1.0 INTRODUCTION

Volume 2: Management Plan is one of seven volumes that comprise the overall Subic Bay 'Protected Area Management Plan' (PAMP).

In addition to the above, the PAMP is supported by 15 volumes of Resource Inventory Reports. Each of these focuses on a separate aspect of the biophysical and socio-economic setting of the Study Area. The resource inventories therefore contain the descriptive background of the PAMP.

The PAMP is specifically concerned with the establishment of, and strategic/policy framework for, managing the Protected Area.

The PAMP presents comprehensive advice and guidance on the biophysical character in the Subic Bay Protected Area (SBPA), the land use and jurisdictional background of the regional setting, and the establishment and management of the Protected Area and its associated buffer area.

1.1. Origins of the Management Plan

In 1992, the U. S. Navy withdrew from their base at Subic Bay leaving an airstrip, port facilities, and a fully functional infrastructure for a small city. Shortly thereafter, by virtue of its infrastructure and proximity to Manila, Republic Act 7227 designated the former naval base and parcels of surrounding land as the Subic Bay Freeport Zone. Besides the extensive facilities, the zone encompassed undeveloped beaches, mangrove swamps, coral reefs, and many thousands of hectares of tropical rain forest that have been largely protected from development. The indigenous inhabitants of the forest, the Aeta, have continued to live in or near the forest through these changes.

Subsequently, SBMA established the Subic Forest Watershed Reserve (SWFR) to serve as the nucleus of the proposed protected area. The SBMA then set about the challenging tasks of simultaneously balancing future development with the protection of its valuable natural resources. In August 1999, SBMA hired URS Woodward-Clyde, Philippines (now URS Corporation), to develop a Protected Area Management Plan, in accordance with the National Integrated Protected Areas System. It adopted the PAMP in 2001.

2.0 VISION, MISSION AND GOALS

2.1. Vision

The vision for the PAMP was developed through the stakeholder process undertaken during the PAMP project workshops in 2000. The development of the vision statement involved presentation of a preliminary statement prepared by the PAMP study team to Stakeholder Workshop No. 2 (June 2000). It was debated in special workshop sessions and in the open workshop forum. The final vision statement is as follows:

Vision Statement

The vision statement for the SBPA, as devised during the public workshops and subsequently endorsed by workshop participants, is as follows:

> "Healthy ecosystems conserved and enhanced to provide the full complement of human use and ecological values at levels that are sustainable for current and future generations; planned and managed with stakeholders involvement."

2.2. Mission

The mission supporting the PAMP is as follows:

> "To provide ongoing custodianship of the SBPA with the collaboration of all stakeholders, to permanently protect the ecosystem values while allowing permissible uses, and ensuring the maximum benefits to local, national and international community, in an economically responsible manner".

2.3. Goals

The goals of the PAMP were derived from the various stakeholder workshops that were held in the course of the planning phase of the project. The detailed list is provided in the Appendices to the PAMP.

To protect and maintain a healthy ecosystem that is sustainable and can continue to support high biodiversity, it must:

- Maintain all vital natural processes such as water systems (flows and water balance), water quality, and soil stability and fertility
- Retain/preserve habitats and vegetation
- Protect flora and fauna especially the endemic
- Restrict harmful impacting human activities
- Restore and rehabilitate degraded sites and environments
- Provide alternative sources of livelihood

- Avoid conflicting uses of resources
- Ensure that the ecosystem and all its elements are sustained and sustainable
- Acknowledge the responsibilities of the community (stakeholders in particular) to the SBPA
- Involve the communities within and without the SBPA in the planning and management of the SBPA
- Ensure statutory compliance and adherence to the law by all concerned
- Ensure that planning and management span a period of no less than 50 years

3.0 SUMMARY OF ISSUES, THREATS AND OPPORTUNITIES

3.1. Introduction

This chapter presents a summary of the issues, threats, and opportunities associated with the SBPA. It commences with a brief explanation of the history of Subic and an overview of the Philippine ecosystems.

3.1.1. History of Subic Bay Region

Subic Bay is set in what used to be a remote and rugged coastal portion of western Luzon Island. For many centuries this mountainous area was the ancestral homeland of the Aeta peoples. Prior to recent times the landscape was dominated by a magnificent rainforest reaching unbroken from the highest peaks and ridges of the volcanoes down to the ocean foreshores and shoreline of Subic Bay.

Much of this magnificent rainforest ecosystem remained intact until the 1900s. However, by the end of the 20th Century the area of evergreen tropical rainforest had dwindled to a mere fraction of its former extent. The SBFZ contains the remnant of a unique forest ecosystem that is different from all other remnant rainforests of Luzon.

US President Theodore Roosevelt in 1907 designated certain parcels of land in Subic as the Subic Naval Reserve. It was to become the largest American naval installation outside the US. While the US Navy undertook both infrastructure development and logging activities over much of the next 85 years, the US naval presence restricted access into the area, even for indigenous tribes. This lead to the preservation of an important enclave of rainforest from the mountains to the seacoast. In 1992, the US presence in the country ended.

The resulting ordered development and excellent infrastructure left by the Americans provided the opportunity for the modified portions of Subic to be designated as a major 'freeport' enterprise zone.

In February 1992, the passage of Republic Act No. 7227 created the Subic Bay Economic and Freeport Zone (SBFZ) under the control of the SBMA. Proclamation No. 532 expanded the boundaries of the SBFZ to include adjacent municipalities encompassing an area of approximately 67,452 hectares. It mandated the SBMA to identify the natural areas and resources under its jurisdiction that require protection and management. Consequently, SBMA initiated the Subic Bay Protected Area Management Plan project.

3.1.2. Natural Ecosystems in the Philippines

Natural rainforest ecosystems in the Philippines have greatly diminished in extent over the past 100 years. The remaining areas are fragmented and are subject to various forms

of exploitation for timber, food, and medicine. Additionally, these are exposed to natural disturbances such as cyclones or volcanic eruptions. Because of the limited extent and generally disturbed condition of these areas, several species that exist in these areas have small populations and are threatened with extinction.

Some species are able to cope in areas of human development, foraging for food or moving through these areas to reach other habitat patches. The mosaic of habitats within the SBFZ and their importance to plant and animal species is now recognized as important.

While Protected Areas may conserve core areas of environmental value, ecosystems function well beyond their borders requiring establishment of various levels of general protection on a broader scale. Flora and fauna require protection from a diverse range of threats on a regional basis.

3.2. Summary of Issues

In general terms the major issues concerning the Protected Area and wider region are outlined as follows:

3.2.1. Consolidation versus fragmentation

The most important single issue for the Protected Area is the need for the remaining contiguous concentration of intact ecosystem to remain unchanged, and to avoid slow erosion of the total resources by incremental development of small and large areas within its defined borders. This applies equally to both the terrestrial and marine environments of SBPA.

Each small incursion by development may not seem significant by itself, but even if each loss of natural environment were offset by an equal expansion and addition to the Protected Area elsewhere, the final fate of the Protected Area would be its eventual demise.

The Protected Area is already too small spatially to support some of the fauna it contains without proactive management. A reduced area would not be tenable for many more species.

Loss of area is not just through excisions of land on the boundary (due to boundary revisions). It is also consequent on the use of small parcels within the Protected Area itself, and in particular the implementation/construction of linear infrastructure (e.g. roads, pipelines, transmission lines, etc).

3.2.2. Conservation Values

The conservation values of any area of tropical rainforest are extremely high. This is because they are ever diminishing environments. Even a relatively small area such as the

SBPA still contains many species and ecosystem functions that are yet to be discovered and understood. Such areas represent a vanishing 'living laboratory' with high potential value to research, education, and economics. It is imperative to conserve these values both for their intrinsic worth and for the benefits they provide society.

3.2.3. Biodiversity Protection

The biodiversity of tropical rainforest environments is exceptionally high. Consequently, the Philippines is regarded as one of the cradles of marine and terrestrial plant and animal life. Its geological history, geographic position, and climate have contributed to the evolution of an ecosystem with a high incidence of endemism. The intact areas of rainforest in the Philippines are therefore regarded as significant global biodiversity 'hot-spots'.

The SBPA contains extremely high biodiversity values and high species endemism. The principal issue of concern here is that a rainforest environment of high quality is in very close proximity to a large concentration of human population and intense land use and economic activity. Maintenance of the ecological balance is dependent on exceptionally good protection from all sources of impact. Modification and change originating from human activity, whether deliberate or unwitting, will erode the rainforest ecosystem and consequently reduce its component elements (populations, habitats, species variation, etc).

Ironically, if successfully managed and protected (even enhanced) the ecological values could in fact contribute greatly to the overall economic prosperity of the area.

3.2.4. Habitat Rehabilitation Needs

Owing to the proximity of intense land use adjacent to, and within small portions of the Protected Area, past activities have resulted in the degradation or destruction of localities, habitats and landscape. In addition, occasional natural events, such as the eruption of Mount Pinatubo and fires started by lightning have impacted on the rainforest and marine environments.

Management of the Protected Area requires regular, systematic repair and rehabilitation of habitats of value. This particularly applies to small niche habitats, many of which happen to be on the periphery of the Protected Area, or otherwise physically exposed to human impact, for example:

- Mangroves
- Bamboo groves
- Beaches
- Coral reefs and nearshore shallows
- Streams and rivers

3.2.5. Management Constraints

Protected Area management in rugged terrain and open water areas in close proximity to large concentrations of human population requires considerable deployment of resources, in terms of finance, administration, equipment and manpower. A common issue worldwide in protected area management is access to sufficient levels of reliable on-going funding.

Another constraint is ruggedness and remoteness of the terrain/seascape posing a serious obstacle to management accessibility.

Finally, administrative complexities in the form of competing jurisdictions between different agencies and municipalities have significant limiting influence on achieving effective management.

3.2.6. Local Interests, Rights and Concerns

The complex political, jurisdictional and socio-economic setting of the SBFZ presents a wide variety of local interests, rights and concerns, many of which affect the potential welfare of the Protected Area.

Foremost are the implications of the Aeta 'Ancestral Land Title' that extends over much of the Protected Area. The ancestral title should be viewed as a positive local factor for the future of the PA; the ultimate concerns of the Aeta are for the protection and retention of the rainforest environment and the many habitats it contains (e.g. mangroves, bamboo groves, streams and rivers, upland forest, etc).

More problematic issues are associated with private business interests: private land ownership, speculation and sundry proprietary interests (e.g. mining claims), whether these have legal basis or not.

In the preliminary establishment period of the Protected Area there is the related problem of:

- the existence of numerous development intentions that are in direct conflict with the Protected Area goals and objectives and which must be appropriately resolved;
- a legacy of environmentally unsound practices that should be changed (e.g. infrastructure developments that are inherently destructive – road construction through mangroves); and
- attitudes and cultural frameworks towards environmental values that have to be changed.

Many of the organizations and individuals including stakeholders tend to overlook the imperatives of environmental protection in favor of economic development. These should be made to realize that in the long-term, the deterioration of the PA will lead to dire consequences not only to the area but the country as well. The maintenance of high

quality environmental standards and the successful management of the PA will yield benefits heretofore unimagined. To achieve this, however, require the cooperation and commitment of all concerned.

3.2.7. Development Potential, including Tourism

There is considerable potential for appropriate 'park oriented' development in the Protected Area. The configuration of the Protected Area and many of its parts that have been previously modified or developed provide opportunities for development. This is both a positive and negative issue.

A park must provide the opportunity, within specifically designated management zones, for the development of appropriate park uses (e.g. basic facilities, interpretation centers, tourism/recreation venues, ecotourism trails, essential infrastructure, etc).

However, many sites in the SBPA, prior to and at the commencement of the PAMP project, were being used for a variety of purposes many of which conflict with Protected Area objectives. The negative uses should in due course be relocated to sites external to the Protected Area.

