



# ICM Solutions

## Marine Protected Area Networking in the Center of the World's Marine Biodiversity Abundance: Verde Island Passage Marine Corridor

- Effectively managed MPA sites and networks yield optimal ecological and socioeconomic benefits. Not only do these networks help in the recovery of fisheries, but they also meet other environment and human needs such as maintenance of coastal water quality, shoreline protection, and increased opportunities in livelihood and tourism.
- MPA sites and networks can successfully raise the awareness, vigilance, and participation among local communities in the network. Instead of tension and resentment toward conservation programs, MPA sites and networks are able to secure the support of primary stakeholders, which are the communities. In Batangas, a greater appreciation has been observed among local fishers of the significance and direct benefits of the MPAs in their locality, the linkages between the MPAs of adjacent municipalities and fishing grounds, and the necessity to protect bigger areas beyond their jurisdictions. The strict enforcement of local ordinances and fishery laws has lessened the incidence of illegal fishing.
- The Batangas MPA network has proven to be an effective management mechanism that can be scaled up for broader coverage of the Verde Island Passage Marine Corridor, the center of the center of the world's biodiversity abundance.



## Box 1: VERDE ISLAND PASSAGE MARINE CORRIDOR

The Verde Island Passage Marine Corridor is situated between Luzon (particularly, Batangas) and Mindoro. It is about 100 km long and only about 20 km across at its narrowest point. The channel is relatively deep with maximum bathymetry of about 1,000 m along the northwest coast of Mindoro (fig. 1).



Figure 1. Fisheries Perception Map of the Verde Island Passage Marine Biodiversity Conservation Corridor.

The South China Sea and Pacific Ocean waters converge and probably exchange properties within this passage bringing nutrients that sustain the more than 300 species of corals that host nearly 60% of the world's known shorefish species. Because of its high marine biodiversity, Verde Passage has been placed at the peak of the "Coral Triangle" that spans the Sulawesi and the Sulu Seas and nearby Indonesia. The fact that Verde Passage is a vital corridor for marine-based tourism, transportation and international shipping has focused conservation efforts on this important waterway.

The Batangas MPA network is a significant portion of the Verde Island Passage (VIP) MPA network, which is possibly the only network in the Philippines to have biological and social components dedicated for MPA and enforcement initiatives. In fact, the Verde Island Passage marine biodiversity conservation corridor has 36 MPAs—24 in Batangas and 12 in Oriental Mindoro.

The Province of Batangas has shown significant progress in expanding its management strategies for sustainable development of the coastal and marine areas over the last 14 years. Starting in Batangas Bay in 1994, in partnership with PEMSEA, the ICM system has been replicated, now covering the entire coastline of the Province (extending to Balayan and Adjacent Bays in year 2000, and Tayabas Bay and Adjacent Bays in 2005, in partnership with World Wide Fund for Nature-Philippines [WWF-Philippines] and Conservation International-Philippines [CI-Philippines]).

Batangas Province has formulated an updated 15-year Strategic Environmental Management Plan (SEMP) (2005-2020) to address new challenges; explore new development opportunities; and enhance management skills, stakeholder cooperation, and integration of development and environmental protection in the whole province. Three new action components were included: (1) habitat restoration and management; (2) water resource protection and management; and (3) fisheries protection and management.

Implementing these new action components induced the Provincial Government of Batangas, in partnership with CI-Philippines, to establish, rectify, and expand the existing MPAs and MPA network.

## Solutions

### Identify MPAs and MPA networks using science

Science played a key role in the identification of MPA sites, as well as in the establishment of the Batangas MPA Network. CI-Philippines invested in the conduct of connectivity studies in order to determine potential MPA sites based on their capability to act as efficient sources and sinks of propagules (box 2). MPAs located at sink populations

### Box 2: SIMULATED LARVAL DISPERSAL

An MPA network enables fish larvae to migrate from one MPA to another. Fish populations are connected to other areas through the process of larval drift (fig. 2). Fish egg and larvae spawned inside MPAs in the VIP drift along ocean currents. They can re-seed and replenish fish stock at a distant location, helping fisheries recover.

The MPA network thus provides a framework that unifies the central aims of conservation and fishery management, while also meeting other human needs such as maintenance of coastal water quality, shoreline protection, education, research, and recreational opportunities.

