



The National  
Wetlands Action  
Plan for the  
Philippines  
2011-2016





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DENR-PAWB  
Ninoy Aquino Parks and Wildlife Center Compound  
Quezon Avenue, Diliman  
1101 Quezon City, Philippines  
Tel. (+632) 924-6031  
Fax. (+632) 924-0109; (+632) 925-8950  
planning@pawb.gov.ph  
<http://www.pawb.gov.ph>

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# Foreword

This nation's life-sustaining inheritance includes a treasure trove of wetlands that ensure freshwater reserves and nourish fisheries that supply more than half of its exponentially growing population's protein requirements. To exercise inter-generational responsibility over the Filipino people's invaluable *pamana* is to rise to the challenge of addressing the myriad concerns of these invaluable ecosystems.

The National Wetlands Action Plan of the Philippines for 2011 to 2016 was developed in a series of multi-stakeholder consultations nationwide to update and climate-proof the last action plan released almost a decade ago. As a way of acknowledging their contribution, each and every representative of agencies and organizations, as well as private individuals, who participated in this extensive undertaking are named in the crafting of this final document (Annex D).

At no time, for a nation situated right in the world's typhoon alley, has it been most urgent to press on for the restoration, rehabilitation and promotion of the wise use of its wetlands. For wetlands are the beneficent natural superstructures that also provide, among many others, ecological services like stabilization of the shoreline, flood control and prevention of green house gas release.

Through the NWAPP 2011-2016, wetland-related concerns that cut across the jurisdiction of several government agencies at the national, provincial and local levels are guided with a national framework that identifies priorities and data gaps, delineates responsibilities and expected outcomes—and most of all—enables stakeholders. Its institutionalization, through the creation of a multi-stakeholder National Wetlands Committee, is sought so that funds may be sourced and a monitoring, evaluation, and reporting framework is set in place to ensure that the activities are implemented and the outcomes achieved.

The development and implementation of the NWAPP 2011-2016 is in keeping with international commitments to Conventions and Treaties such as Convention on Biological Diversity, Ramsar Convention on Wetlands, Convention on the Conservation of Migratory Species of Wild Animals, Convention on International Trade of Endangered Species of Wild Flora and Fauna, United Nations Convention on Combating Desertification, and the United Nations Framework Convention on Climate Change.

Theresa Mundita S. Lim  
*Director, Protected Areas and Wildlife Bureau*



# Executive Summary

It was made clear in the report on impacts, adaptation and vulnerability to climate change by the International Panel on Climate Change that species extinction rates increased by a factor of 1,000 over the last century, paving the way for the greatest wave of mass extinction of animal species in 65 million years. It is projected that by 2100, the Earth's remaining species may likely be extinct.

The proactive mitigation of climate change and its impacts as well as the advancement of adaptation measures consistent with the goal for sustainable development, requires informed policy-making and implementation at the national and local levels. The National Wetland Action Plan for the Philippines (NWAPP), integral to the Philippine Development Plan 2011-2016, serves as the guiding document for the country to promote and implement strategies and actions for the wise use of its wetlands, which include its lakes and rivers, caves, mangroves, peatlands, seagrass, and corals.

The typical Filipino diet of rice and fish and a drink of water—products of three types of wetlands—gives a taste of the wetlands that is all but "invisible" as a living ecosystem both in the general public's attitude and in policy-making. Many regulations impacting wetlands do not make direct reference to them but are spread over access to natural resources, jurisdictions over territory and management, or the prohibition of certain acts bound to site-specific areas. Thus to address physical, chemical and biological pollution of the country's wetlands require remedial policy work at the national level, as well as rational and dutiful law enforcement at the local level. Other prevailing issues and trends include taking stock of the wetland resources' climate change capacities and vulnerabilities, narrowing down priority inland and coastal and marine wetlands, and capacitating stakeholders.

The NWAPP is a framework of strategies and actions that harmonizes the work of government agencies and local government units as well as engages non-government organizations, business sector, small communities and the indigenous people for the management and wise use of the wetlands. The primary focus of interventions are along four thematic areas: 1) Wetlands Policy; 2) Inland Wetlands; 3) Coastal and Marine Wetlands; and, 4) Enabling Strategies.

Notable in the NWAPP is the promotion of ecotourism as a conservation strategy that is characterized by inclusive growth of the basic sectors dependent on the wetland resources. Water and food security are the expected outcomes of concerted action to ease the pressure on the wetland ecosystem and improve its resiliency. An initial nine (9) inland wetlands as well as twenty-eight (28) coastal and marine wetlands identified during the nationwide multi-sectoral consultations are prioritized to optimize resources and achieve maximum impacts and outcomes from activities in the NWAPP.

While the implementation partners at different levels of national agencies are already integrating their assigned tasks in their organizational work plan, activities beyond regular agency functions require funding. Thus, institutionalization is proposed through the creation of a National Wetlands Committee with oversight functions for the implementation of the NWAPP.

As a program, the NWAPP 2011-2016 employs a localized approach to management and community-based participation, even as it is premised on the larger framework of sustainable development, the prevention of harm, and the continuity of a healthful ecology for the subsequent generation. It is a commitment to take responsibility for the continued enjoyment of the country's wetland resources.

## Wise Use of Wetlands

The wise use of wetlands is the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development.

—Ramsar Convention





# I. Introduction to Wetlands in the Staple Food of Filipinos

**W**etlands are areas where the environment and the associated plant and animal life are mainly controlled by water. In the Philippines, wetlands refer to areas of marsh, peatland or water, whether natural or artificial, permanent or temporary, with water that is static, flowing, fresh, brackish or salt, including area of marine water, the depth of which at low tide does not exceed six (6) meters.<sup>1</sup> While the notion and the term “wetlands” is not commonly used, its many products are staples in the dining table of many Filipino homes.

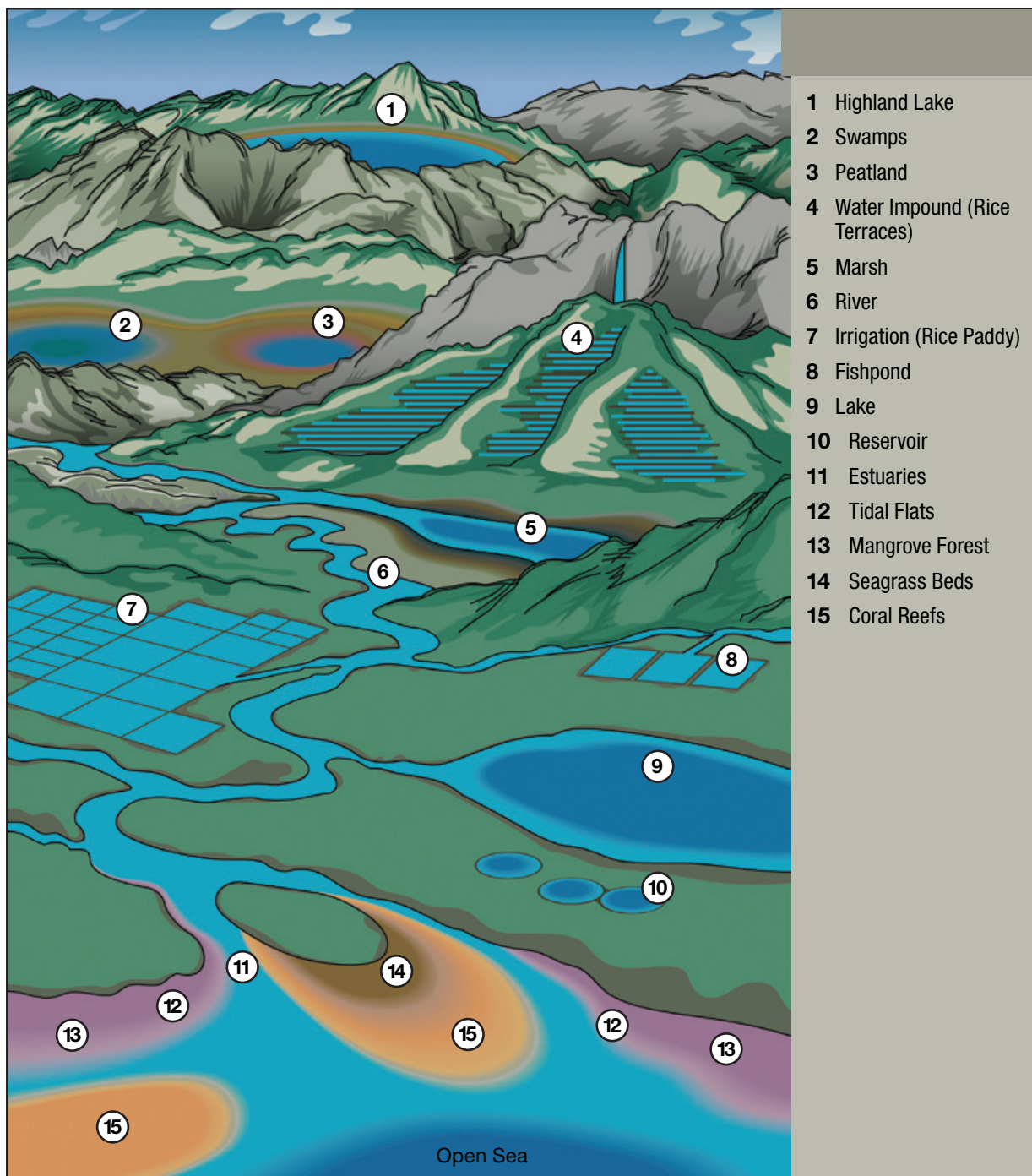
## **Rice and Fish with Water: Staple Foods from the Wetland’s Bounty**

**Rice** – from Human-made Wetlands like the renowned Banawe rice terraces and other irrigated land or seasonally flooded agricultural land. The Bureau of Agricultural Resources Statistics reported in 2011 that 1.9 million hectares produced a total of 7.5 million metric tons of rice.

**Fish** – from fresh, brackish or saltwaters of the Inland Wetlands, like Taal Lake or Coastal and Marine Wetlands like the Tubattaha Reefs in Sulu Sea. The total fisheries production worth P224.7 billion reported by Bureau of Fisheries and Aquatic Resources in 2011 showed that among every 10 fish bought: almost 4 came from aquaculture; 3 from marine fishermen’s catch; over 2 from commercial fisheries, while less than half a fish came from inland fisheries.

**Water** – collected from various freshwater Inland Wetlands resulting from 1000-2000 mm per year of runoff, as cited by Kho in 2005 from the annual Philippine rainfall of 1000 to 4000 mm as per the National Water Resources Board in 2003. The Environmental Management Bureau in 2007 reported that among the 611 classified inland water bodies, only 34% were suitable for water supply.

**Figure 1. Wetland Types**



The Ramsar Convention on Wetlands recognizes three broad categories from the upland ridges to the reef as illustrated in Figure 1:

- 1. Inland Wetlands** – Aquatic-influenced environments, sometimes referred to as freshwater and inland waters/waterbodies but also include brackish water located within land boundaries: inland deltas, rivers/streams/creeks including waterfalls, freshwater and brackish/alkaline lakes, peatlands, freshwater marshes and swamps.
- 2. Coastal/Marine Wetlands** – Wetlands located within coastal watersheds: sea bays and straits, sea-grass beds, coral reefs,

marine shores, sand bars, sandy islets, and dune systems, estuarine and deltas; mud, sand or salt flats; tidal marshes, mangrove swamps, coastal saline lagoon, and marine/coastal caves.

- 3. Human-made Wetlands** – Include fish and shrimp ponds, farm ponds, irrigated agricultural land, salt pans, dams and reservoirs, gravel pits, sewage farms and canals.

Wetlands are ecosystems that support biodiversity and perform an array of ecoservices (Table 1).

**Table 1. Ecosystem Services Provided by or Derived from Wetlands**

<b>Provisioning</b>	
Food	Production of fish, wild game, fruits, and grains
Freshwater	Storage and retention of water for domestic, industrial, and agricultural use
Fiber and fuel	Production of logs, fuelwood, peat, and fodder
Biochemical	Extraction of medicines and other materials from biota
Genetic materials	Genes for resistance to plant pathogens, ornamental species, and so on
<b>Regulating</b>	
Climate regulation	Source of and sink for greenhouse gases, influence local and regional temperature, precipitation, and other climatic processes
Water regulation (Hydrological flows)	Groundwater recharge/discharge
Water purification and waste treatment	Retention, recovery, and removal of excess nutrients and other pollutants
Erosion regulation	Retention of soils and sediments
Natural hazard regulation	Flood control, storm protection
Pollination	Habitat for pollinators
<b>Cultural</b>	
Spiritual and inspirational	Source for inspiration, many religions attach spiritual and religious values to aspects of wetland ecosystems
Recreational	Opportunities for recreational activities
Aesthetic	Many people find beauty or aesthetic value in aspects of wetland ecosystems
Educational	Opportunities for formal and informal education and training
<b>Supporting</b>	
Soil formation	Sediment retention and accumulation of organic matter
Nutrient cycling	Storage, recycling, processing, and acquisition of nutrients

Source: Millennium Ecosystem Assessment, 2005

The continued enjoyment of the products and services of wetlands entail addressing a myriad of challenging concerns and acting with a sense of immediacy. It was made clear in the 2007 report on impacts, adaptation, and vulnerability to climate change by the International Panel on Climate Change that species extinction rates increased by a factor of 1,000 over the last century, paving the way to the greatest wave of mass extinction of animal species in 65 million years. Consequently, the Earth's remaining species may likely be extinct by 2100.

To proactively mitigate climate change and its impacts and to push for adaptation measures consistent with the goal of sustainable development, policy-making at the national and local levels require the best available scientific knowledge, including technical and traditional knowledge. The National Wetlands Action Plan for the Philippines (NWAPP), which is integral to the Philippine Development Plan 2011-2016,<sup>ii</sup> serves as the guiding document for the country to promote and implement science-informed strategies and actions for the wise use of its wetlands.

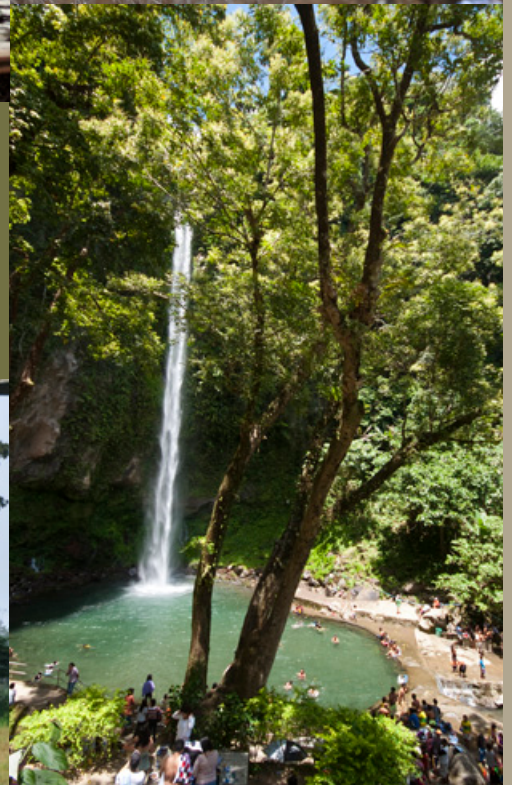
It promotes ecotourism as a conservation strategy that ensures inclusive growth of the basic sectors dependent on the wetland resources, supports collaboration with stakeholders and partners to ease the pressure on the wetland ecosystem for water and food security, and engages decision-makers to improve the resiliency of the wetlands as the country's beneficent superstructures for natural and cost-effective flood control as well as greenhouse gas sink to reduce risk and disaster, and mitigate the impacts of climate change.

The NWAPP 2011-2016 provides a framework of strategies and actions to harmonize the work of government agencies with common wetland-related concerns at the national, provincial and local levels as well as to engage non-government organizations, the business sector, small communities and indigenous people, for the management and wise use of wetlands and their resources for the enjoyment of their benefits by the present and future generations.

# Vision for the Philippine Wetlands



*Philippine wetlands are ecologically healthy and able to provide products, functions and services for the equal benefit of people and nature.*





## II. Arriving at the 2011-2016 National Wetlands Action Plan


Initiatives implemented since the last National Wetlands Action Plan in 1993 were reviewed through a national conference on wetlands and climate change, initiated by the Society for the Conservation of Philippine Wetlands, Inc. and DENR-PAWB. Technical Working groups were then formed, representing the following focal areas of concern: 1) Freshwater Wetlands; 2) Marine and Coastal Wetlands; 3) Wetlands Policy; 4) Enabling Activities. Each group based its assessment on information compiled and consolidated from various sources; identified the threats and challenges and determined whether or not these were sufficiently addressed by national, regional or local plans; designated tasks, timetable, and output targets and indicators. The last two items were a concern over the 1993 NWAPP as the review showed that while many of the activities were implemented, the outcomes were not assessed. Moreover, strategies needed to be updated in the light of developments and issues resulting from climate change. Development of the NWAPP would proceed for the next 22 months in a series of stakeholder consultations (Table 2). Stakeholders and the groups they represent are identified in Annex D.

**Table 2. Developing the NWAPP 2011-2016**

Activity	Place	Date
National Conference on Wetlands, Climate Change Adaptation and Biodiversity Conservation	Dumaguete City	12-14 January 2009
Luzon Stakeholders Regional Consultation	Antipolo City	11-12 November 2010
Visayas and Mindanao Stakeholders Regional Consultation	Davao City	2-3 December 2010
Integration Writeshop	Quezon City	6 January 2011
Ad-Hoc Technical Working Group Meetings		September 2011 to December 2012

### Some Key Reference Materials Reviewed For The NWAPP 2011-2016

1. The 1993 National Wetlands Action Plan for the Republic of the Philippines
2. National Action Plan for the Sustainable Use and Protection of Philippine Peatlands
3. Philippine Technical Reports for the UNEP/GEF Project: Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand: Seagrasses, Corals, Mangroves, Wetlands
4. Proceedings of the First National Lake Congress on Philippine Lakes
5. National Ecotourism Strategy
6. Philippine Biodiversity Conservation Priorities
7. Key Biodiversity Areas
8. National Biodiversity Strategy and Action Plan (NBSAP)
9. Integrated River Basin Management and Development Plan
10. Verde Island Passage Marine Corridor Management Plan Framework
11. Integrated Water Resources Management Plan Framework
12. Invasive Alien Species in the Philippines: Status, Challenges and Directions
13. Directory of Philippine Wetlands



### III. *Pamana*, The Invaluable Philippine Wetlands



The right to a balanced and healthful ecology explicit in the 1987 Constitution<sup>iv</sup> carries with it the moral duty of intergenerational responsibility: whereby the current generation is bound not only to refrain from blighting the environment but also to conserve and enhance it for subsequent generations.<sup>v</sup> If the right to a robust environment is not to be denied of anyone who breathes on the womb of this earth, then we can no more disown our responsibility than shear off our umbilical cord to what is our life-sustaining inheritance or *pamana*.

The Philippine's distinctive bio-geographical setting has endowed it with a natural wealth of wetlands. As an archipelago, the second largest in the world, it has a 36,289 sq km coastline and an estimated 2.2 sq km of archipelagic waters. Bounded in the north by the Bashi Channel, in the east by the Pacific Ocean, in the south by the Celebes Sea, and in the west by the West Philippine Sea, the Philippine islands lie within the major migration route of East Asian shorebirds and numerous other migratory waterbirds that makes it among the significant avian wintering areas as indicated in the country report in Ramsar's 1989 Directory of Asian Wetlands.



Its place in the Pacific ring of fire has produced a mineral-rich depository even among its sands and beaches, and most recently led to the explosive birth of a new crater lake in the aftermath of Mt. Pinatubo's eruption in 1991. Geological studies cited by Hall's 1998 study show that the Philippines had been separated from its neighbors by deep-sea channels for millions of years accounting for its biodiversity, evolving distinctly and separately from its neighbors sufficient for it to be rightly regarded as a separate biological region, as pointed out in Mallari *et al.* 2001 study.



**Table 3. List of conservation and research priority areas for inland waters**

Name of Inland Wetland	Location	Name of Inland Wetland	Location
Abulog River	Apayao and Cagayan	Bulusan Lake	Sorsogon
Cagayan River	Cagayan and Isabela	Jalaud River	Capiz, Antique and Iloilo
Abra River	Abra, Mt. Province, Benguet, Ifugao and Ilocos Sur	Lake Danao	Leyte
Agno/Amburayan River	Mt. Province, La Union, Benguet, Ifugao, Tarlac, Nueva Vizcaya, Pangasinan and Ilocos Sur	Ilog River	Negros Oriental and Occidental
Candaba Swamp	Pampanga and Bulacan	Twin Lakes	Negros Oriental
Umiray River	Aurora, Quezon and Bulacan	Lake Mainit	Agusan del Norte and Surigao del Norte
Kaliwa-Kanan River	Quezon	Lake Duminagat	Misamis Occidental
Laguna de Bay	Laguna, Manila and Rizal	Olangui River	Lanao del Norte and Lanao del Sur
Pasig River	Manila and Rizal	Lake Lanao	Lanao del Sur
Tadlak Lake	Laguna	Lake Napalit	Bukidnon
Taal Lake	Batangas	Agusan Marsh	Agusan del Sur
Pansipit River	Batangas	Pulangi River	Bukidnon, Maguindanao and North Cotabato
Seven Lakes of San Pablo City	Laguna	Agusan River	Agusan del Norte and del Sur, Compostela
Lake Nabua	Camarines Sur	Ligawasan Marsh	North and South Cotabato, Maguindanao, Sultan Kudarat
Lake Buhi/Lake Manapao/Lake Katugday	Albay and Camarines Sur	Lake Sebu and Mt. Three Kings	South Cotabato
Coron Lakes	Palawan	Lake Maughan	South Cotabato
Lake Naujan	Mindoro Oriental	Lake Manguao	Palawan

Source: Ong *et al.*, 2002.

## A. Philippine Inland Wetlands

Wetlands directly connected to groundwater regulate the quantity and quality of a vital source for drinking and agriculture. Rainwater runoff, streams, and rivers carry sediments and nutrients from fertilizers or even sewage effluent. Wetland vegetation filters lock up these contaminants in their leaves, stems and roots. These actions help improve water quality by: 1) preventing build-up of toxic levels in groundwater used for drinking purposes and; 2) preventing eutrophication downstream, where high concentrations of nitrates and phosphates can cause the explosive growth of algae to trigger a competition for dissolved oxygen as well as block out light in water needed by other aquatic plants and animals to survive. This natural function notably for inland wetlands, has proven to be more cost-effective than conventionally built water treatment plants

for treating wastewater from industries, mining, and sewage. Moreover, floodplain wetlands such as lakes and freshwater marshes naturally store and slow down floodwater, helping to protect downstream areas from destructive flooding.

According to the Philippine Biodiversity Conservation Priorities (PBCP), the country has 216 lakes, 421 principal rivers, and 22 marshes, swamps and reservoirs. The biodiversity associated within these inland water ecosystems is critical to food security and livelihood through fisheries and other resources. The Bureau of Fisheries and Aquatic Resources (BFAR) in its 2011 Philippine Fisheries Profile considers the following, according to fishery resources, as the country's Inland Resources: 1) Swamps 246,063 ha. with freshwater at 106,328 ha. and brackishwater at 139,735 ha.; 2) Existing fishpond 253,854 ha. with freshwater at 14,531 ha. and

brackishwater at 239,323 ha.; 3) Other Inland Resources 250,000 ha. with lakes at 200,000 ha., rivers at 31,000 ha., and reservoirs at 19,000 ha.

These inland wetlands host a multitude of organisms including 316 fish species of which 121 are endemic and 76 are threatened. It also harbors numerous species of waterbirds, aquatic plants and a majority of amphibians and semi-aquatic species such as the highly endangered Philippine crocodile (*Crocodylus mindorensis*) as indicated in the 4th National Report to the Convention on Biological Diversity (2009).

Inland wetlands being mostly freshwater sources become congregating points for human settlements. Thus while it is the most accessed, it is also accorded the least attention among these type of wetlands of all ecosystem types. An Integrated Lake Basin Management and an Integrated River Basin Management have been developed for these inland wetlands.