3.2.8. Changes Required in Legal Status

Establishment of the Protected Area requires that jurisdictional conflicts and overlaps should be resolved including land tenure. Land parcels in strategic locations should be secured under appropriate government or park control.

Other legal matters will involve the resolution of outstanding legal claims, mining leases, existing contractual arrangements with government (SBMA) deemed inappropriate, as well as the creation of powers to fund, enforce and delegate powers for management and control of the Protected Area.

3.2.9. Coastal and Forestry Resource Management Issues

The PAMP must overcome the challenge posed by two very different environment types: the forest and coastal/marine environment, each of which has unique management requirements. Likewise the pressures placed on the two resources are also different.

The issues associated with the coastal and forestry resources are that the communities in and around the SBFZ mainly source their livelihood (e.g. fishing, forest harvesting) from these. The PAMP must allow for sustainable use of the natural resources for legitimate livelihood purposes, where and when it is appropriate to do so. This is a major management challenge.

3.3. Threats

The economic value of the natural resources, proximity of population, and land use give rise to a range of threats to the survival of this remnant terrestrial/marine ecosystem.

The general threats include many of the common pressures obtaining in the other regions of the Philippines. They include:

- population increase and in-migration of new settlers and squatters;
- land use intensification and spread of both infrastructure and settlements;
- exploitation and speculation by wealthy power groups which is in defiance of good planning and management practices;
- political pressure and local power dynamics;
- crime and corruption;
- vegetation clearing and land conversion;
- simplifying vegetation complexity and species biodiversity, particularly in areas of remnant forest and riparian vegetation;
- infestations of weed and pest species, and introduction of exotic species (plant and animal);
- increased physical impact, including fire, erosion, general human use, modification of natural drainage;
- illegal hunting and harvesting of native plant materials;
- unplanned and uncontrolled disposal of solid wastes;
- release of contaminants, effluents and emissions (including noise) into the environment;
- hunting/poaching wild animals;
- poor land use management and agricultural practices; and
- poor land use planning and development control.

In addition to these common threats, a number of threats specific to Subic Bay exist (see Volume 1, Section 4). These are summarized as follows:

3.3.1. Geophysical

Earthquakes, volcanic activity and mass movement all present significant hazards to the region. The effects of the ash 'fallout' from the Mount Pinatubo eruption still scars the rainforest and coral reefs of Subic. Earthquakes can cause liquefaction of water-saturated alluvial deposits with consequent structural failure, and deep soils on sloping ground are highly prone to erosion and mass movement if exposed through clearing.

3.3.2. Terrestrial Biology

There is currently insufficient knowledge or research into many fauna species of the region and the fauna values of many habitats. This includes a lack of understanding of the rare and endangered species within the Subic Watershed, Redondo Peninsula and Mount Balakibok areas. The same can be said for the flora of the region. In a situation where

rapid change and destruction of many areas of remnant vegetation take place, the need for effective ongoing monitoring is high.

Of the major physical threats to the biology of the region, fire and illicit timber cutting are the most destructive events.

3.3.3. Forests

The remaining forests are at constant threat from various illegal activities, particularly illegal logging and competing legal claims (e.g. minerals/mining, fire, pasture and tree farms)

3.3.4. Marine and Coastal

The marine environment is currently greatly affected by the sedimentation from the terrestrial catchments, garbage and general waste originating from land use, and untreated wastewater discharge.

Also of critical importance are the social and economic threats. These include deficiency of laws to regulate fishing and fishing practices, extreme pressure on fisheries, and lack of small-scale financing for fishermen. Additionally, there is extensive piracy and a corresponding lack of policing/enforcement.

Another threat to the marine and coastal environment stems from highly conflicting attitudes towards the environment in general, and coastal resources in particular. This is most obvious with respect to the conversion of coastal sites for commercial and industrial purposes.

3.3.5. Livelihood

A substantial aspect of the protection of the Subic environment relates to the continued existence of sustainable livelihood. This includes traditional dependency on sustainable use of forest resources upon which a significant percentage of the poorest members of the population rely on for survival. As the condition of the marine, aquatic and forest resources decline greater hardship is placed on the community, with corresponding greater pressure placed on the remaining resource base.

Other issues associated with livelihood include lack of water, limited markets and low prices for products and limited product processing (little innovation, change, and 'value adding'). These are all aggravated by a lack of all types of support (educational, training, supervision, outreach, etc). The poorest in the community are also hampered by a general lack of access to resources and to tenure of land.

All these factors exert pressure on the SBPA environment from that portion of the community that is generally preoccupied with survival, existing on the margins of

society, and taking advantage of anything in the open environment that helps them to survive.

3.3.6. Land Use

In the wider region land use threats stem from the existence of anomalies between the land classification and regulatory system versus actual land use and widespread legal cadastral anomalies concerning many jurisdictions and gazetted areas.

The SBFZ presents significant physical and land management constraints on development. Inspite of these, there are many examples of land use on steep slopes that are susceptible to erosion.

Agricultural land use is progressively suffering from the gradual loss of productive soils, either through displacement by higher return activities, or through soil degradation.

3.3.7. Built-up Environment

The principal threat resulting from built-up zones includes uncontrolled spread, unplanned growth, development over unsuitable terrain and landforms, poor or non-existent urban design and the absence of basic services (e.g. urban wastewater treatment).

3.4. Opportunities

The opportunities for benefiting the region and community of the Subic Bay Freeport Zone through environmental protection and the implementation of the PAMP in particular, are considerable. In summary, they are:

3.4.1. Biophysical

- retention of unique and rare coastal and forest landscape, the special values of which include green canopy rainforest extending over a number of entire surface catchments from the upper ridges and hill/mountain tops down to the ocean foreshore;
- protection of an extensive and rare rainforest ecosystem with a high level of endemism;
- protection of major habitats and minor habitat niches supporting a variety of rare flora and fauna species;
- maintenance of regional biodiversity;
- maintenance of food webs that are essential to the sustainability of the rainforest and marine ecosystems;
- protection of individual animal plant species and their discrete populations;
- maintenance of natural processes in the landscape that support the natural ecosystems and provide important resources for society (i.e. surface water supply, air quality, etc);
- maintenance of good water quality (surface, ground and marine);
- minimizing the risk of soil erosion and sedimentation of surface water bodies;

- retaining large areas of vegetation/forest cover with corresponding beneficial influence on microclimate modification (i.e. reducing glare, reduction in 'thermal islands' during the dry season); and
- retention of physical/natural heritage of the region.

3.4.2. Socio-Economic

- retention of high environmental quality and unique landscapes intact that will strengthen regional identity, and enhance the image of the Subic Bay region;
- preservation of physical/historic heritage of the Subic Bay area that will enrich the community and become a significant national and international tourist destination;
- adding value to the historical sites within the area (i.e. US naval base – restricted security zone) and promotion of the various sites as attractions in their own right (e.g. Grande Island, Naval Magazines, etc);
- developing an integrated regional land use, social and economic development strategy that is integrated into a regional environmental protection strategy based around the PAMP;
- presenting the SBFZ as a desirable destination for investment in commercial enterprises and a location offering high quality of amenities and lifestyle for the families of management and other employees;
- attracting ongoing international funding for conservation research, studies, special science initiatives, and community development programs, using the various attractions and assets of SBFZ as 'living laboratory';
- demonstrating an innovative approach to the integration of indigenous peoples heritage interests with both physical and economic management objectives of the SBFZ; and
- ultimately promoting the SBFZ as a world class business/lifestyle and freeport economic development zone.

4.0 CONCEPTUAL FRAMEWORK and SBPA DESCRIPTION

The Implementing Rules and Regulations (DAO 25, S 1992) of the NIPAS Act provides the principal guidance for the establishment of the SBPA. The IRR specifies the requirements of the law and sets out basic categories and performance criteria to be met in developing a Protected Area.

The process of establishing the SBPA first required a systematic evaluation of the overall natural resource values of Subic Bay, followed by the design and adoption of a conceptual framework. It also required consideration of the social and land use setting, and the implications of local and regional economic activities. This section describes the conceptual framework used in the PAMP project to establish the SBPA.

The process of developing the conceptual framework and validating the various elements also entailed a series of five stakeholder workshops. The workshops involved the significant participation of many diverse stakeholder representatives. All workshop proceedings were recorded and documented. Views, information and advice received during the workshops were subsequently incorporated into the development of the SBPAMP.

4.1. Development Plan Framework

4.1.1. Background and Inputs

A series of logical steps were taken in the overall process of identifying, justifying and delineating the SBPA. These were as follows:

- undertake resource inventory;
- confirm general identification of protected area;
- establish boundary selection criteria;
- identify SBPA boundary and internal management zone; and
- establish management needs and principles.

Resource inventory
The resource inventory was undertaken in the initial stages of the program and involved the work of a number of scientists from various scientific disciplines. Fieldwork teams undertook a region wide appraisal of the core natural environment zones of the SBFZ, both terrestrial and marine. Baseline data were collected, and 15 volumes of resource inventory were subsequently prepared and published.

Confirm identification of Protected Area
With this extensive information base and the comprehensive understanding of the region it provided, the PAMP study team was able to focus on the principal area to be protected. The proposed Protected Area in the Triboa/Ilanin Bay area was confirmed, subject to more detailed definition of the boundary. Two other major areas in the SBFZ, one on

Redondo Peninsula and the other in the Mount Balakibok area, were also identified as having important protected area 'core zone' values worthy of further consideration in the future.

The next step involved the development of an overall framework to guide planning.

4.2. The Plan Framework

The resource inventories established that the ecological and biodiversity values contained in the Subic Bay Protected Area are exceptional and worthy of the highest level of protection. However, it was also clear that these values extend beyond the core area and that the linkages and dependencies of various flora and fauna extend correspondingly beyond the core area. It was therefore necessary to develop a planning framework that would address the wildlife management and environmental protection at varying levels of intensity within and without the SBPA. The broader concern involves both the issues of an immediate buffer to the SBPA and natural resource and habitat values further afield.

The plan framework deals with the need for:

- various levels of protection and management intensity according to site conditions and land use;
- a range of management tools and controlling instruments according to differing needs; and
- involvement of various stakeholders and government agencies according to location and jurisdiction.

The plan framework draws upon the idea of a management zonation radiating outwards from the ecological core to the external land use and socio-economic setting. Thus, core area designation provided the strictest protection of natural ecosystems (forest and marine) surrounded by zones where human uses are increasingly permitted so that areas of intensive human use do not occur adjacent to sensitive natural ecosystems. This sequence of related zones reflects the general concept of the more valuable ecological and environmental values identified and situated at the center of the SBPA model with increasing accommodation of activities, human uses, and land use activity progressively to the margins of the SBPA. The buffer functions as additional protection to the SBPA.

This concept of zoning protection levels did not apply in all locations because areas of human development were already in places next to important ecosystems and natural corridors connecting them. Riverbank and mangrove habitats in coastal zones are prime examples of such exceptions. Figure 1 presents a graphic depiction of the 'generic' circular SBPA with a series of concentric zones. The series of zones are titled according to the various management zones stipulated under the NIPAS Act. The outer zone is denoted as the Buffer Zone. Beyond the buffer is the external land use and economic environment of the region. The model explicitly recognizes the SBPA extent over terrestrial and marine environment alike.

Figure 2 illustrates the range of tools that would logically apply to the various zones within the model, reflecting different management needs that would be met at the differing levels of use intensity, natural values and applicable stakeholder influence.

Collectively these tools, or mechanisms, represent the potential for an integrated management system that extends beyond SBPA management to the environmental protection of the wider SBFZ region.

While this management plan is confined to the SBPA, the need for reinforcing policy and environmental management outside the SBPA is recognized for the long-term maintenance of the SBPA. This especially applies to the marine portion of the SBPA that is essentially an open system. The natural processes of the marine system are directly part of, and influenced by, activities and events occurring in the wider system, and cannot be protected by the designation of legal jurisdictions and social boundaries alone.

