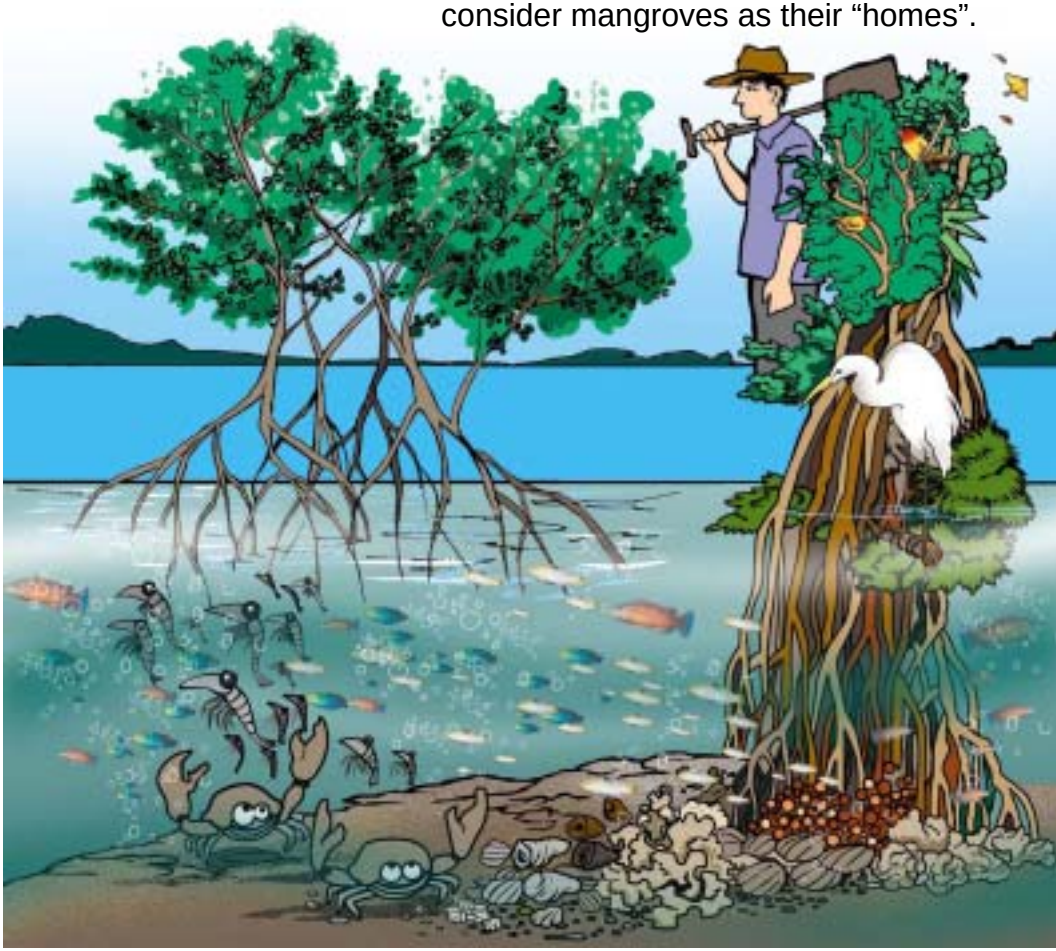
Why protect mangroves?

Fish and other marine life depend on habitats such as mangroves to enable them to feed, take shelter in, spawn and reproduce. A good number of marine fish and invertebrates live in mangrove areas at some stages of their life cycles and consider mangroves as their “homes”.



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Mangroves are essential to fish production. They are extraordinary rich habitats that serve as life support systems to about 75 percent of fish species caught in the area as well as to indeterminate numbers of crustaceans and wildlife. Mangrove loss directly translates to losses in fish catch and food supply.

What are mangroves?

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 are found along sheltered tropical mudflats or wetlands or in association with estuaries and lagoons and may extend inland along rivers, streams and their tributaries. They require slow currents and plenty of fine sediment in which to set their roots.

