the government will conduct surveys on forest stand structures and monitoring surveys on the inhabitation of wild organisms. The government will then take appropriate measures such as vegetation restoration in accordance with the identified conditions. (MAFF)
[Current situation] The area of green corridors: 586,000 hectares (April 2011)
- The government will monitor natural environments including forests across the country through the implementation of the National Survey on the Natural Environment and Monitoring Sites 1000. (MOE)

2.7 Information development for river environments

(Specific measures and policies)

- The government will promote the creation of river environmental information maps based on the results of the National Census on River Environment, so that the general characteristics of the environments, characteristic areas and important habitats for living organisms can easily be

identified. The government will then utilize the maps for the improvement and administration of rivers. (MLIT)

- The government will implement the National Census on River Environment so that one cycle of the fish survey and the benthic animal survey can be completed in five years in principle and one cycle of other surveys can be completed in 10 years in principle. Through the surveys, the government will collect information about river environments nationwide in order to grasp national trends and local inhabitation characteristics. (MLIT)
- The government will continue the development and publication of river environment GIS. The government will also promote mutual usage between river environment GIS and other nationwide survey data such as the results of the National Survey on the Natural Environment. (MLIT, MOE)

2.8 The improvement of the marine environment database (Specific measures and policies)

- The government will integrate data on the marine environmental database and improve the content of the database. (MLIT)

2.9 Centralized management and provision of oceanographic data (Specific measures and policies)

- The government will promote the accumulation of basic data on the marine environment at the Japan Oceanographic Data Center and further strengthen cooperation with marine research institutes. (MLIT)
- In order to effectively conserve the marine environment and ecosystems, it is important that the collection of various types of oceanographic data is centralized and the collected data is managed in such a way that it can be used in different ways for different purposes, such as the superimposed display of multiple data sets. For this purpose, the government will promote the development of the Marine Cadastre. (MLIT, the Cabinet Secretariat and other relevant government offices and ministries)
- The government will operate CeisNet, which is an online system where, the coastal area information needed to take appropriate measures in the case of large-scale oil spills, etc. is collected with the cooperation of relevant organizations. The information is managed in a database and provided via the Internet. The government will also release ESI (Environmental Sensitivity Index) maps created by editing information obtained from CeisNet, in a printable PDF format. (MLIT)

2.10 Information development for the natural environment in National Parks (Specific measures and policies)

- The government will collect the scientific information needed for the management and operation of National Parks with the cooperation of related administrative agencies, researchers, local experts, etc. and will conduct appropriate management and operation of National Parks based on the collected information. (MOE)

3 Promoting research and technology development

3.1 Surveys and research in the environmental field

(Specific measures and policies)

- Based on the priority issues specified in the strategy for promoting environmental research and technology development, the Environment Research and Technology Development Fund will implement the following research: clarification of the impacts of the Great East Japan Earthquake on ecosystems; comprehensive research on the observation, evaluation and forecasts for biodiversity in Asia; and the development of methods to evaluate ecosystem services with the aim of coordination between climate change measures and biodiversity conservation measures. (MOE)
- In the second term Policy Studies on Environmental Economics (FY 2012-2014), the government will develop methods to appropriately and efficiently evaluate the economic value of biodiversity conservation in Japan, and study effective ways to disseminate the evaluation results. (MOE)
- Through integrating the large quantity of biodiversity information collected at the Group on Earth Observations Biodiversity Observation Network (GEO BON), the government will develop methods to forecast and assess changes in biodiversity. Also, through the utilization of other environmental information, the government will conduct research and development as well as human resource development with the aim of biodiversity conservation and adaptation to global warming. (MEXT)

3.2 Technology development for the conservation and maintenance of forests (Specific measures and policies)

- The Forestry and Forest Products Research Institute (FFPRI) will take the lead in research and development projects on technologies to reduce the damage caused by organisms, technologies to enable coexistence between forestry and wild organisms as well as forest management and utilization technologies. The aims of the projects are to establish a recycling-oriented society by tapping into the benefits from forests, prevent forest damage caused by disease, insect pests and animals, and conduct biodiversity-friendly sustainable forest management. (MAFF)
[Current situation] FFPRI and others continue to work on the development of methods to evaluate the quantity, the quality and the functioning of biodiversity, on technologies to mitigate impacts on endemic ecosystems caused by alien species and on technologies to manage the damage caused by disease, insect pests and animals that is spread over an extended area.

3.3 Surveys and research in urban areas (Specific measures and policies)

- In order to provide scientific knowledge that contributes to local governments' efforts to conserve biodiversity in urban areas, the government will conduct surveys and research into the relationship between biodiversity and the quantity, quality, size, continuity of green spaces in urban areas. (MLIT)

3.4 Surveys and research on rivers (Specific measures and policies)

- The government will promote a variety of surveys and research projects and utilize their results in cooperation with academics and various organizations, including cooperating with research projects at the Aqua Restoration Research Center. (MLIT)

- The government has conducted many surveys and studies on fish habitats and the results are being used to develop river channel plans and riverbank design methods when conducting nature-oriented river works. In surveys and research into flow rate and the amount of soil supply, the government conducted fundamental studies including looking into the inhabitation of attached algae and benthic animals. The obtained results are being used as basic information for setting normal flow rates and for considering specific measures such as the restoration of soil. The government is also attempting to disseminate research results in an easy-to-understand manner, as part of its focused efforts to train river engineers and provide environmental education. (MLIT)
- The government will conduct river ecological research on the Chikuma River, the Tama River and the Gokase River, analyze the past research results, and then organize and evaluate the obtained academic outcomes. (MLIT)

3.5 Surveys and research at ports and harbors (Specific measures and policies)

- Using one of the world's largest tidal flat experiment facilities (mesocosms), the government will promote surveys and research into living organisms that have recruited themselves naturally in the tanks as well as surveys and research into material cycles including oxygen, nitrogen and phosphorus. (MLIT)
- The government will promote surveys of a wide variety of organisms ranging from bacteria to birds at existing natural tidal flats as well as artificially developed tidal flats and seagrass beds. (MLIT)
- Based on the basic data obtained from the above-mentioned surveys, the government will promote research into measures for sustaining a rich coastal biodiversity while developing coastal ecosystem models. (MLIT)