This framework provides the first step in the development of criteria for the selection of boundaries.

4.3. Development Criteria

4.3.1. Guidance Provided in the NIPAS Act

The designation of the SBPA and the internal management zones should take into account the provisions of the NIPAS Act (1992). The NIPAS Act provides the following instructions on protected area management zoning:

"*To provide flexibility in management, each protected area and its attached buffer zones shall be divided into one or more of the categories listed below. Cultural communities, tenured migrants, other existing protected area users and local governments shall be a part of the decision making process in zone establishment and management planning. Management objectives and strategies shall be developed for each zone and specific approaches and technologies identified and implemented in accordance with the strategy to meet those objectives. Provided, that the zoning of a protected area and its buffer zones and management prescriptions within those zones shall not restrict the right of indigenous communities to pursue traditional and sustainable means of livelihood within their ancestral domain unless they so concur." (DAO 25, Chapter 4, sec.10, 1992, page 20)*

Figure 1. PAMP Framework

Figure 2. Integrated Tools

The NIPAS Act defines a few of the terminology employed such as:

" Sustainable' shall mean not causing permanent or long term diminishment or qualitative degradation of biological species or of other resources extracted or disturbed; 'traditional' shall mean using no power machinery in the extraction process and consistent with historically customary techniques of production; and 'commercial' shall mean involving market sale in volume or value in excess of that required to maintain a basic subsistence for workers and their dependents."

NIPAS Management Zones

The NIPAS Act then describes the following management zone categories:

- Strict Protection Zone
- Sustainable Use Zone
- Restoration Zone
- Habitat Management Zone
- Multiple-Use Zone
- Buffer Zone
- Cultural Zone
- Recreational Zone
- Special Use Zone
- Other – may be used in the management plan and approved by the DENR Secretary

Strict Protection Zone: areas with high biodiversity value which shall be closed to all human activity except for scientific studies and/or ceremonial or religious use by indigenous communities.

Sustainable Use Zone: natural areas where the habitat and its associated biodiversity shall be conserved consistent with the human management plan and with Protected Area Management Board (PAMB) approval:

- indigenous community members and/or tenured migrant and/or buffer zone residents may be allowed to collect and utilize natural resources using traditional sustainable methods that are not in conflict with biodiversity conservation requirements:
- research, including the reintroduction of indigenous species, may be undertaken;
- park visitors may be allowed limited use; and
- provided no clearing, farming, settlement, commercial utilization or other activities detrimental to biodiversity conservation shall be undertaken, the level of allowable activity may vary from one situation to another.

Restoration Zone: areas of degraded habitat where the long term goal will be to restore natural habitat with its associated biodiversity and to rezone the area to a more strict protection level. Initially, natural regeneration will be assisted through such human interventions as fire control and cogon suppression, and the planting of native species

including indigenous pioneer tree species as well as climax species. Exotic species (not native to the site) shall not be used in the restoration process. Existing houses and agricultural developments may be allowed to remain initially but would be phased out eventually.

Habitat Management Zone: areas with significant habitat and species values where management practices are required periodically to maintain specific non-climax habitat types or conditions required by rare, threatened or endangered species. Examples would be forest openings for the tamaraw or brushy forest for the Philippine tarsier or Parkia-bamboo for the giant fruit bats. Human habitation and sustainable use may be allowed if they play a habitat management role.

Multiple-Use Zone: areas where settlement, traditional and/or sustainable land use, including agriculture, agroforestry, extraction activities and other income generating or livelihood activities, may be allowed to the extent prescribed in the management plan. Land tenure may be granted to residents, whether indigenous cultural community members or migrants.

Buffer Zone: areas outside the protected area but adjoining it that are established by law (Section 8 of the Act) and under the control of the DENR through the Park Area Management Board. These are effectively multiple-use zones that are to be managed to provide a social fence to prevent encroachment into the protected area by outsiders. Land tenure may be granted to occupants who qualify. Buffer zones should be treated as an integral part of the protected area in management planning.

Cultural Zone: areas with significant cultural, religious, spiritual or anthropological values where traditional rights exist and ceremonies and/or other cultural practices take place.

Recreational Zone: areas of high recreational, tourism, educational, or environmental awareness values where sustainable eco-tourism, recreational, conservation education or public awareness activities may be allowed as prescribed in the management plan.

Special Uses Zone: areas containing existing installations of national significance such as telecommunications facilities, irrigation canals or electric power lines. Such installations may be retained subject to mutual agreements among the concerned parties, and provided such installations will not violate any of the prohibitions contained in Section 20 of the Act.

4.3.2. Identifying Areas and Boundaries

With the above information and guidelines in mind, the development of criteria for boundary selection followed. Identifying SBPA boundaries involved consideration of the following factors:

- outer boundary of the SBPA;
- boundary alignments of SBPA and internal zones;

- the identification of internal zones (core areas of value) and transition zones between identifiable zones; and
- identification of the core zones.

Additional inputs used in identifying the boundaries and zones included:
- resource inventory information (marine, terrestrial, fauna, flora);
- site assessment and field investigations;
- land use survey;
- policy review;
- consultation with authorities and stakeholders;
- air photo-interpretation;
- PAMP project study team internal workshop; and
- application of the selection criteria.

4.3.3. Subic Bay PAMP Selection Criteria

Initially, three order headings were used to provide a system of criteria for undertaking protected area boundary definition. These were as follows:

- **First** order categories (Biological, Functional, Social, Institutional, Economic, Legal)
- **Second** order categories (e.g. major subject headings referring to key considerations)
- **Third** order categories (e.g. key words that indicate the considerations and concerns pertinent to the criteria)

This criteria system was designed to provide a systematic approach to the consideration of various criteria in identifying boundaries. This includes not only the core area definitions but also the various sub-zones required under the NIPAS guidelines, and any other sub-zones considered essential to the management of the study area. The criteria identified are subordinate to, and to be integrated with, the comprehensive ecosystem analysis, identification of critical ecosystem sub-units and the food-web analysis. These are core activities of this study.

It should be noted that for discrete spatial localities or entities being referred to ‘in a general sense’, the term ‘area’ or ‘sub-area’ is used. The term ‘zone’ or ‘sub-zone’ is used in reference to localities or spatial areas fitting the NIPAS guidelines.

The three levels (or orders) of criteria used can be found.

4.3.4. Criteria Priority

Not all criteria rate equal importance. Hence, in using the selection criteria it was necessary to consider the relative priority of each. A priority rating was developed in the workshops. The broad rating agreed upon is illustrated in the following table.

Table 1 : **Summary of Major Criteria for Overall Protected Area**

1st Order Criteria	2nd Order Criteria	Essential	Desirable	Supplementary	Priority Rating 3=high 2=medium 1=low
BIOLOGICAL					
	Biodiversity	•			3
	Integrity	•			3
	Representative	•			3
	Heritage (physical)		•		2
	Security		•		2
FUNCTIONAL					
	Spatial		•		2
	Proximity		•		2
	Linkage, connectivity		•		2
	Manageability	•			3
SOCIAL					
	Heritage	•			3
	Usability		•		2
	Visual, landscape			•	1
	Icon, image			•	1
	Stakeholders		•		2
INSTITUTIONAL					
	Institutional	•			3
	Stakeholder interest		•		2
ECONOMIC					
	Developments			•	1
	Affordability		•		2
	Marketability		•		2
LEGAL					
	Law	•			3
	Policy	•			3
	Tenure		•		2

4.4. The Final Protected Area

The outcome of the series of steps and inputs outlined in the above section was the identification of the final Protected Area. The proposed SBPA was presented to the 3rd stakeholder workshop conducted in October 2000. This elicited comments and suggested modifications and final validation of the boundaries and various management zones.

The final Protected Area and internal management zones are illustrated in Figure 3. The surrounding Buffer Zone is shown in Figure 4.

4.4.1. Outer Perimeter of the Protected Area

The overall 'footprint' of the SBPA is illustrated in Figure 3. The outer SBPA boundary alignments are as follows:

- southern and eastern SBPA boundary runs as much as possible immediately adjacent to the Bataan Natural Park boundary as much as possible;
- a northern boundary extending west from near Mt Santa Rita towards Olongapo City and following the existing edge of the forested area, then going around so as to include the foot slopes of two taller topographic features, and avoiding inclusion of the Pastolan Aeta settlement;
- an alignment that largely accommodates the Pastolan Aeta Strategy Plan as presented to the 3rd stakeholder workshop;
- a western boundary in the vicinity of Olongapo City that runs along the edge of the built residential and industrial areas that abut the forested environment
- a marine boundary alignment that runs westward from the approximate location of the power station outward to Cubi Point and then back to Nagcaban Point, extending along the inland side of Subic Port District, around the southwestern side of the airport, continuing westward to the Cubi Point/Grande Island alignment, before extending in a southerly direction to include the marine environment in the vicinity of Grande and Chiquita islands;
- a marine boundary from south of Chiquita Island to the central landward point of Port Binanga Bay; and
- a final southern terrestrial boundary that extends northward along the inner foreshore of Port Binanga Bay, turning due east along the forest edge, thereby avoiding an area of intensive irrigated agriculture, then turning in a northerly direction and meeting up with the northwestern corner of Bataan Natural Park.

The final outer SBPA boundary includes many areas of highly built up environment and major infrastructure. This was decided and validated in the workshops. Consequently, some natural environments (e.g. mangroves and watercourses in the vicinity of Subic Gateway/Boton Sub-District) are included in the overall 'fabric' of the SBPA which would otherwise have remained outliers and unprotected.

Figure 3. Subic Bay Protected Area Map

Figure 4. Subic Bay Protected Area Buffer Zones

The internal features of the SBPA are as follows. (see Figure 3 – PA Management Zones)

Core Ecological Zone – Terrestrial (CEZ-T)

The CEZ-T extends over the most remote and highest elevated terrain in the eastern portion of the PA. Much of the southern, eastern and northeastern parts abut the boundary of the Bataan Natural Park. In fact, the configuration of the zone adjacent to Bataan Natural Park, in addition to the high ecological values and rugged remoteness of the area, are principal reasons for the designation of the zone.

The key factors in delineating the CEZ – T include the following:

- meets the majority of 2nd and 3rd order criteria under 'biological' criteria;
- protects the upper catchments of Malawaan, Binictican, Batan, Triboa and Binanga Rivers;
- directly connects with the greater area of the Bataan Natural Park;
- includes the highest elevation, most rugged and remote areas of the SBPA;
- includes the least disturbed (past and present) ecosystem values of the SBPA; and
- represents the physical, visual and conceptual core of the SBPA, without which the remainder of the SBPA would not be ecologically viable or credible.

Core Ecological Zone – Marine (CEZ-M)

The CEZ-M extends westward from Camayan and Binanga Points to the immediate west of the old US Naval magazine storage area, to include Chiquita Island and the southern coastal fringe of Grande Island. The designated area includes coral reef and biologically productive habitat associated with shallow coastal marine environment. Sub-sets of the CEZ-M include the Hidden Beach between Camayan Point and Binanga Point, and the approaches (immediate nearshore zone) in the vicinity of the turtle nesting beach to the north of Camayan Point.

The intent of the CEZ-M is to designate the highest conservation values portion of the SBPA into this core zone for purposes of maximum protection possible.

Sustainable Use Zone - Terrestrial (SUZ-T)

The SUZ-T extends over the major portion of the remaining terrestrial forest environment lying between the CEZ-T to the east and the foreshore of Subic Bay to the west. The SUZ-T also extends (wraps) around the edge of the CEZ-T and in effect creates a buffer of high conservation and low usage. The SUZ-T includes the remaining intact forest environment running down from the higher inland slopes down to the foreshore. Necessarily, this zone extends around several areas of intense development and small nodes of infrastructure and land use activity, as does the forest ecosystem itself. The importance of this zone 'footprint' is that it extends over all remaining forest not included

in the CEZ-T. The SUZ-T is also critical in landscape and scenic terms, providing the major visible forest backdrop to the SBFZ.