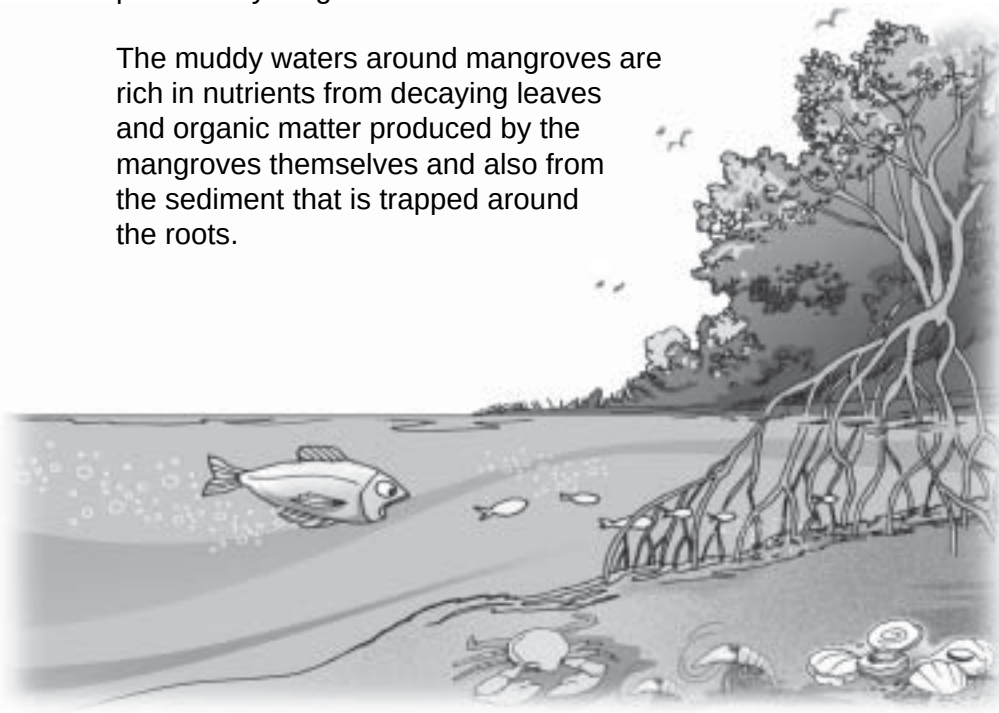
Why are mangroves important?

> "Mangroves support the natural food chain by forming a link between the land and the sea. They serve as the sanctuary of both aquatic and terrestrial wildlife... Mangroves help a great deal in the recruitment of fish and other fishery products because the mangrove ecosystem is a part of their habitat."
>
> *(Baldevarona, 2001)*

Mangroves are critical spawning, nursery, feeding and transient shelter areas to hundreds of fish species, crustaceans and invertebrates and support an abundant and productive marine life.

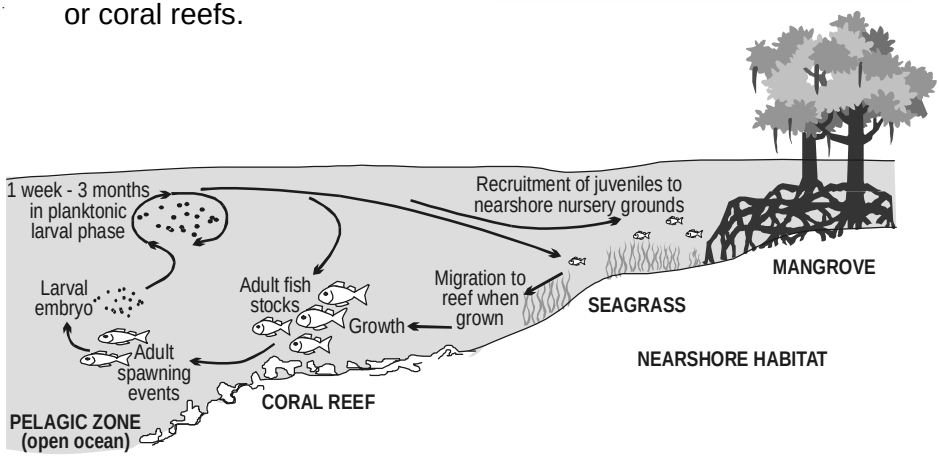
Like all other animals, fish, shrimp, crabs and other marine life in the sea need a safe place to grow, away from many predators. With their tangled and intricate root systems, mangroves are excellent nurseries, providing safe hiding places for young animals.

The muddy waters around mangroves are rich in nutrients from decaying leaves and organic matter produced by the mangroves themselves and also from the sediment that is trapped around the roots.