3.6 Surveys and research in sea areas (Specific measures and policies)

- The government will promote surveys and research into carbon sequestration by marine organisms ("blue carbon") in coastal shallow areas. (MLIT)
- The government will identify the impacts and effects that coastal conservation facilities have on the natural environment including ecosystems, as well as conducting surveys and investigations into ecosystem-friendly coastal developments based on the idea of the "development of seacoasts in harmony with nature." (MLIT, MAFF)
- There is a concern that global warming will cause changes in weather conditions and hydrographic conditions as well as causing a long-term rise in sea levels. There is a concern that there will be serious impacts on coasts including the progress of coastal erosion, an increase in below-sea-level areas, the escalation of damage by storm surges and changes in the territories of organisms. For this reason, the government will monitor tide levels, ocean waves, etc. as well as considering the measures needed to cope with these changes. (MAFF, MLIT)

- In light of increasing citizen awareness about changes in the marine environment caused by global warming, etc. and about the need for the stable supply of marine bioresources as food, the government will promote research and development for clarifying the physiology of marine life in order to develop innovative production methods. The government will also promote research and development into understanding ecosystems comprehensively in order to achieve accurate estimates on the quantity of marine life resources. (MEXT, MAFF)
- The government will conduct research and development for advanced measuring technologies to be used to analyze marine biodiversity and ecosystems as well as research and development for models that contribute to the improvement of forecasting. Thus the government will work to create the basic technologies needed to conserve and restore marine biodiversity and ecosystems. (MEXT)
- For the biosphere, especially the sea area, the government will conduct surveys of living organisms and research into their ecology and functions. It will also find potential uses for various organisms as resources and supply the findings and other information that contribute to social and economic development. Through understanding the interrelationship between the biosphere and the atmosphere, the ocean and the solid earth, the government will contribute to impact assessments for global environmental changes that could take place in the future. (MEXT)
- In order to provide scientific knowledge that contributes to the recovery of the fishing grounds in the sea off the coast of the Tohoku Region, the government will conduct surveys and research mainly in model sea areas using state-of-the-art observation and analysis technologies, with the aim of clarifying the mechanisms of change in marine ecosystems. (MEXT, MAFF, MOE)

[Efforts concerning global warming]

Section 9 Promoting mitigation of global warming and adaptation to its impacts from a biodiversity standpoint

(Basic concepts)

It has been pointed out that progress in global warming may have serious impacts on the natural environment, etc. In fact, in some vulnerable ecosystems on islands, coasts, subalpine and alpine zones, and arid areas, changes thought to have been caused by global warming are already being observed. Regarding sea areas, some have also pointed out the impacts of ocean acidification that is caused by a rise in CO₂ concentrations in the atmosphere. The impacts on human life and socio-economic conditions are also a concern, including the impacts on agriculture, forestry and fisheries and changes in potential food production capacity, the impacts on local biodiversity and changes in the distributions and populations of organisms that carry infectious diseases. Therefore, based on the impacts of global warming and other global environmental changes on biodiversity and the scientific forecasts for these changes, it is necessary to consider measures that mitigate global warming and adapt to its impacts.

Forests, grasslands, wetlands including peat bogs and other soil masses serve as sinks for large quantities of carbon. Maintaining their healthy ecosystems or restoring them increases the ecosystems' capacity to absorb greenhouse gases, and thereby contributes to mitigating global warming. Therefore, the government will maintain and conserve forests in order to ensure that the forests function as carbon sinks to the fullest extent in addition to maintaining their role in biodiversity conservation. In addition, the government will promote the use of grass and wood biomass resulting from the ecosystem management needed to conserve a rich level of biodiversity (including thinning of artificial forests, the management of secondary forests, cutting grass in waterside areas and mowing secondary grasslands) as alternative energy sources to fossil fuels. The government will promote biomass energy use in a way that reduces CO₂ emissions and leads to the revitalization of local industry.

Urban greening is the most familiar carbon sink measure (vegetation restoration) to citizens. Therefore, urban greening is seen as a very effective measure for raising awareness about the significance of climate change measures, in addition to being a measure that creates carbon sinks. It also contributes to the establishment of low-carbon urban structures. For this reason, the government will enhance its efforts to create new green spaces by developing city parks and promoting greening projects on the rooftops of private buildings, while taking local ecosystems into consideration.

With regard to adaptation to the impacts of global warming on biodiversity, it is important that surveys and research into adaptation measures are implemented before the impacts become too serious. Therefore, the government will improve the systems for monitoring the impacts of global warming, etc., and consider adaptation measures with a view to conserving biodiversity, for example by examining the conditions of ecological networks that are highly adaptive to environmental changes including climate change and by identifying the points to keep in mind when trying to maintain or restore healthy ecosystems.

1 Promoting mitigation of global warming and adaptation to its impacts from a biodiversity standpoint

(Specific measures and policies)