## 1. Lakes

Lakes have been defined as bodies of standing water surrounded by land (Palma 2005); an inland body of water that occupies a depression (Castillo, 2005); inland bodies of water with distinct basin or depressions that are formed by natural sinking and rising of land Guerrero (2001) as cited by Tanduyan *et al.* at the Second National Congress on Philippine Lakes (2011). Some of the major lakes in the country are: Laguna de Bay, Lake Lanao, Taal Lake, Lake Buhi and Naujan Lake. Laguna de Bay, the country's largest lake with a total area of 3,813.2 sq km., is also one of Southeast Asia's largest inland water bodies providing various products and services for the





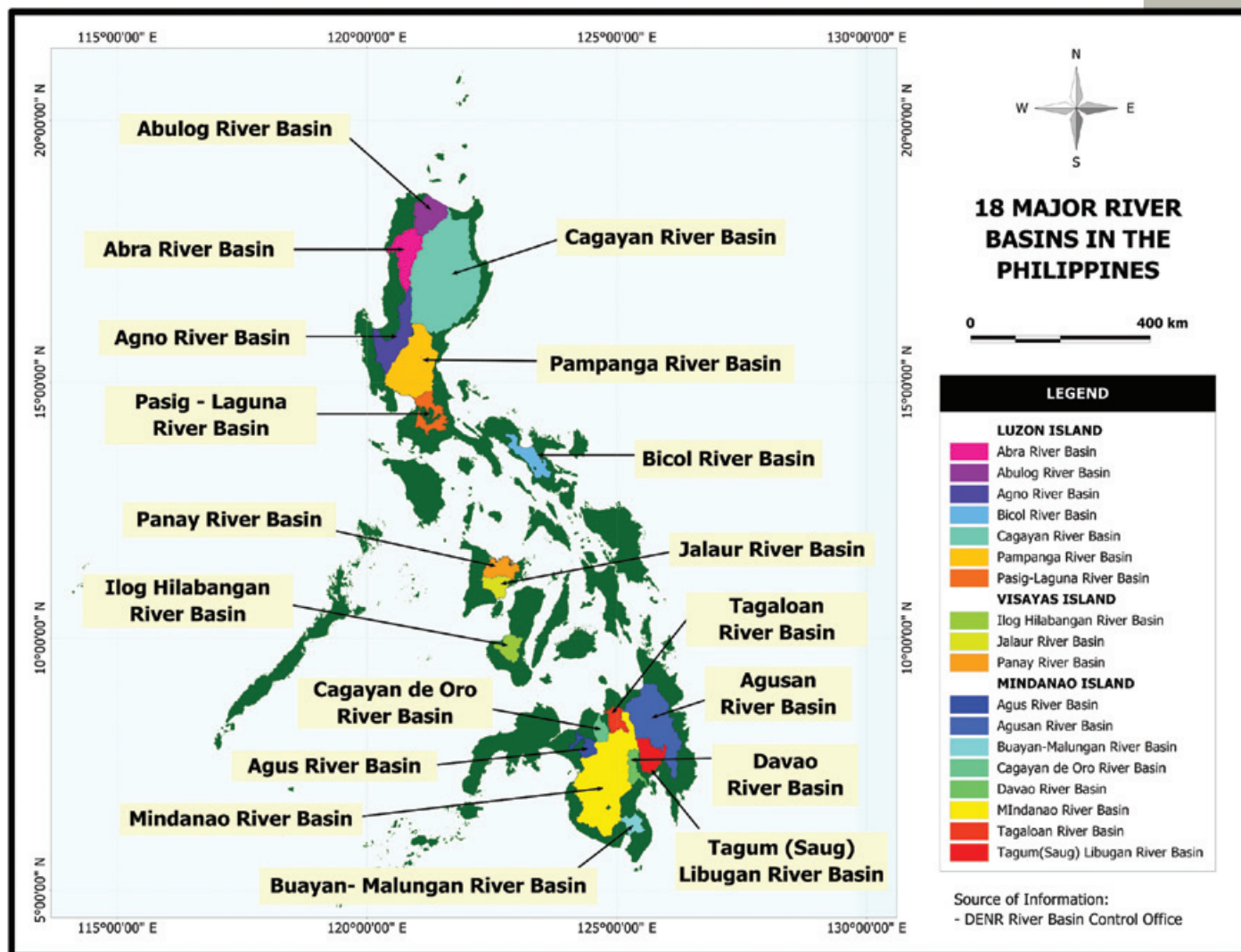
more than 13 million people that live in its lake basin. Lake Lanao in Lanao del Sur is one of 17 ancient lakes in the world (EMB, 2006) and the second largest freshwater lake in the country, a reservoir for the Agus hydroelectric power plants which generate 55-65% of Mindanao's power (Greenpeace, 2007). Taal Lake is important for tourism because of its high scenic value, it is also home to the "tawilis" (*Sardinella tawilis*), an endemic fish considered as one of the few freshwater *Sardinella* in the world, as well as the "duhol" (*Hydrophis semperi*), one of only three freshwater sea snakes in the world as stated in the 4th National Report to the Convention on Biological Diversity (Republic of the Philippines, 2009). Lake Buhi has the distinction of being home to the smallest commercial fish in the world, the "sinarapan" (*Mistichthys luzonensis*). Naujan Lake in Oriental Mindoro is an important staging and wintering area for a large number of tufted duck (*Aythya fuligula*) species.

## 2. Rivers and River Basins

River basin is an area drained by a river and its tributaries. There are 421 principal rivers that provide various services such as means for mobility and transport of people and goods, hydropower, recreation, and irrigation, among others. Rivers act as waterways—the route that floodwaters take from watersheds to coastal areas. Twenty of the country's river basins are larger than 1,000 sq km in size while 18 are larger than 1,400 sq km. Cagayan River Basin is the largest at 25,649 sq km.



Figure 2. Major River Basins in the Philippines



### 3. Swamps, Marshes and Peatlands

Swamps and marshes are water-logged areas with inadequate drainage. Fed by ground and surface water, they serve as nursery grounds for fish. While swamps are dominated by shrub and woody plants and trees, marshes have soft-stemmed vegetation like grass, reeds and sedges and are not as deep as swamps. On the other hand, peatlands are characterized by the accumulation of organic matter called “peat” derived from dead and decaying plant material under high water saturation conditions. Saturated peat is typically up to 98% water by mass, absorbing rainfall and allowing it to percolate more slowly into the soil, thereby reducing the speed and volume of runoff entering streams and rivers. Healthy, intact peatlands act as storage houses for carbon gases whereas drainage, peat extraction and burning release it into the atmosphere in the form of yet more greenhouse gases (GHGs).

Among all the marshes, Ligawasan Marsh in Cotabato province is the largest in area at 220,000 hectares. It is a conglomeration of three marshes: Ligawasan, Libungan and Ebanan. Fishing is the primary means of livelihood of families in the marsh during periods of heavy rainfall when most of the area is underwater. However, during dry season, some 140,000 hectares dry out and are cultivated. Likewise, Ligawasan Marsh is an important bird area and a Key Biodiversity Area (KBA #198). Consequently, about 30,000 hectares of the Marsh has been declared as a game refuge and bird sanctuary.

Candaba Swamp in Central Luzon is a vast complex of freshwater ponds, swamps and marshes with surrounding areas of seasonally flooded grassland, arable land and palm savanna on a vast alluvial flood plain. These wetlands are mostly privately-owned

with a very small part that is state-owned but has been classified as “alienable and disposable” land, thus posing a peculiar concern for conservation. A Key Biodiversity Area (KBA #31), it is an extremely important staging and wintering area for ducks, specially in October and November when the swamp regularly supports thousands of birds. Candaba Swamp acts as a natural flood retention basin holding wet season overflow from the Maasim, San Miguel, Garlang, Bulu and Penaranda Rivers, and draining into the Pampanga River. Its natural retention capacity is estimated at approximately 1.5 billion cubic meters.

Peatlands have been confirmed in Sab-a basin in Leyte and in Agusan Marsh in Agusan del Sur. Information indicates that peat is also probably present in Ligawasan Marsh in Mindanao, Dolongan area in Basesy, Samar, Southern Leyte, Mt. Pulag in Northern Luzon, Surigao del Norte, Northeastern Mindanao, and Naujan Lake Marshland as indicated in the National Action Plan for the Sustainable Use and Protection of Philippine Peatlands prepared in 2009, which forms an integral part of the National Wetlands Action Plan.

**Table 4. Major Swamps/Marshes in the Philippines**

Swamp/Marsh	Location	Area (has)
Candaba Swamp	Bulacan and Pampanga Provinces, Central Luzon	32,000
Lalaguna	Lamon Bay, Quezon Province, Luzon	400
Manlubas Swamp	Camarines Norte, Southern Luzon	unknown
Leyte-Sab-a Basin	Leyte Island, Leyte Province	90,000
Hinunagan Rice Paddies	Southeastern Coast of Leyte, Southern Leyte Province	5,000
Agusan Marsh	Agusan del Sur Province	90,000
Ligawasan Marsh	North and South Cotabato Provinces	220,000
Aju, San Dionisio and Sara Wetlands	Panay Island, Iloilo Province	45,000

Source: DENR 2009 (4th National Report to the Convention on Biological Diversity)





## B. Philippine Coastal and Marine Wetlands

Coastal and marine wetland ecosystems consist of coral reefs, mangroves, beach and beach forest as well as soft bottom communities, including tidal flats, estuaries and seagrass beds, and open water areas. These act as frontline defenses against potential devastation. The roots of wetland plants bind the shoreline together, resisting erosion by wind and waves and providing a physical barrier that slows down storm surges and tidal waves, thereby reducing their height and destructive power.

One of the major strategies being implemented to manage threats to coastal and marine resources is Integrated Coastal Management (ICM)<sup>vi</sup>. The importance of preserving coastal habitats and other marine resources is also a priority strategy in managing threats to coastal wetlands, including the National Plan of Action for the Coral Triangle Initiative. Meanwhile, at least 30% of the coastal and marine ecosystems is targeted for full protection and management to increase resilience of coastal environment against climate change as proposed through the UNDP-managed joint program on Strengthening the Philippines' Institutional Capacity to Adapt to Climate Change (2008-2010).

### 1. Mangrove Forests

Mangroves are salt-tolerant trees that have adapted to living in salt and brackish water conditions. They vary in size from shrubs to tall trees and require slow currents and plenty of fine sediment in which to set their roots. They support the natural food chain by forming a link between the land and the sea and serve as the sanctuary of both aquatic and terrestrial wildlife (Baldevarona, 2001).

Based on 2012, satellite data validated by ground surveys, it was determined that mangrove cover increased from 120,000 ha. in 1995 to 210,497 ha. in 2008, based on 2002 satellite data validated by ground surveys. The upward trend makes for improved habitats for species that depend on mangrove, which then translate to an aggregate



increase in fisheries stock and livelihoods. The largest mangrove areas are found in Palawan (52,693 ha.), Northern Samar (9,961.69 ha.), Surigao del Sur (16,865.14 ha.), and Bohol (14,156.37 ha.) (DENR-PAWB-CMMO, 2008).

In 2009, a total of 2,000 ha were identified under the Upland Development Program. Moreover, in 2010, 7,500 ha. were identified under the DENR-GPOA. The National Greening Program, which targets the planting of 1.5 billion trees in 1.5 million ha. of public land in six years (2011-2016), includes the reforestation and rehabilitation of coastal and mangrove areas. In its first year of implementation, a total of 8,421.18 ha. were planted with 3,161,430 seedlings in 64 Protected Areas, and 319.5 ha. of mangroves were planted with 549,730 seedlings.

## 2. Seagrass Beds

Seagrasses are flowering plants specialized to thrive completely submerged in the saline environment of marine and estuaries. They maintain water clarity by slowing down water velocity and allowing for the settling of fine sediments that are anchored by the seagrass roots thus, acting like a protective layer against silting to coral reefs. They stabilize and hold bottom sediment, even under the force of hurricanes and storms, thus providing shelter and refuge to adult and young marine animals. They also prevent coastal erosion. Half a hectare of seagrass can produce over 10 tons of leaves per year—a biomass that provides food, habitat, and nursery areas for many fish species, invertebrates, crustaceans, including marine turtles and the *Dugong dugon* (sea cow). Seagrass beds also function as organic carbon storage much like that of forests. Studies indicate that it is considered a globally significant carbon stock, the loss of which could release of up to 299 Tg of organic carbon per year (Fourqurean *et al.*, 2012).

The Philippines has the second highest

seagrass diversity in the world contributing about 19 species or about 55 % of the number of species in East Asia. A total of 343 sq km of sea grass have been estimated using combined satellite images and ground surveys while the rest are based on unvalidated satellite images. Among the sites with the widest area of seagrass beds are Puerto Princes/Honda Bay in Palawan (with 43 sq km), Bolinao in Pangasinan (25 sq km) and Malampaya Sound in Palawan (21 sq km). The unvalidated sites with the widest area of seagrass beds include Sulu Archipelago (167 sq km), Northern Palawan (89 sq km) and Southwestern Palawan (47 sq km) (Fortes, 2004). In the past five decades, about 30-40 percent of seagrass areas in the Philippines have been lost. Recent data shows that seagrasses in the country are distributed over an area of about 27,282 sq km (Fortes, 2008). Although they are believed to be the least studied among tropical coastal ecosystems, efforts to showcase successful conservation strategies include a demonstration site established in Bolinao, Pangasinan and a seagrass sanctuary in Narra, Palawan.

## 3. Coral Reefs

So formidable and yet essentially miniscule, coral reefs built over a thousand years by colonies of coral polyps half-an inch long are a sophisticated



ecosystem resulting from what is essentially a simply built animal shaped like a sack with an opening for a mouth ringed with tentacles to catch prey. These coral polyps, enclosed in a calcium-carbonite crust of protective corralite, have also built a symbiotic relationship with the single-celled zooxanthellae algae (*Symbiodinium* species) which live inside its host and feed on its waste. Through photosynthesis, the algae makes 90% of the polyp's food and energy requirements and is responsible for a coral's vivid coloring. When the sensitive zooxanthellae are killed off by the warming and/or acidification of waters from climate change, the result is massive coral bleaching.

The constant influx of this kind of synergy and symbiotic processes within the coral reef system accounts for a complexity among the variety of reef species that make it a rich laboratory of natural product chemistry. Its biomedical and agricultural applications are vast. Fish are dependent on the reef habitat to complete their life cycle, visit and use coral reefs as spawning, breeding and nursery grounds; thus, it significantly accounts for fish landings (UNEP, 2004). Coral reefs also buffer coastlines from the pounding action of waves, thus also protecting other ecosystems like seagrass beds and mangroves. As the sea levels rise, they provide vital protection against storm surges and inundation.

Scientists, using coral and reef fish diversity as the two major criteria, identified an area roughly 2% the size of the world's ocean where 75% of the coral species are found. Dubbed the Coral Triangle—located along the equator at the confluence of the Western Pacific and Indian Oceans, within the exclusive economic zones of the Philippines, Indonesia, Malaysia, Papua New Guinea, Solomon Islands and Timor-Leste—it boasts of 35% of the world's coral reefs that exhibit climate change resilience and 40% of all coral reef fish species (CTI RPOA, 2008).

The Philippines, alone, records species diversity identified by various authors at 468 scleractinian corals, 1,755 reef-associated fishes, 648 species of mollusks, 19 species of seagrass and 820 species of algae (Fishbase 2008, BFAR-NFRDI-PAWB, 2005). Carpenter and Springer (2005) noted that the country is the center of the center of marine shore fish diversity in the world.

A report from PhilReefs (2008) using data from biophysical monitoring in 6 biogeographic regions of the Philippines-South China Sea (SCS), also known as the West Philippine Sea, North Philippine Sea (NPS), South Philippine Sea (SPS), Visayan Seas (VS), Sulu Sea (SS) and Celebes Sea (CS)—provided reef survey information on the reef conditions in the country and updated the previous status report by Nanola *et al.* in 2004. Coral reef benthos sites, reef fish sites with fish abundance and biomass data from 52 municipalities/cities and 31 provinces nationwide were used to determine the status of coral reef and associated reef fishes. These sites were also categorized into Marine Protected Areas and non- MPA or outside MPAs. Findings indicated that of the 6 biogeographic zones, the SCS had the most number of MPA and non-MPA sites followed by VS, SS, NPS, SPS and CS. Monitoring data—using hard coral cover, fish abundance and fish biomass as indicators—showed that the country still exhibits an overall declining trend specially in non-MPA sites (Table 13).

In the South China Sea region, average hard coral cover for both MPA and non-MPA sites did not show much change, although there was a higher percentage of coral cover observed in MPA sites. In terms of fish abundance, the Visayan Sea and Sulu Sea regions showed a slightly decreasing trend, while the South China Sea region showed an increasing trend. Outside MPAs, there was a general decrease in trend, except for Sulu Sea and Celebes Sea regions which remained stable. In terms of fish biomass, the Sulu Sea MPA sites showed a decreasing trend, the Visayan Sea showed an increasing trend, while the South China Sea region remained stable. Many of the non-MPA sites remained stable.

## C. Human-made Wetlands

Human-made wetlands are principally utilized for agriculture. They include fish and prawn ponds, small water impoundments, irrigated agricultural land like the rice terraces as well as salt pans, reservoirs, gravel pits, sewage farms and canals.

The Ifugao people's engineered Banawe Rice Terraces of Cordillera, a UN World Heritage site, are a 2,000 year-old prime example of sustainable water resources management. Rain-fed farms, particularly those in sloping/undulating areas





not serviced by the National Irrigation Administration (NIA) systems, benefit from the development of small-scale, on-farm type water resources management technologies undertaken by the Bureau of Soils and Water Management, which reports that as of 2012 it had built 444 Small Water Impounding Projects, 1,616 Small Diversion Dams, and 30,000 Small Farm Reservoirs. While these facilities supplement irrigation for improved farm productivity, they also enhance the environmental services of agriculture, in terms of flood mitigation, fostering groundwater recharge and sediment capture. The construction of a 4,000 sqm wetland—launched by the LGU of Alaminos, Pangasinan in March 19, 2012 to naturally cleanse wastewater utilizing wetland vegetation for irrigation purposes, growing fresh

water fish as well as mitigate pollution to the waters of the tourism-generating Hundred Islands while becoming a park and recreation site was modeled from a Best Practice facility in Thailand. Such man-made wetland can trap nitrogen and phosphorus runoff, retain pesticides, antibiotics, and other agricultural pollutants as well as sequester carbon dioxide.

## D. Caves

Caves are natural underground voids, cavities or systems of interconnected passages large enough to permit a human to enter. These are found inland or in the coast or—in some cases—tunnel from the ridge to the reef. It includes smaller spaces like rock shelters, sea caves, and grottos. They are home to specialized mineral formations as well as unique and diverse flora and fauna; at least 23 species of bats, birds, reptiles and frogs recorded dwelling in Philippine caves were found to be endemic.

The country has more than 1,500 identified caves with more yet to be explored and mapped. Listed under the World Heritage Site, the Puerto Princesa Subterranean River National Park in Palawan highlights a complex cavern with unique speleothems, a 20-million-year old *Serenia* fossil in its walls and an 8.2 kilometer navigable underground river that empties into the bay. The Tabon Caves Complex, on the other hand, is where fossilized human remains were excavated, with artifacts believed to be dating back 47,000 years to the Ice Age. Four caves proclaimed under the NIPAS Act with the Protected Landscape category are Peñablanca Protected Landscape (Tuguegarao, Cagayan); Pamitinan Protected Landscape (Rodriguez, Rizal); Calbiga Protected Landscape (Northern Samar); and Banahaw San Cristobal Protected Landscape (Quezon and Laguna). Because of the increased collection of cave resources and various human interventions, caves are critically in danger, despite their significance.



## IV. Relevant Laws and Policies Affecting the Management of Philippine Wetlands

Over time, resources that are owned by no one or owned in common—thereby accessed by all as each sees fit—rapidly deteriorates with the burgeoning rise in population. It is a story with only a tragic outcome in a finite biosystem (Stewart, 2005). Thus, arresting the trend in the matter of the country’s wetlands becomes the purview of the state to deploy through its designated agents to delimit the notion of open access<sup>viii</sup> and to establish mechanisms for the management of the wetland commons.<sup>viii</sup> In a significant adjudication, the Supreme Court ruling in favor of Concerned Residents of Manila Bay whereby it issued a mandamus on December 18, 2008, ordering all concerned government agencies<sup>ix</sup> to coordinate in the clean-up and restoration of Manila Bay, requiring them to undertake steps, and submitting quarterly progress reports to address the bay’s urgent concerns continues to even date, underscores the magnitude of the right to a balanced and healthful ecology.

A review of legislations and policies on Philippine wetlands commissioned in 2005 is indicative of the “invisibility” of the country’s wetlands among its policy-making bodies, despite the ecosystem’s valuable services. Many of the regulations with direct impact on wetlands do not make direct reference to them but instead regulate access to natural resources, jurisdictions over territory and management, or prohibit certain acts relating to the areas themselves. On the other hand, those with indirect application are an assortment of environmental regulations that affect wetlands allowing or restricting actions that eventually impact many ecosystems, as well (Luna, 2005).

Ensuring biodiversity and the continued enjoyment of the wetland eco-services requires informed policy-making at the national and local levels that proactively addresses the direct and indirect drivers of change in the country’s wetlands. According to the Millenium Economic Assessment, major policy decisions in the next decades will have to address trade offs among current uses of wetland resources and between current and future uses. Particularly important trade offs involve those between agricultural production and water quality, land use and biodiversity, water use and aquatic biodiversity, and current water use for irrigation and future agricultural production (2005).

Successful policy implementation in the country’s wetlands has been noted when there are management structures that (a) “is locally based but nationally endorsed, (b) understands the flexibility required in policy application thereby having the ability to focus on certain regulations with the



**Table 5. Some Recent Policies and Legislations Relevant to Philippine Wetlands**

<b>Policy/Law</b>	<b>Title/Description</b>
Republic Act 8550	Philippine Fisheries Code of 1998 (An Act Providing for the Development, Management and Conservation of the Fisheries and Aquatic Resources, Integrating All Laws Pertinent Thereto, and for other purposes)
Republic Act 7586	National Integrated Protected Areas System Act of 1992 (An Act Providing for the Establishment and Management of National Integrated Protected Areas System, Defining its Scope and Coverage, and for other purposes)
Republic Act 9147	Wildlife Resources Conservation and Protection Act (An Act Providing for the Conservation and Protection of Wildlife Resources and Their Habitats, Appropriating Funds Therefor and for other purposes)
Republic Act 9072	National Caves and Cave Resources Management and Protection Act. (An Act to Manage and Protect Caves and Cave Resources and for other purposes)
Republic Act 7160	Local Government Code of 1991.(An Act Providing for a Local Government Code of 1991)
Republic Act 9275	Philippine Clean Water Act of 2004 (An Act Providing for a Comprehensive Water Quality Management and for other purposes)
Republic Act 9003	Ecological Solid Waste Management Act of 2000 (An Act Providing for an Ecological Solid Waste Management Program, Creating the Necessary Institutional Mechanisms and Incentives, Declaring Certain Acts Prohibited and Providing Penalties, Appropriating Funds Therefor, and for other purposes)
Executive Order 533	Adopting Integrated Coastal Management as a National Strategy to Ensure the Sustainable Development of the Country's Coastal and Marine Environment and Resources and Establishing Support Mechanisms for its Implementation (2006)
Executive Order 578	Establishing the Policy on Biological Diversity, Prescribing its Implementation Throughout the Country, Particularly in the Sulu Sulawesi Marine Ecosystem and Verde Island Passage Marine Corridor (2006)
Executive Order 797	Adopting the Coral Triangle Initiative National Plan of Action
Republic Act 9729	Climate Change Act of 2009 (An Act Mainstreaming Climate Change into Government Policy Formulations, Establishing the Framework Strategy and Program on Climate change, Creating for this Purpose the Climate Change Commission, and for other Purposes)
Executive Order 111	Establishing the Guidelines for Ecotourism Development in the Philippines
Executive Order 798	Transferring the Philippine Reclamation Authority from the Department of Public Works and Highways to the Department of Environment and Natural Resources (May 29, 2009)
Executive Order 672	Defining and Clarifying the Responsibilities of the Department of Environment and Natural Resources (DENR) and Philippine Reclamation Authority (PRA) in the Approval and Implementation of Reclamation Projects Nationwide

greatest impact, and (c) has consensus-building mechanism and participation among the multiple users of the resource.” Thus, a National Wetlands Policy to rationalize laws and policies on access to wetland resources, management jurisdiction and enforcement is envisioned that allows for a menu of options that institutions working closely at the ground-level can swiftly and appropriately use in order to protect specific wetland areas and their associated ecosystems. (Luna, 2005)

The NWAPP is linked to and supportive of national, regional and international initiatives. At the national level, it provides a framework of strategies and actions to harmonize the work of government agencies with common wetland-related concerns (Table 6); it is linked to the Philippine Development Plan 2011-2016 and is cognizant of the thrusts of the Philippine Government. On the other hand, the international level supports the implementation

of the commitments to the following Conventions and Treaties, among others: Convention on Biological Diversity, Ramsar Convention on Wetlands, Convention on the Conservation of Migratory Species of Wild Animals, Convention

on International Trade of Endangered Species of Wild Flora and Fauna, United Nations Convention on Combating Desertification, United Nations Framework Convention on Climate Change.