Many commercial marine species such as *bangus* (milkfish) and prawns spend their early life within the mangrove area where they find food and protection from predators.

Juveniles of some deep sea fishes also spend some time in the mangroves before moving on to other ecosystems such as seagrasses or coral reefs.



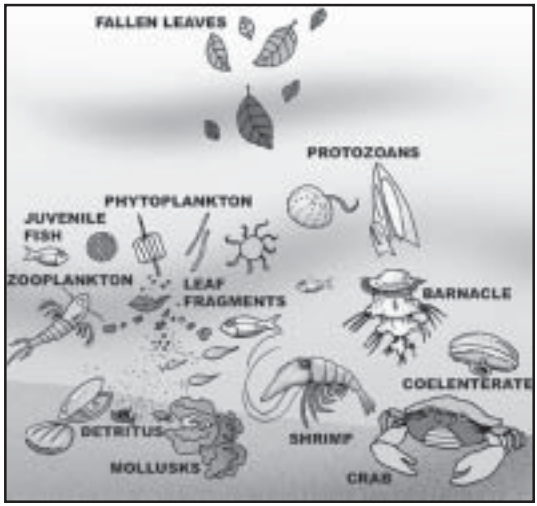
Typical life cycle of coral reef fish species and interconnectivity of habitats.
(DENR *et al.* 2001)

In addition, mangroves are also habitats to shore birds, some species of mammals (monkeys, rats, etc), reptiles and insects. These animals utilize the mangroves as places to roost, breed or take shelter from strong winds or heat of the sun.

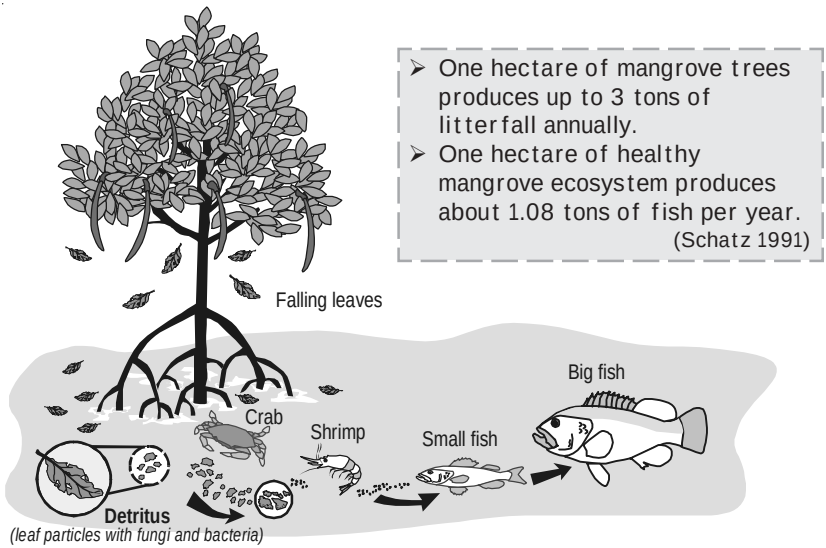
How do mangroves provide food for marine species?

Marine leaves are a source of food for fish, shrimps and crabs and other marine animals. When a leaf falls, it breaks up and decomposes into smaller pieces, until they become too small to be seen with the naked eye.

The decomposing plant matter is collectively known as detritus. Detritus is covered with large amount of small organisms which take up the nutrients in the leaves. Individually, these organisms are too small to be of much value to any larger animal, but together they form a coating around leaf particles which many different animals use as food.



Leaves eaten by animals are not totally digested. They are excreted almost intact, again coated with organisms, and then eaten by marine animals. This process is repeated several times, so that one leaf can literally nourish a juvenile fish for much of its life in the mangrove area. Mangroves contribute about 3.65 tons of litter per hectare per year.