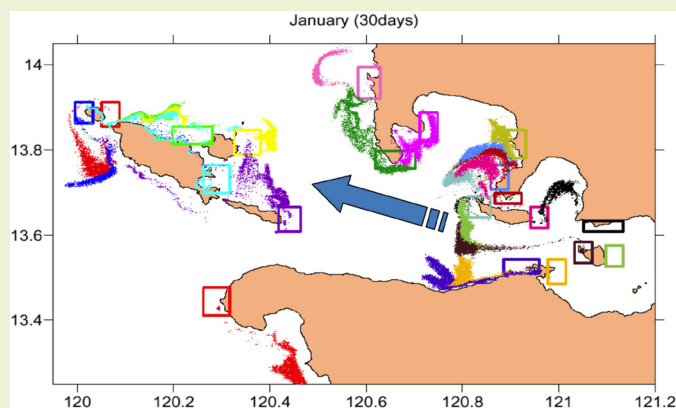


Figure 2. Simulated larval dispersal patterns.



often depend upon replenishment from outside areas. The prospects for long-term viability as well as fishery benefits are diminished if the source is removed or depleted.

The results from the studies were used as basis in rectifying and establishing new MPA sites in the Verde Island Passage. New information (e.g., presence of coral reefs, accurate coordinates, and actual size in hectares) was used to correct the profiles of the existing areas to be protected and conserved.

The body of scientific knowledge was important particularly in educating the communities. It provided the fishers and local leaders a different perspective on the interconnectivity between sites and their importance to marine conservation. Principally, it afforded greater appreciation among the local fishers of the significance of the MPAs in their locality, their linkages with the MPAs of adjacent municipalities and fishing grounds, and the necessity to protect bigger areas beyond their jurisdictions (box 3).

## Box 3: SCIENCE-BASED MANAGEMENT

As in the identification and establishment of MPAs, scientific information should drive the management of MPA networks; biological information such as profiles and migration patterns of species should be the basis in the design of a resilient ecological MPA network. As experts have discussed and concluded during the East Asian Seas (EAS) Congress in 2009: biological information helps to design an effective and efficient network of MPAs, and should be the basis in expanding managed sites as needed to help secure critical habitats.

Based on the foregoing, experts proposed that MPA networks should build upon existing MPAs towards better MPA sizes and connectivity; streamline of existing networks rather than create new networks; and mainstream MPAs within ICM as MPAs cannot exist in isolation without the management of externalities or the effects felt outside the MPA.

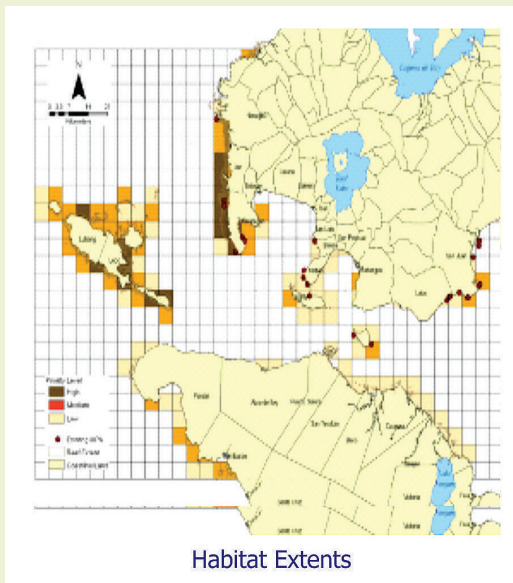


Figure 3A. Extent of habitats. Maps and ranks (from high to low) the distribution of habitat (corals, sea grass, mangroves) and spatial extent that can be declared as protected areas.

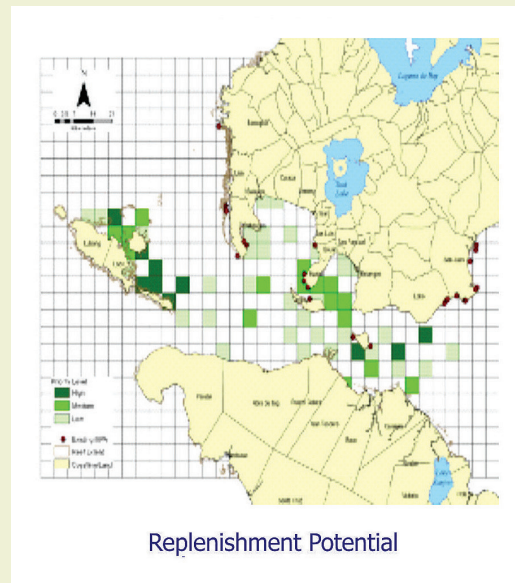


Figure 3B. Replenishment potential. Based on the extent of habitats within the area, this shows the potential sources of fish larvae (and other organisms) which need protection.