**Table 6. Wetland-related Functions Across Government Agencies**

<b>Wetland-Related Functions</b>	<b>DENR</b>	<b>DA</b>	<b>DFA</b>	<b>DILG</b>	<b>DOST</b>	<b>DOT</b>	<b>DOTC</b>	<b>DPWH</b>	<b>DepEd / CHED / TESDA</b>	<b>DND</b>	<b>DOE</b>	<b>DOH</b>	<b>NEDA</b>
Conservation & Natural Resources Management													
Ecosystems-based Management													
Watershed Management													
River basin Management													
Marine & Coastal Resources Management													
Research & Extension													
Water Quality / Water Pollution													
Groundwater Resources													
Water distribution													
Sewerage and Sanitation													
Recreation / Tourism													
Mineral Resources													
Agricultural Use & Fish Production													
Domestic & Industrial Use													
Territorial waters													
Flood control and Drainage													
Energy Resources													
Socio-economic development													
Reclamation													
Water transport													

# V. Conservation Strategies Employed

## A. Designation as Wetland of International Importance

The honorific title of being a Ramsar Site is conferred to wetlands designated under the Ramsar Convention's List of Wetlands of International Importance, which aims to develop and maintain an international network of wetlands which are important for the conservation of global biological diversity and for sustaining human life through the maintenance of their ecosystem components, processes and benefits/services. For contracting parties like the Philippines, it effectively calls to prominence these "invisible" ecosystems for its wise use as a national patrimony.

## B. Establishing Conservation Areas

### National Integrated Protected Areas System (NIPAS)

Enshrined in Republic Act 7586, which became law on June 1992, the NIPAS ensures the "*In Situ*" conservation of biological diversity through the appropriate management of ecologically important areas for conservation and sustainable development. After 20 years, the legal framework was subjected to review to address certain provisions, which are in conflict with other environment laws. There were 202 identified initial components of the NIPAS. Among the 202 identified initial components to date—comprising of proclaimed national parks, game refuge and wildlife sanctuaries, nature reserves, wilderness areas, mangrove reserves, watershed reservations, fish sanctuaries, protected landscapes and seascapes, among others—112 protected areas were formally proclaimed by the President under the System covering 3.54 million hectares. Nonetheless only 13 protected areas were officially declared by law as part of the NIPAS.

### Identification of Biodiversity Conservation Priorities

One significant tool utilized in conservation action works by focusing on its key components: the individual species at the greatest risk of extinction, and the specific sites and landscapes that are most important for their protection. The tool, called Key Biodiversity Area (KBA) helps in directing scant resources to where they can, and while they still can make a difference. KBA

### Philippine Ramsar Sites

- 1. Agusan Marsh Wildlife Sanctuary (AMWS)**, located almost at the center of the Agusan River Basin, is comprised of a vast complex of freshwater marshes and water courses including 59 lakes that acts as the catchment basin for waters flowing from the surrounding areas of Compostela Valley, Agusan del Norte and Agusan del Sur, and Bukidnon. One of the initial components of the NIPAS, it became Ramsar site No. 1009 on Nov. 12, 1999 and is also considered as a Key Biodiversity Area (site #180). It hosts one of the very few known peat forests, with its **invaluable role as carbon sink**. Ramsar site no. 1009, 12/11/99
- 2. Naujan Lake National Park (NLNP)** in the northeast coast of the province of Oriental Mindoro, is the fifth largest lake in the Philippines at 14 kilometers long and 6 kilometers wide, a productive freshwater fishing site, and the central feature of Naujan Lake National Park, a 2,175-hectare area of marshes and forest established in 1956 boasts a rich biodiversity. Endemic species in Naujan Lake include the amphibian *Rana magna*, and the mammal *Ptenochirus jagori*. Ramsar site no. 1008, 12/11/99
- 3. Puerto Princesa Subterranean River National Park (PPSRNP)** on the west coast of Palawan serves as a catchment to the Cabayugan River that flows down the slopes of Mt. Bloomfield. It is cited for the successful turnover of wetlands management from national to local with the participation of the Batak and Tagbanua whose ancestral domains were included from the initial 3,900 has. to cover 22,000 has. Among others, it is a designated UNESCO World Heritage Site and Biosphere Reserve, became one of the New 7 Wonders of Nature in November 11, 2011, and was cited by the World Wildlife Fund's Global Report cited for containing the richest tree flora, with high levels

of regional and local endemism and for having the largest and most valuable limestone forest in Asia.<sup>1</sup> Ramsar site no. 2084, 30/06/12

4. **Tubbataha Reefs Natural Park (TRNP)** in the middle of the Sulu Sea covers an area of almost 100,000 hectares of high quality marine habitats containing three atolls and a large area of deep sea which contains about 10,000 hectares of coral reefs. A UNESCO World Heritage Site and nominated one of the new seven wonders of nature—it is located at the apex of the Coral Triangle, supporting over 359 species of corals equivalent to about 80% of all coral species in the Philippines. TRNP plays a key role in the process of reproduction, dispersal and colonization by marine organisms in the whole Sulu Sea system, and helps support fisheries outside its boundaries (Campos *et al.* 2007). Most of its seabird species are threatened at either the national or regional levels (Jensen, 2008). Ramsar site no. 1010, 12/11/99
5. **Olango Island Wildlife Sanctuary (OIWS)** in the City of Lapu-lapu, Cebu Province, is a 920-hectare area located in the Olango Island Group in the Central Visayas region. Its surrounding reef flat-lagoon is considered one of the most extensive reef areas in the Central Visayas at 4,482 hectares of extensive sandy beach, rocky shoreline, inshore flats, seagrass beds, coral reefs, mangrove forest, mudflats, and salt marsh grass. It is also one of the Important Bird Areas (IBA) in the Philippines (Mallari, 2001), hosting more than half of the 77 species of migratory birds that use the East-Asian Austral-Asian flyways. Ramsar site no. 656, 01/07/94

identification in the Philippines is based on the 117 Important Bird Areas (IBAs) identified for the country by the Haribon Foundation and Birdlife International, and the 206 Conservation Priority Areas (CPAs) identified through the Philippine Biodiversity Conservation Priority-setting Program. The species, determined with a risk parameter, gives a “face” to the conservation site and becomes a baseline to gauge the success of the investment. Identifying KBAs paves the way for site-scale, conservation-focused investment targets that can be implemented for globally significant ecosystems and species. Among the country’s wetlands, seven (7) lakes have been considered KBAs while another 14 are listed as Candidate Key Biodiversity Areas (CKBA).<sup>x</sup>

## Designation of Critical Habitats

Critical habitats are designated to hasten protection of a threatened species pursuant to the Wildlife Resources Conservation and Protection Act of 2001 (RA 9147). The Wildlife Act mandates the joint preparation and implementation of a Critical Habitat Management Plan by the concerned DENR Region Office and the local government to address management issues and

strategies, including the enforcement of applicable environmental laws and prohibited acts such as waste dumping, mineral extraction, quarrying, burning and logging.

The endemic and threatened *Anas luzonica* (Philippine duck) along with the other species of wild fauna and flora are protected within the 26.93 hectare *Cabusao Wetland Critical Habitat* in the municipality of Cabusao, Camarines. Similarly, the Malasi Tree Park and Wildlife Sanctuary situated in Brgy. San Antonio in the Municipality of Cabagan, Isabela was declared a Critical Habitat for Waterbird species while a Critical Habitat for *Rafflesia schadenbergiana* was declared at Sitio Kalanganan, San Vicente, Baungon, Bukidnon. Threatened, restricted-range and congregatory species of birds including the vulnerable resident bird species Philippine Duck (*Anas luzonica*) which breeds at the site are protected in a 175-hectare coastal

urban or a peri-urban wetland and bird sanctuary in the *Las Piñas–Parañaque Critical Habitat and Ecotourism Area (LPPCHEA)*. To date, there are four (4) critical habitats established with a total area of 382.237 ha.

## Establishing Marine Protected Areas

The establishment of Marine Protected Areas (MPAs), essentially protected no-take zones, are an important strategy of Integrated Coastal Management (ICM), which is established via a local ordinance through RA 7586, “National Integrated Protected Areas System (NIPAS) Act,” or through RA 8550, “The Fisheries Code”. Nonetheless, to be truly effective, these small, community-controlled MPAs must be incorporated into broader management regimes for overall fishing effort reduction and networking of MPAs. Thus was established the Marine Protected Area Support Network (MSN), a multi-sectoral alliance of government and non-government organizations that aims to support MPA initiatives through complimentary collaborative efforts at the local, regional and national level based on the Phil. Marine Sanctuary Strategy (PhilMarSaSt) and the Philippine Coral Reef Information Network

(PhilReefs) for the full protection of coastal areas. It identified that among more than 500 existing MPAs (UPMSI database, 2007), only 10-15% are effectively managed.

## C. Recognizing Best Practices through Conservation Awards

Individuals, people's organizations or non-government organizations, and local government units with significant contributions to the wise-use of the country's wetlands are being recognized every five years under the Philippine since the Philippine Wetlands Conservation Awards (PWCA), organized under the PAWB-DENR, were begun in 2004. On the other hand, the Marine Protected Areas (MPA) Awards and Recognition (MAR) dubbed as "Para el MAR", organized by the Marine Protected Areas (MPA) Support Network (MSN) and the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) GmbH to recognize outstanding MPA management in the Philippines was begun in 2007. The Ramsar Wetland Conservation Awards, which recognizes the work of governments, organisations and individuals in promoting the wise use and conservation of wetlands in the fields of Education, Management and Science honors awardees every three years since 1996.

### Winners of the Philippine Wetlands Conservation Award (PWCA)

Year	Category		Winner	Special Citation
<b>2004**</b>				
	Luzon	Individual	Prof. Victor S. Soliman (Bicol University)	
		Local Organization	Brgy. Tadalac FARMC (Los Baños, Laguna)	
		Local Government Unit	Municipality of Bolinao, Pangasinan	
	Visayas	Local Organization	Banacon Fisherfolks & Mangrove Planters Association (Getafe, Bohol)	
		Local Government Unit	Municipality of Inabanga, Bohol	
	Mindanao	Local Organization	Danao Bay Resource Management Organization (Baliangao, Misamis Occidental)	
		Local Government Unit	Municipality of Linamon, Lanao del Norte	Barangay Berong, Quezon, Palawan
<b>2009***</b>				
	Luzon	Local Government Unit	Municipality of Prieto Diaz, Sorsogon	Municipality of Bani, Pangasinan
	Visayas	Local Government Unit	Municipality of Amlan, Negros Oriental	Municipality of Bais, Negros Oriental

\*\*1st PWCA, Judges: Mr. Victor O. Ramos, Dr. Perry S. Ong, Dr. Rafael S. Guerrero III; Sponsors: San Miguel Corporation, Unilever

\*\*\*2nd PWCA, Judges: Dr. Rafael Guerrero II, Ms. Elisea Gozun, Dr. Gil Jacinto; Sponsors: San Miguel Corporation, Ford Foundation, Manila Water

## D. Other Wetland Conservation Programs and Projects

Predators and endemic species are indicative of the state of a wetland. Thus programs protective of iconic top predators and endangered species may include captive breeding while restoration and protection of their natural habitat is undertaken. Laguna de Bay, an important water and fishery resource of Metro Manila, as well as its tributary, the Pasig River, which connects it to Manila Bay have site-specific management programs. From the ridge—reforestation programs, to the reef—coastal management programs are undertaken to increase the resiliency of the country's wetlands (Table 7).

**Table 7. Some Wetland-related Conservation Programs and Projects**

<p>DENR-PAWB Pawikan Conservation Project (PCP)</p>	<p>The foraging habitats of marine turtles are considered Critical Habitats. The PCP formulates and implements conservation and protection policies, management and propagation schemes as well as massive information and education program to ensure the survival and growth of the country's marine turtle resources. It maintains the hatcheries in Turtle Islands Wildlife Sanctuary (TIWS) in Tawi-Tawi, and in Nagbalayong, Morong, Bataan.</p>
<p>Philippine Crocodile Program</p>	<p>The program entails the breeding and eventual release in protected habitats of the <i>Crocodylus mindorensis</i>—a freshwater species, considered the most endangered crocodile in the world by the IUCN/SSC Crocodile Specialist Group—as well as the <i>Crocodylus porosus</i>, an estuarine or saltwater species considered threatened. It includes <i>in-situ</i> and <i>ex-situ</i> programs within as well as outside the Philippines in partnership with various zoological institutions in North America, Australia and New Zealand. The Wildlife Rescue and Conservation Center continues its maintenance and protection of the two (2) species of crocodiles and their habitats. To date, the Center maintains 312 heads of <i>Crocodylus porosus</i> and 444 heads of <i>Crocodylus mindorensis</i>.</p>
<p>Laguna de Bay Community Watershed Rehabilitation Project (2006-2008)</p>	<p>It promotes the sustainable use of natural resources in the watershed and facilitated long-term improvement in local livelihoods. The Laguna Lake Development Authority together with the National Power Corporation, and Caliraya, Botocan and Kalayaan Power Company implemented the BioCarbon funded project, aimed at sequestering and conserving carbon in forest and agroecosystems.</p>
<p>Community-based Forest and Mangrove Management Project (2009-2015)</p>	<p>It ensures the sustainable development, protection and utilization of forest resources (including mangroves) and the participation of forest dwellers and local communities in forest management in four projects in Leyte, Negros, Panay, with the participation of the DENR, Provincial and Municipal Local Government Units, the Land Bank of the Philippines and the support of Deutsche Forestservice GMBH.</p>
<p>National Greening Program (2011-2016)</p>	<p>Nationwide reforestation program via Executive Order No. 23 to establish 1.5 billion trees covering 1.5 million hectares for productivity in the uplands, self-sufficiency in wood and forest products, economic security, and environmental stability.</p>
<p>Pasig River Rehabilitation Program (1996 to present)</p>	<p>The objective is to attain a Class C water quality and the renewal, redevelopment and upgrading of its surrounding urban environment. All cities and municipalities along the river and several government departments, coordinated under the Pasig River Rehabilitation Commission, are involved with the strong private sector and civil society presence.</p>
<p>Integrated Coastal Resource Management Project (2007-2013)</p>	<p>The framework followed is the “ridge to reef” approach for sustainably managing the coastal resources of 80 municipalities in the provinces of Cagayan, Zambales, Romblon, Masbate, Cebu, Siquijor and Davao Oriental and to increase the income of the fisher folks by providing them greater access to livelihood opportunities. The DENR implements the project with the Bureau of Fisheries and Aquatic Resources and the Municipal Development Fund Office.</p>
<p>Manila Bay Project to Implement the Operational Plan for the Manila Bay Coastal Strategy (2000-2015)</p>	<p>This is in compliance to the continuing mandamus issued by the Supreme Court, the DENR–CALABARZON, NCR, and Region III offices, together with other public and private entities collaborate for the cleaning, restoration, and preservation of Manila Bay.</p>
<p>Adopt - an Estero/Water Body Program</p>	<p>A collaborative undertaking among communities along the <i>esteros</i>, creeks and rivers, LGUs, private sector and the DENR to clear up the wastes, debris, and silt and ensure its unimpeded flow during the rainy season; institutionalize waste management practices through education and actual participation; reduce pollution loading to the rivers and to Manila Bay. By July 2012, a total of 315 Memorandums of Agreement had been forged for the clean-up of 168 <i>esteros</i> / waterbodies nationwide.</p>



## E. Some Existing Management Plans and Initiatives

Management plans, to date, that are being applied in various wetland types of the country at different stages of implementation (Table 8).

**Table 8. Some Existing Management Plans and Initiatives**

RIVER BASINS	The Philippines adopts an Integrated Water Resources Management (IWRM) as a process and approach to water resources management with broad emphasis to basin level management, in general, and for specific priority basins, in particular. At the basin level, the National Integrated River Basin Management and Development Framework Plan has been prepared by the RBCO to provide guidance and directions for action-oriented planning at the basin level.
PEATLANDS	A National Action Plan for the Sustainable Use and Protection of Philippine Peatlands prepared in 2009 focused on: 1) awareness raising and capacity-building; 2) protecting peatlands with high conservation values; 3) setting up of appropriate institutional structure and; 4) developing sustainable peatlands management strategies.
CORALS	The Philippines' commitment to the Coral Triangle Initiative is expressed in its National Plan of Action (NPOA), contained in Executive Order 797, "Adopting the Coral Triangle Initiative Plan of Action" enacted in May 2009. Its objectives are to eventually contribute to achieving higher level outcomes of sustaining coral reef ecosystems and services, establishing sustainable fisheries production and improved food security. It also provides for the coordinating mechanism between the Department of Environment and Natural Resources (DENR) and the Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR) and established the CTI National Coordinating Committee (NCC) consisting of government agencies with functions relevant to NPOA implementation.
CAVES	Under Republic Act 9072, the "National Caves and Cave Resources Management and Protection Act of 2001", the DENR is tasked to formulate, develop and implement a national program for the management, protection and conservation of caves and cave resources, with the National Museum, National Historical Institute, the Department of Tourism, and Local Government Units concerned. Policies supportive of RA 9072 include: (a) Cave Act Implementing Rules and Regulations (DAO 2003-29); (b) Cave Classification Guidelines and Manual (DMC 2007-04); and (c) Guidelines in Treasure Hunting in Caves (DAO 2007-34). RA 9072 also provided for the drafting of Cave Management Plan based on the classification of that particular cave.



# VI. Prevailing Issues & Trends in Philippine Wetlands

*“For many of us, water simply flows from a faucet, and we think little about it beyond this point of contact. We have lost a sense of respect for the wild river, for the complex workings of a wetland, for the intricate web of life that water supports.”*

– Sandra Postel

*Freshwater Fellow of the National Geographic Society*

The diversity of life animates a worshipful attitude and elicits a sense of wonder and affirmation to humanity’s connectedness to this biosphere. Celebrating biodiversity moves away from a short-term, self-orientedness to a more far-reaching, outward-orientedness committed to doing everything it can to better the greater whole.

Addressing threats to the country’s wetlands requires nothing less than a missionary zeal. It entails remedial policy work at the national as well as rational and dutiful law enforcement at the local level, making an inventory and taking stock of the capacities and adaptability of the very wetland resources that are the country’s best defenses against climate change, narrowing down to inland and coastal and marine wetlands to be prioritized, containing the spread of exotic species while re-establishing endemic species and capacitating stakeholders so that they can significantly contribute to effectively monitor, promote sustainable use and alternative livelihoods including ecotourism as well as increase the resilience of wetlands.

Needless to say, a solid partnership with LGUs furthers wetland advocacy the most. Thus, a conscientious education and sustained awareness campaign, directed particularly at the local level, completes the NWAPP. Reversing the attitude of regarding wetlands as wastelands in which to dump waste or to drain and build on or abandon if it is deemed unproductive for agri or aqua culture shall entail sustained advocacy that includes funding of wetland-related activities, engaging local educational institutions as well as documenting and promoting best practices.

## A. Policy-related issues

Overlapping and conflicting policies related to:

1. Land use
  - Claims of ownership and access over vulnerable wetland areas
  - Fraudulent titles, Inappropriate tenure instruments, reversion of fishpond lease agreements
  - Abandoned underdeveloped, undeveloped fishponds
  - Inadequate tenurial instruments for mangroves declared as alienable & disposable
  - Illegal water use
  - Non-observance of easement and buffer zones for urban areas, agricultural areas, forest areas
  - Illegal reclamation
2. Raw water discharges and sewage from industrial and domestic pollution sources
3. Gap in vulnerability of low-lying areas to inform climate change-related policy decisions

## B. Inland Wetland Issues

1. Knowledge gaps in bio-physical and socio-cultural, cultural including tenurial status assessment and monitoring of inland wetlands
2. Knowledge gaps in capacity of stakeholders in preparing management plans and in the carrying capacity of priority freshwater wetlands

3. Challenges of priority inland wetlands
  - Presence of settlements with resulting problems in sanitation and waste disposal
  - Deforestation of upland and mangrove forests
  - Lack of soil conservation appropriate for wetlands
  - Chemical pollution from industry and domestic sources
  - Biological pollution (introduction of exotic species)
  - Prevalent practice of drainage for agriculture (esp. peatlands)
  - Increasing saltwater intrusion; contamination of freshwater sources
4. Climate change vulnerabilities
  - Gap in vulnerability assessment of wetlands and wetland species in priority lakes rivers, marshes
  - Gap in vulnerability of migratory birds
5. Lack of adequate watershed protection and plantation management capability
6. Marginalization of native species in reforestation
7. Undetermined value of peatlands for climate change mitigation
8. Gaps in carbon sequestration functions of specific wetlands
5. Untapped potential of ecotourism as a conservation and anti-poverty strategy for inland wetlands
6. Unsustainable aquaculture practices
  - Invasion of exotic species in inland wetlands
  - Undetermined vulnerability of inland aquaculture to climate change





## C. Coastal and Marine Wetland Issues

1. Gaps in bio-physical and socio-cultural, cultural including tenurial status assessment and monitoring of selected priority coastal and marine wetlands
2. Challenges of degraded coastal and marine wetlands
  - Deterioration of mangroves and beach areas
  - Declining fish catch in coastal and marine wetlands
3. Untapped potential of ecotourism as a conservation and anti-poverty strategy for coastal and marine wetlands:
  - Data gaps in carrying-capacity for ecotourism
  - Technical groundwork to masterplanning, piloting and marketing of coastal and marine wetlands for ecotourism
4. Unsustainable aquaculture practices
5. Data gaps on vulnerability on flora and fauna to sea level rise and other climate change impacts
6. Continuing threats to endangered species
7. Inadequate coastal and marine law enforcement

### Some of the Invasive Exotic Species Already in Philippine Wetlands

About 93% of exotic species are fish, 2.67% mollusks and the rest are crustaceans, frogs and turtles. They are primarily used for ornamental (76%), food (21%) and biological control (2%).