- The government will promote measures to curb global warming in the fields of agriculture, forestry and fisheries, including forest sink measures, biomass usage, energy saving measures for protected horticulture, agricultural machinery and fishing boats, and efforts to reduce the amount of fertilizer to be used through the promotion of conservation oriented agriculture. (MAFF)
- In order for Japan to continue making maximum efforts for climate change measures, the government will work to ensure that the amount of CO₂ equivalent to 3.5% of emissions in the base year will be additionally absorbed by forest sinks through forest management. This percentage is the maximum percentage that can be included in the calculation for the target emissions reduction, which was internationally agreed at the seventeenth session of the Conference of the Parties (COP 17) to the UN Framework Convention on Climate Change, etc. To this end, the government will work towards securing the necessary financial resources as well as accelerating its efforts to restore forests and reinvigorate forestry. Through cooperation between national and local governments, those involved in forestry and the timber industry, citizens and other entities, the government will also further promote comprehensive efforts including: the development of healthy forests and the expansion and development of forests whose CO₂ absorption amounts are to be included in the calculation for the target emissions reduction; the appropriate management and conservation of protection forests; maintaining or improving forest sink capacity through reforestation, etc.; maintaining the carbon sink function of forests through promoting the use of wood products; forest development activities involving citizens; and promoting the use of timber and wood biomass. (MAFF)
[Current situation] 3.8% of total emissions in the base year (the first commitment period: 2008-2012)
[Target] 3.5% of total emissions in the base year (2013-2020)
- The government will promote the creation of new green spaces including the development of city parks and the greening of the rooftops of buildings, as a measure to create sinks for greenhouse gases through urban greening. (MLIT)
- Biomass does not increase CO₂ in the atmosphere overall when it is burned, because it only emits CO₂ that has been absorbed from the atmosphere through photosynthesis. Therefore, the utilization of biomass as an alternative to energy and products derived from fossil resources contributes to curbing global warming. The government will thus promote the use of biomass. (MAFF, MEXT, METI, MLIT, MOE)
[Current situation] The quantity of wood biomass used (derived from thinning, etc.): 550,000 m³ (2010)
[Target] The quantity of wood biomass used (derived from thinning, etc.): 6,000,000 m³ (2020)
- Based on the Act on the Promotion of the Use of Nonfossil Energy Sources and Effective Use of Fossil Energy Source Materials by Energy Suppliers established in July 2009, the government is promoting systematic efforts by energy suppliers in order to promote the expansion in the use of nonfossil energy sources including biomass. More specifically, the government has formulated the basic policy on the promotion of the use of nonfossil energy sources by energy suppliers. The government has also formulated and published the criteria for each type of business to determine the target for the use of nonfossil energy sources and to determine measures which should be implemented systematically in order to achieve the targets,

in light of the content of the Basic Energy Plan (decided by the Cabinet on June 18, 2010). (METI)

- With regard to the greening of rooftops and walls, the government will collect empirical data on the degree to which it contributes to curbing global warming by measuring how much impact it has on alleviating the heat island phenomenon in cities, as well as collecting empirical data on its living organism habitat creation abilities. The government will thereby work to understand the effects of the measures. (MLIT)
[Current situation] The area of greened rooftops: 304 hectares, the area of greened walls: 39 hectares (March 2011)
- In order to alleviate the heat island phenomenon, the government will promote alleviation measures and technologies such as the greening of rooftops and walls, and the use of highly reflective paint. (MOE)
- The government will promote international cooperation for sustainable agriculture, forestry and fisheries through the utilization of Japan's experience and knowledge accumulated in Japan and abroad, and make vigorous contributions to conservation of global environment including prevention of desertification, sustainable use of water resources and climate change measures. (MAFF)
- In order to promote sustainable forest management and climate change measures in developing countries including REDD+, the government will work on basic surveys, technology development and human resource development. (MAFF, MOFA, MOE)
[Current situation]
 - Implementing forest conservation and awareness-raising activities in areas around refugee camps in Africa, etc.
 - Providing support for the development of afforestation and forest management methods that give consideration to the water balance in arid regions
 - Developing and transferring technologies for understanding changes to forests over time using satellite images, etc. and developing human resources in developing countries
 - Providing support for the development of the domestic systems needed to implement internationally discussed REDD measures such as providing training and disseminating forest management techniques
- The government will vigorously participate in the revision work for the IPCC (Intergovernmental Panel on Climate Change) Guidelines (for forests) which provide the technical base for implementing international climate change measures. (MAFF, MOE)
[Current situation] The IPCC scoping meeting was held (in May 2012).
[Target] Agree on the revisions at COP 19 (in 2014).
- Through active involvement in international policy discussions at the United Nations Forum on Forests (UNFF) and other forums, the government will play an active role in the international community for the promotion of sustainable forest management including illegal logging prevention in cooperation with the relevant countries, in order to conserve biodiversity nurtured by the world's forest resources and to curb global warming. (MAFF, MOFA, MOE)

[Current situation] In order to promote efforts for sustainable forest management around the world, the Japanese government is participating in and contributing to international discussions at UNFF, etc. and promoting international activities in cooperation with relevant countries, international organizations and others.

In particular, for the Montreal Process, Japan as the secretariat is coordinating 12 member countries and assisting in the organization of the Working Group Meetings and the Technical Advisory Committee Meetings (TAC Meetings). Japan is also contributing to promoting cooperation and coordination with other international processes for the establishment of criteria and indicators.

Japan is also hosting international meetings involving a wide range of participants on forests and forestry every year with a view to continuously taking the initiative in solving problems in order to promote sustainable forest management around the world.

- Japan has made financial contributions of 14 million dollars to the Forest Carbon Partnership Facility (FCPF) established by the World Bank to support developing countries working to reduce deforestation through forest conservation activities. The Japanese government will actively support developing countries' capacity building projects for controlling deforestation and monitoring to reduce deforestation. (MOF, MOFA, MAFF, MOE)
- At wind turbines, there have been bird strikes involving rare bird species such as the white-tailed eagle and this represents one of the obstacles to wildlife conservation and the promotion of wind power generation. Therefore, the government will strive to develop technologies to reduce the risk of bird strikes at wind turbines with the aim of achieving both wildlife conservation and the promotion of wind power generation. (MOE)
- Through the Asia-Pacific Network for Global Change Research (APN), the government will promote joint research with researchers from the region and strengthen ties with those in charge of the relevant policies in Asia-Pacific countries. (MOE)

[Current situation] The government is implementing joint research and capacity development projects. It continues to give input to the United Nations Framework Convention on Climate Change (UNFCCC) and holds events related to the *Satoyama* Initiative.

[Target] The government will strategically work on research into ecosystems and biodiversity as they are one of the priority fields in APN's Third Strategic Plan (2010-2015).
Biodiversity is also expected to be included as one of the priority fields in APN's Fourth Strategic Plan (2015-2020).