### Box 3: (continued)

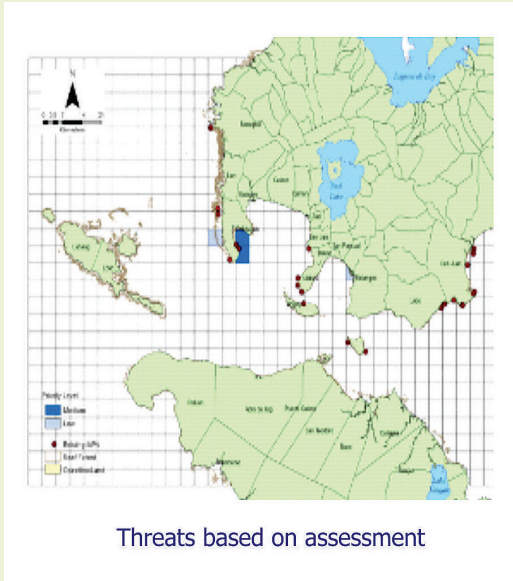


Figure 3C. Threats based on assessment. A composite ranking of threats needed for selection, management and monitoring of MPAs.

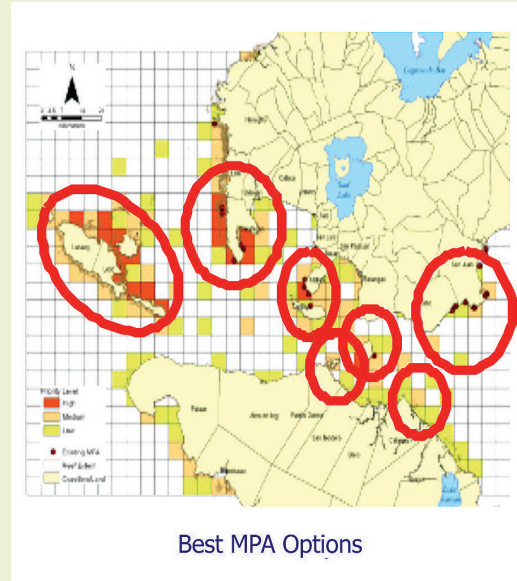


Figure 3D. Best MPA options. Based on the extent of habitats and potential replenishment; maps the best area where to declare a marine protected area.

#### Establish a mechanism for improved governance

The Batangas Marine Protected Areas (MPA) Network is a multi-sectoral network consisting of government and nongovernment organizations, people's organizations, and academic institutions bound by the terms and conditions of a Memorandum of Agreement (MOA) (fig. 4). The MOA aims to support MPA actions through complementary collaborative efforts at the local, regional, and national levels. The MOA was formulated in accordance with the Philippines Marine Sanctuary Strategy (PhilMarSaSt), which seeks to contribute to the improvement of MPA management effectiveness of achieving at least 10% full protection of coastal areas by 2020.



Figure 4. Signing of Memorandum of Agreement Batangas MPA Network.

To facilitate the operation of the MPA Network, both officially and legally, the Saligang Batas (Constitution and By-Laws) were formulated and approved by the Network through a resolution. Stipulated in the Constitution and By-laws is the vision, mission, goals, policies, functions, and responsibilities of each member and officers of the Network.