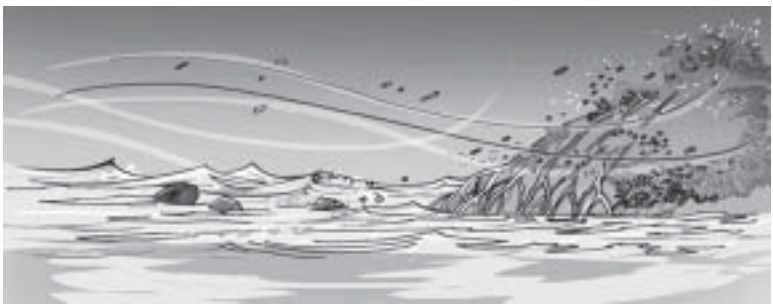


- One hectare of mangrove trees produces up to 3 tons of litterfall annually.
- One hectare of healthy mangrove ecosystem produces about 1.08 tons of fish per year. (Schatz 1991)

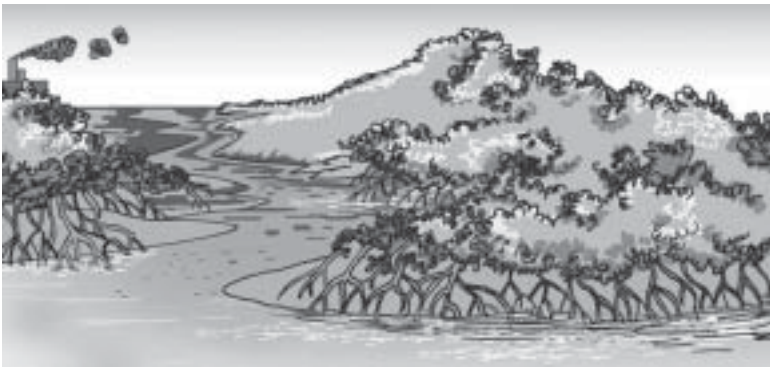
Mangrove detrital food chain. (DENR *et al.* 2001)

Other uses of mangroves

Mangroves protect coastlines from the onslaught of storms and wave surges. Their crowns, trunks and stems serve as physical barriers that help break the winds and waves, reducing their speed and intensity and subsequently their destructive impact. Scientists say that during such surges, at least 70-90 percent of the energy of wind-generated waves is absorbed, depending in how healthy these ecosystems are and their physical and ecological characteristics (UNEP, 2006).



Mangroves are also capable of absorbing pollutants such as heavy metals and other toxic substances as well as nutrients and suspended matter. Mangroves therefore serve as natural wastewater filters, preventing many land-based and nearshore pollutants from reaching deeper waters (UNEP, 2006).



Mangroves are a good source of wood and timber, nipa shingles for housing materials, firewood and charcoal, and of poles for fish traps. Several mangrove species provide high-quality commercial timber, used for various building materials as well as for fuel. In fact, in the Philippines, mangrove wood has been widely used as fuel for bakeries due to their high heat and charcoal value.

Tannins from mangroves were also used to coat and preserve wood, nets and fishing gear as well as for cloth-dyeing. Some species of mangroves are also habitat to bees and are sources of honey and beeswax.

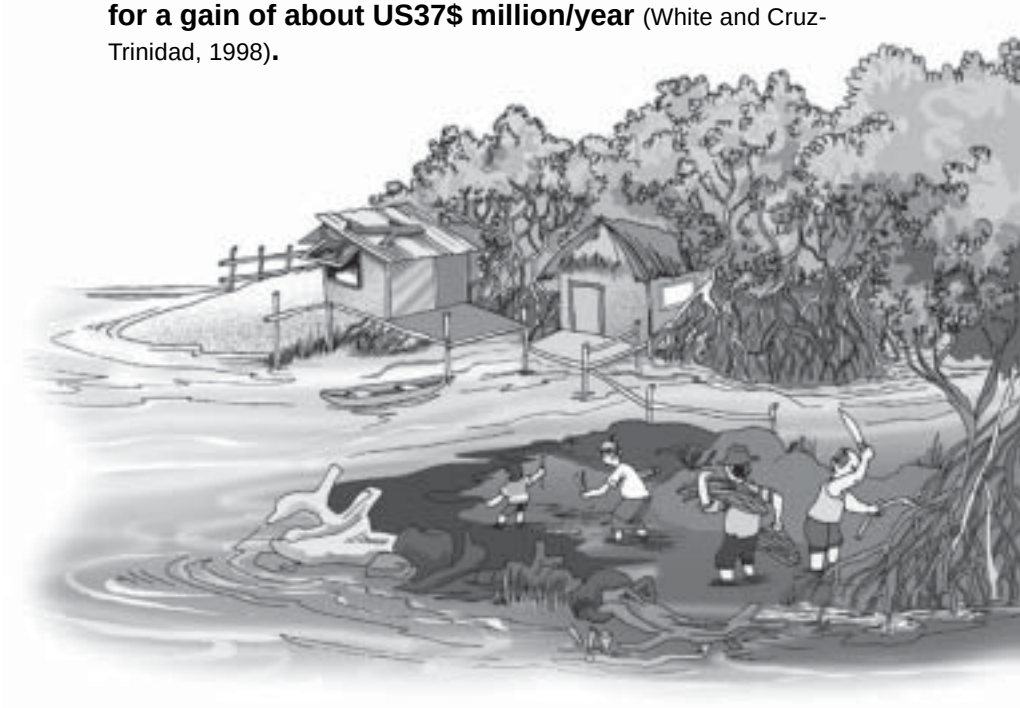
As breeding and nursery grounds for many fish species, mangrove areas are sources of wild fry and juvenile fish for the aquaculture/mariculture industry. In addition, mangrove seeds and propagules can be harvested and sold to reforest denuded areas.