- Mosquito fish *Gambusia affinis*
- Snakehead *Ghanna striata* (*Ophicephalus striatus*)
- Common carp *Cyprinus carpio*
- Mossambique tilapia *Oreochromis mossambicus*
- Nile tilapia *Oreochromis niloticus*
- Crucian carp *Carassius carassius*
- Freshwater mussel *Cristaria plicata*
- Janitor fish
  - (*Liposarcus disjunctivus*; *Pterygoplichthys disjunctivus*) Weber, 1991
  - (*Liposarcus pardalis*; *Pterygoplichthys pardalis*) Castelnau, 1855
- Thai catfish *Clarias batrachus*
- Golden Apple snail *Pomacea canaliculata*
- Guapote tigre *Parachromis managuensis*

### Potential Exotic Species in Philippine Wetlands

- Java barb or tawes *Barbodes gonionotus*
- Red piranha *Pygocentrus nattereri*
- African catfish *Clarias gariepinus*
- Giant snakehead *Channa micropeltes*
- Arapaima *Arapaima gigas*
- Red-bellied pacu *Picaractus brachypomus*
- White shrimp *Litopenaeus vannamei*
- Australian redclaw *Cherax quadricarinatus*
- Louisiana crayfish *Procambarus clarkia*

Source: Cagauan, 2007

# Endnotes

- <sup>i</sup> Definition based on the Implementing Rules and Regulations of the Wildlife Resources Conservation and Protection Act of 2001 as adopted from the Ramsar Convention on Wetlands (Joint DENR-DA-PCSD Administrative Order No. 01 dated May 18, 2004 of Republic Act No. 9147)
- <sup>ii</sup> Philippine Development Plan 2011-2016 states in Chapter 10: Conservation, Protection and Rehabilitation of the Environment and Natural Resources, under Goal 1 of Improved Conservation, Protection and Rehabilitation of Natural Resources, for the Rehabilitation of important habitats such as wetlands; To manage priority wetlands for food production, water conservation and disaster mitigation
- <sup>iii</sup> Section 16, Article II of the 1987 Constitution states: “The State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature.”
- <sup>iv</sup> The concept of intergenerational responsibility was first expounded on timber licensing agreements in *Oposa et al. v Factoran*, GR No. 101083 (30 July 1993)
- <sup>v</sup> ICM addresses the interlinkages among associated watersheds, estuaries and wetlands, and coastal seas by all relevant national and local agencies, civil society and the private sector. ICM involves strategies on habitat, fisheries, shoreline, and waste management, enterprise and livelihood development, sustainable coastal tourism, coastal zoning, legal and institutional development, and risk/coastal hazard management. An important strategy for ICM in the Philippines is the establishment of Marine Protected Areas (MPA) to increase fish stock and prevent overfishing. These are established via a local ordinance through the National Integrated Protected Areas System (NIPAS) Act (RA 7586 ) or through the Fisheries Code (RA 8550).
- <sup>vi</sup> Since the Philippine Constitution and the Water Code of the Philippines (Presidential Decree No. 1067) both declare wetlands as part of the public domain and are inalienable. Open access is delimited for large-scale use as to be undertaken directly by the state or in joint-venture arrangements as well as through 25-year fore shore leases. Whereas for small-scale use, access remains open to subsistence fishers and cooperatives. Through the Local Government Code, the *Sangguniang Bayan* or local councils have jurisdiction over wetlands in their area. While wetlands that are part of ancestral domain become the communal private ownership of the corresponding indigenous people-group. (Luna, 2005)

- <sup>vii</sup> As pointed out by Luna, among the state's relevant instrumentalities as owner of the wetland commons are: RA 8850, the Philippine Fisheries Code of 1998 which defines municipal waters and designates the Fisheries and Aquatic Resource Management Council (FARMC) which has advisory capacity and consent requirements; RA 7586, the National Integrated Protected Areas System Act of 1992 which designate Protected Area Management Board (PAMB) for biodiversity conservation and sustainable development although lack of appropriation cripples its functions; RA 9275, the Clean Water Act of 2007 which designated the Water Quality Management Areas (WAQMA) that are managed by governing boards which are funded by water quality discharge fees collected in the area and are thus regarded as the ideal management structure to regulate point and non-point sources of pollution that end up in wetlands.
- <sup>viii</sup> The petitioners include the Metropolitan Manila Development Authority (MMDA), Department of Environment and Natural Resources (DENR), Department of Education (DepEd), Department of Health (DOH), Department of Agriculture (DA), Department of Public Works and Highways (DPWH), Department of Budget and Management ((DBM), Philippine Coast Guard (PCG), the Philippine National Police Maritime Group, and the Department of the Interior and Local Government (DILG) to address urgent threats to Manila Bay: (1) informal settlers along waterways; (2) solid waste management; and (3) liquid waste management.

# References

- Baldevarona, R. 2001. In Tacio, H. *Where have all our mangroves gone?* Retrieved from [http:// www.peopleandplanet.net/doc.php?id=923](http://www.peopleandplanet.net/doc.php?id=923).
- Banks, C. (ed) 2005. *National recovery plan for the philippine crocodile, *Crocodylus mindorensis* 2005 – 2008 (2nd ed)*. Department of Environment and Natural Resources- Protected Areas and Wildlife Bureau (DENR-PAWB) and the Royal Melbourne Zoological Gardens (RMZG). Quezon City, Philippines.
- Cagauan, A. G. 2007. Review paper: Exotic aquatic species introduction in the Philippines for aquaculture— a threat to biodiversity or a boon to the economy? *Journal of Environmental Science and Management*, 10 (1), 52-53, 59-60.
- Carpenter K. E. and V. G. Springer. 2005. The center of the center of marine shore fish biodiversity: the Philippine Islands. *Environmental Biology of Fishes* 72: 467–480.
- Conservation International, Department of Environment and Natural Resources-Protected Areas and Wildlife Bureau, Haribon Foundation. 2006. *Priority sites for conservation in the Philippines: Key biodiversity areas*.
- Coral Triangle Initiative. 2008. Regional plan of action: Coral triangle initiative on coral reefs, fisheries and food security (CTI-CFF). Retrieved September 19, 2013 from <http://www.coraltriangleinitiative.org/>.
- Department of Agriculture-Bureau of Fisheries and Aquatic Resources. 2011. Philippine Fisheries Profile. Quezon City.
- Department of Agriculture-Bureau of Agricultural Resources Statistics. *Performance of Philippine Agriculture January to December 2012*. Quezon City, Philippines.
- Department of Agriculture-Bureau of Soils and Water Management, Department of Agrarian Reform, Department of Environment and Natural Resources, Department of Science and Technology. 2010. *The Updated National Action Plan to Combat Desertification, Land Degradation and Drought (DLDD) FY 2010-2020*. Quezon City, Philippines.
- Department of Environment and Natural Resources - Protected Areas and Wildlife Bureau, and Gaia Exploration Club. 2012. *Philippine Cave Primer*. Quezon City, Philippines.
- Department of Environment and Natural Resources-Protected Areas and Wildlife Bureau. 2009. *National Action Plan on the Sustainable Use and Protection of Peatlands*. Quezon City, Philippines.
- Department of Environment and Natural Resources-Protected Areas and Wildlife Bureau. 2005. *UNEP/GEF Project: Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand – Philippines National Report on Wetlands*. Quezon City, Philippines, 104pp.
- Department of Environment and Natural Resources-Protected Areas and Wildlife Bureau. 1993. *The 1993 National Wetlands Action Plan for the Republic of the Philippines*. Quezon City, Philippines.
- Department of Environment and Natural Resources, Department of Agriculture, Philippine Council for Sustainable Development. 2004. *Joint Administrative Order No. 01 Implementing Rules and Regulations of Republic Act 9147: Wildlife Resources Conservation and Protection Act*.
- Fourqrean, J.W., C. M. Duarte, H. Kennedy, N. Marbai, M. Holmer, M. A. Mateo, E. T. Apostolaki, G. A. Kendrick, D. Krause-Jensen, K. J. McGlathery and O. Serrano. 2012. Seagrass ecosystems as a globally significant carbon stock. *Nature Geoscience* 5, 505-509. doi:10.1038/ngeo1477.
- Gonzales, R.O, M.R. Deocadez, and P.M. Aliño. 2008. Reefs Through Time: State of the Coasts 2008. *Coral Reef Information Network of the Philippines (Philreefs)*. Philreefs, MPA Support Network (MSN) Marine Environment and Resources Foundation, Inc. (MERF, Inc.) and the Marine Science Institute, University of the Philippines (MSI-UP), Diliman, Quezon City, Philippines.
- Green Peace. 2007. *The State of Water Resources in the Philippines*. Quezon City, Philippines.
- Hall R. 1998. The plate tectonics of Cenozoic SE Asia and the distribution of land and sea. In: Hall R., Holloway J.D. (eds.) *Biogeography and Evolution of SE Asia*. Backhuys Publisher, Leiden: 99-131.
- Haribon Foundation. 1989. Philippines. Scott, D.A. (ed.) *A Directory of Asian Wetlands*. Retrieved July 27, 2012 from <http://ramsar.wetlands.org/ToolsforParties/WetlandDirectories/ADirectoryofAsianWetlands/tabid/822/Default.aspx>.
- International Panel on Climate Change (IPCC). 2007. Climate change 2007: Climate change impacts, adaptation, and vulnerability, summary for policy makers. *Contribution of the Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, February 2007*. Brussels: IPCC.

- Joint DENR-DA-PCSD Administrative Order No. 01. Series of 2004. Republic Act No. 9147: Implementing Rules and Regulations of the Wildlife Resources Conservation and Protection Act of 2001.
- Kho, J. and E. Saño. 2005. *Country study on customary water laws and practices-Philippines*.
- Luna, Ma. Paz G. 2005. Review of Legislation and Policies on Philippine Wetlands. *UNEP/GEF Project: Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand*. Department of Environment and Natural Resources - Protected Areas and Wildlife Bureau, Quezon City, Philippines, 24 pp.
- Mallari, N.A.D., B.R. Tabaranza, Jr. and M.J. Crosby. 2001. Key Conservation Sites in the Philippines: a Haribon Foundation and Birdlife International Directory of Important Bird Areas. Department of Environment and Natural Resources and Bookmark Inc. Makati City.
- Millennium Ecosystem Assessment. 2005. *Ecosystems and Human Well-Being: Wetlands and Water Synthesis*. Washington, DC: World Resources Institute.
- Nañola, C.L., Jr., P.M. Aliño, H.O. Arceo, W.Y. Licuanan, A.J. Uychiaco, M. Quiblan, W. Quibilan, W. Campos, A. Alcala, A. White and E. Gomez. 2006. *Status Report on Coral Reefs of the Philippines-2004*. Proceedings of 10th International Coral Reef Symposium, 1055-1061.
- National Economic and Development Authority. 2011. *Philippine Development Plan 2011- 2016*. Pasig City.
- National Ecotourism Steering Committee and Ecotourism Technical Working Group. 2002. *National Ecotourism Strategy*.
- Ong, P.S., L.E. Afuang, and R.G. Rossell-Ambal (eds.) 2002. *Philippine Biodiversity Conservation Priorities: A Second Iteration of the National Biodiversity Strategy and Action Plan*. Department of Environment and Natural Resources - Protected Areas and Wildlife Bureau, Conservation International Philippines, Biodiversity Conservation Program-University of the Philippines Center for Integrative and Development Studies, Foundation for the Philippine Environment. Quezon City, Philippines.
- Oposa et al. v Factoran, GR No. 101083 (30 July 1993).
- Philippine Constitution. 1987. art. II, § 16.
- Philippine News Agency. 2012, March 19. Man-made wetland to rise soon in Alaminos to cleanse waste water. *Science.ph: Science for every juan local news*. Retrieved September 19, 2013 from [http://www.science.ph/full\\_story.php?key=3308:man-made-wetland-to-rise-soon-in-alaminos-to-cleanse-wastewater&type=local%20news](http://www.science.ph/full_story.php?key=3308:man-made-wetland-to-rise-soon-in-alaminos-to-cleanse-wastewater&type=local%20news).
- Protected Areas and Wildlife Bureau – Department of Environment and Natural Resources, 2009. *The Verde Framework*.
- Republic of the Philippines. 2012. National report on the implementation of the RAMSAR Convention on Wetlands. *National reports to be submitted to the 11th meeting of the conference of the contracting parties*, Romania, June 2012.
- Republic of the Philippines. Department of Environment and Natural Resources (2009). *4th National Report to the Convention on Biological Diversity*. Quezon City, Philippines.
- Stewart, R. 2005. Tragedy of the Commons. *Oceanography in the 21st Century - An Online Textbook*. Retrieved March 4, 2013 from <http://oceanworld.tamu.edu/resources/oceanography-book/tragedyofthecommons.htm>
- Supreme Court of the Philippines. Oposa et al. v Factoran, GR No. 101083 (30 July 1993).
- Tanduyan, S.N., B.T. Andriano and R.B. Gonzaga. 2011. Lake Danao, San Francisco, Central, Philippines: Status and Government Initiatives for its Conservation and Sustainability. *Proceedings of the Second National Congress on Philippine Lakes*.
- Tanduyan, Serapion N., B.T. Andriano and R.B. Gonzaga. Lake Danao, San Francisco, Central, Philippines: Status and Government Initiatives for its Conservation and Sustainability. *Proceedings of the Second National Congress on Philippine Lakes: Building on the pillars of Integrated Lake Basin Management, 27-29 April 2011, Los Baños, Laguna*. SEARCA.
- Tuddao, Vicente B. Jr., 2009. *Framework planning for river basin management – the Philippine Approach*. CRBOM Small Publication Series No. 12, Indonesia.
- United Nations Environment Program. 2004. *Coral Reefs in the South China Sea*. UNEP/GEF/SCS Technical Publication No. 2





The National  
Wetland Strategy  
and Action Plan



# The National Wetland Strategy and Action Plan

## Vision for the NWAPP (2011-2016)

By 2016, priority wetlands in the Philippines are sustainably managed by empowered stakeholders, based on a Management Plan that was formulated and implemented through a participatory manner.

## Mission Statement

To provide an effective framework and integrating tool for the conservation and wise use of Philippine wetlands, in support of the overall sustainable goals of the country.

## Aim

The NWAPP 2011-2016 serves as an effective framework and integrating tool for the conservation and wise use of Philippine wetlands, in support of the overall sustainable development goals of the country.

## Objectives

- To harmonize and strictly enforce existing policies affecting the use of wetlands.
- To increase the awareness of key stakeholders on the importance of wetlands and effect a change in their behavior towards these ecosystems.
- To enhance the capacity of stakeholders, so that they are more capable of implementing wetland conservation measures.
- To promote collaboration among stakeholders for effective wetland management; and
- To establish comprehensive monitoring systems to ensure that wetlands are conserved, well managed, and wisely used

## Thematic Areas and Goals

Setting the overall direction of the NWAPP are the General Strategies which were grouped into four thematic areas, according to their primary focus of interventions and their supporting goals.

They are the following:

Over all Goal: Sustainable utilization of wetlands in the Philippines.

### Thematic Area 1: Wetlands Policy

**Goal:** Clear policy on wetlands conservation including its wise use.

1. Review of existing land use and management of wetlands
2. Implement existing policies and recommended interventions
3. Integrate climate change mitigation and adaptation measures into relevant plans and policies

## Thematic Area 2: Inland Wetlands

**Goal:** Sustainable utilization of freshwater wetlands ecosystem

1. Establish baseline data and conduct bio-physical and socio-cultural assessment and monitoring of freshwater wetlands (using ridge to reef framework)
2. Prepare and implement management plans for priority freshwater wetlands in the country
3. Rehabilitate priority freshwater wetlands
4. Implement climate change mitigation and adaptation strategies
5. Promote ecotourism as a conservation strategy for freshwater wetlands
6. Implement sustainable aquaculture practices in freshwater wetlands

## Thematic Area 3: Coastal and Marine Wetlands

**Goal:** Sustainable utilization of coastal and marine ecosystems

1. Establish baseline data and conduct bio-physical and socio-cultural assessment and monitoring of freshwater wetlands (using ridge to reef framework)
2. Rehabilitate degraded coastal and marine wetlands
3. Promote ecotourism as a conservation strategy for coastal and marine wetlands
4. Implement sustainable aquaculture practices
5. Research and development
6. Establish critical habitat for threatened/endangered species
7. Improve coastal and marine law enforcement

## Thematic Area 4: Enabling Strategies

**Goal:** Increased awareness of key stakeholders on the importance of wetlands and increased capacity to implement wetland conservation measures

1. Compile and organize information on Philippine wetlands and make these accessible to stakeholders
2. Knowledge management

3. Prepare, adopt and implement a Communication, Education, Participation, and Awareness (CEPA) Action Plan
4. Capacity development and enhancement
5. Develop and/or implement innovative methods, tools and technologies for wetland management

## Outcomes

The overall outcome of the successful implementation of the NWAPP 2011-2016 is that wetlands in the country are ecologically intact, and thus, are able to provide products, functions and services for the benefit of the people and nature.

Specific outcomes include the following:

- Wetlands in the country are ecologically healthy and continuously provide products, functions and services.
- Resilient and stable coastal and marine wetland ecosystems
- Resilient and stable inland wetland ecosystems
- Priority wetlands in the country are managed well and used wisely.

## Guiding Principles

The NWAPP is anchored on the building of a strong sense of ownership by the country's stakeholders and the establishment of collaborative partnerships and inclusion of the private sector and civil society. It employs a localized approach to management and community-based participation. Premised on the larger framework of sustainable development, the prevention of harm and the continuity of a healthful ecology for the subsequent generation, the NWAPP is a commitment to take responsibility for the continued enjoyment of the country's wetland resources.

**Ownership** of the NWAPP is critical in the success of its implementation. The NWAPP is recognized in the Philippine Development Plan 2011-2016 and is primarily a blueprint for strategies and actions for the conservation and wise use of wetlands in the country that each sector or stakeholder can implement as they see fit and within their capacities.

**Collaborative Partnerships** at the national, regional, and local levels. These partnerships are to be driven by the DENR with support from the other concerned government

agencies. Since the NWAPP was formulated jointly by key stakeholders, champions from the private sector and civil society as well as from international organizations shall be tapped for the successful implementation of the NWAPP 2011-2016. This will entail joint activities and require continuous and effective information, education and communication dissemination activities for its successful implementation.

**Linkages to Regional and International Initiatives** are to be formed in line with its implementation, in particular the Global and National Agenda 21, Convention on Biological Diversity, Ramsar Convention, Convention on Migratory Species, UN Framework Convention on Climate Change, UN Convention to Combat Desertification and Land Degradation, Convention on International Transport of Endangered Species. ASEAN Working Group on Nature Conservation and Biodiversity, ASEAN Working Group on Coastal and Marine Environment, and the ASEAN Working Group on Water, among others.

**The Three Pillars of Sustainable Development**, as first stated during the Rio Earth Summit in 1992, are built on: 1) Environmental Protection; 2) Social Development and; 3) Economic Development. The NWAPP promotes this convergence, whereby natural resource conservation, poverty alleviation, and business development are addressed simultaneously and treated with equal importance.

**The Precautionary principle**, which maintains that the absence of full scientific certainty shall not be used as a reason for postponing decisions when faced with the threat of serious or irreversible harm, shall be applied to the development of options and policies for the NWAPP. Before there is solid evidence of harm, measures shall be undertaken to reduce potential hazards or preclude disasters. Cost-benefit analysis of action and inaction shall be utilized to recommend actions to reduce potential risk and undertake further research and monitoring to detect hazards.

**Informed decision-making** through science-based data, appropriate technology and environmental education. The NWAPP enables policy-making at the national and local levels by requiring the best available scientific knowledge, including technical and traditional knowledge. Granted that the effects of various factors on the wetland resources may not be apparent, the collection and analysis of data enables planners to refine management objectives, evaluate and implement corresponding measures based

on scientific/ecological theory.

**Application of adaptive management** entails a degree of flexibility. The NWAPP shall be subject to monitoring and periodic review and revised accordingly. It allows for modification through the years with acquisition of more knowledge and tools, challenges encountered on the field, even by new stakeholders. Thus, it must adapt to the changes within its timeframe.

**Upholds the Constitutionally-guaranteed right and responsibility** to a balanced and healthful ecology that carries with it the moral duty of intergenerational responsibility. The NWAPP is this generation's commitment to the wise use of the country's rich endowment of wetland resources and its enhancement for subsequent generations.

## Strategic Action

Strategies have been developed for each Thematic Area and Goal. These actions took into consideration the following factors:

1. Existing structures, measures or mechanisms in place;
2. Perceived importance of need;
3. Availability of resources to implement the identified action; and
4. Potential of collaboration and cooperation with partners.

Activities required to implement each strategy have been tabulated\* with a timeframe, the implementing partner/s (agencies or organizations) and the expected outputs. Output indicators are likewise identified for each of the strategic action to facilitate the effective monitoring and evaluation of plan implementation, its overall performance and impact (\*Tabulated NWAPP 2011-2016 follows this section).

## Priority Wetlands in the NWAPP 2011-2016

To optimize resources and achieve maximum impacts and outcomes from the activities in the NWAPP, priority wetlands for the period covered have been identified, based on a set of criteria agreed upon during the TWG meetings and confirmed by the consultations. Annex A lists down priority coastal and marine wetlands as well as inland wetlands, based on the criteria used for designating KBAs and the PBCP. Based on these criteria, additional wetland areas were

**Table 9. NWAPP 2011-2016 Priority Wetlands**

Inland Wetlands	Coastal and Marine Wetlands
Candaba Swamp Lalaguna Marsh Naujan Lake Coron Lake Lake Maguao Puerto Princesa Subterranean River National Park Agusan Marsh Wildlife Sanctuary Lake Lanao Ligawasan Marsh	Batanes Islands Protected Landscape and Seascape Babuyan Islands Buguey Wetlands Manila Bay Pagbilao and Tayabas Bay Ragay Gulf Mactan, Kalawisan, Cansaga Bay Tubbataha Reef National Marine Park Polillo Island Caramoan Peninsula Puerto Galera Ursula Island Balabac Group of Islands Northwest Panay Peninsula Natural Park Olango Island Biliran and Maripipi Island Siargao Island Protected Land and Seascape Tawi-tawi Island Simunul and Manuk Manka Islands Sibutu and Tumindao Islands El Nido Managed Resource Protected Area Cabulao Bay Malampaya Sound Balayan Bay Talabong Island and Bais Bay Panguil Bay Ulugan Bay Inabanga Coast

recommended for inclusion in the priority list (Annex B) during the Regional Consultations. These, however, have to be subjected to a review using a set of criteria for a more rational setting of additional priorities. Moreover, during the integration workshop, another round of prioritization for the listing in Annex A was done, based on the level of investment/attention being given to the wetland area. This is included in the report as Annex C.

### **Proposed Implementation Mechanism**

While the NWAPP already identifies implementation partners at different levels, and as per consultations their assigned tasks should already be integrated in their agency or organization’s work plan, funding may not suffice, specially for newly identified activities that are added on to their regular functions. Thus, there is a need to institutionalize the NWAPP, define its implementing mechanism, identify sources of funds, and set a monitoring, evaluation, and reporting framework to ensure that the activities are implemented and the outcomes achieved.

### **Creation of a National Wetlands Committee**

In general, wetland-related concerns cut across the jurisdiction of several government agencies at the national, provincial and local levels. Thus, the ideal focal point is the Philippine Council for Sustainable Development (PCSD), in which the Secretary of the DENR chairs the Committee on Conservation and Management of Resources for Development (CCMRD). It is from here—under the Sub-Committee on Biodiversity, chaired by the DENR-PAWB—that a Task Force or TWG can explore the configuration and function/responsibilities of a multi-sectoral group that will compose the National Wetlands Committee. From their recommendations, the CCMRD Chair secures the PCSD Executive Committee's endorsement to the President of the enabling Executive Order.

The National Wetlands Committee or a similar body should provide oversight functions for the implementation of the NWAPP. Existing institutional arrangements have to be reviewed, so that an appropriate body that can function optimally within this milieu can be constituted.