#### Develop short-term MPA Management Plans with targeted goals and actions

Network members formulated operative management plans for their respective MPAs (fig. 5). In addition to addressing the reduction of threats on biodiversity from resource use conflicts and natural occurrences, the plans included setting up and operationalizing a representative management council, organizing and mobilizing of communities, delineating

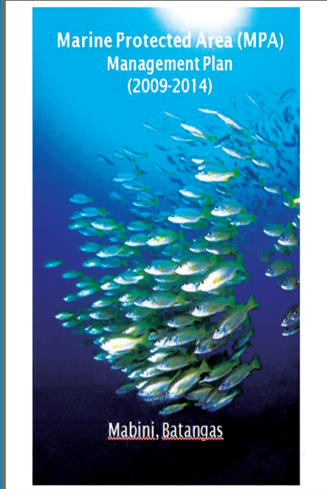
 <p>Marine Protected Area (MPA) Management Plan (2009-2014)</p> <p>Mabini, Batangas</p>	<p><b>Mabini Marine Protected Area (MPA) Management Plan (2009-2014)</b></p> <p><b>Contents</b></p> <p><b>Chapter I.</b> Profile of Mabini Marine Protected Areas and the Sanctuaries</p> <p><b>Chapter II.</b> Existing Laws and Policies Governing the Marine Protected Areas and the Sanctuaries</p> <p><b>Chapter III.</b> Management Plan on the Marine Protected Areas and the Sanctuaries</p> <p><b>Chapter IV.</b> Implementation of the Plan</p> <p><b>Chapter V.</b> Monitoring and Evaluation of the Plan</p>
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Figure 5. A typical table of contents of an MPA management plan.

MPA boundaries and zoning of approved activities within and adjacent to the MPAs, establishing of user fee systems, and implementing of information and education campaigns.

**Maintain public education, communication and awareness building programs**

Inadequate knowledge and understanding on the importance of the MPA and the sanctuaries cause people to do things or activities that are detrimental to the natural growth and development of the areas. Thus, all stakeholders and the people of the city/municipality in general, should be informed, educated and be made to take on the ideas of nurturing, managing and protecting the marine



Figure 6. Information campaigns were also conducted to increase public awareness.

protected area and the sanctuaries declared within the Province. The concern and commitment of the people must be obtained and mobilized for a concerted action on the sustainable development of the MPA and the sanctuaries.

The conduct of intensive and continuous information campaigns through lectures and by distribution of reading materials to increase awareness on environmental protection and sustainable development were undertaken (fig. 6). Signage along the road pointing to the MPA and the sanctuaries directing people to the site where the MPAs were situated were also installed, through a collaborative effort of CI-Philippines, PG-ENRO, and the concerned city/ municipality.

**Monitor, assess and report on the impacts and benefits derived from the MPA network**

Regular biophysical and socioeconomic monitoring was done annually to assess the health of the marine ecosystem, including the study of adjacent barangay's local economy and resource utilization in the coastal community. Permanent biophysical monitoring sites were also established for the conduct of reef surveys, which include the monitoring and identification of fishes, invertebrates, and corals.

In addition, perception surveys were conducted regularly to gauge the level of awareness of the stakeholders, their perceived benefits from the MPA, their perception on the functionality of the management and their willingness to



support the program. The Network was appraised of the result of the survey. The designated coordinators in turn implemented action programs to address the weak points in achieving an effective management of the MPAs.

### **Reward to incentivize**

To generate sustained interest among the implementers at the city/municipal level, the Provincial Government of Batangas with the support of CI-Philippines established an incentive scheme—the conduct of Recognition Awards for MPA Development Plan drafters and implementers. The awards not only recognized but also popularized good MPA governance practices and performance across members of the VIP MPA Network in Batangas coastal city/municipalities. Aside from facilitating transparency and incentives that promote accountability of the management bodies, the impacts and benefits derived from such efforts helped promote the significance of MPAs.

### **Implement regular and deputized patrols**

Management of MPAs requires an enforcement system for compliance. In the case of Batangas, this responsibility falls on the Bantay Dagat (Sea Patrol), a group of volunteer fishermen from coastal barangays who regularly patrol the municipal waters against illegal fishing, duty bound to execute all policies, rules and regulations. These Bantay Dagat members are legitimate enforcers, deputized by the Philippine Department of Agriculture under the Bureau of Fisheries and Aquatic Resources (BFAR) Office subject to undergoing the corresponding training required. Having been deputized by BFAR, they are respected and recognized by the Municipal Governments to conduct or execute their operational plans in coordination with Philippine National Police (PNP) and PNP Maritime presently.