The SUZ-T also features a sub-zone defined as 'Forest Ecosystem Corridor'. This sub-zone identifies corridors of forest ecosystem that run from the CEZ-T down to the shoreline and Subic Bay waters through areas of largely unmodified forest. The corridors represent an extension of the core environment of the PA (the CEZ) and both illustrate and reinforce the concept of functional and biological linkage within the ecosystem, from the ridge tops to the marine environment. As such the Forest Ecosystem Corridors represent a more restrictive portion of the SUZ-T as far as use and activity is concerned. The most important single factor is that there should be no interference or obstruction of the continuous linkage represented by them. The only exceptions to this are the three special Recreation Sub-zone sites near Camayan Point. The area or boundaries of the sub-zone are not tightly defined, but instead indicate important spatial concept as a basis for ongoing management by the SBPA.

The intent of the SUZ-T is to secure the balance of unmodified and uncleared rainforest ecosystem in a low (sustainable) use zone where the prime objective is forest protection.

Sustainable Use Zone – Marine (SUZ-M)

The SUZ-M extends over the 'outer' portions of the marine part of the SBPA on either side of the CEZ-M, and in the vicinity of Nagcaban Point. The SUZ-M provides a buffer to zones featuring more important habitat value. It includes open water areas with less critical habitat values where higher levels of sustainable activity can occur.

The intent is to protect the marine environment and limit use and activities to acceptable levels.

Restoration Zone – Terrestrial and Marine (RZ-T) (RZ-M)

The RZ-T includes a number of locations with either partially or extensively degraded/modified environments, but owing to either their location or the habitat type involved, have a high priority for restoration. The areas include an extensive re-forestation area in the vicinity of the Pastolan community, mangrove communities on the foreshore, and portions of the former naval magazines. A number of non-specific restoration zones in the south of the CEZ-T are also identified. These are sites of illicit clearing and burning in the forest (swidden agriculture) and require restoration to forest habitat at the earliest opportunity.

It should be noted that no marine restoration zones are shown in the accompanying plan. However, locations will be identified on a need basis in order to nominate and undertake marine restoration when and where required. The marine restoration sites are likely to be small in area and extent.

The intent is to ensure that important habitats in strategic locations are rehabilitated and restored.

Habitat Protection Zone – Terrestrial (HPZ-T)

The HPZ-T extends over the important mangrove habitat areas within the PA. These are 'primary producer' ecosystems of great interest and scientific value. In addition, they are important habitats for a range of fauna (terrestrial and aquatic), and as such represent a vital ecosystem linkage between the terrestrial and marine environments. An additional nominated HPZ-T is the bat roost area, which has significance as a habitat of international importance. The HPZ-T zone also identifies and covers the major water courses that extend through the SUZ-T, regardless of whether the water courses extend into the CEZ-T or not.

The intent is to ensure special protection to these important habitat areas.

Habitat Protection Zone – Marine (HPZ-M)

The HPZ-M covers an extensive area of marine ecosystem in the Ilanin and Triboa Bays. This area could be considered a CEZ-M. However due to the existence of foreshore developments and existing activity nodes the total restriction of a CEZ-M is impractical. Hence, the priority is placed on marine habitat protection. Due to the partial embayments and shallow waters this portion of the marine environment is not particularly well flushed and is therefore potentially vulnerable to the effects of pollution entering the marine system. This is particularly important at this location, due to the integrity of the unique remnant coastal landscape that forms a reasonably well contained (i.e. discrete) visual catchment of the forested ocean foreshore. It is of heritage significance to the Philippines.

The intent is to ensure a high level of protection to the marine ecosystem in this specific location, and that this be coordinated strongly with the protection of the adjacent terrestrial forest/mangrove environment, and the appropriate (tight) control of foreshore development.

Recreation Zone – Terrestrial (REZ-T)

Within the SBPA there are existing recreation/tourism developments as well as formerly modified sites with excellent potential for appropriate recreational development. It is important to recognize both the legitimacy of existing appropriate recreational activities within the SBPA and the provision of additional sites suitable for eco-tourism and other nature-based recreational activities/developments. The RZ-T zones include the naval magazine sites, the golf course and equestrian center/club at Binictican, and two small 'industrial' sites. It also includes a specific node on Hill 394. This is the cleared summit of Hill 394 identified as an eco-tourism development node allowing for acceptable visitor 'penetration' into what is otherwise a restricted access zone.

The intent is to safeguard appropriate existing recreational/tourism developments and to allow for the development of future opportunities.

Recreation Zone – Marine (REZ-M)

Marine environments can attract highly impacting motorized water sports and recreational activities. The REZ-M is designated to provide an area for such high impacting pursuits where there will be little or no impact on other users of the environment or on the marine habitats themselves. The REZ-M in the vicinity of the airport further out into the open waters of Olongapo Bay/Subic Bay is so located to accommodate 'open water' marine recreational activities.

Multiple Use Zone (MUZ)

The MUZ is principally confined to two locations in the northern and eastern portions of the SBPA covering areas of largely cleared, open country with varying vegetation cover (remnant vegetation cover, particularly along streamlines and larger watercourses). In particular the larger MUZ covers an area identified for 'multiple use' in the Pastolan Aeta strategy plan.

The intent is to designate appropriate areas that have been subjected to change and are supporting a variety of land use activities, to recognize the need to accommodate such activity but consistent with the framework of SBPA control and management.

Special Use Zone (SPZ)

A dilemma was presented by the existence of intense and conflicting land uses. Ideally they would be placed outside the SBPA, and more appropriately occur within a buffer zone, as for example in the case of the airport and Subic Port developments (e.g. the proposed container terminal). However, because the natural processes and important environments of value (e.g. mangroves, rivers/streams) extend around and beyond some of these land use developments (e.g. Binictican residential area, Cubi tourist area), their inclusion within the SBPA was considered essential.

The SPZ is therefore designated to cover the major areas of 'non-conforming' land use that exist within the designated SBPA outer boundary. The zone effectively separates the industrial park, some foreshore commercial land use activities, hospital complex, residential and tourist accommodation areas, etc. The purpose of the SPZ is to alienate these activities and land uses from the SBPA but designate them to a zone that allows some level of control to ensure they have the lowest impact possible upon SBPA values.

Other Miscellaneous Zones

A number of specific management sub-zones are also included as allowed by the NIPAS guidelines. These include:

- **Beach sub-zone** (within REZ – T): includes the beaches in the vicinity of Camayan and Binanga Points that require special management consideration.
- **Swimming sub-zone** (within REZ – M): provides for an area of public access and swimming between Grande and Chiquita Islands.
- **Park infrastructure sub-zone** (within SPZ): includes the modified sites in the vicinity of the entry to the NavMag area, in the Triboa Bay area.
- **Vegetation protection sub-zone** (within SPZ): identifies a specific area of vegetation with important visual qualities associated with chalet developments on the north side of Triboa Bay.
- **Turtle habitat sub-zone** (within SUZ – M): identifies the only turtle nesting beach in the PA and which requires specific management provisions to accommodate both human use and turtle nesting needs. Other beach areas are known to host nesting turtles and are in need of protection.
- **Forest Ecosystem Corridor (within the SUZ – T)**: identifies core rainforest environment extending from the terrestrial core of the PA to the Subic Bay marine environment.

4.5. Assessment Of Management Zones Against Selection Criteria

Following the identification and mapping of the zones the PAMP project team undertook an evaluation of the SBPA and management zones to determine the degree in which the selection criteria (Section 4.2.3) have been met. The results of this exercise are annexed to this report. The table illustrates that each of the zones has a high degree of fit between the designation of the zones and accommodation of the selection criteria.

5.0 THE PROTECTED AREA MANAGEMENT ZONES

5.1. Introduction

Management Zones provide a spatial basis for implementing differing management prescriptions in order to protect the natural resource values of the SBPA. Management by designated zones allows the management body (PAMB) to minimize existing and potential conflicts between uses and activities, and to restrict all degrading and impacting activities. The management zones therefore provide a broad guide for community uses and management activities that are appropriate to certain areas and indicate management priorities in any part of the SBPA.

The designation of management zones and buffer areas is based on the many inputs described and explained in Sections 2 to 4 as well as in Volume 1.

The Buffer is located adjacent to the outer boundary of the SBPA. This is divided into a series of buffer zones and sub-zones. The buffer is integral to the overall structure of the SBPA but performs a different function - that is, to protect the SBPA from external land use pressures and miscellaneous impacts.

This chapter presents the following information:

- key management planning considerations;
- summary of management zone categories;
- designation of management zones;
- management zones – definition, areas, prescriptions;
- buffer zones – definition, development framework, criteria;
- buffer zones description; and
- buffer zones areas.

5.2. Key Management Planning Considerations

Two important factors underlie the designation of the management zones.

5.2.1. Variable Resource Character

The PAMP framework recognizes that the SBPA is a complex blend on natural ecosystems and human use areas. It has multiple management requirements with characteristics and values that differ progressively from its core to its borders. The strategic requirement is for management to respond to each according to the theoretical underpinning of the PAMP project. This includes in particular consideration of food web and broad ecosystem functions of the SBPA.

5.2.2. Protected Area Management Continuum

The PAMP provides a management framework that meets geographically varied management needs. It also provides a range of flexible management tools as required by distinct management zones.

This section provides an overall strategy as well as 'zone specific' strategies and management activities. Buffer zones are treated as an integral part of the SBPA for planning purposes.

5.3. Zones and Boundaries

The PA boundary and the various SBPA management zone sub-boundaries are derived based on the following major criteria:

- biophysical;
- functional (physical);
- social;
- economic;
- institutional; and
- legal.

Core to Periphery

The PA provides essential protection to a core ecological zone (marine and terrestrial) that radiates outward in concentric zones requiring increasingly intensive management intervention and intensity.

Protected Area Management Needs

Each management zone responds to a wide range of management needs unique to the zone. The management needs include the following:

- surveillance;
- protection and enhancement of landscape;
- protection of vegetation associations;
- protection of fauna (general and specific);
- protection of habitat (general and specific);
- environmental and habitat rehabilitation;
- restriction or control of human access;
- restriction or control of human activities;
- facilitation and management of environment related scientific research and education;
- administration and monitoring of permitted activities/uses and developments in the appropriate management zones;

- development of control responsibilities in designated 'intensive use' sites/locations (under the PAMP management zoning);
- management of park visitors;
- provision and maintenance of park visitor facilities; and
- control of illegal activities and enforcement of laws and ordinances/regulations.

External Pressures on the Protected Area

Environmental resource management pressures/impacts do not stop at the SBPA boundary. This also applies to the specific management zones. Successful management of the SBPA requires a strategy that extends beyond the boundary(s). This gives rise to a Buffer Zone that will provide a 'social and land use barrier' around the SBPA perimeter. In this buffer, a variety of natural area management and other tools, mechanisms and techniques are used to achieve its objectives. These include:

- flora and fauna protection techniques/activities;
- land care techniques;
- forestry practices and reforestation;
- erosion control;
- environmental rehabilitation and site remediation;
- pest and weed control;
- fire control;
- land use planning policy and strategy implementation;
- development control;
- alternative livelihood programs/community development programs; and
- surveillance, monitoring, control and enforcement.

Regional Continuum of Environmental Protection Practices

Ecosystem protection and management ideally (and of necessity) extend well beyond the prescribed but essentially artificial limits of the SBPA. Examples are:

- the marine environment is an 'open system' subject to the effects of pollution/ contamination from sources far and near the area;
- surface drainage catchments are complete natural systems and are functionally linked throughout, irrespective of land use change and legal boundaries; and
- many species of fauna have habitats that range beyond a designated protected area or nature reserve (e.g. giant fruit bat, 'pelagic' fish species).