# Thematic Area 1: Wetlands Policy

**Outcome:** Wetlands in the country are ecologically intact and thus are able to provide products, functions and services

**Overall Goal:** Clear policy on wetlands conservation including its wise use

**Overall Objectives:** To streamline land use in wetlands, based on strict enforcement of various laws affecting them

**Indicators:** Maps produced, database created, policies revised/amended

## ACTION PLAN

Project/Activities	Targets and Timetable		
	Short Term (2011-2012)	Medium Term (2011-2014)	Long Term (2011-2016)
<b>Strategy 1. Review of existing land use and management of wetlands</b>			
1.1 Inventory and Mapping of priority wetlands (PRS 92)– mapping to include watershed/river basin	3 High priority Luzon-Candaba Visayas-Bais City, Negros Oriental Mindanao-Agusan Marsh	Rest of the High and Medium priority	Remaining identified priority wetlands
Interagency formulation of mapping guidelines by DENR in consideration of seasonal inundations to be classified as vulnerable, priority and intermittent wetlands, small islands as well as tenure, claims of ownership and access issues	1 mapping guidelines formulated and approved		monitoring
Prepare proposal indicating the cost and timetable	1 Proposal prepared, submitted and approved		
Create inventory oversight committee (to provide policy directions)	1 oversight Committee created		
Establishment of a Unified and enhanced Geographical Information System maps and database for wetlands		1 GIS database created	
Include in the unified database a sub-database of wetlands with tenurial instruments and fraudulent titles		Database on wetlands with tenurial instruments and fraudulent titles included in the Unified database	
<b>1.2 Review and Cancellation of fraudulent titles and inappropriate tenure instruments, and reversion of Fishpond Lease Agreements</b>			
Submission by BFAR of a listing of abandoned fishponds to DENR	List submitted by BFAR to DENR		
Implement moratorium on surveys until implementation of Joint DA DENR DILG AO No. 1 2008 (cancellation of fishponds AUU–abandoned, underdeveloped, undeveloped)	Moratorium implemented		
Cancellation and/or reversion of fraudulent titles and lease agreements	20% of the list per region	50% of the list per region	30% of the list per region
Prosecute those responsible for issuance of fraudulent titles		Filing of cases to appropriate agencies	
Formulate and adopt appropriate guidelines for tenurial instruments for mangrove areas declared as A&D both titled and untitled	1 set of guidelines formulated and approved.		
<b>1.3 Strict implementation of water user's rules and regulations.</b>			
Review and identify legal and illegal water users	All water users identified (legal or illegal)		
Formulate and implement sanctions for illegal water user	Sanctions for illegal water users developed and implemented.	Sanctions for illegal water users implemented	Continuation
<b>1.4 Strict enforcement of Easement and buffer zone regulations</b>			
-Implementation of PD 705, Water Code, and other applicable laws, rules and regulations			
Integrate easement and buffer prescriptions in the Building Permit process particularly in developments on or near wetlands	Easement and buffer prescriptions for developments in wetland areas integrated in the Building Permit process	Easement and buffer prescriptions for developments in wetland areas integrated in the Building Permit process	

Implementing Agencies/ Organizations (*Lead Agency/ies)	Expected Outputs	Indicators	Means of Verification
PAWB*, NAMRIA*, BSWM, BFAR, LMB, DENR ROs, NWRB, SCPW	Inventory and Maps of Wetlands	Number of priority wetlands mapped	Copies of wetland maps
PAWB*, NAMRIA*, BSWM, BFAR, LMB, DENR ROs, SCPW	Mapping guidelines and institutionalization instrument, i.e. DAO	1 set of mapping guidelines	Copy of mapping guidelines and DAO
PAWB*, SCPW*, TWG on Wetlands	1 Proposal submitted and approved	Number of proposals prepared and submitted	Copy of proposals and letters of submission, approval
DENR-PAWB* , DENR agencies	Oversight Committee	Number of Oversight Committee created	Directive on the creation of the Committee
PAWB*, NAMRIA*, BSWM, BFAR, LMB, DENR ROs, SCPW	1 Unified and enhanced Geographical Information System maps and database established	Number of Unified and enhanced Geographical Information System maps and database established	Report; copies of maps
PAWB*, NAMRIA*, BSWM, BFAR, LMB, DENR ROs, SCPW	Sub-database created in the Unified wetlands database	Number of sub-database established	Report
BFAR*, DENR*	Listing of abandoned fishponds	Submission of List of abandoned fishponds	Communication transmitting the Listing with the actual listing
DA*, DENR*, DILG*, DENR-ICRMP Policy Study	Implementation of moratorium	Directive imposing the moratorium	Copy of the directive.
DA*, DENR*, LGU*, BFAR, FMB, NWRB LMB/LMS*, DILG/LGUs*, OSG*	Fraudulent titles reviewed, cancelled or reversed	Percentage of fraudulent titles reviewed, cancelled and/or reversed	Reports
DENR*, DA*, OSG*	Cases filed against people who issued fraudulent titles	Number of cases filed	Reports and copies of cases filed
DENR-ICRMP Policy Study*	Guidelines formulated and adopted	Set of guidelines formulated and approved	Hard copy of guidelines and document approving them
NWRB*	List of legal and illegal water users	Listing of water users	Report from NWRB with listing
NWRB*	Sanctions for illegal water users formulated, approved and implemented	Approval of sanctions	DAO approving and implementing the sanctions; copy of the sanctions
DENR*, LGUs*	Revised Building Permit procedure incorporating easement and buffer prescriptions for developments in wetland areas	Section on easement and buffer prescriptions integrated in the Building Permit procedure for developments in wetland areas	Copy of revised Building Permit procedure for developments in wetland areas

Project/Activities	Targets and Timetable		
	Short Term (2011-2012)	Medium Term (2011-2014)	Long Term (2011-2016)
Issuance of local ordinances on buffer zone for developments in wetland areas with sanctions for violations (at least 200 meters; (3 meters in urban areas, 20 meters in agricultural areas, 40 meters in forest areas and apply to new projects)	Local ordinances on buffer zone policies formulated and implemented in all cities in the country particularly for developments in wetland areas	Local ordinances on buffer zone policies formulated and implemented in developments in wetland areas	Local ordinances on buffer zone policies formulated and implemented for developments in wetland areas
Formation of a Multi-sectoral team led by LGU for implementation of buffer ordinance (may tap existing ENR committees)	Multi-sectoral team formed		
Create an online database of best practices on river bank easement/protection	Document and create an online database on best practices on river bank easement/protection	Update and maintain online database	Update and maintain online database
Give recognition/incentives to LGUs with documented best practice activities on river bank/easement protection	Formulate and implement an incentive system for LGUs with documented best practice policy/activities on river bank/easement protection		
<b>1.5 Resolve reclamation issues</b>			
Identify areas reclaimed without permit and which have not been reclassified by Congress	All Regions have identified such areas		
Revert for public use illegally reclaimed lands			Revert 30% of illegally reclaimed land
Amend and implement reclamation guidelines based on new EO 798 including sanctions and mechanism for penalizing violators	Guidelines amended and approved		
<b>Strategy 2. Implement local management and economic measures to conserve wetlands</b>			
<b>2.1 Set user's and service fees/ PES/raw and annual water charges</b>			
Set user's and service fees/ PES/raw water charges in sites that are ready.	1 per region	1 per region	1 per region
<b>2.2 Include resource valuation in determining IRA/Host Community</b>			
Formulate and implement policy/guidelines	1 set of Guidelines formulated	1 set of guidelines approved and implemented	Continuing implementation of guidelines
<b>Strategy 3. Integrate Climate Change mitigation and adaptation measures in relevant plans and policies</b>			
<b>3.1 Review and/or adoption of relevant policies and legislations relevant to wetlands and climate change</b>			
Integrate green technology in the Building Code, Sanitation and Plumbing Code, Water Code)	Building, Sanitation and Plumbing Code reviewed and amended through Congressional Process.	Amendments approved and amended Codes disseminated to LGUs	Amendments implemented
Include in the ECC conditions "Greenline and cistern requirement" for high rise buildings, condominiums, residential, commercial and industrial establishments (water conservation, green house gas emissions);	Inventory of ECC issued with this Greenline and cistern requirement  Best practice example documented	Recognition and rewards	Continue the recognition and rewards
Include in local policy that that communities within or near wetlands should have toilets			
<b>3.2 Assess vulnerable priority wetlands to climate change based on NAMRIA's 10 clusters of low lying areas</b>	Vulnerability Assessment of 1 priority wetland per region	Vulnerability Assessment of 3 priority wetlands per region	Vulnerability Assessment of 5 priority wetland per region



Implementing Agencies/ Organizations (*Lead Agency/ies)	Expected Outputs	Indicators	Means of Verification
DENR*; DILG*, LGUs* through the Leagues DENR-LMS; DENR-CMMD, DPWH	Local ordinances and other directives on buffer zones for developments in wetland areas	Number of Local ordinances issued per region	Copy of ordinances and other directives
DILG/LGUs*, DENR, DPWH	Multi-sectoral team formed	Multi-sectoral team formed	Directive forming the multi-sectoral team
DILG/LGUs*, DPWH	Database on best practices on river bank/easement protection  e.g. Napindan (Makati-Pasig)	Online database created and maintained	Project Report
NWRB and the Leagues*, DENR, DPWH	Incentive Scheme	Incentive Scheme formulated and approved	Directive approving the incentive scheme and copy of the incentive scheme
DENR-PAWB thru Reclamation Committee*, PRA*, LGUs	Inventory of illegally reclaimed areas	Number of Regions that have identified areas reclaimed without permits and which have not been reclassified by Congress	Reports with inventory
	Illegally reclaimed lands reverted for public use	Number of cases of reversion per Region	Reports, publications
DENR, PRA	Approved amended guidelines	1 set of guidelines amended and approved	Reports, copy of guidelines
Local Water Management Bodies, DENR	User's fees set and implemented	Number of user's fees policy approved and implemented per region	Directive approving its implementation
Congress, academe LGU, DBM			
DILG-LGU/DENR DBM	Policy and guidelines formulated and implemented	number of policy/guidelines formulated and implemented	Policy directive; copy dog policy/guidelines
UAP*, Congress*, DILG, LGU SIBAT, other professional organizations	Amendments to the Building Code, Sanitation and Plumbing Code that are relevant to wetlands and climate change	Number of legislations reviewed; amended	Copies of amended laws
EMB*, DILG/LGUs*, DENR-PAWB		Number of ECCs issued with greenline and cistern requirements	
DENR-PAWB*, ERDB*, NAMRIA*, LMB*, NGOs (SCPW), academe	Listing of wetlands that are highly vulnerable to climate change	Number of priority wetlands assessed	Reports

# Thematic Area 2: Freshwater/Inland Wetlands

**Outcome:** Resilient and stable freshwater wetland ecosystems, reduced poverty among wetland-dependent communities

**Overall Goal:** Sustainable utilization of freshwater wetlands ecosystem; enhanced livelihood opportunities for wetland-dependent communities

**Overall Objectives:**

- To improve the management and conservation of freshwater wetlands
- To provide alternative livelihood for wetland-dependent communities

**Indicators:**

- Environment/ecological: Quality of fresh water, coastal productivity (fish catch), quality and area of rivers, lakes, swamps, marshes and other inland wetlands
- Socio-economic: Income, equity; job or livelihood opportunities; access to common resources

## ACTION PLAN

Project/Activities	Targets and Timetable		
	Short Term (2011-2012)	Medium Term (2011-2014)	Long Term (2011-2016)
<b>Strategy 1. Establish baseline data and conduct bio-physical and socio-cultural assessment and monitoring of freshwater wetlands (using ridge to reef framework)</b>			
1.1 Conduct an inventory, assessment and monitoring of priority freshwater wetlands:			
Conduct of national workshop to level off terminologies (i.e. major freshwater wetlands), methods and procedures for inventory, assessment and monitoring	1 National Workshop conducted		
Prepare an inventory of freshwater wetlands with maps	1 inventory per Region		
Conduct an assessment of the country's major lakes, rivers, and swamps (biological, _physic-chemical, socio-economic including tenurial status)	3 major wetlands (lakes, rivers swamp/marsh) assessed	3 major wetlands (lakes, rivers swamp/marsh) assessed	3 major wetlands (lakes, rivers swamp/marsh) assessed
Monitor selected priority freshwater wetlands	3 priority lakes, rivers or swamp/marsh monitored	3 priority lakes, rivers or swamp/marsh monitored	3 priority lakes, rivers or swamp/marsh monitored
1.2 Review existing database on freshwater wetlands and recommend systematic access to these databases.	1 online database	Updating and maintenance of online databases	Updating and maintenance of online databases
Create links to web-based databases (i.e. CHM)	Regional databases linked to CHM and other web-based databases		
<b>Strategy 2. Preparation and implementation of Management Plans for priority freshwater wetlands in the country</b>			
Prepare a Management Planning Manual containing procedures with framework and templates that can be done by communities	Wetland Management Plan Preparation Manual prepared		
Conduct training on how to use the Management Planning Manual	One Training conducted at the national level	1 Training conducted per Region	
Conduct a carrying capacity study of selected priority freshwater wetlands	Carrying capacity studies conducted in 1 priority freshwater wetland per Region		
Prepare Management Plans for priority freshwater wetlands in the country	1 Management Plan for a priority freshwater wetland prepared per Region per year	1 Management Plan for a priority freshwater wetland prepared per Region per year	1 Management Plan for a priority freshwater wetland prepared per Region per year
Implement Management Plans for priority freshwater wetlands in the country	1 Management Plan for a priority freshwater wetland implemented per Region per year	1 Management Plan for a priority freshwater wetland implemented per Region per year	1 Management Plan for a priority freshwater wetland implemented per Region per year
<b>Strategy 3. Rehabilitate Priority Freshwater Wetlands</b>			
3.1 Design a scheme to manage settlements in wetlands	Management scheme designed		

Implementing Agencies/ Organizations (*Lead Agencies)	Expected Outputs	Indicators	Means of Verification
DENR-PAWB*, NAMRIA, DENR-RBCO, DENR-ROs, LGUs, PCAMRD, academe	Standard terminologies, methods and procedures for freshwater wetland inventory	Number of workshops conducted	Activity Report; Compilation of Standard Terms, Methods and Procedures
DENR-PAWB*, NAMRIA*, DENR-RBCO, DENR-ROs, LGUs, PCAMRD, academe, NGOs	Updated inventory of lakes, rivers, and swamps per Region	Number of Regions that submitted inventories	Report of inventories
DENR-PAWB*, DENR-RBCO*, DENR-ROs, LGUs, PCAMRD, academe, NGOs	Profiles of selected priority lakes, rivers, marshes/swamps (biological, physico-chemical, socio-economic, including tenurial status) using the Ramsar Information Sheet	Number of priority lakes, rivers, marshes/swamps assessed.	Assessment Reports; Profiles of wetlands that were assessed
DENR-PAWB*, DENR-RBCO*, DENR-ROs, LGUs, PCAMRD, academe, NGOs	Monitoring data on selected freshwater wetlands	Number of wetlands monitored	Data on the state of priority wetlands
DENR-PAWB*, ERDB, PCMARRD, ERDB, LLDA, RBCO, NWRB), LGUs, academe, NGOs	Online databases on priority wetlands	online databases	Reports
DENR-PAWB*, BFAR, LLDA, PCMARRD, LGUs, academe, NGOs, POs	Links established to other databases	Number of links established	Report; system test
DENR-PAWB*, LGUs, SCPW, academe, NGOs, POs	Management Planning Manual for the Wetland Conservation	Number of Manuals prepared	Report; copy of document
DENR-PAWB*, LGUs, SCPW, academe, NGOs, POs	Training on the use of the Management Planning Manual for the Wetland Conservation	Number of Trainings conducted	Activity Reports
DENR-PAWB*, DENR-ERDB*, academe	Carrying Capacity of selected priority freshwater wetlands	Number of Regions that conducted carrying capacity studies	Reports of the Study
DENR-PAWB*, LGUs, SCPW, academe, NGOs, POs	Management Plans for priority freshwater wetlands prepared	Number of Management Plans prepared	Report; copy of Management Plans
DENR-PAWB*, LGUs, SCPW, academe, NGOs, POs	Management Plans for priority freshwater wetlands implemented	Number of Management Plans implemented	Reports
DENR*, LGUs*, NGOs, Bayan ni Juan, Gawad Kalinga	Management Scheme design		Reports

Project/Activities	Targets and Timetable		
	Short Term (2011-2012)	Medium Term (2011-2014)	Long Term (2011-2016)
3.2 Implement community-based reforestation in the watershed areas of priority wetlands (i.e. Treepreneurs)	(link to NGP targets)	(link to NGP targets)	(link to NGP targets)
3.3 Implement bioremediation and/or phytoremediation technologies to address pollution on a pilot basis at selected priority wetlands			
Conduct a seminar-workshop to assess appropriate bioremediation and phytoremediation technologies appropriate to types of wetlands	1 Seminar-workshop conducted		
Pilot implementation of appropriate bioremediation and/or phytoremediation technologies at selected priority wetlands	Pilot implementation in 1 priority freshwater wetland		
3.4 Implement soil conservation technologies in priority wetlands			
Conduct a seminar-workshop to compile soil conservation technologies that can be applied to wetland			
3.5 Implement activities to address invasive alien species (i.e. golden kuhol, janitor fish, water hyacinth)	Activities implemented	Activities implemented	Activities implemented
3.6 Launch and implement a project on "Adopt a Wetland"	Project launched and implemented in all Regions		
<b>Strategy 4. Implement Climate Change mitigation and adaptation strategies</b>			
Adaptation Activities/Measures:			
4.1 Conduct a vulnerability assessment of wetlands and wetland species to climate change			
Conduct a workshop to develop a toolkit for vulnerability assessment of freshwater wetlands to climate change	1 National Workshop		
Using the toolkit, conduct vulnerability assessment of wetlands and wetlands species in priority freshwater wetlands	1 priority wetland assessed per Region per year	1 priority wetland assessed per Region per year	1 priority wetland assessed per Region per year
4.2 Conduct a study to identify vulnerable species for climate change effects on freshwater wetlands	1 Study conducted in major freshwater wetland types (lakes, rivers, marshes)		
4.3 Conduct a monitoring of migration patterns of birds vis-à-vis their established migration usage	Conduct monitoring of migratory birds in 3 wetland sites per major island groups (Luzon, Visayas, Mindanao)	Continue monitoring of migratory birds in 3 wetland sites per major island groups (Luzon, Visayas, Mindanao)	Continue monitoring of migratory birds in 3 wetland sites per major island groups (Luzon, Visayas, Mindanao)
4.4 Formalize and implement a Philippine Bird Banding Scheme	Bird Banding scheme formalized and implemented in the country	Bird banding conducted in the 3 sites identified in item 4.2	Bird banding conducted in the 3 sites identified in item 4.2
4.5 Hold a National Conference on Climate Change Adaptation and Population, Health and Environment	One National Conference held; Proceedings and recommendations posted in the wetland website (CHM)		
Mitigation Activities/Measures:			
4.6 Adoption of appropriate (wetland) watershed protection and (conservation) plantation management strategies			
mainstreaming of native species in reforestation projects (priority wetlands: Agusan Marsh, Candaba Marsh)	Link targets to NGP	Link targets to NGP	Link targets to NGP
4.7 Promote the conservation of peatlands (Please refer to the National Peatlands Action Plan for the Philippines which is an integral part of the National Wetlands Action Plan)			
4.8 Conduct of R & D studies on specific climate change mitigation functions of wetlands			
Conduct studies on carbon sequestration functions of specific wetlands (rate of sequestration, carbon stock, etc)	1 study per major freshwater wetland type (lake, river, marsh; include rice fields)		
4.9 Adopt a Green technology to promote sanitation in wetlands	Conduct of IEC on green sanitation technology in three pilot priority wetlands	Conduct of pilot green sanitation technology in three priority wetlands	Upscaling of green sanitation technology in three other priority wetlands

Implementing Agencies/ Organizations (*Lead Agencies)	Expected Outputs	Indicators	Means of Verification
DENR-FMB*, PAWB, LGUs, NGOs	Watershed areas reforested	Number of hectares reforested	Reports, site visits
DENR-ERDB*, DENR-EMB, NGOs, academe, LGUs	Seminar-workshop conducted	Number of seminar workshop conducted	Documentation on appropriate bioremediation and phytoremediation technologies for various wetland types in the Philippines
DENR-ERDB*, DENR-EMB, NGOs, academe, LGUs	Bioremediation and/or Phytoremediation implemented in priority freshwater wetlands.	Number of bioremediation or phytoremediation projects implemented	Reports
DENR-PAWB*, BFAR, FARMC, PAMBs PCMARD, LGUs, NGOs, POs	Projects to address IAS	Number of projects implemented	Reports, site visits
DENR-PAWB*, Private sector, LGU, DENR, NGOs, stakeholders	Project launched and implemented in all Regions	Number of Regions that launched and are implementing the project	Reports; agreement instruments; site visit
DENR*, PCMARD, DA-BFAR, academe, NGOs/POs, LGUs	List of vulnerable wetland species	Number of species assessed	Assessment Reports
DENR-PAWB*, DENR-ERDB, LGUs, academe, NGOs, SCPW	Workshop(s) held; Toolkit	Number of workshops held	Activity Report; Toolkit
DENR-PAWB*, DENR-ERDB, LGUs, academe, NGOs, SCPW	Report of the vulnerability assessment study	Number of freshwater wetlands assessed using the toolkit	Activity Report
DENR-ERDB*, DENR-PAWB, academe, NGOs, POs, LGUs	List of species sensitive to climatic changes in wetlands	Number of studies conducted	Study Reports
DENR-PAWB*, LGUs, academe, NGOs, Wildbird Club of the Philippines, POs	Monitoring results i.e. migration pattern; Schedule of migration monitoring of wetlands/waterbirds	Number of sites monitored; number of monitoring activities conducted	Monitoring reports
DENR-PAWB*, DENR-ERDB, SCPW, LGUs, academe, NGOs	Philippine Bird Banding Scheme implemented	Number of sites where bird banding is being conducted	Reports
DENR-PAWB*, DOH, DENR-ERDB, EMB, FMB, SCPW, LGUs, academe, NGOs	Compilation of Adaptation measures by local wetland communities	Number of Conference held	Activity Report
DENR*	Reduction of GHG emission		
DENR-FMB*, DENR-PAWB, LGUs, ERDB			
DOST*, DENR*, academe	Data on carbon sequestration by selected wetland types	Number of studies conducted	Report of the study
LGUs*, DOH, NGOs, PCWS	Green sanitation technologies being implemented in priority wetlands	Number of priority wetlands implementing green sanitation technologies	Reports; site visits

Project/Activities	Targets and Timetable		
	Short Term (2011-2012)	Medium Term (2011-2014)	Long Term (2011-2016)
<b>Strategy 5. Promote ecotourism as a conservation strategy for freshwater wetlands</b>			
5.1 Update list and profile of freshwater wetlands with ecotourism potential	One List per Region updated		
5.2 Conduct mapping of freshwater wetlands with eco-tourism potential (for inclusion as a classification under mapping of the policy action plan)	1 map prepared per Region		
5.3 Develop Ecotourism Plans for priority wetlands	1 Master Plan developed for priority wetlands per Region per year	1 Master Plan developed for priority wetlands per Region per year	1 Master Plan developed for priority wetlands per Region per year
<b>Strategy 6. Implement sustainable aquaculture practices in freshwater wetlands</b>			
6.1 Regulate aquaculture and stocking of exotic species in wetlands			
Enforce zero introduction of exotic species for aquaculture in freshwater wetlands with reference to the Wildlife Act	LGU ordinance on zero introduction of exotic species for aquaculture in priority freshwater wetlands passed		
6.2 Promote policies that support sustainable aquaculture (i.e. FAO Code of Conduct for Responsible Fisheries and other Codes of Conduct for Sustainable Aquaculture, BFAR A01-2008 (joint DA, DILG, DENR), Wildlife Act	Include in the National CEPA Action Plan for Wetlands		
Conduct vulnerability study on the impacts of climate change on freshwater aquaculture		One study completed	

Implementing Agencies/ Organizations (*Lead Agencies)	Expected Outputs	Indicators	Means of Verification
DENR-PAWB*, DOT*, academe, Civil Society	Inventory and profile of freshwater wetlands with ecotourism potential	Number of Regions that submitted an updated listing and profile of wetlands with ecotourism potential	Report; copy of list
NAMRIA*, DENR-PAWB, DOT, LGUs, NGOs	Maps of wetlands with ecotourism potential	Number of Regions that submitted maps	Report; Copies of maps
DENR-PAWB*, DOT*, LGUs*, academe, Civil Society	Ecotourism Master Plans for selected priority wetlands	Number of Regions that submitted Master Plans for Ecotourism for priority freshwater wetlands	Copies of Master Plans
DENR-PAWB*, DA-BFAR*, DENR-ROs, PCMARD, LGUs, SCPW, NGOs	LGU Ordinances passed	Number of LGU ordinances passed	Copy of the LGU ordinance
DENR*, DA-BFAR*, SEAFDEC, LLDA, SCPW	Inclusion in the National CEPA Action Plan for Wetlands	Item in the National CEPA Action Plan for Wetlands	Copy of National CEPA Action Plan for Wetlands
DOST-PCMARD*, DA-BFAR*, DENR-ERDB, academe			

# Thematic Area 3: Coastal and Marine Wetlands

**Outcome:** Resilient and stable coastal and marine wetland ecosystems, reduced poverty among coastal communities

**Overall Goal:** Sustainable utilization of coastal and marine ecosystems, enhanced livelihood of coastal communities

**Overall Objectives:**

- To improve management and conservation of coastal and marine wetlands
- To provide alternative livelihood to wetland-dependent communities