- Through the Monitoring Sites 1000 project, the government will continue implementing surveys to correctly understand changes in various ecosystems that are typically found in Japan, including alpine zones where the impact of global warming can be seen more clearly than in other types of ecosystems. In addition, based on the monitoring results for the impacts of global warming etc., the government will consider adaptation measures with a view to conserving biodiversity, for example by examining the condition of ecological networks that are highly adaptive to environmental changes including climate change and by identifying the points to keep in mind when trying to maintain or restore healthy ecosystems. (MOE)

- Based on discussions at the World Heritage Committee, the government will build monitoring setups and programs in order to understand the impact of global warming on world heritage sites. (MOE, MAFF)
- With regard to the Shiretoko World Natural Heritage Site, the government will monitor changes in the marine environment and alpine vegetation, in order to understand the impact of climate change on the ecosystems and biodiversity in the world heritage site. It will also consider and implement climate change adaptation measures including measures to reduce environmental impacts such as feeding damage caused by the Yezo deer. (MOE, MAFF)
- In order to raise interest in biodiversity and deepen understanding about biodiversity among the general public, the government will implement participatory surveys in cooperation with various relevant organizations and experts, where citizens will participate in the collection of a wide range of information about changes in the natural phenomena close to where they live and the distributions of wild species. The government will then disseminate the survey results widely. (MOE)
- In order to secure routes through which wild organisms can migrate or disperse in the case of environmental changes such as global warming, the government will promote the formation of ecological networks. (MOE, MAFF, MLIT)
- In light of the ICRI (International Coral Reef Initiative) resolution on coral reefs & climate change, the government will conduct studies into improving coral reef resilience in order to consider climate change adaptation measures. It will also support the implementation of relevant activities as well as conducting studies concerning ocean acidification. (MOE)
- There is a concern that global warming will cause changes in weather conditions and hydrographic conditions as well as causing a long-term rise in sea levels. There is a concern that there will be serious impacts on coasts including the progress of coastal erosion, an increase in below-sea-level areas, the escalation of damage by storm surges and changes in the territories of organisms. For this reason, the government will monitor tide levels, ocean waves, etc. as well as considering the measures needed to cope with these changes. (MAFF, MLIT)
- In order to respond to the impacts of global warming on agriculture, forestry and fisheries that are unavoidable in the future and impacts that may threaten the safety and security of citizens' such as mountain disasters and flooding caused by local downpours as well as droughts, the government will work on the development and dissemination of adaptation measures, including the development of heat-resistant varieties of crops, the control of damage caused by wildlife, diseases and insect pests, measures to prevent mountain disasters, etc. (MAFF)
- The government will examine methods for comprehensively conserving and managing natural resources in arid regions, etc. and implement research and surveys. The government will provide the scientific knowledge gained through these activities to the Conference of the Parties to the United Nations Convention to Combat Desertification (UNCCD) and to the meetings of subsidiary bodies, and vigorously tackle the global desertification problem. (MOFA, MOE, MAFF)

- The government will compile the latest findings on the impacts of global warming for each field including natural ecosystems, food, water environments and resources, water disasters and coastal environments, health, life in urban areas as well as citizens' lives in general. The government will then conduct standardized forecasts and assessments of global warming in Japan and its impacts. Based on the information, the government will formulate adaptation guidelines that contain the basic policy on adaptation measures in Japan, common points to remember when planning and implementing adaptation measures in all fields, priority fields and roles of each type of entity. The government will then support adaptation measures taken by the relevant ministries and agencies as well as local governments. (MOE)
- On national forest, the government will make more effective forest ecosystem conservation efforts covering larger areas. For example, the government will establish "green corridors" (a system established in 2000) which create networks mainly focusing on forest reserves in order to promote interaction between populations and secure species and genetic diversity by conserving or creating migration routes linking the habitats of wild animals and plants. (MAFF)
[Current situation] The area of green corridors: 586,000 hectares (April 2011)
- With regard to green corridors on national forest, under the policy of management of forests with a balanced species composition of coniferous and broad-leaved trees and diversifying the ages of trees and canopy species, the government will implement operations that give consideration to the habitats of wild animals and plants, for example conserving broad-leaved trees which are naturally growing in artificial forests wherever possible, while maintaining the stands in an excellent condition. The government will also carry out monitoring surveys to understand the relationship between forest conditions and the inhabitation of wild animals and plants and use the findings to improve the conservation and management of the forests. If green corridors of a sufficient size cannot be established with national forests alone, the government will strive to specify green corridors which include neighboring private forests where necessary by obtaining cooperation from their owners. The government will try to create more elaborate forest ecological networks by ensuring links between parts of forests along mountain streams and other water bodies. (MAFF)
- The government will conduct empirical research and development for technologies that reduce CO₂ emissions derived from energy use that can be and need to be put into practical use quickly, including the utilization of grass and wood biomass resulting from Satochi-Satoyama conservation activities as energy sources. (MOE)

[Integrated measures]

Section 10 Integrated efforts towards a society in harmony with nature, a recycling-oriented society and a low-carbon society (Basic concepts)

There is a concern that climate change (which is very likely to have been caused by increased greenhouse gas emissions derived from human activities) and the modification of land for the extraction of mineral resources will lead to the loss of habitats for living organisms and have a major impact on biodiversity. Promoting the utilization of naturally renewable resources such as wood and other biomass leads to a reduction in the consumption of non-renewable resources as well as the maintenance and conservation of forests and the conservation of human-influenced natural environments inhabited by characteristic living organisms.

Therefore, it is important to consider efforts to establish a society in harmony with nature, a recycling-oriented society and a low-carbon society in an integrated manner.

Since there is a concern that climate change will have major impacts on biodiversity, various policy instruments need to be used to establish a low-carbon society. In the Fourth Basic Environment Plan, Japan aims to persuade all other countries to share the target of at least halving global greenhouse gas emissions by 2050 and to reduce Japan's greenhouse gas emissions by 80% by 2050. With the aim of establishing a low-carbon society, the government will promote the use of renewable energy sources such as small-scale hydropower generation, binary cycle power generation, as well as photovoltaic power, wind power, other hydropower, geothermal energy and biomass derived from unused timber from forest-thinning, etc. The government will give due consideration to impacts on biodiversity that may be caused by the production and harvest of these resources as well as caused by the establishment and operation of facilities, in order to promote the sustainable use of these resources. In order to curb global warming, the government will also promote the appropriate management and conservation of forests as well as promoting the appropriate conservation and management of grassland, peat bogs, etc. which are all important carbon sinks.