Hence, the PAMP framework requires a diverse range of existing and potential instruments, practices, laws/regulations, policies and strategies applicable to the region around the SBPA to secure a high level of environmental protection. There are no limitations to the mechanism that can be applied to implement the PAMP framework in regional terms, however.

5.4. Management Zoning

The SBPA is divided into management zones derived from the NIPAS guidelines. It was found, however, that a strict translation of NIPAS management zone categories did not readily address the unique circumstances prevailing at Subic Bay. There is a generally greater degree of complexity obtaining in SBPA than in other Protected Area situations.

Strict definitions of certain NIPAS categories could not be applied to the Subic Watershed. An example is the definition of 'Habitat Management' referring to the maintenance of specific non-climax habitat types or conditions required by rare, threatened or endangered species. The habitat areas in the SBPA cannot be classified 'non-climax'. Hence, the term Habitat Protection is used instead.

Accordingly, the original NIPAS management zone categories were modified to establish the following main zones.

Protected Area Zones:
- Core Ecological Zone (Terrestrial and Marine)
- Sustainable Use Zone (Terrestrial and Marine)
- Habitat Protection Zone (Terrestrial and Marine)
- Restoration Zone (Terrestrial and Marine)
- Recreation Zone (Terrestrial and Marine)
- Multiple Use Zone
- Special Use Zone
- Buffer Zone

In addition, a number of subsidiary or minor zones, were identified. These are:

- Protected Area Sub-Zones
- Turtle Nesting Sub-Zone
- Swimming Sub-Zone
- Beach Sub-Zone
- Special Use Landscape Protection Sub-Zone
- Special Use Park Infrastructure and Administration Sub-Zone
- Forest Ecosystem Corridor Sub-Zone

These adopted zones differ from the NIPAS management zone categories (Table 2).

Table 2. Comparative Table for NIPAS and PAMP Zones

NIPAS ZONES	SUBIC BAY PAMP ZONES	SUBIC BAY PAMP SUB-ZONE
Strict Protection	Core Ecological (terrestrial, marine)	
Sustainable Use	Sustainable Use (terrestrial, marine)	Turtle nesting beach Forest Ecosystem Corridor
Restoration	Restoration (terrestrial, marine)	
Habitat Management	Habitat Protection (terrestrial, marine)	
Multiple-Use	Multiple-use	
Buffer	Buffer (terrestrial, marine)	
Cultural	(not applicable)	
Recreational	Recreation (terrestrial, marine)	Beach Swimming Special Sites
Special Use	Special Use	Vegetation protection Park infrastructure and administration
Other		

5.4.1. Designating Appropriate Uses and Prescriptions for Management Zones

Having established the management zone categories and their spatial delineation, the next step is the determination of appropriate permitted uses as well as prohibited uses for each zone.

The determination of permitted and prohibited uses is derived from an analysis of all previously gained information on the study area as a whole and each management zone in particular. This involves the application of first principles, intellectual intuition, together with factual findings/information gained from the resource inventories, air photo interpretation, field investigations and field verification, and consultation with a variety of organizations and individuals, ecosystem functions, and the food web.

This systematic approach determines the potential uses, whether essentially environmentally benign (**appreciative**), or environmentally destructive (i.e. **consumptive**). Use restrictions provide controls that permit sustainable uses, thus protecting the important structures and functions of natural ecosystems.

Table 3 provides a framework of 'use orientations' for protected areas within a park 'type' context.

Table 4 presents a summary of the advantages and disadvantages from use orientations. These tables are intended to give context to the subsequent part of this chapter that provides lists of permitted and prohibited uses for each zone.

Table 3. Use Orientation for Subic Bay Protected Area

INTEREST/JUSTIFICATION CATEGORIES	EXAMPLES
APPRECIATIVE	Uses and activities that are fundamentally appreciative toward the environment and natural values.
1. Resource-conservation oriented	Landscape conservation, vegetation protection, wildlife habitat conservation, wildlife observation, scientific study, wilderness experience, indigenous peoples traditional activities/practices (forest gathering, hunting, fishing)
2. Resource-enhancement oriented	Trails and trekking, wildlife observation hikes, canopy walks, adventure trails, lookout facilities, natural feature (i.e. caves, waterfalls, etc) presentation/access, safety facilities, public conveniences to support park/protected area uses, cabin shelter/accommodation, restricted vehicle access/track/parking, signage, landscape improvement/management, ecological orientation
CONSUMPTIVE	Uses and activities that are fundamentally consumptive in their orientation to the environment and natural resources.
3. Resource-exploitation oriented: extractive-harvesting	Non-traditional hunting, removal of forest materials and timber, marine materials, fauna and fish (e.g. birds, bats, nest materials, crustacea), mining, water supply (from existing surface drainage system)
4. Resource-exploitation oriented: productive-utilitarian	Cropping, clearing, planting, commercial harvesting, tourism development (commercial, non-appreciative), recreation/sporting/tourist events sites/venues (e.g. mountain biking, marathons, off-road vehicle, hill-climbing, water skiing, jet-skiing, underwater sledding, para gliding, free-dive descenting, power boat racing, etc), modified parkland landscape/amenity landscaping for tourism or other purposes, water supply dams of rivers and tributaries.
5. Resource-eradication oriented: eradication	Commercial development (industrial, manufacturing, storage, transport, communications, infrastructure), residential/urban development, tourism development (i.e. incidental to natural area resource values), activities involving alienation of tenure, land use appropriation by miscellaneous interests (e.g. formal commercial interests/land developers, informal groups/squatters), major earthworks, landfill and land reclamation, reef bombing/blasting, marine sand mining, surface and open cut terrestrial mining

Table 4. Advantages and Disadvantages of Use Continuum

APPRECIATIVE		
Conservation		
	Advantages	Retention of natural values and biodiversity, maintenance of key natural processes required to support system and ensure ecological sustainability, value to science and education, posterity and heritage values, value to indigenous peoples and support for sustainability of culture and lifestyle, preservation of genetic materials (e.g. medicinal and other materials with potential benefit to mankind and other organisms/natural systems), retention of natural landscapes, ongoing (in perpetuity) increase in resource value (all types of value stated above, and including monetary value to regional and national economy – that will far exceed any short-term financial trade-off)
	Disadvantages	Restricted access for humans/visitors, restriction on use potential, restriction on degree of development within designated park area, cost of protection (on-going) and park entity administration, limited options (justification to lending institutions) to attract funding
Enhancement		
	Advantages	Multi-use recreation, eco-tourism/nature based tourism, appropriate installation and placement of facilities, increased management presence, increased direct and indirect management, amenity and landscape value presented and valued, marketing and promotion facilitated, improved options to attract funding, increased eco-tourism to generate management funds, research opportunities provided
	Disadvantages	Increased management cost implications (e.g. to maintain improvements, manage visitors, control anti-social and illicit activities), potential disruption to natural processes, habitats and fauna behavior, costs of remedial action and crisis response, loss of wilderness values
CONSUMPTIVE		
Exploitive (extraction-	Advantages	Economic potential of forest realized more directly, utilization of forest products, basic raw materials

harvesting)		and minerals, water supply catchments used
	Disadvantages	Conservation/preservation imperatives subordinated to exploitation objectives, damage to vegetation and habitats, disturbance of fauna, ecosystem perturbations and trauma, loss of wilderness values, devaluation of resource status (heritage, biosphere and park values)
Exploitive (productive-utilitarian)	Advantages	Potential for direct economic benefits of overall forest resource and land area exploited on a broad scale, conventional 'commercial' tourism development encouraged and facilitated in the short-term, high level of local/regional visitor levels may be encouraged in the short term, rapid increase in level of awareness of 'park' tourist venues during early development stage
	Disadvantages	Substantial destruction of forest habitat, severe disturbance of fauna/wildlife, ecosystem severely damaged, loss of wilderness values, devaluation of resource status (as above), significant change to natural landscape values, indigenous peoples interests damaged, heritage values severely diminished
Eradication	Advantages	Land made available for further development and for settlement of surplus population (in-migration), entrepreneurial exploitation of any opportunities facilitated, high short-term gain for specific interests/organizations/individuals, unrestricted short- term exploitation of resources contained in the designated area.
	Disadvantages	Total loss of the biological/ecological resources contained in the natural area, largely unsustainable system created, discount of all future value of the original resource value (which would be 'orders of magnitude' higher than all short-term/intermediate wealth generation), major loss to science, total loss of global bio-diversity 'hotspot', Philippine's international reputation for wildlife conservation management damaged worldwide

5.5. Management Zones

This section presents the definition, description and guidelines for each of the SBPA management zones.

5.5.1. Core Ecological Zone - Terrestrial (CEZ-T)

Definition

The CEZ-T is defined as a remote and rugged rainforest environment extending over the upper slopes and higher elevation of the Subic Bay Watershed Area, and lying adjacent and to the north of Bataan Natural Park. It is mainly in natural, unmodified condition (See Figure 5). CEZ-T is a highly restricted human use/activity zone where only park functions and very limited indigenous people's visitation are allowed. Incursions and clearings in the CEZ-T are illicit/unauthorized and are not sanctioned in anyway.

Area and Boundaries

Management Zone	Area (has)	Survey Description (in meters)	
		x-coordinates	y-coordinates
CEZ-T	3,548.56	429,488.70	1,631,612.00

The boundary of the CEZ-T largely runs mid-slope between the X and Y contour range, as shown in the plan. The spatial definition of the CEZ-T is provided graphically in the accompanying plan as described in the attached survey information – see Annexes.

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Management Prescription

Land Use Categories by PAMP Zone are provided in the following table. The general intention is for a very high level of restriction on all human activities. Only those uses that are considered to be highly resource-preservation oriented are permitted.

Details of permitted and prohibited uses are provided in the following table.

Table 5. Management Prescription for Core Ecological Zone - Terrestrial

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
Core Ecological Zone – Terrestrial	**Resource-preservation oriented**: • bio-diversity maintenance, ecological systems maintenance, gene-pool protection, natural process	• ecological sustainability secured • ecological integrity and bio-diversity unaffected • natural processes unmodified • indigenous peoples traditional

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
	continuance unaltered, traditional heritage practices (cultural, ritual, livelihood)	practices sustainable and monitored with prime ecological protection directive • natural (unassisted) restoration/rehabilitation of disturbed, degraded areas able to occur
	Permitted: • science research and monitoring • agreed traditional indigenous peoples' activities (access, movement, ritual ceremony, sustainable food and materials gathering, etc.)	• no permanent disturbance, damage or change • no unacceptable change (disturbance in keeping with sustainable traditional practices only)
	Prohibited: • passive recreation (walking, observation and any authorized human presence and activity) • active recreation (trekking, orienteering, horse riding, mountain biking, hunting, etc.) • landscape/landform modification • development of any kind • placement of any permanent fixture (emergency beacon, survival station, indigenous peoples structure [agreed] excepted)	• unauthorized people presence of any sort • any human sports activity, facility or venue • any modification of landform or natural vegetation system • any earthworks or structure • any built or prefabricated object/structure

Figure 5. Core Ecological Zone - Terrestrial (CEZ-T)

5.5.2. Core Ecological Zone – Marine (CEZ-M)

Definition

The CEZ-M is defined as the most restricted human use zone extending over the most bio-diverse portion of the marine zone, including the coral reef, near-shore marine shallows, and seagrass areas on the east side of Subic Bay. The area also contains the approaches to turtle nesting beaches near Camayan Point. The CEZ-M is a more or less rectangular area extending out to Grande and Chiquita Islands (See Figure 6).