Economic Value

In the Philippines, it is estimated that the value of a complete mangrove ecosystem ranges from US$500 to US$1,550 per hectare per year (Dixon, 1989) or at US$600/ha/yr or US$60,000/sq km/yr (A. White and Cruz-Trinidad, 1998).

The total gain to the Philippines for protecting its remaining mangrove ecosystem is substantial. Using the conservative estimate of value from direct benefits of only US$600/ha/yr, the Philippines gains at least US83 million/ year in fish production and potential sustainable wood harvest from the existing 138,000 ha.

If the Philippines increase the area of healthy mangrove forest to 200,000 ha, the annual natural benefits would potentially increase to US$120 million for a gain of about US37$ million/year (White and Cruz-Trinidad, 1998)**.**



Philippine Mangroves:
FACTS & FIGURES

- There are 54 species of true mangroves (34 major and 20 minor) worldwide and 60 mangrove associates (Tomlinson, 1996).
- The Philippines has around 47 "true mangrove" and associated species belonging to 26 families. True mangrove species are those that strictly grow in the mangrove environment while associated species may thrive on other habitat types such as beach forest and lowland areas (Melana and Gonzales, 1996).
- Satellite image analyses indicate that currently, Mindanao has the most mangrove areas in the country (29% of the country's total) while Luzon and Mindoro have the least. Old-growth mangrove forests are mainly found in Mindanao (4,582 hectares) and Palawan (5,317 hectares) (World Bank, 2005).
- Among the mangrove sites with high diversity are the island province of Bohol with 26 mangrove species, Pagbilao Bay in Quezon Province with 24 species, Aurora Province with 23 species, Ibajay in Aklan province with 22 species, Puerto Galera, Mindoro and San Remegio, Cebu with 18 species (Primavera, 2000).

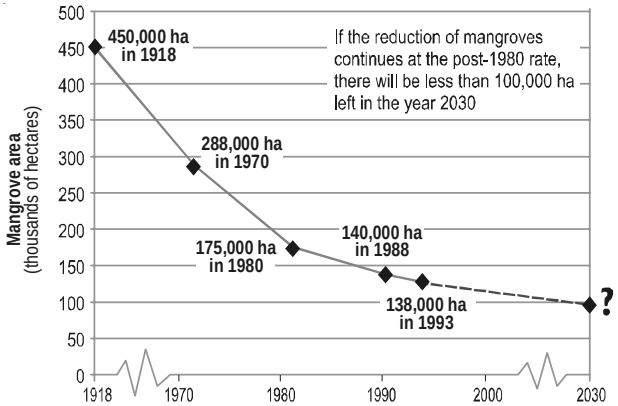
- Overall, there are three dominant mangrove groups found in the Philippines: **bakauan group** (bakauan lalaki [*Rhizophora apiculata*], bakauan babae [*R. mucronata*], bakauan bato or bangkau [*R. Stylosa*]), **bungalon group** (bungalon [*Avicennia marina*], api-api (*A. officinales*], piapi [*A. lanata*]), and **pagatpat group** (pagatpat [*Sonneratia alba*], pedada [*S. caseolaris*], pagatpat *baye* [*S. ovata*].

- Mangrove-dependent fauna are equally diverse — studies have recorded as much as 128 fish species from 54 families in the mangrove ecosystems of Pagbilao Bay, Quezon; 56 species of birds belonging to 28 families in 11 sites in Central Visayas and 9 species of paneid shrimps in a riverine and an island mangrove in Guimaras Island (Primavera, 2000).