As integrated efforts to establish a low-carbon society and a recycling-oriented society, the government will promote the 3R (reduce, reuse and recycle) efforts, thereby preventing the loss of habitats for organisms caused by the extraction of new natural resources. The government will also utilize wood and other biomass which are naturally renewable resources including resources that are currently untapped, and strive to improve and conserve agricultural land and forests as well as conserve ecosystems endemic to Satochi-Satoyama areas. In addition, the government will promote the establishment of local recycling zones where these resources, produced as part of sound material cycles, are used as energy sources locally to the greatest extent possible.

1 Promoting integrated efforts towards a society in harmony with nature, a recycling-oriented society and a low-carbon society (Specific measures and policies)

- The government will seek new effective methods of utilizing Satochi-Satoyama areas, through the implementation of local experimental programs such as the provision of spaces for environmental education and ecotourism, and the use of Japanese plume grass and timber obtained from forest-thinning as biomass. The government will also establish a framework through which diverse stakeholders including urban residents and companies manage and

sustainably utilize Satochi-Satoyama areas as resources shared by them (“commons”). (MOE, MEXT, MAFF)

- Based on the decision made at the COP 10, the government will globally promote the *Satoyama* Initiative which aims at the conservation and sustainable use of biodiversity in human-influenced natural environments, using the International Partnership for the *Satoyama* Initiative as an effective tool. (MOE)
- Through taking into consideration global trends and coordination with existing measures such as the *Satoyama* Initiative, the government will consider developing new measures and policies to take advantage of the Biosphere Reserve system which aims at harmony between ecosystem conservation and the sustainable use of the ecosystems (coexistence between nature and human society), in cooperation with local governments and other relevant parties. (MEXT, MAFF, MOE)
- The government will promote the conservation of green spaces and greening in urban areas, by assisting with the development of city parks and the conservation of green spaces which absorb greenhouse gases. (MLIT)
- The government will promote efforts which indirectly contribute to CO₂ emissions reduction. For example, it will promote the reduction of heating and cooling demand through implementing measures to alleviate the heat island phenomenon such as the greening of city parks and building plots in order to improve ground cover. (MLIT)
- With regard to the greening of rooftops and walls, the government will collect empirical data on the degree to which it contributes to curbing global warming by measuring how much impact it has on alleviating the heat island phenomenon in cities, as well as collecting empirical data on its living organism habitat creation abilities. The government will thereby work to understand the effects of the measures. (MLIT)
[Current situation] The area of greened rooftops: 304 hectares, the area of greened walls: 39 hectares (March 2011)
- In order to alleviate the heat island phenomenon, the government will promote alleviation measures and technologies such as the greening of rooftops and walls, and the use of highly reflective paint. (MOE)
- The Act on the Promotion of Recycling of Used Small Electronic Devices was promulgated in August 2012, with the aim of establishing appropriate and effective recycling systems for rare metals with a view to preventing the destruction of the natural environment caused by the extraction of resources. It is planned that the law will be put into force in FY2013 and the collection of used small electronic devices and the recovery of useful metals including rare metals will be launched.
 - The government will take the necessary measures to contribute to the stable supply of rare metals, etc., including the implementation of demonstration projects for the establishment of rare metal recovery schemes proposed at the joint meeting of the Industrial Structure Council and the Central Environment Council, with the aim of “collecting a sufficient amount of used devices containing rare metals” and “improving recycling efficiency.”
 - The government will promote the “research and development of buildings with new structural systems that use innovative structural materials” and the “development of

technology to recover priority rare metals for recycling,” with the aim of developing technologies to design and manufacture long-life products and easy-to-recycle products. In addition, the government will promote the “project for the development of alternative materials to rare metals” and the “strategic project for chemical elements,” with the aim of supporting the development of technologies to replace rare metals with more abundant resources or to substantially reduce rare metal consumption. (MOE, MEXT, METI)

- Sewage systems are a type of “urban mine” which contains rare and useful resources. The government will promote efforts to collect and recycle materials contained in sewage systems in cooperation with the resource users, in an effort to establish a recycling-oriented society. (MLIT)
- The government will promote the use of sewage sludge resulting from sewage treatment as energy sources by manufacturing solid fuel from the sludge or utilizing the biogas generated from methane fermentation using the sludge, by supporting related projects using the general grant for social capital development and by conducting demonstration projects for innovative technologies for sewage systems. (MLIT)
- The government will promote the use of sewage sludge resulting from sewage treatment as biomass. (MLIT)
- The government will promote projects for establishing sound water circulation systems from a wide-area viewpoint, including the reuse of treated sewage water and rainwater and discharge control by employing rainwater storage and percolation systems. (MLIT)
- The government will promote the introduction of highly sustainable agricultural production systems that intend to promote in an integrated manner composting-based soil cultivation and the reduction of the use of chemical fertilizers and agricultural chemicals. The government will promote advanced practices, for example farming practices which seek to reduce the use of chemical fertilizers and agricultural chemicals to less than half of the amount typically used in local farming practices, combined with efforts to conduct farming practices that are highly effective in curbing global warming and conserving biodiversity. (MAFF)
- The government will promote organic farming, which makes it a rule to avoid the use of any chemical fertilizer or agricultural chemical and aims to significantly reduce the environmental impacts attributed to agricultural production activities and facilitate the growth of diverse living organisms. As part of this effort, the government will promote the establishment of technological systems for organic farming, improvement in the frameworks for education and guidance on these systems for farmers, and will seek to deepen understanding about organic farming among processing industries and distributors. Thus, the government will promote the creation of conditions which encourage farmers to engage in organic farming. (MAFF)
- With regard to aquaculture, the government will promote the formulation of Aquaculture Improvement Plans in order to encourage community-led improvements to aquaculture areas in order to achieve sustainable aquaculture production that does not degrade aquaculture areas. (MAFF)
- Regarding fish aquaculture, the government will promote the development of low environmental impact feed in order to reduce environmental impacts caused by residual feed. (MAFF)