Area and Boundaries

Management Zone	Area (has)	Survey Description (in meters)	
		x-coordinates	y-coordinates
CEZ-M	368.68	417,289.80	1,632,797.00

The southern and northern boundary of the CEZ-M extend out into Subic Bay from Binanga Point and from north of Camayan Point as shown in the accompanying plan, respectively. The spatial definition of the CEZ-M is provided graphically and described by the attached survey information – see Annexes.

Management Prescriptions

The CEZ-M is an area in which only uses that do not impact upon the fragile marine habitats will be allowed. The zone will be clearly identified with visible markers, and there will be a constant and high level of park regulation enforcement and surveillance.

Details of permitted and prohibited uses are provided in the following table.

Table 6. Management Prescription for Core Ecological Zone - Marine

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
Core Ecological Zone – Marine	**Resource-preservation oriented**: • biodiversity maintenance, ecological systems maintenance, gene-pool protection, natural process continuance unaltered, traditional heritage practices (cultural, ritual, livelihood)	• ecological sustainability secured • ecological integrity and bio-diversity unaffected • natural processes unmodified • indigenous peoples traditional practices sustainable and monitored with prime ecological protection directive • natural (unassisted) restoration/rehabilitation of

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
		disturbed, degraded areas able to occur
	Permitted: • restricted preservation zones • science research • ecological base-line monitoring • guided underwater scuba tours • marine micro-photography • sailing (dinghy, windsurfer)	• no interference of any kind • no permanent disturbance • no permanent disturbance or damage • no permanent disturbance, no damage • no permanent disturbance, no damage • no use of anchors, minimum 1.5m depth • no use of anchors, no engine idling, no trolling, no use of nets, no long lines
Note: Fishing vessels of over 3 gross tons are considered commercial fishing vessels.	**Prohibited** • anchorages (permanent or temporary) • sports fishing • spearfishing • unsupervised scuba diving • power boating in waters less than 5 meters depth (under keel) • sullage discharge • navigation channels for vessels over 3 tons	• use of any bottom anchor • fish damage or death • fish damage or death, habitat disturbance • habitat disturbance, unauthorized presence • any powered boat/craft movements over 8 knots • release of waste from any boat • absence of vessels over 3 gross tons • 4-stroke engine technology only

Figure 6. Core Ecological Zone – Marine (CEZ-M)

5.5.3. Sustainable Use Zone - Terrestrial (SUZ-T)

Definition

The SUZ-T is defined as an area of rainforest environment containing a variety of vegetation communities and forest habitats, in which the management focus is on protecting and maintaining ecosystem functions and the forest landscape. The SUZ-T is located between the CEZ-T and the foreshore of Subic Bay, and extending around other zones within the PA (See Figure 7). It is the largest single zone within the PA. Use levels are to be strictly compatible with this definition.

The SUZ-T also contains a series of 'non-specific' sub-zones termed Forest Ecosystem Corridors. These are corridors of connecting rainforest running from the western edge of the CEZ-T down through the major undisturbed areas of the SUZ-T, extending over mangrove habitat areas and key beach zones, to the Subic Bay foreshore and marine waters. In so doing the Forest Corridors tangibly connect the core terrestrial environment with the core marine environment (CEZ-M and HPZ-M). The denoted Forest Ecosystem Corridors thereby reinforce the underlying principle of the PAMP which is the protection and sustainable management of the biological/ecosystem continuum from ridge-top to ocean floor.

Area and Boundaries

The total area of the SUZ-T is 3,673.08 hectares.

The boundary of the SUZ-T abuts with the CEZ-T boundary on the upslope boundary. The lower slope boundary is complex and varied depending on the proximity and shape of other zones. The spatial definition of the SUZ-T is provided graphically and described in the attached survey information – see Annexes.

Management Prescriptions

The SUZ-T Forest Corridors (Figure 8).

The SUZ-T is an area in which an increasing number of 'nature based' recreation, sports and education pursuits can be accommodated. The range is considerable and includes both active and passive pursuits. Permitted activities are determined on the basis of performance criteria specifying very low impact on the rainforest environment, and very limited and tightly specified levels of permanent modification in the placement of facilities and structures.

Active park management is intensively carried out in this zone. While the higher elevation and more easterly portions of the SUZ-T are comparatively remote and therefore less easy to access, the westerly portions are highly exposed to random entry by visitors, and numerous impacts originating from the special use zones, roads, tracks.

Figure 7. Sustainable Use Zone - Terrestrial (SUZ-T)

Figure 8. SUZ-T Forest Corridors

There is therefore a correspondingly higher requirement for all levels of management activity.

Details of permitted and prohibited uses are provided in the following table.

Table 7. Management Prescriptions for SUZ-T Forest Corridors

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
Sustainable Uses – Terrestrial (SUZ-T)	**Resource-conservation/enhancement oriented:** • Maintenance of ecological values and biodiversity, protection and strengthening biological diversity, protection of habitats and habitat diversity, maintenance of landscape integrity and values	• vegetation cover retained and strengthened • wildlife protected and managed • degraded sites rehabilitated, used or managed
	Permitted: • passive recreation: walking, picnicking, photography and other appreciative pursuits • active recreation: ridge climbing, tree climbing/abseiling, forest trekking, botanical tours, nature photography, equestrian activity (on specified trails) etc • nature based sporting events, e.g. orienteering, marathons, triathlons • indigenous peoples' traditional activities: hunting, gathering forest materials, ritual/ceremony • other activities: jungle survival training,	• allowable on authorized trails, paths and within specified recreation nodes. No disturbance to vegetation to occur • allowable on authorized trails, paths, tracks, and subject to permits being granted. No disturbance to vegetation, habitats or wildlife. • allowable subject to permits being granted, approved management plans for the specific activities, and provision of performance bonds by sponsoring organizations. Approval required for equipment use and installation. • allowable subject to prior

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
	military jungle training (on foot only) • developed eco-tourism node (e.g. Hill 394) • approved structures associated with authorized ecotourism (trails, pedestrian bridges, overhead canopy walkways, areal tramways).	formal agreements with PAMP management authority, as part of PAMP documentation. • allowable on a case to case basis, subject to management plans, bonds, permits • allowed subject to approval of detailed design development plans, including EIA and Environmental Management Plan
	Prohibited: • permanent development (structures) of any kind, except those associated with agreed environmental interpretation initiatives such as signs, trails, pedestrian bridges and overhead canopy walkways. • landscape or landform modification (except installing trails, management access tracks, etc) • any environmentally destructive or harmful sporting activity, or that causes disturbance	• temporary fixtures and equipment associated with activities and management allowable • no change to existing landscape and landform

5.5.4. Sustainable Use Zone – Marine (SUZ-M)

Definition

The SUZ-M is defined as extending over the 'outer' westerly portions of the marine part of the PA on either side of the CEZ-M, and also over a portion of Olongapo Bay in the vicinity of Nagcaban Point to the east of the airport (See Figure 9). The SUZ-M provides a buffer to zones featuring more important habitat value. It includes open water areas with less critical habitat values where higher levels of sustainable activity can occur. The water areas include habitat and water quality ranging from high in the southerly and westerly locations and moderate to poor within Olongapo Bay.

Area and Boundaries

Management Zone	Area (has)	Survey Description (in meters)	
		x-coordinates	y-coordinates
SUZ-M1	208.28	423,456.50	1,637,384.00
SUZ-M2	61.31	420,282.10	1,635,455.00
SUZ-M3	405.04	417,962.40	1,634,729.00
SUZ-M4	311.88	418,138.80	1,631,251.00
Total	986.51		

The boundary of the SUZ-M abuts with the boundaries of the CEZ-M, RZ-M, HPZ-M, SPZ and the outer boundary of the PA. The boundary alignment is as described in the attached survey information – see Annexes.

Management Prescriptions

The SUZ-M is a zone in which a wide range of low impact water activities can occur, mainly water recreation and sports activities subject to minimum depths, maximum speeds, maximum vessel size, maximum keel depth, and various other requirements. The levels of control required in this zone include limitations on the nature and extent of recreational fishing, and strict use of designated anchorages. A wide variety of activities are prohibited, including removal of materials, navigation by large vessels, high impact sports fishing and commercial fishing. Details of permitted and prohibited uses are provided in the following table.

Table 8. Management Prescriptions for SUZ-Marine

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
Sustainable Uses – Marine (SUZ-M)	**Resource-conservation oriented**: • Maintenance of ecological values and biodiversity, protection and	• habitat protection • coral reef protection • sea grass meadow protection • water quality maintenance

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
	strengthening of biodiversity, protection of habitats and underwater features, allowing natural regeneration of disturbed and damaged sites.	
	Permitted: • unrestricted swimming and non-motorized water sports (human immersion) • unrestricted scuba diving and snorkeling • unrestricted small dinghy sailing, and sea kayaking/canoeing • fixed keel yachting permitted in designated navigable zones • power boat usage permitted in designated navigable zones • water skiing, jet skiing and para-gliding allowed in designated zones only • lure and fly catch and release fishing • anchorages in designated zones or buoys only	• from beach, boats, and swimming structures (subject to water quality maintenance) • within specified dive zones, launched from designated mooring buoys, or drift platforms • racing and events within designated zones • minimum depth requirement of 5 meters (overall) • minimum depth 5 meters under keel, max 15 knots speed (lower, preferable - the areas proposed have seagrasses that support fish nurseries), authorized fuel bowsers only • 4 stroke engine technology preferred • minimum depth of 10 meters under keel • minimum depth of 5 meters, no trawling, no long lines, anchoring in designated areas only.
	Prohibited: • All extractive activities • large vessels (+50 tons), except in designated navigable channels accessing berths/docks • sports fishing	• designated navigable channels only • no exceptions • no exceptions • no exceptions • except traditional indigenous peoples activities – by

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
	• spear fishing • power boat racing • removal of coral, reef fish, benthic material • mining (sand, limesand, limestone, etc) • aquaculture or associated structures • farming/structures • drop anchorage	agreement or permits • no exceptions • no exceptions (sewage generated will be detrimental to marine resources in the area • unless assessed and approved as part of indigenous peoples 'alternative livelihood strategy'

5.5.5. Habitat Protection Zone – Terrestrial (HPZ-T)

Definition

The HPZ-T is defined as those areas of the PA with special habitat values that deserve special protection and active management. The habitats included within this category are the mangrove areas, all surface watercourses, and the bat roost area (See Figure 10). These nominated habitats may or may not be non-climax habitat types. Other habitats of value will be included in this zone on an ongoing, progressive basis, as new locations requiring special consideration are identified.

Area and Boundaries

The combined area of the nominated HPZ-Ts is 733.75 hectares. The area and survey location of each designated HPZ-T is as follows:

Table 9. Area and Location of HPZ-T Zone

Management Zone	Area (has)	Survey Description (in meters)	
		x-coordinates	y-coordinates
Bat Roost Area	188.89	422,673.80	1,635,329.00
Forest 1	1.68	416,434.20	1,632,998.00
Mangrove 1	35.85	424,934.90	1,638,782.00
Mangrove 2	12.04	424,466.30	1,637,297.00
Mangrove 3	2.27	422,095.50	1,634,219.00
Mangrove 4	24.18	421,289.40	1,633,738.00
Mangrove 5	8.76	420,881.90	1,633,244.00
Watercourse 1	78.92	426,636.80	1,638,233.00
Watercourse 2	74.49	426,200.80	1,637,272.00
Watercourse 3	62.41	425,612.10	1,635,445.00
Watercourse 4	35.51	424,620.90	1,635,757.00

Management Zone	Area (has)	Survey Description (in meters)	
		x-coordinates	y-coordinates
Watercourse 5	48.16	424,091.20	1,634,082.00
Watercourse 6	35.62	422,303.00	1,632,783.00
Watercourse 7	14.82	424,752.40	1,631,364.00
Watercourse 8	60.67	429,524.70	1,638,800.00
Watercourse 9	14.83	430,626.60	1,639,080.00
Watercourse 10	1.87	432,401.90	1,634,875.00
Watercourse 11	35.15	432,305.60	1,633,405.00
Total	**736.13**		

Management Prescriptions

The management requirements for HPZ-Ts include designed and managed access control. General or uncontrolled access is to be restricted, however controlled/managed access is to be provided and encouraged as part of the educational, scientific and environmental interpretation objectives of SBPA. Special habitat areas therefore are to be regarded as both vital ecosystems/niches playing an important role in overall ecosystem function, but also vital 'assets' for marketing to potential visitors and users of the SBPA. Hence, management prescriptions must achieve a balance between protection and 'exploitation' of park/natural resource attractions.