- Many Philippine villages are named after mangroves. The frequent usage of these common names reflects the usefulness/economic importance of mangroves in the daily lives of the people. The City of Manila is named after *maynilad* – which literally means "*there is nilad*", a mangove scientifically known as the Scyphiphora hydrophyllacea, which lined the shores of Manila Bay and the banks of the Pasig River (Gruezo, 1999).

Mangroves in Trouble

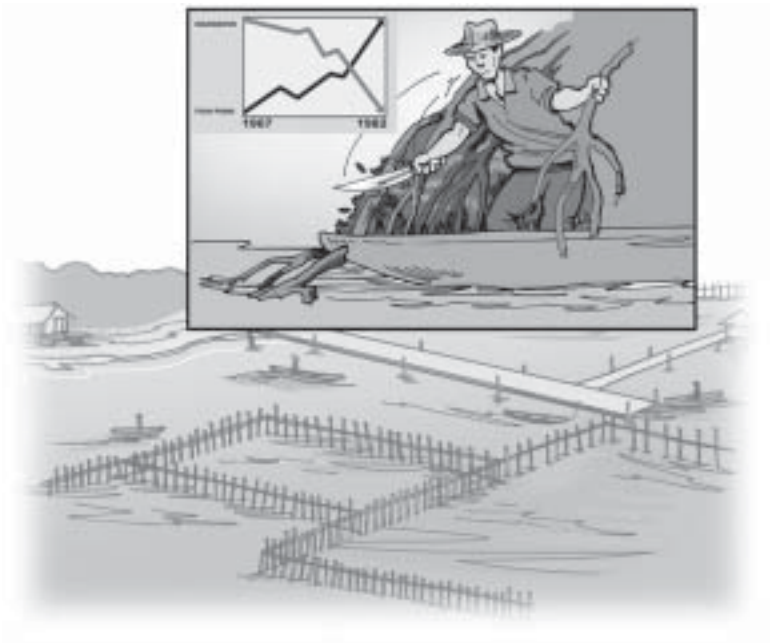
Forested mangrove area in the Philippines has decreased from an estimated coverage of 450,000 ha in 1918 to less than 120,000 ha in the late 1990's. The most rapid decrease in mangrove coverage occurred during the 1960's and 1970's when national policies encouraged the expansion of aquaculture. Today, fishponds cover about 289,000 ha, most of which were formerly mangroves. For the period 1967-1968, the average rate of decline was about 8,000 ha annually (DENR, 2001).



Decline of mangrove resource in the Philippines. (DENR 1998; White and de Leon 2004; White and Cruz-Trinidad 1998)

Mangrove stands remaining in the country are mostly found on the southern islands of Mindanao and the eastern islands of Palawan. Less than 5 percent of existing trees are in old or primary growth forest and found mostly in Palawan. Most mangrove forests in Luzon and Visayas islands are secondary growth or in plantations. Sadly, mangrove forests in the Philippines are of much lower quality now and cover less than one-third of their original range.

Despite a 1982 government ban on further mangrove conversion to fishponds, mangrove areas continued to decline by about 3,700 ha annually, roughly matching the increase in fishpond areas. Production of firewood, charcoal, and building materials often was the initial incentive to cut trees, followed later by conversion to fishponds. The low annual rent for Fishpond Lease Agreements (FLAs) – around US$2/ha/yr has encouraged fishpond conversion since they carry no penalties for low production. They also pay very little back to the government or local community for lost benefits (Primavera, 2005).



Studies and experience now show that a mangrove forest can support more than up to 1 ton per hectare per year of natural fish production. Thus, when many fishponds were abandoned in the late 1980's because of disease outbreaks and declining economic returns, the country found itself losing not only the production of fishponds but also natural fishery production from abandoned mangrove areas.

Urbanization has also contributed to the denudation of mangrove forests, with the intrusion of human settlements and conversion of mangrove areas for reclamation, ports and coastal tourism development. While the rate of loss has slowed and reforestation programs have been underway for the past decade to rehabilitate mangrove areas, coastal development in the Philippines continues to be aggressive, resulting in a wide variety of conflicting uses – industry, construction, dump sites, boat landings, tourism and recreation.