**Indicators:**

- Environment/ecological: Coastal productivity (fish catch), quality and area of mangrove, beach forests estuaries, seagrass and coral reefs
- Socio-economic: Income, equity; job or livelihood opportunities; access to common resources

## ACTION PLAN

Project/Activities	Targets and Timetable		
	Short Term (2011-2012)	Medium Term (2011-2014)	Long Term (2011-2016)
<b>Strategy 1. Enhance baseline data on and conduct assessment and monitoring of coastal and marine wetlands</b>			
1.1 Conduct an inventory, assessment and monitoring of priority coastal and marine wetlands			
Conduct of national workshop to standardize terms (i.e. major marine and coastal wetlands), methods and procedures for inventory, assessment and monitoring	1 National Workshop conducted		
Prepare an inventory of major coastal and marine wetlands with maps	1 inventory per Region		
Conduct an assessment of the country's major coastal and marine wetlands (biological, physio-chemical, socio-economic including tenurial status)	6 major coastal and marine wetlands assessed per Region	11 major coastal and marine wetlands assessed per Region	11 major coastal and marine wetlands assessed per Region
Monitor selected priority coastal and marine wetlands	6 major coastal and marine wetlands monitored per Region	11 major coastal and marine wetlands monitored per Region	11 major coastal and marine wetlands monitored per Region
1.2 Develop a Database on the country's coastal and marine wetlands			
Review existing databases on coastal and marine wetlands	Review conducted and recommendations for systematic access to database		
Develop a system for the easy access to coastal and marine databases	1 online database	Updating and maintenance of online databases	Updating and maintenance of online databases
Link to national and regional databases e.g. CHM, NSAP, MSN, MIDAS, Reef Base	Regional databases linked to CHM and other web-based databases		
<b>Strategy 2. Rehabilitation of degraded coastal and marine wetlands</b>			
2.1 Conduct workshops to review protocol on the rehabilitation, restoration of mangroves and beach areas to include history of vegetative cover			
2.2 Issuance of a directive to adopt and dissemination the revised protocol			
2.3 Following the amended protocol, conduct mangrove and beach rehabilitation activities in selected priority sites			
2.4 Establishment of Marine Protected Areas			
2.5 Conduct re-stocking and sea ranching activities			
Conduct a workshop to develop protocols for re-stocking and sea-ranching	Workshop conducted		
Identify species for re-stocking and sea ranching	Species identified		



Implementing Agencies/Organizations (*Lead Agencies)	Expected Outputs	Indicators Short Term	Means of Verification
DENR-PAWB*, NAMRIA, DENR-RBCO, DENR-ROs, LGUs, PCAMRD, academe	Standard terminologies, methods and procedures for coastal and marine wetland inventory	Number of workshops conducted	Activity Report; Compilation of Standard Terms, Methods and Procedures
DENR-PAWB*, NAMRIA*, DENR-RBCO, DENR-ROs, LGUs, PCAMRD, academe, NGOs	Updated inventory of major coastal and marine wetlands per Region	Number of Regions that submitted inventories	Report of inventories
DENR-PAWB*, CMMO*, BFAR*, LGUs*, ERDB, NAMRIA, PCMARD, academe, NGOs	Profiles of selected priority coastal and marine wetlands (biological, physico-chemical, socio-economic, including tenurial status)	Number of priority coastal and marine wetlands assessed	Assessment Reports; Profiles of wetlands that were assessed
DENR-PAWB*, CMMO*, BFAR*, LGUs*, PAWB, ERDB, NAMRIA, PCMARD, academe, NGOs, NFRDI, International research organizations	Monitoring data on selected priority coastal and marine wetlands	Number of coastal and marine wetlands monitored	Data on the state of priority coastal and marine wetlands
DENR-PAWB*, CMMO*, PAWB, ERDB, NAMRIA, BFAR, PCAMRD, LGUs, NGOs, academe	Recommendations	Review conducted	Reports
DENR-PAWB*, CMMO*, PAWB, ERDB, NAMRIA, BFAR, PCAMRD, LGUs, NGOs, academe	Online databases on coastal and marine wetlands	Number of system developed	Reports
DENR-PAWB*, CMMO*, BFAR, PCMARD, LGUs, academe, NGOs, POs, NFRDI, International research organizations	Links established to other databases	Number of links established	Report; system test
PAWB-CMMO*, ERDB*, POs, NGOs, LGUs, DENR ROs, FARMCs, BFAR, academe	Amended protocol on the rehabilitation, restoration of mangroves and beach forest	Number of workshops conducted	Activity Report; copy of revised protocol
PAWB-CMMO*, ERDB*, POs, NGOs, LGUs, DENR ROs, FARMCs, BFAR, academe	DAO or similar directive issued	Issuance of DAO or similar directive	Copy of DAO or similar directive
PAWB-CMMO*, LGUs*, POs, NGOs, LGUs, DENR ROs, FARMCs, BFAR, academe	Improved and expanded mangrove and beach forest, including abandoned fishponds within the beach areas, returned to the natural state	Number of hectares reforested	Report and site visit
PAWB-CMMO*, ERDB*, POs, NGOs, LGUs, DENR ROs, FARMCs, BFAR, academe	Marine Protected Areas established	Number of MPAs established	Reports; Site visit
PAWB-CMMO*, ERDB*, POs, NGOs, LGUs, DENR ROs, FARMCs, BFAR, academe	Protocols developed	Workshop conducted	Activity Report; copy of protocol
PAWB-CMMO*, ERDB*, POs, NGOs, LGUs, DENR ROs, FARMCs, BFAR, academe	List of species for re-stocking and sea-ranching	Number of species identified	Reports

Project/Activities	Targets and Timetable		
	Short Term (2011-2012)	Medium Term (2011-2014)	Long Term (2011-2016)
Conduct re-stocking and sea-ranching activities in selected coastal and marine wetlands	How many re-stocking, sea-ranching projects per year and where?	How many re-stocking, sea-ranching projects per year and where?	How many re-stocking, sea-ranching projects per year and where?
2.6 Launch and implement a project on "Adopt a Wetland"	Project launched and implemented in all Regions		
<b>Strategy 3. Promote ecotourism as a conservation strategy for coastal and marine wetlands</b>			
3.1 Update the list of coastal and marine wetlands with ecotourism potential	One List per Region updated		
3.2 Conduct mapping of coastal and marine wetlands with eco-tourism potential	1 map per Region prepared		
3.3 Develop ecotourism Master Plans in selected priority wetland sites	1 Master Plan developed for priority wetlands per Region per year	1 Master Plan developed for priority wetlands per Region per year	1 Master Plan developed for priority wetlands per Region per year
3.4 Conduct piloting ecotourism activities in selected sites to include key habitat types of coastal and marine wetlands	2 pilot ecotourism activities implemented	2 pilot ecotourism activities implemented	2 pilot ecotourism activities implemented
3.5 Conduct IEC on the role of coastal and marine ecotourism in wetland conservation			
Produce an AVP in English, Filipino, Cebuano and Ilocano)	1 AVP in 4 languages produced and shown in local events; exposure on radio and TV	Exposure of AVP on radio and television	
Produce community bulletins (poster type) in vernacular	Community Bulletins produced in vernacular		
3.6 Implement marketing activities to promote eco-tourism sites			
Develop websites for pilot ecotourism activities/sites	1 Website developed per pilot site		
<b>Strategy 4. Implement sustainable aquaculture practices</b>			
4.1 Promote appropriate aquaculture in coastal and marine areas			
Development of management plans for coastal and marine aquaculture sites/parks	Management Plans developed for aquaculture sites/parks (1 per Region)	Management Plans developed for aquaculture sites/parks (1 per Region)	Management Plans developed for aquaculture sites/parks (1 per Region)
Identify appropriate aquaculture systems in coastal and marine areas and suitable mariculture sites	List of appropriate aquaculture systems		
4.2 Conduct monitoring of aquaculture parks			
		1 aquaculture park monitored per Region	1 aquaculture park monitored per Region
4.3 Compile documentation of Best Practices in marine and coastal aquaculture			
	1 Best Practice documented per Region per year	1 Best Practice documented per Region per year	1 Best Practice documented per Region per year
<b>Strategy 5. Research and Development</b>			
Conduct studies on carrying capacity of small islands and other coastal and marine ecosystems (e.g. ecotourism) Conduct carrying capacity for Ecotourism		1 study per Region conducted	1 study per Region conducted

Implementing Agencies/Organizations (*Lead Agencies)	Expected Outputs	Indicators Short Term	Means of Verification
PAWB-CMMO*, ERDB*, POs, NGOs, LGUs, DENR ROs, FARMCs, BFAR, academe	Areas re-stocked; areas of sea-ranching activities established	Number of re-stocking and/or sea ranching projects per Region per year	Reports; site visits
DENR-PAWB*, Private sector, LGU, DENR, NGOs, stakeholders	Project launched and implemented in all Regions	Number of Regions that launched and are implementing the project	Reports; agreement instruments; site visit
DENR-PAWB*, DOT*, academe, NGOs/POs, LGUs	Inventory and profile of coastal and marine wetlands with ecotourism potential	Number of Regions that submitted an updated listing and profile of wetlands with ecotourism potential	Report; copy of list
NAMRIA*, DENR-PAWB, DOT, LGUs, NGOs	Maps of wetlands with ecotourism potential	Number of Regions that submitted maps	Report; Copies of maps
DENR-PAWB*, DOT*, academe, NGOs/POs, LGUs, resort owners	Ecotourism Master Plans for selected priority wetlands	Number of Regions that submitted Master Plans for Ecotourism for priority freshwater wetlands	Copies of Master Plans
DENR-PAWB*, DOT*, academe, NGOs/POs, LGUs, resort owners, communities	Pilot ecotourism activities implemented	Number of pilot activities implemented	Reports; site visit
DENR-PAWB*, DOT*, PAO, LGUs, resort owners, communities	AVP produced and shown in local events, on radio and on TV	Number of AVP produced Number of exposures in local events, on radio and on TV	Copy of the AVP; reports
DENR-PAWB*, DOT*, PAO, LGUs, resort owners, communities	Community Bulletins produced	Number of Community Bulletins produced	Reports; copy of the Community Bulletins
DENR-PAWB*, DOT*, LGU*	IEC materials developed and disseminated	Types and numbers of IEC materials/ collaterals	Sample collaterals
DENR-PAWB*, DOT*, PAO, LGUs, resort owners, communities	Website developed	Number of websites developed; number of hits	Report and URL of website
DENR*, DA-BFAR*, PCAMRD, NFRDI, LGUs, POs, FARMCs, academe, SEAFDEC/AQD, World Fish, Funding Institutions	Management Plans	Number of Regions who submitted Management Plans	Reports; copy of management plans
DENR*, DA-BFAR*, PCAMRD, NFRDI, LGUs, POs, FARMCs, academe, SEAFDEC/AQD, World Fish	Listing of appropriate aquaculture systems	Number of Listing	Copy of List
DENR*, DA-BFAR*, PCAMRD, NFRDI, LGUs, POs, FARMCs, academe, SEAFDEC / AQD, World Fish	Monitoring of aquaculture parks	Number of parks monitored	Monitoring Reports
DENR*, DA-BFAR*, PCAMRD, NFRDI, LGUs, POs, FARMCs, academe, SEAFDEC/AQD, World Fish	Best Practice Documentation	Number of best Practices documented	Reports; copies of best practice documentation
DENR-ERDB*, PAWB*, academe, PCAMRD, NFRDI, LGUs, NGOs	Carrying Capacity of selected small islands and other coastal and marine wetlands	Number of Regions submitting results of study—study conducted; carrying capacity models/ prescriptions	Research Report

Project/Activities	Targets and Timetable		
	Short Term (2011-2012)	Medium Term (2011-2014)	Long Term (2011-2016)
Conduct vulnerability study on flora and fauna to sea level rise	1 study conducted		
<b>Strategy 6. Establishment of Critical habitat for Threatened/endangered spp (i.e. pawikan)</b>			
In coordination with concerned LGUs and communities, identify, assess and declare as critical habitats areas where endangered species are found	Areas identified, assessed and declared as critical habitats	Areas identified, assessed and declared as critical habitats	Areas identified, assessed and declared as critical habitats
Develop and implement Management Plans of established critical habitats	Critical habitats with Management Plans	Management Plans implemented	
<b>Strategy 7. Coastal and Marine Law Enforcement</b>			
7.1 Deputize Wetland Enforcement Officers			
Organize citizen brigades to be deputized as Wetland Enforcement Officers		Wetland Enforcement Officers organized (1 per priority wetland)	
Conduct training on coastal and marine law enforcement		Training conducted	

Implementing Agencies/Organizations (*Lead Agencies)	Expected Outputs	Indicators Short Term	Means of Verification
DENR-ERDB*, PAWB*, academe, PCAMRD, NFRDI, LGUs	Study conducted	Completion of study	Research Report
DENR-PAWB*, LGUs, POs, NGOs, Private sector	Areas declared and managed critical habitats	Number and size or areas declared as critical habitats	Reports
DENR-PAWB*, LGUs, POs, NGOs, Private sector	Management Plans of Critical Habitats	Number of Critical Habitats with Management Plans	Reports; copy of Management Plans
DENR-PAWB*, LGUs, POs, NGOs, Communities	Wetland enforcement officers organized and deputized	Number of Wetland Enforcement Officers deputized	Reports
DENR-PAWB*, LGUs, POs, NGOs, Communities	Wetland enforcement officers trained	Number of trainings conducted	Activity Report; Training module

# Thematic Area 4: Enabling Activities

## Goals:

- Increased awareness, understanding and appreciation of key stakeholders on the functions and importance of wetlands
- Increased capacity of key stakeholders to implement wetland conservation measures

## Overall Objectives:

- To increase the awareness, understanding and appreciation of key stakeholders on the functions and importance of wetlands
- To enhance the capacity of stakeholders to implement wetland conservation and apply sustainable and equitable measures
- To promote collaboration among stakeholders for effective wetland management

## Indicators:

- Number of trained stakeholder groups applying learning (e.g. monitoring, etc.)
- Comprehensive educational program for in-school and out-of-school youth, communities, and decision-makers on wetlands functioning, values and management
- Functional institutional structure to manage priority wetlands

## ACTION PLAN

Project/Activities	Targets and Timetable		
	Short Term (2011-2012)	Medium Term (2011-2014)	Long Term (2011-2016)
<b>Strategy 1. Compiling and organizing information on Philippine Wetlands and making these accessible to stakeholders</b>			
1.1 Establishment of a meta-database and information clearinghouse on Philippine wetlands (Resource Center)	Create a section in the Clearing House Mechanism (CHM) on Philippine wetlands	Database maintained and enhanced	Database maintained and enhanced
1.2 Disseminate information and support Clean Development Mechanism (CDM), Reducing Emission from Deforestation and Forest Degradation (REDD) and other carbon financing mechanisms for mitigation and adaptation	Include information on CDM, REDD+ and other carbon financing mechanism in the wetland section of the CHM		
<b>Strategy 2. Knowledge Management</b>			
2.1 Replication of best practices in wetland conservation			
Develop criteria for selection of best practices	1 set of criteria formulated		
Identify, document, compile, and include in the CHM, best practice/ working models of wetland management	1 best practice documented and included in the CHM (per Region)	1 best practice documented and included in the CHM (per Region)	1 best practice documented and included in the CHM (per Region)
Present the CHM/wetland section to the Leagues (Cities, Municipalities, etc.)	1 Presentation each in the Annual Conferences of the various Leagues	1 Presentation each in the Annual Conferences of the various Leagues	1 Presentation each in the Annual Conferences of the various Leagues
<b>Strategy 3. Preparing, adopting and implementing the Communication, Education, Participation, and Awareness (CEPA) Action Plan</b>			
3.1 Conduct CEPA Action Planning and integrated them into Regional and local plans	One National CEPA Action Plan formulated	Regional CEPA Action Plan per Region formulated and implemented (1 per Region)	National and Regional CEPA Plan reviewed
Conduct small group workshop to revisit/update Draft Wetlands Communications Plan	Conduct one small group workshop to finalize the CEPA Action Plan	Conduct annual evaluation and assessment of the implementation of the CEPA Action Plan	Conduct annual evaluation and assessment of the implementation of the CEPA Action Plan
Adoption and integration of National CEPA Action Plan into Regional and Local Plans	National CEPA Action Plan adopted and implemented at all levels by integrating them into Regional and local plans	CEPA Action Plan integrated into Regional and Local Plans implemented at all levels	CEPA Action Plan integrated into Regional and Local Plans implemented at all levels

Implementing Agencies/ Organizations (*Lead Agencies)	Expected Outputs	Indicators	Means of Verification
DENR-PAWB*, DENR-FMB, DA-BFAR, ERDB, PCMARD, academe, NGOs and POs, private sector, other partners	Database and clearinghouse on wetlands established as part of the CHM, maintained and enhanced periodically	Section on wetlands created in the CHM	Functional electronic database as a section in the CHM
DENR*, DILG*, ADMU-KLIMA Climate Center*, Leagues (Cities, Municipalities Climate Change) FMB*, DENR-PAWB, EMB, ERDB, etc.	Information on CDM, REDD+ and other carbon financing mechanism included in the wetland section of the CHM	Wetlands section of the CHM contains information on CDM, REDD+ and other carbon financing mechanism; number of hits	Copy of the information on the website
	Compilation of best practices published on the website every 2 years.	Number of best practices documented; number of hits	Reports; URL of website
DENR-PAWB*, TWG on Wetlands	Criteria for selection of best practices in wetland conservation	Set of criteria formulated.	Copy of approved criteria
DENR-PAWB*, DENR-PAWDs*, TWG on Wetlands, DILG, LGU, Galing-Pook	Compilation of best practices published on the website every 2 years.	Number of best practices/working models documented and included in the wetland section of the CHM	Copies of write-up/ case studies; wetland section in the CHM website
DENR-PAWB*, TWG on Wetlands, DILG, LGU	Presentations at the Annual Conferences of the various Leagues	Number of presentations made per year to the various Leagues	Activity Report with photo-documentation
DENR-PAWB*, SCPW*, SCPW, DA-BFAR, ERDB, PCMARD, academe, NGOs and POs, private sector	National CEPA Action Plan for Philippine Wetlands	Number of CEPA Action Plan prepared	Copy of document
DENR*, SCPW*, DA-BFAR, ERDB, academe, NGOs and POs, private sector, other partners	Workshop conducted; CEPA Plan updated	Number of workshops conducted	Activity Report; copy of updated CEPA Action Plan
DENR*, SCPW, DA BFAR, ERDB, academe, NGOs and POs, private sector, other partners	Adopted National CEPA Action Plan; integration of national CEPA Action Plan into Regional and other local plans; implementation at all levels	Number of Regions that have integrated the national CEPA Action Plan into their Regional Plans; Number of local plans that have integrated the CEPA Action Plan; Number of partner organizations implementing the CEPA Plan	Document adopting the Plan; Reports

Project/Activities	Targets and Timetable		
	Short Term (2011-2012)	Medium Term (2011-2014)	Long Term (2011-2016)
<b>3.2 Upscale existing CEPA activities</b>			
Mainstream <i>Dalaw-Turo</i> in public and private schools through local resolutions	1 Resolution either at the Regional, Provincial, or Local level (per Region)	1 Resolution either at the Regional, Provincial, or Local level (per Region)	1 Resolution either at the Regional, Provincial, or Local level (per Region)
Translate CEPA materials into vernacular	Prepare primer on wetlands in Filipino, Cebuano and Ilocano	Prepare primer on wetlands in 3 other vernacular languages	Prepare primer on wetlands in 3 other vernacular languages
Expand the conduct of Wetlands Caravan in priority wetlands	2 Wetlands Caravan conducted per year	2 Wetlands Caravan conducted per year	2 Wetlands Caravan conducted per year
<b>3.3 Establish Wetlands Information Centres in priority wetlands</b>	3 wetland centres established and operational	3 wetland centres established and operational	3 wetland centres established and operational
<b>3.4 Develop a framework for stakeholder participation</b>	Framework development and piloting in selected priority wetlands	Documentation and replication	Documentation and replication
<b>3.5 Hold a National Wetlands Conference every three years</b>	1 Conference held 2012	1 Conference held	1 Conference held
<b>3.6 Provide incentives for wetland conservation</b>			
Implement "Philippine Wetlands Conservation Award" every 4 years	Bi-annual search and awarding implemented	Bi-annual search and awarding implemented	Bi-annual search and awarding implemented
Implement Eco-certification or similar incentive/recognition scheme in priority wetlands with ecotourism potential	Develop and adopt guidelines for Eco-Certification of wetland activities;	implement eco-certification (1 site per region/year)	implement eco-certification (1 site per region/year)
Search for a local advocate/champion for wetland to be implemented at the local or site level	Hold a contest among the youth to choose a local wetland advocate/champion		
<b>Strategy 4. Capacity Development and Enhancement</b>			
<b>4.1 Prepare a Capacity Development Plan for wetlands management</b>			
Conduct a capacity needs assessment for wetlands conservation in priority wetland areas with recommendations for the Capacity Development Plan	Conduct capacity needs assessment study		
Prepare the Capacity Development Plan	Conduct of National and Regional Conference to validate Plan		
Adopt and disseminate the Capacity Development Plan for Wetland Management	Adoption and virtual publication in the wetland section of the CHM		
Implement and monitor the Capacity Development Plan for Wetlands Conservation in the Philippines	Implementation monitored and assessed annually	Implementation monitored and assessed annually	Implementation monitored and assessed annually
<b>4.2 Enhance human capacity for management of wetlands (i.e. formal and non formal education)</b>			
Conduct training on specific topics	Training on water quality monitoring	Training on bio-monitoring	
	Orientation on the National Ecotourism Strategy	Training on stock/species assessment	
	Training in natural resources management for key decision makers;	Training on appropriate sustainable livelihood technologies;	
	Training on bird banding	Training of community and school-based monitoring, e.g. river watch, CLMN	
	Training on liquid and solid waste management		



Implementing Agencies/ Organizations (*Lead Agencies)	Expected Outputs	Indicators	Means of Verification
DENR*, LGU*, DepEd*	Resolutions mainstreaming Dalaw-Turo in public and private schools in specific localities	Number or Resolutions passed	Copies of Resolutions
DENR-PAWB*, NGOs, academe	Primers translated into major Philippine languages/dialects	Number of languages/dialects used in translating the primers	Copy of translated primers
SCPW*, DENR*, LGUs, DepEd, academe, NGOs	Wetlands Caravan conducted	Number of Wetlands Caravan conducted	Activity Report with photo-documentation
DENR-PAWB*, LGUs, SCPW, NGOs, academe	Wetlands Information Centres established and operational	Number of Wetlands Information Centres established and operational	Reports
DENR-PAWB*, Other DENR agencies, SCPW and other partners	Framework for Stakeholder Participation (Defined level of participation for each key stakeholder)	Number of framework developed	Copy of document
DENR-PAWB*, SCPW*, PCMARD, ERDB	National Wetlands Conference held every 3 years	Number of Conference held	Conference Report
DENR-PAWB*, DENR-ROs, other partners (GAs, NGOs, POs, academe)	Search and awarding of winners for Philippine Wetland Conservation Award	Number of Awarding events implemented	Names of awardees, Activity Report
DENR-PAWB*, DOT, LGUs, other Gas	Eco-Certification Guidelines developed and adopted; Eco-certificates issued	Eco-Certification guidelines formulated and adopted; Number of eco-certificates issued	Copy of guidelines and endorsement; Reports
DENR-PAWB*, SCPW, business	Contest to choose local wetland advocate/champion held	Number of contest held	Name of local wetland advocate/champion; Activity Report
DENR-PAWB*, DENR-ROs, ERDB, EMB, MGB, LLDA, other partners	Capacity needs assessment report	Number of assessment study conducted	Report of the Study
DENR-PAWB*, DENR-ROs, ERDB, EMB, MGB, LLDA, other partners	Capacity Development Plan for Wetland Management	Number of Conference conducted	Activity Report with photo-documentation; copy of the Capacity Development Plan for Wetland Management
DENR-PAWB*, DENR-ROs, ERDB, EMB, MGB, LLDA, other partners	Capacity Development Plan for Wetland Management adopted through an endorsement or directive	Endorsement or directive issued by DENR adopting the Plan; Plan uploaded/published in the wetland section of the CHM	Endorsement or directive; publication on the website
DENR-PAWB*, DENR-Regional Offices, other partners	Assessment and Monitoring Conducted	Number of assessment and monitoring evaluations conducted annually	Monitoring Reports
	Training conducted	Number of trainings conducted; number of people trained; tracking of impact of training on the participant's work	Activity Report; Training curricula; training aids developed for the course
		Number of trainings conducted; number of people trained; tracking of impact of training on the participant's work	Activity Report; Training curricula; training aids developed for the course
		Number of trainings conducted; number of people trained; tracking of impact of training on the participant's work	Activity Report; Training curricula; training aids developed for the course
		Number of trainings conducted; number of people trained; tracking of impact of training on the participant's work	Activity Report; Training curricula; training aids developed for the course
		Number of trainings conducted; number of people trained; tracking of impact of training on the participant's work	