Management will therefore involve a combination of design/installation of infrastructure (appropriate parking/entry control, footpaths, boardwalks, observation hides and platforms, etc), interpretative aids (signage and information nodes), and active management of park visitors. Where significant visitor interpretation is encouraged (e.g. bat roost) a high level of continuous management presence and intervention (patrol, surveillance, monitoring, site maintenance, visitor control and guidance, etc.) is required. In such locations (i.e. bat roost, Triboa Bay mangroves habitat, etc.). The intensive use areas should be located within the adjacent Special Use Zone (SPZ), and only interpretation trails, observation decks, etc, to be located in the habitat area itself – as appropriate.

Figure 9. Sustainable Use Zone – Marine (SUZ-M)

Figure 10. Habitat Protection Zone – Terrestrial (HPZ-T)

Details of permitted and prohibited uses are provided in the following table.

Table 10. Management Prescription of Habitat Protection – Terrestrial Zone

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
Habitat Protection – Terrestrial	**Resource-conservation oriented**: • Conservation and protection of key habitats and specified fauna/flora associations. Habitat management zones identified and designated due to outstanding wildlife value as being critical management imperative	• vegetation/habitat protection • maintenance of natural processes (water table/drainage, surface water quality, seed dispersal, species recruitment) • suitable buffers to disruption, noise and pollutants
	Permitted: • monitoring • proactive wildlife management • land management • scientific research • fauna observation (controlled) and wildlife interpretation	• as part of management plan implementation • as part of management plan implementation • as part of management plan implementation • authorized and approved • within designated zones, using provided trails, boardwalks and hides (with supervision)
	Prohibited: • passive recreation • active recreation • sports activities • any development (fixtures or structures) not directly associated with habitat management or wildlife observation (as in permitted uses)	• no disturbance to fauna or flora • no disturbance to fauna or flora • no disturbance to fauna or flora • only the use of fixtures, devices or structures required as part of habitat management activities

5.5.6. Habitat Protection Zone – Marine (HPZ-M)

Definition

The HPZ-M is defined as the extensive near-shore marine habitat extending over the majority of Ilanin and Triboa Bays (See Figure 11). This is an area of high quality coastal habitat, with moderate depths. The water quality is high to very high due to the protected and uncleared nature of the virtually the entire inland surface catchment that drains into the zone. The zone has relatively poor circulation due to bay morphology and benthic contours, and hence there is a high management priority on retaining existing environmental quality.

Area and Boundaries

Management Zone	Area (has)	Survey Description (in meters)	
		x-coordinates	y-coordinates
HPZ-M	431.71	420,025.60	1,634,232.00

The spatial definition of the HPZ-M is provided graphically in the accompanying plan, and as described in the attached survey information – see Annexes.

Management Prescriptions

The HPZ-M is a habitat area requiring protection from two particular sources of impact:

1. High impacting marine activities.

2. Deterioration of the terrestrial catchments flowing into the zone, and the possible development of either point or diffuse source pollution.

Management prescriptions will therefore be oriented to a high level of control over ongoing and incidental threats, and to the surveillance/control and guidance of authorized activities. Management activities will need to be closely coordinated with activities occurring in other zones, particularly the HP-Z extending over adjacent mangroves and watercourses, and also the REZ-T (marine exploratorium site).

Figure 11. Habitat Protection Zone – Marine (HPZ-M)

Details of permitted and prohibited uses are provided in the following table.

Table 11. Management Prescriptions for Habitat Protection Zone

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
Habitat Protection – Marine	**Resource conservation oriented**: • Conservation and protection of designated marine zones with habitat value in need of protection and rehabilitation	• coral reef protection • seagrass meadow protection and re-establishment • retention of undersea topography with specified habitat value
	Permitted: • scientific research and monitoring • active habitat management • swimming and snorkeling (human immersion) • traditional indigenous peoples activities • supervised scuba diving • non-powered (engine or sail) small boats activity (dinghy, kayak, canoe, row boat) in open water zones only • launches with engines under 50hp, in minimum water depth of 1.5 meters, maximum speed 8 knots (only for purposes of access and management of approved activities and facilities e.g.	• no permanent damage • as specified in management plans (to include permanent monitoring transects) • from shoreline, jetties, dive platforms and small craft • as specified and permitted • from authorized/licensed dive platforms • allowed from designated launch locations only • allowed from designated launch locations only • 4-stroke engine technology • restriction on all boat/watercraft activities within 200 meters of known bird nesting zones/sites during breeding season.

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
	Ocean Adventure)	
	Prohibited:-	
	• all extractive activities	• no exceptions
	• water sports involving motor powered craft (speed boats, jet skis, launches)	• absence of high-speed motorized craft
	• sports fishing,	• no exceptions
	• spearfishing,	• no exceptions
	• turtle eggs collecting	• no exceptions
	• harvesting of ducks and other shore birds	• no exceptions
	• mining	• no exceptions
	• dumping of wastes (garbage, sewage, etc.)	• no exceptions
	• drop anchorage	• no exceptions

5.5.7. Recreation Zone – Terrestrial (REZ-T)

Definition

The REZ-T is defined as an area either currently being used for recreation activity, or an area/site that is previously modified and owing to its relative position to natural attractions within the SBPA provides good opportunity for recreational (nature based) purposes. There are 10 REZ-Ts. They include:

- Grande Island
- The naval magazine storage areas
- Hill 394
- Sundry industrial sites
- Equestrian center (Binictican locality)
- Golf course (Binictican locality)
- Marine exploratorium
- Three sites at Camayan Point
- All foreshore beaches (unless otherwise prescribed)

Area and Boundaries

The combined area of the nominated REZ-Ts is 346.38 hectares. The area and survey location of each designated REZ-T is as follows:

Table 12. Area and Location of Recreation Zone - Terrestrial

Zone	Area (has)	Boundary Definition (in meters)	
		x-coordinates	y-coordinates
Equestrian Site	5.44	425,702.20	1,637,610.00
Golf Course	66.73	426,227.30	1,638,778.00
Grande Island	39.96	416,608.90	1,633,842.00
Hill 394	0.63	428.004.70	1,632,437.00
Marine Exploratorium	7.10	419,460.70	1,633,048.00
Misc. Industry Site 1	9.57	423,743.90	1,634,749.00
Misc. Industry Site 2	1.11	422,531.30	1,634,337.00
Naval Magazine 1	46.50	421,836.30	1,633,255.00
Naval Magazine 2	40.16	420,682.30	1,632,645.00
Naval Magazine 3	3.18	418,366.90	1,632,683.00
Naval Magazine 4	3.27	418,950.80	1,632,395.00
Naval Magazine 5	35.79	419,400.20	1,631,642.00
Naval Magazine 6	67.03	421,021.10	1,631,638.00
Naval Magazine 7	62.62	425,070.10	1,632,341.00
Total	**389.09**		

Management Prescriptions

The REZ-T are areas requiring sound land management of activities within each site, to ensure there are no impacts on the adjacent environment of the SBPA. Management prescriptions shall therefore pay attention to the following considerations:

- well managed site boundaries
- good visitor control on and off the sites
- adequate provision of liquid and solid waste disposal (originating from public toilets, accommodation and restaurant facilities, and other activity venues)
- adequate control to restrict or limit nutrients and contaminants from entering the surrounding environment
- guidelines and control for use of sites (nature of use, permitted and prohibited uses, acceptable performance criteria, levels of use, intensity of development, etc)
- control of visual impacts affecting the immediate and surrounding rainforest landscape
- guidelines for provision of all structures and landscaping (architecture style, height scale and bulk of structures, car parks, signage, plantings and landscape treatment)
- management of visitor numbers, and means of access and egress

Figure 12. Recreation Zone – Terrestrial (REZ-T)

- legal basis for operations on SBPA administration controlled sites
- levy and fee rates from commercial operations, etc.
- acceptable forms of operation, tenure and site/property transfer.

The intention of management prescriptions for REZ-Ts are to ensure that appropriate uses and recreation/tourist/ecotourism activities are able to establish and operate in the SBPA, but in such a way that:

- economic benefit is returned to the SBPA and the SBMA;
- the environment of the SBPA is protected;
- no rainforest vegetation (triple canopy, old growth) is removed or damaged; and
- the natural attractions of the SBPA are enhanced.

Details of permitted and prohibited uses are provided in the following table.

Table 13. Management Prescriptions for Recreation Zone - Terrestrial

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
Recreation – Terrestrial	**Resource productive-utilitarian oriented**: • Provision of designated zones where recreation and tourism facilities can be developed, and activities can occur	• use of sites and specified zones that have been changed by former land use (e.g. munitions storage) and have limited natural area value
	Permitted: • Passive and active recreation nodes with a range of facilities • Recreation and sports venues of varying size and sophistication • 'Design/site sensitive' tourism nodes (activity, accommodation) based on natural resource interest (e.g. bat viewing, marine exploratorium, jungle setting, coastal location, etc)	• built park and sporting facilities to accepted standard: • architectural standards that meet park design guidelines (construction type, materials, roof cladding, design vernacular, etc) • 'water sensitive design' landscaping, incorporating nutrient stripping 'treatment trains', etc • earthworks in conformance with prescribed limits (as specified in Management Plan) • height limits for all structures • aerobic waste-water package

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
	• Commercial tourism facilities designed to benefit from the Protected Area setting	treatment plants development nodes, and/or appropriate technology options for toilets and gray-water uses (ablutions, kitchens, accommodation) • vehicle parking to accepted standards • access and circulation to park planning standards (one way systems, limited road width, traffic calmers, vehicle barriers) • appropriate environmental buffers (natural or designed) between developments and sensitive habitats (e.g. bat roost) and natural systems (e.g. mangroves), vegetation, etc • toll booths for visitor control and user pays
	Prohibited: • commercial developments incidental or unrelated to specified park use zones and/or park management objectives (e.g. manufacturing, agriculture, silviculture, aquaculture, fabrication, mining, timber/forestry, infrastructure, depot and storage, etc)	• recreation, sports or tourism activities or development without philosophical, functional or aesthetic relationship to the PAMP setting and values. • noxious, anti-social, or environmental polluting or degrading (e.g. air emissions, effluent, contaminants, noise, odor, or aesthetic/visual) activities

5.5.8. Recreation Zone – Marine (REZ-M)

Definition

The REZ-M is defined as the open water area in the vicinity of the Subic Bay International Airport that is designated as suitable for moderate level impact water sports and recreation activities, and that excludes high impact motorized activity (See Figure 13). The zone is defined as being adjacent to the non SBPA (Buffer Zone) portion of the Subic Bay/Olongapo Bay, so that more site expansive activities (i.e. requiring larger spatial areas free of encumbrances) can operate more freely.

Area and Boundaries

Management Zone	Area (has)	Survey Description (in meters)	
		x-coordinates	y-coordinates
REZ-M	174.89	419,334.30	1,635,496.00

The boundary alignment is as described in the attached survey information – see Annexes.