The Philippines has lost some 60% of its total mangrove area, and mangroves remain vulnerable to loss from fishpond development, cutting for building materials, firewood and charcoal production. Should such loss continue, already declining fisheries will suffer more losses; and depleted habitats, such as coral reefs and seagrass beds will be further threatened.

What is the advantage of a mangrove area as a sustainable source of food supply over that of a fishpond?

While undoubtedly, aquaculture contributes to fisheries production and food supply, studies show that maintaining mangroves in their present form, instead of converting them into fishponds is the more superior alternative. Sustainable management and protection of mangroves result in more and longer term benefits for a greater number of people and can continue to supply fish products, wood and other useful products with minimum capital and labor.

In contrast, intensive aquaculture is susceptible to disease, soil acidity problems, water quality problems and vagaries of the market, all of which can undermine economic viability. This is why many shrimp farms have closed in the Philippines and elsewhere in Southeast Asia resulting in many abandoned fishponds and degraded mangrove areas.

What is “mangrove rehabilitation” and “management”?

To rehabilitate mangroves means to rejuvenate or restore them proximate to their former state. Rehabilitation efforts may cover the full range of reforestation activities or be limited to enrichment planting. The primary objective of mangrove rehabilitation is to bring back the biological productivity of mangroves particularly as this relates to their marine nursery and nutrient support functions.

Mangrove management on the other hand entails the setting up of mechanisms that would regulate mangrove forest access and utilization. Its primary objective is to address the root cause(s) of continuing mangrove losses. The range of management activities may include access control, strict prohibition of mangrove conversion to other uses, habitat protection and provision of stewardship agreements.

What can we do to help protect our mangroves?

1. Support the enforcement and implementation of fishery laws and laws protecting coastal habitats.
2. Report any violation of these laws to the police or the local government in your area.
3. Stop the cutting of mangroves and conversion of mangrove areas into other uses.
4. Rehabilitate/reforest denuded areas.
5. Recover abandoned fishponds and re-establish these as mangrove areas.
6. Establish mangrove nurseries to provide a reliable source of seedlings for mangrove replanting and rehabilitation.
7. Establish/support marine protected areas (MPAs) or marine sanctuaries.
8. Advocate for and support the establishment of a coastal resource and fisheries management program in your municipality.
9. Advocate for and support coastal zoning initiatives that will allow for rationalization of fishing gear and other resource use.
10. Don't pollute. Stop others from polluting our coastal areas.
11. Inform yourself. Learn more about our marine ecosystems — coral reefs, mangroves, seagrasses, beaches and estuaries and their importance to life on this planet.

A Call to Action

Given their natural ecological roles and their various human beneficial products, mangroves are a powerhouse resource that needs to be protected and managed. As a life support system for marine species, mangroves are a critical component of the marine and coastal environment that contributes significantly to food security. Given the trends of mangrove destruction and conversion in the Philippines, we urgently need to do the following:

- Save those areas that are still forested. Maintaining mangroves in their natural state is a far superior situation than converting these for other purposes. In the interest of food security, there is no justification whatsoever to remove or convert mangrove areas.
- Restore (converted) mangrove areas proximate to their natural state. There are large tracts of these areas covered by fishpond lease agreements (FLA) which are now either abandoned or have never been developed. These areas can be restored as mangrove areas rather left idle and unproductive.
- Support mangrove forest protection activities.
- Enforce fishery laws.

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Save and protect our mangroves for food security and environmental stability!

For more information, contact:

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Website: www.oneocean.org

MANILA OFFICE 18/F OMM-CITRA Bldg., San Miguel Ave., Ortigas Center, 1605 Pasig City, Metro Manila
Tel. nos: (02) 636-0052 to 53 Fax: (02) 634-0327 Email: FISH@ttemi.com.ph

CEBU OFFICE 5/F CIFC Towers, J. Luna Ave. cor. J.L. Briones St., NRA, 6000 Cebu City
Tel. nos.: (032) 232-1821 to 23, 412-0487 Fax: (032) 232-1825 Email: fishproject@oneocean.org

BOHOL FIELD OFFICE 2/F Robins Home Depot, 40 Palma St., 6300 Tagbilaran City, Bohol
Tel. no.: (038) 501-7134 Cell. no.: (0918) 906-1318

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Tel. no.: (068) 268-1253 Cell. no.: (0918) 906-1304

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