Project/Activities	Targets and Timetable		
	Short Term (2011-2012)	Medium Term (2011-2014)	Long Term (2011-2016)
	Participatory resource assessment and monitoring		
		Conduct eco-tourism capacity-building activities for local communities	
		Conduct training on tour-guiding and homestay	
		Conduct learning visits to other developed ecotourism sites	
<b>4.3 Strengthen Institutional Capacity for wetlands conservation</b>			
Formation of National Wetlands Committee or a similar entity to provide policy direction and oversee the implementation of the National Wetlands Action Plan	National Wetlands Committee or a similar body reconstituted	National Wetlands Committee or a similar body operational	National Wetlands Committee or a similar body operational
4.4 Build Financial Capacity (internal resource mobilization) Prepare and implement a Resource Mobilization Plan for Wetlands Conservation	Resource Mobilization Plan prepared	Resource Mobilization Plan implemented	Resource Mobilization Plan implemented
Conduct of Partners Meeting	One partners meeting conducted		
<b>Strategy 5: Development and/or Implementation of Innovative Methods, Tools and Technologies for Wetland Management</b>			
5.1 Development of (an integrated) wetland management framework for wetland management at the local level consistent with the Comprehensive Land Use Policy (CLUP) and investment plan	(Integrated) wetland management framework for local wetlands developed	(Integrated) wetland management framework integrated into local plans	
5.2 Develop appropriate and cost-effective monitoring tools that take into consideration biophysical and socio-cultural aspects	Monitoring tools developed (1 for inland wetlands; 1 for coastal and marine wetlands)	Implement monitoring tools in pilot sites (6 sites—Luzon, Visayas, Mindanao; 3 inland/3 coastal and marine per major island group)	
Identification of important indicators for monitoring wetland conditions	Wetland indicators identified and included in the monitoring system		
5.3 Apply management effectiveness assessment method for areas with existing management plans	Application of management effectiveness assessment method in one pilot site		
5.4 Implement pilot rainwater harvesting facilities in households near or on priority wetlands	1 pilot project per region	Upscaling to 3 project sites per region	Replication (1 per province per region)
5.5 Conduct a study to come up with a scheme for the phase-out of aquaculture in NIPAS sites that existed before RA 7086		Study conducted	

Implementing Agencies/ Organizations (*Lead Agencies)	Expected Outputs	Indicators	Means of Verification
DENR-PAWB*, PCSD-Sub-committee on Biodiversity	National Wetlands Committee or a similar body formed		
DENR-PAWB*, SCPW and other partners	Resource Mobilization Plan	Resource Mobilization Plan prepared and implemented	Copy of the Resource Mobilization Plan
DENR-PAWB*, SCPW*	Meeting conducted	Conduct of meeting	Minutes of Meeting; pledges from partners
DENR-PAWB*, DILG, LGUs	Framework for local (integrated) management of wetlands developed and integrated into local plans	Number of local plans that have integrated the wetland management framework	Copy of the wetland management framework
DENR-PAWB*	Monitoring Tool	Number of monitoring tools developed	Copy of document/report
DENR-PAWB*, ERDB, academe	Wetland indicators identified	Number of indicators identified	Report
DENR*	Assessment Method applied		
DENR*, NWRB*, PCWS*, PCWS, SCPW NGOs, academe and other partners	Rainwater harvesting pilot projects	Number of rainwater harvesting pilot projects in priority wetlands	Reports; documentation.
DENR-PAWB*; DA-BFAR*	Phase-out Plan of aquaculture in wetlands that are in KBAs and NIPAS sites formulated and implemented	Number of studies conducted	Report of the Study

# Budgetary Requirements of the National Wetlands Action Plan

Project/Activities	Estimated Cost (Php'000)
<b>Thematic Area 1: Wetlands Policy</b>	3,450
<b>Strategy 1. Review of existing land use and management of wetlands</b>	2,450
1.0 Inventory and Mapping of priority wetlands (PRS 92)–mapping to include watershed/river basin (assessment/mapping); purchased of equipment etc.	950
2.0 Review and Cancellation of fraudulent titles and inappropriate tenure instruments, and reversion of Fishpond Lease Agreements (site validation/meetings)	500
3.0 Strict implementation of water user's rules and regulations	200
4.0 Strict enforcement of Easement and buffer zone regulations (field validation/consultation)	300
5.0 Resolve reclamation issues (site visit; consultation)	500
<b>Strategy 2. Implement local management and economic measures to conserve wetlands</b>	500
1.0 Set user's and service fees/ PES/raw and annual water charges (meeting; consultation/workshop; hiring consultant, site evaluation)	300
2.0 Include resource valuation in determining IRA/Host Community	200
<b>Strategy 3. Integrate Climate Change mitigation and adaptation measures in relevant plans and policies</b>	500
1.0 Review and/or adoption of relevant policies and legislations relevant to wetlands and climate change	200
2.0 Assessment of vulnerability of priority wetlands to climate change based on NAMRIA's 10 clusters of low lying areas (actual validation; meetings)	300
<b>Thematic Area 2: Freshwater/Inland Wetlands</b>	8,500
<b>Strategy 1. Establish baseline data and conduct bio-physical and socio-cultural assessment and monitoring of freshwater wetlands (using ridge to reef framework)</b>	1,200
1.0 Conduct an inventory, assessment and monitoring of priority freshwater wetlands	700
2.0 Review existing database on freshwater wetlands and recommend systematic access to these databases	500
<b>Strategy 2. Preparation and implementation of Management Plans for priority freshwater wetlands in the country</b>	2,000
1.0 Preparation of Management Plan Manual (hiring of consultant/conduct of training)	500
2.0 Conduct of Carrying Capacity Study on selected/priority fresh water wetland	700
3.0 Management Plan prepared for priority wetland site (site visit/assessment; consultation)	500
4.0 Implementation/Monitoring of Wetland Management Plan Prepared for priority wetland	300
<b>Strategy 3. Rehabilitate Priority Freshwater Wetlands</b>	2,600
1.0 Design a scheme to manage settlements in wetlands (hiring of consultant/meetings)	200
2.0 Implement community-based reforestation in the watershed areas of priority wetlands (i.e. Treepreneurs) Capacitation/mplementation/consultation	1,000
3.0 Implement bioremediation and/or phytoremediation technologies to address pollution on a pilot basis at selected priority wetlands (trainings/pilot testing)	500
4.0 Implement soil conservation technologies in priority wetlands	200
5.0 Implement activities to address invasive alien species (i.e. golden <i>kuhol</i> , janitor fish, water hyacinth)	200
6.0 Launch and implement a project on "Adopt a Wetland"	500
<b>Strategy 4. Implement Climate Change Mitigation and Adaptation Strategies</b>	1,800
1.0 Conduct vulnerability assessment of wetlands and wetland species to climate change	200
2.0 Conduct a study to identify vulnerable species for climate change effects on freshwater wetlands	150
3.0 Conduct monitoring of migration patterns of birds <i>vis-à-vis</i> their established migration usage	200
4.0 Formalize and implement a Philippine Bird Banding Scheme	150

<b>Project/Activities</b>	<b>Estimated Cost (Php'000)</b>
5.0 Hold a National Conference on Climate Change Adaptation and Population, Health and Environment	500
6.0 Adoption of appropriate (wetland) watershed protection and (conservation) plantation management strategies	50
7.0 Promote the conservation of peatlands (Please refer to the National Peatlands Action Plan for the Philippines which is an integral part of the National Wetlands Action Plan)	200
8.0 Conduct of R&D studies on specific climate change mitigation functions of wetlands.	300
9.0 Adoption of Green technology to promote sanitation in wetlands	50
<b>Strategy 5. Promote ecotourism as a conservation strategy for freshwater wetlands</b>	<b>750</b>
1.0 Update list and profile of freshwater wetlands with eco-tourism potential	300
2.0 Conduct mapping of freshwater wetlands with eco-tourism potential (for inclusion as a classification under mapping of the policy action plan)	300
3.0 Develop Ecotourism Plans for priority wetlands	150
<b>Strategy 6. Implement sustainable aquaculture practices in freshwater wetlands</b>	<b>150</b>
1.0 Regulate aquaculture and stocking of exotic species in wetlands	50
2.0 Promote policies that support sustainable aquaculture (i.e. FAO Code of Conduct for Responsible Fisheries and other Codes of Conduct for Sustainable Aquaculture, BFAR AO1-2008 (joint DA, DILG, DENR), Wildlife Act	100
<b>Thematic Area 3: Coastal and Marine Wetlands</b>	<b>5,900</b>
<b>Strategy 1. Enhance baseline data on and conduct assessment and monitoring of coastal and marine wetlands</b>	<b>300</b>
1.0 Conduct an inventory, assessment and monitoring of priority coastal and marine wetlands	150
2.0 Develop a Database on the country's coastal and marine wetlands	150
<b>Strategy 2. Rehabilitation of degraded coastal and marine wetlands</b>	<b>1,500</b>
1.0 Conduct workshops to review protocol on the rehabilitation, restoration of mangroves and beach areas to include history of vegetative cover	300
2.0 Issuance of a directive to adopt and dissemination the revised protocol	
3.0 Following the amended protocol, conduct mangrove and beach rehabilitation activities in selected priority sites	200
4.0 Establishment of Marine Protected Areas	300
5.0 Conduct re-stocking and sea ranching activities	300
6.0 Launch and implement a project on "Adopt a Wetland"	300
<b>Strategy 3. Promote ecotourism as a conservation strategy for coastal and marine wetlands</b>	<b>1,750</b>
1.0 Updating of the list of coastal and marine wetlands with eco-tourism potential	150
2.0 Conduct mapping of coastal and marine wetlands with eco-tourism potential	200
3.0 Develop eco-tourism Master Plans in selected priority wetland sites	100
4.0 Conduct piloting eco-tourism activities in selected sites to include key habitat types of coastal and marine wetlands	300
5.0 Conduct IEC on the role of coastal and marine eco-tourism in wetland conservation	500
6.0 Implement marketing activities to promote eco-tourism sites (with pilot site at 3)	500
<b>Strategy 4. Implement sustainable aquaculture practices</b>	<b>550</b>
1.0 Promote appropriate aquaculture in coastal and marine areas	100
2.0 Conduct monitoring of aquaculture parks	150
3.0 Compile documentation of Best Practices in marine and coastal aquaculture	300
<b>Strategy 5. Research and Development</b>	<b>800</b>
1.0 Conduct studies on carrying capacity of small islands and other coastal and marine ecosystems (e.g. eco-tourism) Conduct carrying capacity for Eco-tourism	500

<b>Project/Activities</b>	<b>Estimated Cost (Php'000)</b>
2.0 Conduct vulnerability study on flora and fauna to sea level rise	300
<b>Strategy 6. Establishment of Critical habitat for Threatened/endangered spp (i.e. pawikan)</b>	700
1.0 In coordination with concerned LGUs and communities, identify, assess and declare as critical habitats areas where endangered species are found	500
2.0 Develop and implement Management Plans of established critical habitats	200
<b>Strategy 7. Coastal and Marine Law Enforcement</b>	300
1.0 Deputize Wetland Enforcement Officers	300
<b>Thematic Area 4: Enabling Activities</b>	14,550
<b>Strategy 1. Compiling and organizing information on Philippine Wetlands and making these accessible to stakeholders</b>	2,150
1.0 Establishment of a meta-database and information clearinghouse on Philippine wetlands (Resource Center)	650
2.0 Disseminate information and support the Clean Development Mechanism (CDM), Reducing Emission from Deforestation and Forest Degradation (REDD) and other carbon financing mechanisms for mitigation and adaptation	1,500
<b>Strategy 2. Knowledge Management</b>	500
1.0 Replicate best practices in wetland conservation	500
<b>Strategy 3. Preparing, adopting and Implementing the Communication, Education, Participation, and Awareness (CEPA) Action Plan</b>	6,600
1.0 Conduct CEPA Action Planning and integrated them into Regional and local plans	1,500
2.0 Upscale existing CEPA activities	300
3.0 Establish Wetlands Information Centres in priority wetlands	2,300
4.0 Develop a framework for stakeholder participation	500
5.0 Hold a National Wetlands Conference every three years	1,500
6.0 Provide incentives for wetland conservation	500
<b>Strategy 4. Capacity Development and Enhancement</b>	2,000
1.0 Prepare a Capacity Development Plan for wetlands management	500
2.0 Enhance human capacity for management of wetlands (i.e. formal and non formal education)	500
3.0 Strengthen institutional capacity for wetlands conservation	500
4.0 Build financial capacity (internal resource mobilization)	500
<b>Strategy 5: Development and/or Implementation of Innovative Methods, Tools and Technologies for Wetland Management</b>	3,300
1.0 Develop (an integrated) wetland management framework for wetland management at the local level consistent with the Comprehensive Land Use Policy (CLUP) and investment plan	800
2.0 Develop appropriate and cost-effective monitoring tools that take into consideration biophysical and socio cultural aspects	500
3.0 Apply management effectiveness assessment method for areas with existing management plans	500
4.0 Implement pilot rainwater harvesting facilities in households near or on priority wetlands	1000
5.0 Conduct a study to come up with a scheme for the phase out of aquaculture in NIPAS sites that existed before RA 7086	500
<b>GRAND TOTAL</b>	<b>32,400</b>

# Annex A. Priority Wetlands for the NWAPP 2011-2016

Based on conservation priorities of the PBCP and the KBAs (terrestrial and marine)

Conservation Priorities	Municipalities	Biographic Region	Province/Region
<b>Coastal/Marine</b>			
1. Batanes Islands Protected Landscape and Seascape	Basco, Ivana, Mahatao, Uyugan, Sabtang, Itbayat	Batanes	Batanes (II)
2. Babuyan Islands	Babuyan, Calayan, Dalupiri, Fuga, Camiguin Norte	Babuyan	Cagayan (II)
3. Buguey Wetlands	Aparri, Camalaniugan, Buguey, Santa Teresita	Greater Luzon	Cagayan (II)
4. Manila Bay	Orani, Hermosa, Lubao, Guagua, Bacolor, San Fernando, Minalin, Apalit, Macabebe, Masantol, Santa Maria, Sasmuan, Lubao, Hagonoy, Calumpit, Malolos, Paombong, Plaridel, Bulacan, Guiguinto, Balagtas, Pandi, Bocaue, Obando, Meycauayan, Marilao, San Jose del Monte, Caloocan, Malabon, Valenzuela	Greater Luzon	Pampanga, Manila, Rizal, and Bulacan (NCR, IV, III)
5. Pagbilao and Tayabas Bay	Pagbilao	Greater Luzon	Quezon (IV)
6. Ragay Gulf	San Narciso, Buenavista, Guinayangan, Tagkawayan, Del Gallego, Ragay	Greater Luzon	Camarines Sur and Quezon (V, IV)
7. Mactan, Kalawisan, Cansaga Bay	Mandaue City, Lapu-lapu, Cebu City, Consolacion	Greater Negros-Panay	Cebu (VII)
8. Tubbataha Reef National Marine Park	Cagayancillo	Greater Palawan	Palawan (IV)
9. Polillo Island	Bordeos, Polillo, Panukulan, Patnanungan	Greater Luzon	Quezon (IV)
10. Caramoan Peninsula	Lagonoy, Presentacion, Garchitorena	Greater Luzon	Camarines Sur (V)
11. Puerto Galera	Abra de Ilog, Puerto Galera, San Teodoro, Santa Cruz	Greater Mindoro	Mindoro Occidental (IV)
12. Ursula Island	Bataraza	Greater Palawan	Palawan (IV)
13. Balabac Group of Islands	Balabac	Greater Palawan	Palawan (IV)
14. Northwest Panay Peninsula Natural Park	Pandan, Libertad, Nabas, Buruanga, Malay	Greater Negros-Panay	Aklan and Antique (VI)
15. Olango Island	Lapu-lapu	Greater Negros-Panay	Cebu (VII)
16. Biliran and Maripipi Islands	Almeria, Biliran, Cabucgayan, Caibiran, Caluba, Kawayan	Greater Mindanao	Biliran (VIII)
17. Siargao Island Protected Land and Seascape	Santa Monica, Burgos, San Isidro, Pilar, General Luna, Dapa, Del Carmen, San Benito, Socorro	Greater Mindanao	Surigao del Norte (CARAGA)
18. Tawi-tawi Island	Languyan, Bungao	Greater Sulu	Tawi-tawi (ARMM)
19. Simunul and Manuk Manka Islands	Simunul	Greater Sulu	Tawi-tawi (ARMM)
20. Sibutu and Tumindao Islands	Sitankai	Sibutu	Tawi-tawi (ARMM)
21. El Nido Managed Resource Protected Area	El Nido, Taytay	Greater Palawan	Palawan (IV)
22. Cabulao Bay	Tagbilaran City	Greater Mindanao	Bohol (VII)
23. Malampaya Sound	San Vicente, Taytay	Greater Palawan	Palawan (IV)
24. Balayan Bay	Batangas	Greater Luzon	Batangas (IV)
25. Talabong Island and Bais Bay	Dumaguete City	Greater Negros-Panay	Negros Oriental (VII)
26. Panguil Bay	Ozamis and Tangub Aurora, Tambulay, and Ramon Magsaysay Zamboaga Sur and Kapatagan, Kulabugan, Lanao Norte and Ozamis City and Tangub City Bonifacio, Misamis Occidental	Greater Mindanao	Zamboanga del Sur (IX)
27. Ulugan Bay	Puerto Princesa City	Greater Palawan	Palawan (IV)
28. Inabanga Coast	Inabanga	Greater Mindanao	Bohol (VII)

<b>Inland/Freshwater</b>			
1. Candaba Swamp	Arayat, Candaba, Cabaio	Greater Luzon	Nueva Ecija, Pampanga and Bulacan (III)
2. Lalaguna Marsh	Lopez	Greater Luzon	Quezon (IV)
3. Naujan Lake	Naujan, Pola, Socorro, Victoria	Greater Mindoro	Mindoro Oriental (IV)
4. Coron Lakes	Coron	Greater Palawan	Palawan (IV)
5. Lake Manguao	Taytay	Greater Palawan	Palawan (IV)
6. Puerto Princesa Subterranean River National Park	Puerto Princesa	Greater Palawan	Palawan (IV)
7. Agusan Marsh Wildlife Sanctuary	Veruela, Loreto, Bunawan, La Paz, Talacogon, San Francisco, Rosario	Greater Mindanao	Agusan del Sur (CARAGA)
8. Lake Lanao	Marawi City, Ditsaan Ramin, Buadipuso Buntong, Molundo, Taraka, Tamparan, Poona Bayabao, Masui, Lumbayanague, Lumbatan, Bayang, Binidayan, Pagawayan, Ganassi, Madamba, Madalum, Bacolod-Kalawi, Tugaya, Balindong, Marantao	Greater Mindanao	Lanao del Sur (ARMM)
9. Liguasan Marsh	Pikit, M' Lang, Tulunan; Pagalungan, Gen. S.K. Pendatun, Sultan sa Barongis; Don Mariano Marcos	Greater Mindanao	North Cotabato, Maguindanao, South Cotabato, and Sultan Kudarat (XII, XI, ARMM)



# Annex B. Recommended Additional Priority Wetlands

(from Regional Consultations)

Wetland Name	Municipalities	Province/Reg.	Bio Geographic Reg./Zone	Remarks
<b>Coastal/Marine Wetlands – Luzon</b>				
Taytay Bay	Taytay	Palawan, Reg. IVB	Greater Palawan	
Cabusao Wetland	Cabusao	Camarines Sur, Reg. V	Greater Luzon	
Prieto Diaz Mangroves	Prieto Diaz	Sorsogon, Reg. V	Greater Luzon	
Tambac Bay	Lingayen Gulf	Pangasinan, Reg. I	Greater Luzon	
<b>Coastal/Marine Wetlands – Visayas and Mindanao</b>				
Ormoc Bay, Leyte	Ormoc City	Leyte, Reg. VIII	Greater Mindanao	
Small islands between Olango island, Cebu, and Jatafe, Bohol	Mandaue City	Cebu, Reg. 7	Greater Mindanao	
Sarangani Bay Protected Seascape	General Santos City, Alabel, Malapatan, Glan, Maasim, Maitum, and Kiamba	Sarangani, Reg. XII	Greater Mindanao	
Sangay-Paril	Lebak and Kalamansig	Sultan Kudarat, Reg. XII	Greater Mindanao	
Baganga Bay Protected Landscape/Seascape	Baganga	Davao Oriental, Reg. XI	Greater Mindanao	
Malalag-Sulop sandflats	Malalag, Padada and Sulop	Davao del Sur, Reg. XII	Greater Mindanao	
Carmen-Panabo sandflats	Brgys. La Paz and Libugaron, Panabo	Davao Del Norte, Reg. XI	Greater Mindanao	
Sagay Marine Reserve	Sagay	Negros Occidental, Reg. VI	Greater Negros-Panay	Migratory site
Takklong Island Marine Reserve	Nueva Valencia	Guimaras, Reg. VI	Greater Negros-Panay	Presence of dugong, pawikan, tabon bird, Phil. Duck
Baganga Mangrove Area	Baganga	Davao Oriental, Reg. XI	Greater Mindanao	1,200 has.
Pujada Bay	Mati	Davao Oriental, Reg. XI	Greater Mindanao	
Malalag Bay	Malalag	Davao del Sur, Reg. XI	Greater Mindanao	
Siasi Island	Siasa	Sulu, ARMM	Greater Sulu	
Sitangkay Island	Sitangkay	Tawi-tawi, ARMM	Greater Sulu	
Illana Bay	Cotabato City, Panang, Mag; Datu Blah Sunsuat, Mag; Kapatagan, Lanao Sur; Bungo Island	Maguindanao, Lanao del Sur, ARMM	Greater Mindanao	
<b>Inland Wetlands – Luzon</b>				
Lake Tagbunsaing	Quezon	Palawan, Reg. IV-B	Greater Palawan	brackish water lake, WWF to provide details
Rinconada Lakes (Buhi, Bato, Baa, Bula and Libon)	Buhi, Bato, Baa, Bula and Libon	Bicol Region	Greater Luzon	including lakelets Manapao, Katugday, Makuao
Manoytoy	Taytay	Palawan, Reg. IV-B	Greater Palawan	WWF to provide details
Babuyan River	Puerto Prinsesa City	Palawan, Reg. IV-B	Greater Palawan	WWF to provide details
Lake Malasi	Isabela	Cagayan, Reg. II	Greater Luzon	
Cagayan River	Covering of 127 municipalities and 9 provinces	Cagayan, Isabela, Qurino, Kalinga, Apayao, Mountain Province, Ifugao and Nueva Vizcaya provinces and small portion of Aurora province	Greater Luzon	migratory route of freshwater eels; CSU to provide details
Abra River			Greater Luzon	