## Results

### **Increase in both size and number of MPAs**

From a baseline of 445 ha of No take Zones and 286 ha of Buffer Zones without clear resource use and contentious policy enforcement in 2008, the Batangas Marine Protected Area Network expanded its MPAs to 1,924 ha within a span of four years. The 38 MPAs cover 1,400 ha of coral reef and seagrass and 523.50 ha of Mangrove Forest Conservation Areas. While management and enforcement of these MPAs are being improved, other municipalities have likewise initiated the establishment of new sites. By 2014, 43 MPAs have been added covering an area of 2,074 ha (mangrove 567 ha; coral reef/seagrass 1,507 ha).

The Network paved the way for enhancing tighter coordination among stakeholders. Strict enforcement of local ordinances and fishery law lessened incidents of illegal fishing. Over time, spill-over effects from the MPAs have been observed; that is, these sanctuaries are beginning to provide benefits not only to the host municipality but even the nearby areas.

### **Sustainable financing**

The MPAs are contributing to the tourism industry of local governments. The local governments enacted a Unified Conservation Fee ordinance to finance the management and maintenance of tourist attractions. Fees are collected from divers and shared between the municipal governments of Mabini and Tingloy. Dive fee amounts to PhP 200/per day and an annual fee of PhP 3,400 for guests; Mabini/Tingloy residents pay PhP 1,500/annually. The fees are set aside as a trust fund, 85 percent of which is intended solely for the conservation efforts in MPAs and 15 percent goes to the general fund of the local government units.

In addition, the MPA Network participating city/municipalities, recognizing the importance of MPAs, increased their appropriation in support to the programs and projects along with the Provincial Government allocation for environment from PhP 4.97 million in 2008 to PhP 14.135 million in 2014.

# Lessons Learned

1. **Science plays a major role in the establishment of effective network of MPAs.** Identifying areas to be declared as protected and conservation zones needs to go through assessment, pinpointing the extent of habitats, threats on the area, and replenishment potential. These parameters are needed to select the best locations for MPAs. The understanding of the scale of MPAs in terms of biodiversity, conservation and management is vital to the effectivity and success of networks. The use of maps to translate scientific information is effective in convincing various parties to be part of the MPA network.
2. **The ICM program contributed to a successful and sustainable MPA network.** The ICM system provided the avenues where stakeholders can act collaboratively through inter-LGU arrangement, enacting joint fisheries law enforcement, and the establishment of bay management councils. The MPA management plans and the subsequent capacity enhancement of people are important to sustain protected area management. Effective enforcement requires coordinated teamwork. Through the Sea Patrols, the strict enforcement of local ordinances and fishery laws has lessened the incident of illegal fishing.
3. **Build strong partnerships.** Strong partnership and the coordination of management efforts — among municipalities along and across the national government agencies, NGOs, academic institutions, the private sector, and other organization and stakeholders in planning, implementation and enforcement — are needed to sustain protected area management.
4. **Ensure suitable livelihood opportunities/options are part of MPA network development.** Local community participation is difficult to get if MPA management does not integrate community development initiatives. Some of the MPAs have been turned into ecotourism ventures managed by people's organizations (e.g., "AngPulo" [Mangrove]) or by the dive site operators. With the increase in tourist arrivals, business plans have been developed, which created the opportunities for the communities to earn additional income: by becoming tour/dive guides and boatmen (servicing divers); being employed as crew and staff members in the resorts; selling souvenir items like bags and T-shirts; and offering food catering services.

## Keywords

MPA, MPA network, science-based management, biodiversity conservation, sustainable livelihood, sustainable financing

## For more information, please contact:

- Nancy Bermas, Sr. Country Programme Manager, PEMSEA ([nbermas@pemsea.org](mailto:nbermas@pemsea.org))
- Luis Awitan, Department Head, PG-ENRO, Batangas Province ([laawitan@yahoo.com](mailto:laawitan@yahoo.com))
- Loreta Sollestre, Environmental Management Specialist II and ICM Coordinator, PG-ENRO, Batangas Province ([lories\\_pgenrobatangas@yahoo.com.ph](mailto:lories_pgenrobatangas@yahoo.com.ph))

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PEMSEA Resource Facility

Tel.: (+632) 929 2992  
Fax: (+632) 926 9712

[info@pemsea.org](mailto:info@pemsea.org)  
[www.pemsea.org](http://www.pemsea.org)