- Based on the Act on the Promotion of the Use of Nonfossil Energy Sources and Effective Use of Fossil Energy Source Materials by Energy Suppliers established in July 2009, the government will promote systematic efforts by energy suppliers in order to promote the expansion in the use of nonfossil energy sources including biomass. More specifically, the government will formulate the basic policy on the promotion of the use of nonfossil energy sources by energy suppliers. The government will also formulate and publish the criteria for each type of business to determine the target for the use of nonfossil energy sources and to determine measures which should be implemented systematically in order to achieve the targets, in light of the content of the Basic Energy Plan (decided by the Cabinet on June 18, 2010). (METI)
- The Basic Plan for the Promotion of Biomass Utilization was decided on by the Cabinet in December 2010 with the aim of implementing measures and policies to promote the utilization of biomass comprehensively and systematically. The plan sets a target which should be achieved by 2020. As the next step, the government will promote the formulation of municipal biomass utilization promotion plans. (MAFF, MEXT, METI, MLIT, MOE)
 - [Current situation] The “biomass town concepts” have been formulated for 318 areas (FY2011).
 - [Target] Municipal biomass utilization promotion plans will be formulated for 600 municipalities (by 2020).
- Biomass does not increase CO₂ in the atmosphere overall when it is burned, because it only emits CO₂ that has been absorbed from the atmosphere through photosynthesis. Therefore, the utilization of biomass as an alternative to energy and products derived from fossil resources contributes to curbing global warming. The government will thus promote the use of biomass. (MAFF, METI, MLIT, MOE)
 - [Current situation] The quantity of wood biomass used (derived from thinning, etc.): 550,000 m³ (2010)
 - [Target] The quantity of wood biomass used (derived from thinning, etc.): 6,000,000 m³ (2020)
- The government established the “investigative team for biomass commercialization strategies” made up of external experts in February 2012. The team will clarify issues at each stage including raw material production, collection, transport, manufacturing and utilization as well as considering strategies for their commercialization, from the standpoint of improving the efficiency of projects and facilities. (MAFF, MEXT, METI, MLIT, MOE)
- Concerning the large-scale biofuel demonstration project that covers the entire process from material procurement, production to the utilization of biofuel which was started in FY2007, from FY2012 the government will support the project in overcoming the problems revealed in the demonstration process before its commercialization, and support the establishment of a local production center for domestically-produced biofuel. (MAFF)
 - [Current situation] Producing about 40,000 kL of biofuel (FY2011)
- Since FY2007, the government has been working on technology development for the breeding and low-cost cultivation of non-food crops and high-efficiency ethanol production using non-food materials and crops such as rice straw and wood biomass. Since FY2008, the government has been conducting a demonstration project aiming to establish technologies for

the entire process covering the collection and transport of soft cellulose biomass such as rice straw and the manufacturing and utilization of biofuel made of such biomass. The government will continue its efforts to develop low-cost, high-efficiency biofuel production technologies. (MAFF)

- Based on the Biofuel Technology Innovation Plan which aims at biofuel technology development, the government will develop technologies to produce cellulose-derived ethanol, which does not cannibalize food supply. The government will also conduct research and development for technologies to manufacture raw materials for chemical products from various types of biomass and technologies to make methane fermentation more efficient. It will also develop BTL (Biomass to Liquid) technology which is expected to be put into practical use in around 2030 and technologies to manufacture biofuel from microalgae, in an effort to utilize biomass resources comprehensively. (METI)
- The government will promote the introduction of power generated using renewable energy through the Act on Special Measures Concerning Procurement of Renewable Electric Energy by Operators of Electric Utilities which was put into force in July 2012. (METI)
- The government will promote technology development for the utilization of wood biomass such as pruned branches resulting from the maintenance of city parks, etc. and disseminate the technologies. (MLIT)
- The government will encourage municipalities to develop facilities for producing compost, feed or methane from biomass waste by providing a grant for the promotion of the establishment of a sound material-cycle society. (MOE)
- The government will encourage municipalities to develop facilities for producing biodiesel fuel from biomass waste by providing a grant for the promotion of the establishment of a sound material-cycle society. (MOE)
- The government will conduct empirical research and development for technologies that reduce CO₂ emissions derived from energy use that can be and need to be put into practical use quickly, including the utilization of grass and wood biomass resulting from Satochi-Satoyama conservation activities as energy sources. (MOE)
- At wind turbines, there have been bird strikes involving rare bird species such as the white-tailed eagle and this represents one of the obstacles to wildlife conservation and the promotion of wind power generation. Therefore, the government will strive to develop technologies to reduce the risk of bird strikes at wind turbines with the aim of achieving both wildlife conservation and the promotion of wind power generation. (MOE)

Chapter 3 Reconstruction and Restoration after the Great East Japan Earthquake

Section 1 Reconstruction and restoration after the Great East Japan Earthquake

(Basic concepts)

The large-scale Tohoku Region Pacific Coast Earthquake which occurred on March 11, 2011 and the accompanying tsunami and land subsidence took their toll on numerous people's lives and property as well as having a great impact on the natural environment.

The Basic Guidelines for Reconstruction in response to the Great East Japan Earthquake (2011) formulated by the Reconstruction Headquarters in response to the Great East Japan Earthquake set forth the following measures: considering the reorganization of existing natural parks such as Rikuchu Kaigan National Park and the establishment of Sanriku Reconstruction (Fukko) National Park; implementing various projects including the promotion of ecotourism; the realization of a society in harmony with nature through nature restoration; conducting studies into the current state of the natural environment as well as monitoring; the utilization of disaster-prevention forests based on the concept of disaster reduction; among others.

People living in the area along the Pacific coast in the Tohoku Region have benefited from the rich natural environment as well as suffering from the violent side of the nature at other times. Through developing wisdom and techniques to live in harmony with nature, they have been conducting agricultural, forestry and fishery activities and have developed unique cultures. In the process of reconstruction, it is important to give consideration to the natural environment, and to utilize the natural environment in the region as well as the Tohoku people's lifestyles and cultures in harmony with nature which are locally distinct tourism resources. All of these resources are benefits from nature.

As can be seen from the earthquake and the tsunami caused by the earthquake which are both natural phenomena, it is necessary to recognize the fact that nature can in essence become a threat and to learn about natural disasters by correctly understanding the 2011 earthquake and tsunami in order to be prepared for earthquakes and tsunamis which are expected to come in the future.