Wetland Name	Municipalities	Province/Reg.	Bio Geographic Reg./Zone	Remarks
<b>Inland Wetlands – Visayas and Mindanao</b>				
Lake Danao	Camotes Islands	Camotes Sea, Bohol, Reg. VII	Greater Negros-Panay	
Lake Danao	Buac watershed	Southern Leyte, Reg. VIII	Greater Mindanao	
Lake Bito	Brgy. Bito, McArthur	Leyte, Reg. VIII	Greater Mindanao	
Lake Mahagnaw	Burawan	Leyte, Reg. VIII	Greater Mindanao	
Lake Maragang	Tigbao, Brgy. Limas	Zamboanga Sibugay, Reg. IX	Greater Mindanao	
Cave-sourced river systems		So. Cotabato, Reg. XII	Greater Mindanao	(to be determined, e.g., Wahig-Inabanga river system, Bohol)
Lake Sebu	Sebu	South Cotabato, Reg. XII	Greater Mindanao	
Lake Maughan	Tiboli	South Cotabato, Reg. XII	Greater Mindanao	
Lake Buluan	Lutayan, Sultan Kudarat, Buluan, and Mangodadato Buluan	Maguindanao (ARMM), Sultan Kudarat (Reg. XII)	Greater Mindanao	
Lake Dapao	Kalanogas	Lanao del Sur, ARMM	Greater Mindanao	
Aliwagwag Protected Landscape	Cateel	Davao Oriental, Reg. XI	Greater Mindanao	
Davao River	Davao Del Norte–Kapalong and Panabo; Davao Del Sur–Davao City; Bukidnon–San Fernando, Quezon and Kitaotao; and Central Mindanao–Magpet	Bukidnon (Reg. X), Davao del sur (Reg. XI), Davao, Davao del Norte (Reg. XI), Cotabato (North Cotabato, Reg. XII), Bukidnon (Reg. X)	Greater Mindanao	
Sibulan River	Sibulan, Sta. Cruz	Davao del Sur, (Reg. XI)	Greater Mindanao	
Tamugan River	Calinan	Davao City, (Reg. XI)	Greater Mindanao	
Allah River		South Cotabato (Reg. XII)	Greater Mindanao	
Lake Mainit	Municipalities within Lake Mainit's watershed (Surigao Del Norte–Alegria, Sison, Tubod and Mainit) and (Agusan Del Norte–Kitcharao, Jabonga, Santiago and Tubay)	Agusan del Norte (Reg. XII) and Surigao del Norte (Reg. XIII)	Greater Mindanao	
Vitali Watershed	Zamboanga City	Zamboanga City, Reg. IX	Greater Mindanao	
TalonTalon	Mampang, Tugbungayan Greater Mindanao	Zamboanga City, Reg. IX	Greater Mindanao	
Cagayan de Oro River Basin	Libona, Talakag & Baungon, and Cagayan de Oro City	Bukidnon (Reg. X) and Cagayan de Oro (Reg. X)	Greater Mindanao	
Budatu Lake	Jolo	Sulu, ARMM	Greater Mindanao	
Languyan River	Languyan	Tawi-tawi, ARMM	Greater Mindanao	
Lake Pinamaloy	Don Carlos	Bukidnon, Reg. X	Greater Mindanao	
Lake Napalit	Pangantukan	Bukidnon, Reg. X	Greater Mindanao	
Magsaysay coastal area	Magsaysay	Misamis Occidental, Reg. X	Greater Mindanao	
Mantigue island	Mahinog	Camiguin Province, Reg. X	Camiguin	
Baliangao Protected Landscape/Seascape	Baliangao	Misamis Occidental, Reg. X	Greater Mindanao	
Lake Duminagat	Don Victoriano	Misamis Occidental, Reg. X	Greater Mindanao	inside Mt. Malindang Range Natural Park
Carmen wetlands	Carmen	Davao del Norte, Reg. XI	Greater Mindanao	

# Annex C. Prioritization Based on Conservation Investments

Category (in terms conservation investment) (investment—management programs)

**LOW** – with management plan and with investment

**MEDIUM** – with management plan and minimum investment

**HIGH** - NO management plan and no investment

Low	Medium	High	Basis
Batanes island			Protected area, high investment, remote area,
Babuyan Island			Protected area, high investment, remote area,
	Buguey Wetlands		Research station of BFAR, included in ICRMP
Manila Bay			supreme court ruling to clean up
Pagbilao and Tayabas Bay			Study of ARCB
	Ragay Gulf		Study of ARCB
	Mactan, Kalawisan, cansaga bay		Urban area
Tubbataha reef			
		Polillo island	
	Caramoan island		Catching up for tourism;
Puerto Galera			LGU manage
		Ursula island	Bird sanctuary
	Balabac Group of Islands		Research only; ongoing project on seaweeds by BFAR; no management plan
	Northwest Panay Peninsula Natural Park		No more existing project, high threat because of mining
Olango Island			
		Biliran and Maripipi	mining
Siargao Island Protected Land and Seascape			
	Tawi-tawi island		BFAR programs; Haribon
		Simunul and Manuk Manka islands	Presence of threats; Peace and order situation
		Sibutu	
El Nido			
Cabulao Bay			
	Malampaya Sound		
		Balayan Bay	
		Talabong island and Bais Bay	
	Panguil Bay		Proposing for Ramsar site
		Ulugan Bay	
Inabanga Coast			Awardee of good governance (PWCA)
		Candaba Swamp	Included in River basin management plan;
		Lalaguna Marsh	Probable peatland

<b>Low</b>	<b>Medium</b>	<b>High</b>	<b>Basis</b>
	Naujan Lake		Probable peatland
Coron Lakes			
	Lake Manguao		
Puerto Princesa Subterranean River National Park			
	Agusan Marsh Wildlife Sanctuary		
	Lake Lanao		
	Liguasan Marsh		

# Annex D. List of Participants

## List of Contributors to the National Wetlands Action Plan 2011-2016

(Participants to the Technical Meetings, Consultations and Workshops)

### A

Abrera, Ma. Victoria –DENR–EMB  
Alcala, Angel C. –SUAKCREM  
Alcala, Frances –RAF  
Alegre, Rosita –MPO  
Alinio, Perry –UP-MSI  
Alpuerto, Judith B. –PPDO  
Amparo, Jennifer Marie S. –CHE, UPLB  
Andres, Armida –DENR-PAWB  
Antolin, Gregorio Jr. –DA–BSWM  
Aradanas, Rodolfo –DENR Region 9  
Aralar, Maria Lourdes C. –SEAFDEC  
Arcamo, Sandra Victoria R. –DA–BFAR  
Arguillas, Marigeline –DENR Region 11  
Arregadas, Edmondo –DENR Region 7  
Azores, Roberto M. –FSLF

### B

Baylon, Myrna –DENR Region 5  
Borja, Adelina –LLDA  
Bernal, Zenaida –Tanggol Kalikasan  
Basbas, Susan –Cabusao, Camarines Sur  
Balane, Edna –Cabusao, Camarines Sur  
Bueno, Reginaldo –DENR Region 7  
Bagayas, Reynaldo –PSSI  
Barrientos, Josephine –DENR–PAWB  
Bangaol, Melchor Q. –DENR-PAWB  
Bayaca, Rustan Deo U. –DENR-EMB  
Balilia, Winnievir S. –DENR–PAWB  
Banluta, Fe Crisilla M. –DILG-WSSPMO  
Barangan, Florencio B. –DENR–CMMO  
Baterna, Joel P. –CENRO  
Briguera, Nazario C. –DA  
Buen, Ruby T. –DENR-PPO  
Baldado, Hon. Jose A. –PGO

### C

Cabrido, Candido A. Jr. –UP-SURP  
Cacao, Babylyn –DENR-PAWB  
Caleda, Jean –ADMU  
Calimag, Priscilla N. –DENR -PAWB  
Capon, Leo –DENR Region 4B  
Capistrano, Lyn –PCWS  
Capistrano, Primo –DENR-NCR  
Castillo, Nelson –DENR-PAWB  
Catapang, Herbert –DENR–NAMRIA  
Clarete, Marilou –DENR Region 10  
Cristales, Aris Neil –WVCA  
Cuevas, Shirley G. –SCPW  
Custudio, Carlo –DENR-PAWB

### D

Daba, Belen –DENR Region 10  
Daco, Glenda –HPCE  
Darvin, Loureeda –DOST–PCAMRD  
Dayao, Deborah Anne –DENR-PAWB  
Dayag, Carmelita –DENR–LMB  
Dela Fuente, Crisanta A.  
Dela Peña Maria Madeline P. –DENR-PAO  
De Mesa, Maria Diosa L –NEDA  
Destajo, Joseph –Prieto Diaz, Sorsogon  
De Vera, Cecilia –PRRC  
Diaz, Eugenio Jr. –DENR–RBCO  
Discaya, Karina R. –SCPW

### E

Elago, Marilou –WMSU  
Elman, Nichol R. –Biology Dept-SU  
Eludo, Mario –DENR Region 13  
Encabo, Sheila Marie M. –NEDA  
Esguerra, Joy –UNDP-GEF-SGP  
Espayos, Ofelia –DENR-PAWB  
Espeja, Elmer M. –PEMO

### F

Fabro, Samuel –DENR–EMB  
Fider, Maria Christina –DENR-PAWB  
Fuentes, Damsao –DENR Region 6

### G

Gamido, Renz Marion B. –LLPCHCA, DENR-NCR  
Galeon, Edgardo –DENR Region 6  
Galicia, Abundio Jr. –DA–BFAR-IFAD  
Garces, Len –WFC  
Garcia, Cecille –DENR-PAWB  
Garcia, Jannete –DENR-PAWB  
Garcia, Mark Raygan E. –SU  
Gerochi, Manuel –DENR  
Gestiada, Alvin S. –EDM-ERO  
Gonzales, Ben –PSU  
Granert, William –SWCF  
Gravoso, Josephine –DENR Region 8  
Guerrero, Rafael D. III –DOST–PCAMRD  
Guiaya, Argean S. –DENR-PAWB  
Guinoo, Robert III –SU  
Gunay, Ana Maria –DENR Region 13  
Guzman, Roger Z. –PFEC

### H

Hadjinasser, Ali –DENR Region 12  
Hails, Sandra –Ramsar Convention Secretariat  
Hiponia, Malcolm –RDC-SU  
Ho, Romeo –DENR–NAMRIA

## H

Honculada, James Arceu –PHILDHRRRA  
Hortaleza, Eliza G. –DPWH

## I

Ingle, Nina –WCSP  
Isaac, Carygine V. –FPE  
Isip, Emmanuel –DENR Region 11

## L

Lagumbay, Reina C. –PENRO  
Layusa, Cynthia –SCPW  
Lecciones, Sara M. –SCPW  
Lecciones, Amy M. –SCPW  
Lim, Theresa Mundita –DENR-PAWB  
Lita, Gerardo –DENR-PAWB  
Lumbres, Zoisane Geam –DENR-PAWB  
Luna, Ma. Paz G. –PUSOD

## M

Macaspac, Enrique A. –DENR–NAMRIA  
Magno, Redentor –DENR Region 11  
Malayang, Ben S. III –SU  
Malibiran, Sherie Rose B.-CTO  
Malihan ,Elisa –DENR NCR  
Manamtam, Arturo –PGCS  
Manila, Antonio –DENR-PAWB  
Manlulu, Felisa M. –NWRB  
Mascardo, Antonie S. –PTOD  
Matillano, Maria Victoria –WWF–Phils.  
Maulana, Ronjamin –SSB  
Melana, Dioscoro –DENR Region 7  
Mendoza, Marlynn M. –DENR-PAWB  
Miguel, Daniel M. –DENR Region 3  
Mijares, Joybert –DENR–FMB  
Miranda, Rufino –DENR Region 13  
Montebon, Rex –CIP

## N

Navarro, Joy M. –DENR-PAWB  
Nuñez, Enrique A. –CIP

## O

Oracion, Enrique G. –SU-RDC  
Orcilla, Leah –DENR NCR  
Osea, Jerry P. –EDM-ERO

## P

Pablo, Ralph –DENR–LMB  
Paguntalan, Lisa Marie –PBSF  
Palis, Honorato G. –DENR-ERDB  
Palma, Adelaida –DA–BFAR-NIFTC  
Panganiban, Marlyn –HPCE  
Pantua, Leo  
Pasicolan, Simplicia –DENR-ERDB  
Pedregosa, Erna Lee  
Pentaliday, Abonawas –CSPC  
Perez, Teresita –DES

## P

Perez, Thelma M. –DENR-PAWB  
Pilorin, Elizabeth P. –DPWH  
Piñosa, Dennis –DENR Region 6  
Pontillas, John Francisco A. –PCSDS  
Posadas, Jesus Jr. –DENR–FMB

## Q

Quetulio, Dilbert –HRCE  
Quiliza, Violeta –DENR–NAMRIA

## R

Racoma, Marilyn –DENR Region 1  
Ratamar, Leo –DA–BSWM  
Reyes, Bonita –SCPW  
Reyes, Rommel –CEHR  
Romero, Ronnie –BFAR-NFRDI  
Roque, Jesusa –NWRB

## S

Salise, Fernando  
Sampulna, Jim –DENR Region 11  
Sandoval, Teresita S. –DA–BSWM  
Saraña, German P. Jr. –LGBC  
Scholz, Uwe –GTC  
Sobrepeña, Lea Myr –DA–BFAR  
Suarez, Dario –DENR Region 8

## T

Trinidad, Rogelio –DENR Region 3  
Tayamen, Melchor –DA–BFAR  
Trinidad, Dorcas –WFC  
Tercero, Rowena –DENR-PAWB  
Tee, Mussaenda –DENR Region 9  
Teves, Emmilie B. –DENR Region 13  
Teves, Mercy S. –ENRD  
Tagtag, Anson –DENR-PAWB  
Tatlonghari, Carmelito A. –SCPW  
Terso, Raul –CNR  
Torres, Daniel S. –ERD  
Tuddao, Vicente B. Jr –DENR–RBCO

## U

Ugat, Zenaida –SCPW

## V

Villafuerte, Reynaldo –DENR NCR  
Varela, Rowena P. –CCARRD/NORMISIST  
Visorero, Perla –CAVAPPED

## Y

Yawan, Reynald F. –DENR-CAR

# Acronyms

ADMU	Ateneo de Manila University
AMWS	Agusan Marsh Wildlife Sanctuary
AO	Administrative Order
AQD	Aquaculture Department
ARBIWRM	Agusan River Basin Integrated Water Resources Management
ARCBC	Asean Regional Center for Biodiversity Conservation
ARMM	Autonomous Region in Muslim Mindanao
AVP	Audio-visual Presentation
AWC	Asian Waterbird Census
BFAR	Bureau of Fisheries and Aquatic Resources
BFAR-IFAD	Bureau of Fisheries and Aquatic Resources-Inland Fisheries and Aquaculture Division
BFAR-NFRDI	Bureau of Fisheries and Aquatic Resources-National Fisheries Research and Development Institute
BFAR-NIFTC	Bureau of Fisheries and Aquatic Resources-National Inland Fisheries Technology Center
BFAR-NSAP	Bureau of Fisheries and Aquatic Resources-National Stock Assessment Program
BOD	Biochemical Oxygen Demand
BSWM	Bureau of Soils and Water Management
CALABARZON	Cavite, Laguna, Batangas, Rizal and Quezon
CARAGA	Caraga Administrative Region
CAVAPPED	Cagayan Valley Program for Peoples Economic Development
CBD	Convention on Biological Diversity
CCARRD	Caraga Consortium for Agriculture, Forestry and Resources Research and Development
CCARRD/NORMISIST	Caraga Consortium for Agriculture, Forestry and Resources Research and Development/Northern Mindanao State Institute of Science and Technology
CCMRD	Committee on the Conservation and Management of Resources for Development
CDM	Clean Development Mechanism
CEPA	Communication Education Participation Awareness
CHM	Clearing House Mechanism
CIP	Conservation International Philippines
CKBA	Candidate Key Biodiversity Area
CLMN	Citizen Lake Monitoring Network
CLUP	Comprehensive Land Use Policy
CMS	Convention of Migratory Species
CNR	Committee on Natural Resources
CPA	Conservation Priority Area
CRMP	Coastal Resource Management Project
CS	Celebes Sea

CSPC	Cotabato City State Polytechnic College
CSU	Cagayan State University
CTI-RPOA	Coral Triangle Initiative-Regional Plan of Action
CTO	City Tourism Office
DA	Department of Agriculture
DA-BFAR	Department of Agriculture-Bureau of Fishery and Aquatic Resources
DA-BSWM	Department of Agriculture-Bureau of Soils and Water Management
DAO	Department Administrative Order
DBM	Department of Budget and Management
DENR	Department of Environment and Natural Resources
DENR-CENRO	Department of Environment and Natural Resources-Community Environment and Natural Resources Office
DENR-CMMD	Department of Environment and Natural Resources-Coastal and Marine Management Division
DENR-CMMO	Department of Environment and Natural Resources-Coastal Marine Management Office
DENR-EMB	Department of Environment and Natural Resources-Environmental Management Bureau
DENR-ERDB	Department of Environment and Natural Resources-Ecosystems Research and Development Bureau
DENR-FMB	Department of Environment and Natural Resources-Forest Management Bureau
DENR-ICMRP	Department of Environment and Natural Resources-Integrated Coastal Resource Management Project
DENR-LMB	Department of Environment and Natural Resources-Land Management Bureau
DENR-LMS	Department of Environment and Natural Resources-Land Management Service
DENR-NAMRIA	Department of Environment and Natural Resources-National Mapping Resource Information Authority
DENR-PAO	Department of Environment and Natural Resources-Public Affairs Office
DENR-PPO	Department of Environment and Natural Resources-Planning and Policy Office
DENR-RBCO	Department of Environment and Natural Resources-River Basin Control Office
DepEd	Department of Education
DES	Department of Environmental Science
DILG	Department of Interior and Local Government
DILG-WSSPMO	Department of Interior and Local Government-Water Supply and Sanitation Program Management Office
DO	Dissolved Oxygen
DOH	Department of Health
DOT	Department of Tourism
DPWH	Department of Public Works and Highways
ECC	Environmental Compliance Certificate
EDM-ERO	Environmental Disaster Management and Emergency Response Office
ENRD	Environment and Natural Resources Division
FAO	Food and Agriculture Organization
FARMC	Fisheries and Aquatic Resources Management Council
FMB	Forest Management Bureau
FPE	Foundation for the Philippine Environment



FSLF	Friends of the Seven Lakes Foundation
GHG	Green House Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit, GmbH
GPOA	General Plan of Action
HREP-CE	House Representative, Committee on Ecology
IBA	Important Bird Area
ICM	Integrated Coastal Management
ICRMP	Integrated Coastal Resource Management Project
IEC	Information Education Communication
IMA	International Marinelife Alliance
IP	Indigenous People
IPR	Indigenous Peoples Rights
IRA	Internal Revenue Allotment
IRR	Implementing Rules and Regulation
IUCN	International Union for Conservation of Nature
IUCN-SSC	International Union for Conservation of Nature-Species Survival Commission
IWRM	Integrated Water Resources Management
KBA	Key Biodiversity Area
LGBC	Local Government of Bayawan City
LGU	Local Government Unit
LLDA	Laguna Lake Development Authority
LPPCHEA	Las Piñas-Parañaque Critical Habitat and Ecotourism Area
MAR	"Para el Mar"
MDFO	Municipal Development Fund Office
MGB	Mines and Geosciences Bureau
MIDAS	Marine Integrated Decision Analysis System
MMRNP	Mt. Malindang Range Natural Park
MPA	Marine Protected Areas
MPO	Municipal Planning Office
MSN	Marine Support Network
NBSAP	National Biodiversity Strategy and Action Plan
NCC	CTI National Coordinating Committee
NCR	National Capital Region
NEDA	National Economic Development Authority
NFRDI	National Fisheries Research and Development Institute
NGO	Non-government Organization
NGP	National Greening Program
NIA	National Irrigation Administration
NIPAS	National Integrated Protected Areas System
NPOA	National Plan of Action
NPS	North Philippine Sea
NPS-ENRMP	National Program Support–Environment and Natural Resources Management Project
NSAP	National Stock Assessment Program

NWAPP	National Wetlands Action Plan for the Philippines
NWRB	National Water Resources Board
OIWS	Olongo Island Wildlife Sanctuary
OSG	Office of the Solicitor General
PAMB	Protected Area Management Board
PAWB	Protected Areas and Wildlife Bureau
PAWCZMS	Protected Areas, Wildlife and Coastal Zone Management Service
PBCP	- Philippine Biodiversity Conservation Priorities
PBSF	Philippine Biodiversity Conservation Foundation
PCAMRD	Philippine Council for Aquatic and Marine Research and Development
PCP	Pawikan Conservation Project
PCSD	Philippine Council for Sustainable Development
PCSDS	Palawan Council for Sustainable Development Staff
PCWS	Philippine Center for Water and Sanitation
PCWS-ITNF	Philippine Center for Water and Sanitation-ITN Foundation
PD	Presidential Decree
PEMO	Provincial Environment Management Office
PENRMO	Provincial Environment and Natural Resource Office
PES	Payment for Ecosystem Services
PFEC	Philippine Federation for Environmental Concern
PGCS	Provincial Government of Camarines Sur
PGO	Provincial Governor's Office
PHILDHRRA	Philippine Partnership for the Development of Human Resources in Rural Areas
PhilMarSaSt	Philippine Marine Sanctuary Strategy
PhilReefs	Philippine Coral Reef Information Network
PO	People's Organization
PPDO	Provincial Planning and Development Office
PPSRNP	Puerto Princesa Subterranean River National Park
PRA	Philippine Reclamation Authority
PRRC	Pasig River Rehabilitation Commission
PRS 92	Poverty Reduction Strategy
PSSI	Philippine Speleological Society Incorporated
PSU	Palawan State University
PTOD	Provincial Tourism Office
PUSOD	Pusod, Inc.
PWCA	Philippine Wetlands Conservation Awards
R&D	Research and Development
RA	Republic Act
RAF	Ramon Aboitiz Foundation
RBCO	River Basin Control Office
RBO	River Basin Organizations
RCS	Ramsar Convention Secretariat
RDC-SU	Research and Development Center- Siliman University
REDD	Reducing Emission from Deforestation and Forest Degradation

RO	Regional Office
SCPW	Society for the Conservation of Philippine Wetlands, Inc.
SCS	South China Sea
SEAFDEC	Southeast Asian Fisheries Development Center
SEAFDEC/AQD	Southeast Asian Fisheries Development Center / Aquaculture Department
SGP	Small Grants Programme
SIBAT	Sibol ng Agham at Teknolohiya, Inc.
SS	Sulu Sea
SSB	Sultan Sa Barounguis
SU	Siliman University
SU-RDC	Siliman University-Research and Development Center
SUAKCREM	Silliman University Angelo King Center for Research and Environmental Management
SWCF	Soil and Water Conservation Foundation
TIWS	Turtle Islands Wildlife Sanctuary
TMO	Tubbataha Management Office
TPAMB	Tubbataha Protected Area Management Board
TRNP	Tubbataha Reefs Natural Park
TWG	Technical Working Group
UAP	United Architects of the Philippines
UN	United Nations
UNEP-GEF	United Nations Environment Programme-Global Environment Facility Coordination
UNFCC	United Nations Framework Convention on Climate Change
UP-MSI	University of the Philippines - Marine Science Institute
UP-SURP	University of the Philippines - School of Urban and Regional Planning
UPLB-CHE	University of the Philippines Los Baños-College of Human Ecology
URL	Uniform Resource Locator
VS	Visayan Sea
WCSP	Wildlife Conservation Society of the Philippines
WFC	WorldFish Center
WMSU	Western Mindanao State University
WRRC	Water Resources Regional Council
WVCA	W.V. Coscolluela & Associates
WWF	World Wide Fund

# Photo Credits

## Front Cover

*Top left*, Agusan Marsh, Agusan Del Sur,  
Dr. Jonathan Davies

*Top right*, Laguna Lake and Boats, Jerome Bonto

*Middle right*, Mangrove Forest, George Tapan

*Bottom right*, Hungduan Ifugao, DENR-PAWB

*Bottom left*, Sohoton Cave, George Tapan

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*Middle right*, Fisherman weaving net, Agusan Del  
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*Middle right*, Agusan Marsh, Agusan Del Sur,  
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*Bottom left*, George Tapan

*Bottom right*, Buguey Cagayan, Buguey Cagayan,  
Joy Navarro

## Back Cover

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Jonathan Davies

*Bottom left*, Sampaloc Lake fishpen, San Pablo  
City, Jerome Bonto

*Top and bottom right*, White Herons and  
Crocodiles, George Tapan