Conserving rich ecosystems which form excellent natural landscapes and support local livelihoods, and restoring natural environments that were affected by the earthquake and the tsunami, will lead to strengthening the connections between forests, rural communities, rivers and the sea that have been developed in each local area. It will also strengthen ecosystem services (benefits of nature) including the supply of food, natural disaster prevention and the mitigation of damage caused by natural disasters. Therefore, the conservation and restoration of the natural environment is needed for the sustainable development of the region after the reconstruction work has been completed.

In addition, it is necessary to conduct long-term surveys of the direct and indirect impacts of radioactive materials released as a result of the accident at the Fukushima Daiichi Nuclear Power Station on wild animals and plants.

1 The establishment of a Sanriku Reconstruction (Fukko) National Park (Specific measures and policies)

- The government will promote the green reconstruction projects centered around the establishment of the Sanriku Reconstruction (Fukko) National Park, which include: (1) the

establishment of Sanriku Reconstruction (Fukko) National Park (restructuring of natural parks); (2) the development of Satoyama and Satoumi field museums and related facilities; (3) tours for enjoying nature in depth using local treasures (reconstruction ecotourism); (4) a trail which connects north and south to deepen exchanges (the Tohoku coastal trail); (5) the restoration of connections between forests, rural communities, rivers and the sea; (6) the promotion of education for sustainable development (ESD); and (7) understanding the impacts of the earthquake and the tsunami on the natural environment (natural environment monitoring). Through the project, the government intends to hand down the natural environment and community lifestyles nurtured by the interrelationship between forests, rural communities, rivers and the sea. It will also contribute to the reconstruction of the affected areas while learning about the benefits and threats of nature and utilizing the information in the reconstruction efforts. (MOE)

2 Measures in response to the accident at the nuclear power station (Specific measures and policies)

- In order to understand the impacts of radioactive materials on ecosystems in areas around the Fukushima Daiichi Nuclear Power Station, the government will collect and analyze samples of plant seeds, mice, etc. in cooperation with the relevant organizations and groups.
Understanding the impacts of radioactivity on ecosystems requires long-term surveys over generations. Therefore, the government will cooperate with relevant research institutes and academic experts in considering the monitoring methods to be used and understanding the ecological impacts. (MOE)
- In order to rescue pets (dogs and cats) left behind in the 20 km radius (in the exclusion zone) due to the accident at the Fukushima Daiichi Nuclear Power Station, the government will fully cooperate with Fukushima Prefecture and also in cooperation with relevant organizations and groups to rescue and keep affected pets (dogs and cats), care for them at shelters, return them to the owners or give them to new owners. (MOE)

3 The utilization of disaster-prevention forests (Specific measures and policies)

- Coastal disaster-prevention forests have functions for disaster prevention, such as protecting land against tide water damage including tsunamis and storm surges and protecting land from drifting sand and wind damage, therefore they play an important role in the conservation of local people's living environments. The tsunami after the Great East Japan Earthquake affected about 1,718 hectares of coastal disaster-prevention forests in 253 sites situated over an extensive area ranging from Aomori to Chiba.
After the earthquake, the government promptly launched post-disaster seawall reconstruction projects, etc. In addition, the Forestry Agency checked the damage to coastal disaster-prevention forests in May 2011, and discussed ways to restore the forests at the "investigative commission on the restoration of coastal disaster-prevention forests after the Great East Japan Earthquake" composed of academic experts, etc. After the discussions at the five commission meetings, the results were compiled in the "report on the future restoration of coastal disaster-prevention forests" in February 2012 (hereinafter referred to as the "report"). The report concluded that, although coastal disaster-prevention forests cannot completely stop tsunamis on their own, they can mitigate damage by absorbing the tsunamis' energy and trapping drifting articles, therefore they can be used as one of multiple guarding systems in city planning. The report also states that, when proceeding with full-scale restoration operations for

coastal disaster-prevention forests, biodiversity should be taken into account and diverse forests should be developed by for example planting broad-leaved trees, while also taking into account the conditions in each affected area, the natural conditions, the local communities' needs and the need to conserve local ecosystems. (MAFF)

- In the tsunami disaster after the Great East Japan Earthquake, most of the trees in the coastal areas were flattened and drifting trees caused damage. On the other hand, coastal forests also contributed to mitigating the tsunami disaster as can be seen in cases where houses behind trees were less damaged and drifting articles such as vehicles were trapped by trees. Based on these findings, the government published “The technical guidelines for development of urban parks towardsthe reconstruction from the Great East Japan Earthquake” in March 2012, concerning the development of urban parks in tsunami disaster-resistant city planning. The document aimed to give guidelines for considering city reconstruction plans for disaster-affected cities and for planning and designing urban parks in post-disaster reconstruction projects. The guidelines state that urban parks are expected to have a disaster reduction effect as one of multiple guard systems, and have the following four functions: (1) absorbing the energy of tsunamis of a certain size and trapping drifting articles; (2) providing evacuation routes and evacuation sites during tsunamis; (3) providing spaces for restoration and reconstruction work; (4) serving as symbols of post-disaster reconstruction and providing venues for disaster-prevention education. The guidelines also stipulate the need to restore and conserve local ecosystems by selecting species that originally existed in local ecosystems as well as conserving topsoil. The government will promote these activities when developing urban parks that contribute to creating tsunami disaster-resistant cities in the post-disaster reconstruction efforts. (MLIT)

Section 2 Efforts to establish a new type of society in harmony with nature (Basic concepts)

The Great East Japan Earthquake made us recognize once again that nature can become a threat at times while providing us various benefits at other times, and that there is nothing humans can do when facing the overwhelming force of nature. The earthquake also revealed the vulnerability of our socio-economic systems and provided us with an opportunity to review current society and our relationship with nature, including the fact that vital systems are over-centralized in Tokyo and that our lifestyles require the mass consumption of resources and energy.

Therefore, it is important that we aim at establishing independent and distributed local communities that can flexibly respond to disasters through the following efforts: prioritize local consumption of locally supplied ecosystem services as much as possible, recycle and sustainably utilize local resources within communities; consider communities that are connected via the supply and reception of ecosystem services as a “socio-ecological sphere” (which could be domestic or international) and deepen cooperation and exchanges between the communities within the sphere, in order to cover shortages that cannot be solved within communities, from a regional standpoint; and utilize valuation systems for ecosystem services in this process.

At a time when efforts to restructure land use in Japan are emerging, the government will strive to reestablish the rich relationship between humans and nature in a way that best suits each local community, through the following efforts: improve the quality of nature throughout the country by utilizing ecosystems’ capacity to recover and providing artificial support where their capacity to recover has been lost; promote nature restoration; and reevaluate traditional methods for using and managing the natural environment that have been practiced in Satochi-Satoyama areas.

The government will also disseminate information in an easy-to-understand manner and share with the world our efforts to establish a society in harmony with nature, including knowledge, technologies, etc. obtained based on the ideas and activities explained above.

1 Efforts to establish a new type of society in harmony with nature (Specific measures and policies)

- In order to facilitate the development of ecological networks, the government will work on the provision of information and awareness-raising about the concept of ecological networks as well as methods for planning and achieving ecological networks. It will also assess and examine the effects of existing networking measures and projects. (MLIT, MAFF, MOE)
- The government, through cooperation between the relevant ministries and agencies, will consider the direction and specific measures for nature restoration from the national and wide-area perspectives, by taking into consideration the findings reported in the Japan Biodiversity Outlook and the progress in the ecological network initiative. The government will then promote the systematic implementation of nature restoration measures. (MOE, MAFF, MLIT)
- Regarding nature conservation areas and natural environment conservation measures in Japan, the government will promote the economic valuation of biodiversity as well as the evaluation of economic losses derived from the loss of biodiversity and the costs of effectively conserving biodiversity. The government will also publicize the evaluation results and consider ways to utilize the evaluation results. (MOE)

- The government will support voluntary community activities for biodiversity conservation and restoration such as the conservation of rare wild animal and plant species, the conservation and management of wildlife, measures to control alien species and the conservation and restoration in priority areas that serve as hubs for ecological networks. It will also support the formulation of statutory plans based on the Basic Act on Biodiversity, the Act on the Promotion of Regional Cooperation for Biodiversity and other laws. (MOE)
- The government will collect and disseminate information about environmental certification systems which certify environmentally friendly products and services, indicators for assessing the relationship between business activities and biodiversity, commendation systems for good practices that contribute to biodiversity conservation, etc. The government will thus promote private sector engagement in biodiversity. (MOE)
- In order to increase the number of biodiversity-conscious “smart consumers,” the government will raise awareness among consumers by promoting existing environmental certification systems and vigorously providing information about businesses that deal with certified products and businesses that are committed to biodiversity conservation. (MOE)
- The government will identify examples of education for sustainable development (ESD) being conducted in various parts of Japan, visualize them, share and disseminate good practices, as well as training personnel who can coordinate those involved in ESD, in order to establish community-based ESD across the country. (MOE, MEXT)
- In order to reevaluate the allure unique to each local area and develop vital and sustainable local communities, the government will support the formulation of “overall schemes” for ecotourism promotion based on the Act on the Promotion of Ecotourism put into force in April 2008. (MOE, MEXT, MAFF, MLIT)
- The government will seek new effective methods of utilizing Satochi-Satoyama areas, through the implementation of local experimental programs such as the provision of spaces for environmental education and ecotourism, and the use of Japanese plume grass and timber obtained from forest-thinning as biomass. The government will also establish a framework through which diverse stakeholders including urban residents and companies manage and sustainably utilize Satochi-Satoyama areas as resources shared by them (“commons”). (MOE, MEXT, MAFF, MLIT)
- With the aim of encouraging Satochi-Satoyama conservation activities, the government will collect and analyze a wide range of characteristic examples of conservation efforts taking place in various parts of Japan, including the reevaluation of the wisdom and techniques used in traditional lifestyles, efforts to hand them down to future generations, and their utilization as local resources. The government will then disseminate the information so that these examples can be used in other parts of Japan. (MOE, MEXT)
- The government will disseminate information within Japan and abroad about advanced activities taking place in Japan, including the conservation and management system for National Parks enabled through coordination and cooperation between various local entities as well as sustainable agricultural, forestry and fishery activities. (MOE, MAFF)

- Based on the decision made at the COP 10, the government will globally promote the *Satoyama Initiative* which aims at the conservation and sustainable use of biodiversity in human-influenced natural environments, using the International Partnership for the *Satoyama Initiative* (IPSI) as an effective tool. (MOE)
- The Basic Plan for the Promotion of Biomass Utilization was decided by the Cabinet in December 2010 with the aim of implementing measures and policies to promote the utilization of biomass comprehensively and systematically. The plan sets a target which should be achieved by 2020. As the next step, the government will promote the formulation of municipal biomass utilization promotion plans. (MAFF, MEXT, METI, MLIT, MOE)
- Sewage systems are a type of “urban mine” which contains rare and useful resources. The government will promote efforts to collect and recycle materials contained in sewage systems in cooperation with the resource users, in an effort to establish a recycling-oriented society. (MLIT)
- The government will disseminate and promote the ideas of Satoumi development and specific activities by utilizing the Sato-umi Net and the manual for developing Satoumi. The government will also conduct surveys and formulate action plans for reconstructing the sea areas which were severely affected by the Great East Japan Earthquake as fertile Satoumi. In addition, the government will disseminate the concept of “Satoumi” domestically and to other parts of Asia through symposia, etc. (MOE)
 - [Current situation] Conducting surveys on the environment (water quality, bottom materials, seagrass beds, etc.) in five closed ocean areas in the Tohoku Region
 - [Target] Formulate Satoumi reconstruction plans in local areas (up to 2013).
- In order to provide scientific knowledge that contributes to the recovery of the fishing grounds in the sea off the coast of the Tohoku Region, the government will conduct surveys and research mainly in model sea areas using state-of-the-art observation and analysis technologies, with the aim of clarifying the mechanisms of change in marine ecosystems. (MEXT, MAFF, MOE)
- At the potential site for the establishment of Sanriku Reconstruction (Fukko) National Park, where the government is working towards the designation of the area affected by the tsunami in the Great East Japan Earthquake as a National Park, the government will cooperate with those working to have the area designated as a Geopark. It will proceed with the conservation of geosites including the evidence of the earthquake and tsunami disasters and the development of mechanisms for learning about the threats and benefits of nature, as well as disseminating the information about the efforts globally. (MOE)