Management Prescriptions

The REZ-M will be a site of increasingly intense water sports usage over time. Water sports and marine recreation activities involve sizeable equipment (yachts, dinghies, other surface craft) capable of travelling at considerable speed, requiring space to operate and freedom to move without endangering or inconveniencing other users/activities. Management of water recreation areas requires clear definition of either areas or time periods for different activities, to ensure conflicts do not occur, and to avoid inconvenience and risk/hazard.

Open water activities require shore-based facilities for access, launching, support, and safety/convenience purposes. The provision of these requires coordinated planning with the shore base development and use of nearby and adjacent locations (SBPA zones) as appropriate. The management plan suggests shoreline development nodes for this purpose.

Management prescriptions (see Volume 3) and action plans will involve consideration of the following:

- establishing designated use areas;
- installing markers and buoys to identify area boundaries;
- designating use levels;
- designating time slots to avoid conflicting activities; and
- monitoring and controlling uses.

Details of permitted and prohibited uses are provided in the following table.

Figure 13. Recreation Zone – Marine (REZ-M)

Table 14. Management Prescriptions for Recreation Zone - Marine

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
Recreation – Marine	**Resource productive-utilitarian oriented**: • Provision of designated zones where marine recreational and tourism activities can be located.	• use of marine zones with appropriate environmental qualities (non-sensitive) and proximity (e.g. close to land based activity nodes, etc) • all activities registered and operational only with permits
	Permitted: • swimming • yacht and dinghy sailing • canoeing and kayaking • rowing (sculling, etc.) • paragliding • scuba diving • sports fishing • 'catch and release' competition fishing • anchoring in designated anchorages only, and use of registered buoys	• suitable zoning (indicated by floating buoys/markers), authorized and permitted according to the marine management plan, suitable depths for specific depths, appropriate separation between intrinsically conflicting activities (power boating versus sailing), suitable distance from shore • with permits obtained from the managing authorities
	Prohibited: • spear fishing • power boat racing • all commercially extractive activities (commercial fishing, mining) • drop anchoring • aquaculture installations	• disallowed within 300 meters of any portion of shoreline. • no exceptions • no exceptions

5.5.9. Restoration Zone – Terrestrial (RZ-T)

Definition

The RZ-T is defined as those areas with degraded or modified environments that owing to the location and condition are considered to be appropriate for restoration to a standard, and for purposes, prescribed in the PAMP (See Figure 14). Nominated RZ-Ts are considered to have either remnant values (environmental, landscape or ecosystem function) that are worth restoring, or are in locations where restoration will advantage adjacent environmental values (e.g. consolidate surrounding forest environment that is otherwise fragmented, or in danger of becoming further fragmented). The designated RZ-Ts are as follows:

- portions of the naval magazine area that are particularly fragmented sites;
- degraded land near the tank farm;
- degraded site of former mangroves and coastal foreshore in vicinity of tech park;
- degraded site south of Binictican River, south of mangrove area; and
- cleared upland area associated with Pastolan Aeta reforestation site.

Area and Boundaries

The area and spatial definition of the boundaries of each RZ-T are provided in the following table:

Table 15. Area and Location for Restoration Zone - Terrestrial

Zone	Area	Boundary Definition (in meters)	
		x-coordinates	y-coordinates
Binictican River Site	2.87	424,363,30	1,638,527.00
Naval Magazine Area 1	17.50	423,389.00	1,633,125.00
Naval Magazine Area 2	27.89	422,810.90	1,632,412.00
Pastolan Restoration Site	446.25	431,423.10	1,635,222.00
Site near Gas Farm 2	7.21	424,255.50	1,636,292.00
Total	**501.71**		

Management Prescriptions

The RZ-T requires highly specific management prescriptions for each area. The first consideration is the objective for restoration. This can vary from restoration for:

- 'human use purposes' or
- habitat recreation/landscape restoration purposes.

Figure 14. Restoration Zone – Terrestrial (RZ-T)

The former includes restoration of a site for any specified use that is appropriate under the provisions of the PAMP. The preference is for nature-based recreation/ecotourism, tourism, and park administration/management functions (nursery, storage, depot, administration buildings, visitor center, etc). Other end-uses may be considered on a case to case basis.

The latter includes restoration to reinstate vegetation/habitat/ecosystem functions considered important to benefit the SBPA. This will include reinstatement of mangroves where an opportunity still remains for recovering the habitat type. Mangroves are a vital ecosystem and site of primary producers in the ecosystem, and important breeding sites for a range of fauna.

Details of permitted and prohibited uses are provided in the following table.

Table 16. Management Prescriptions for Restoration Zone - Terrestrial

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
Restoration – Terrestrial	**Resource conservation, enhancement oriented**: • restoration of degraded sites with suitability for rehabilitation	• restoration, rehabilitation activities • active intervention and works
	Permitted: • earthworks • drainage works • forward planting • demolition of existing structures and removal of foreign materials and site remediation (of toxic substances) • construction and installation of 'improvements' according to approved protected area management plan • reforestation	• as required to restore site values • to reinstate natural drainage • to establish vegetation cover • as required to allow restoration of biological values and reinstatement of natural processes • to established 'park' design and construction standards, for the purpose/objective stated in the plan
	Prohibited: • continuation of degrading activities	• cessation as soon as possible • policing, prevention and

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
	• any activity not in accordance with approved management plan, and/or in conflict with restoration objectives	prosecution as appropriate

5.5.10. Restoration Zone – Marine (RZ-M)

Definition

The RZ-M is defined as a marine benthic site or habitat that is degraded, but to a degree and in such a location that restoration through management intervention is considered practical and beneficial. This may apply to the following habitat types:

- coral reef;
- seagrass meadows; or
- shoreline tidal/sub-tidal platforms.

No major RZ-Ms are identified in the PAMP document at this stage. Sites will generally be small in area, and targeted for discrete restoration activities. Larger sites are those for which restoration is achieved by removing any source of physical impact (e.g. propeller scouring, anchor drag, extraction of lime-sand, harvesting seagrass, removal of coral), chemical impact (e.g. nutrient input, cyanide bombing), and biological impact (e.g. excessive harvesting of biota, removal of fish population, etc).

Area and Boundaries

Not applicable. Areas and boundaries will be described when RZ-Ms are identified and designated.

Management Prescriptions

RZ-Ms will involve both the removal of impacting activities to allow sites to naturally rehabilitate/restore themselves through re-colonization by species from other habitats, and through active restoration activities to repair damage and replace biological stock. The former involves restricting activities both within and external to the site, and hence employs ranger activities, enforcement and surveillance. The latter involves the implementation of restoration programs, for example:

- hard coral regeneration;
- seagrass planting; and
- seeding aquatic vegetation.

Human uses will generally be allowed in restoration zones providing they are:
- permissible in the surrounding management zone; and
- compatible with restoration activities.

Details of permitted and prohibited uses are provided in the following table.

Table 17. Management Prescriptions for Restoration Zone - Marine

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
Restoration – Marine	**Resource conservation, enhancement oriented**: • restoration of degraded sites with suitability for rehabilitation	• restoration activities that prevent or mitigate against degrading activities • removal of pollutants, or managing pollutant sources (point or diffuse)
	Permitted: • active management to prevent or negate degrading influences • activity to restore habitat or biological values • monitoring and science research, including experiments on artificial underwater structures • 'marine' human use activities compatible with restoration activities • mariculture activities • reseeding	• involving marine and terrestrial sites (within the designated catchment) • use of equipment, biotechnology as approved under the management plan • as specified in the management plan • as specified in the PAMP (+on/off handline fishing seasons) • subject to full EIA and as specified in the PAMP
	Prohibited: • any degrading activity • dumping of wastes (garbage and sewage) • anchoring in non-designated areas • any aquaculture	• contributing to the ongoing habitat decline, or that prevents its restoration

5.5.11. Multiple Use Zone (MUZ)

Definition

The MUZ is defined as a partially or significantly modified area located within the SBPA landscape owing to proximity, contiguous landform and/or the existence of natural processes essential to the other SBPA management zones. The MUZ is usually subject to existing human activities, such as farming/plantation or open grasslands.

There is one nominated MUZ in the SBPA on the eastern edge of the SBPA in the vicinity of the Pastolan Aeta community lands south of Mount Santa Rita (See Figure 15).

Area and Boundaries

The area and spatial definition of the boundaries of each MUZ-T are provided in the following table:

Table 18. Area and Location of Multiple Use Zone

Zone	Area	Boundary Definition (in meters)	
		x-coordinates	y-coordinates
MUZ –T	818.71	431,388.90	1,636,638.00

Management Prescriptions

The MUZ involves a broad range of management approaches based on the nature of the MUZ and the activities it supports, and on the objectives specified in the management zone guidelines. Generally, however, there is a greater emphasis on land use control over a wider range of potential use than for other management zones. Additionally, the MUZ functions to some degree as both a buffer zone and restoration zone. The buffer function arises out of the need to ensure that human use activities do not impact upon the environmental values of the adjacent SUZ-T. The restoration zone function arises from the need for active site rehabilitation of portions of the SUZ-Ts, and in locations where reforestation activities are planned or being undertaken.

Details of permitted and prohibited uses are provided in the following table.

Figure 15. Multiple Use Zone (MUZ)

Table 19. Management Prescriptions for Multiple Zone

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
Multiple Use	**Resource exploitive and utilitarian oriented**: • extensive 'non-core' natural environment zone, proprietary sense of accessibility by many stakeholders (indigenous people, adjacent land users, nearby communities), range of historical/traditional uses (clearing, swidden agriculture to forest gathering), hunting, natural environment use and protection, wildlife protection,	• active management and policing/rangering required to check spread of excessive uses, inappropriate uses and illicit activities • protect habitat values • retain vegetation cover • maintain landscape character • avoid landform degradation
	Permitted: • indigenous peoples' traditional activities (forest materials gathering, hunting, forest species planting/husbandry, ritual/ceremony, etc) • specifically identified and approved alternative livelihood activities for indigenous people and other nominated groups • passive and active recreation (trekking, walking, equestrian/trail riding) • natural area sporting activities (orienteering, mountain bike racing, etc)	• environmentally integrated and subject to management plan provisions, self regulation and monitoring, permitted and authorized • specifically planned and approved activities, subject to project feasibility studies and environmental impact assessment – prescribed and approved in management plan • approved and monitored within provisions of management plan, allowable on authorized trails and routes • approved and monitored within provisions of management plan, allowable on authorized sites/routes
	Prohibited: • urban • commercial retail	• settlement and habitation • urban, retail service provision

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
	• manufacturing (light, heavy, natural resource processing) • infrastructure • use of explosives, chemicals and fine meshed nets for fishing • other commercial activities unrelated to SBPA objectives and functions, or that would be contrary to SBPA objectives	• of any sort • major non-linear infrastructure alignments/sites

5.5.12. Special Use Zone - SPZ (and special use sub-zone Park Infrastructure, Vegetation Protection)

Definition

SPZ is defined as covering land areas and sites mainly used for non-SBPA intended purposes. The land portions included in the SPZ generally feature a high level of modification, clearing and/or structures, or are legally designated for development and land use activity. For this reason, substantial portions have low ecosystem function, biodiversity and habitat value. SPZ extends over areas of non-conforming land use that by virtue of location and relative position has been included in the SBPA, because it is impractical not to do so. In some cases the SPZ supports land use activities and functions that can be considered allied to, or supportive of, SBPA objectives. These include residential and visitor accommodation, and tourist nodal development that is oriented to the natural attractions of the SBPA (e.g. Bat roost). In other instances the uses are highly conflicting (e.g. fabrication, machine workshops, etc). See Figure 16.

The principal SPZs include:
- Bat roost tourism node;
- JEST tourism node;
- Olongapo Bay/ Nagcaban Point foreshore industry zone;
- Tech park;
- Oil tank farm
- Binictican residential area;
- Hospital node; and
- Sundry small industry sites
- Existing roads

Roads:

The SPZ includes all made and designated (legal) road carriageways and road reserves (to be identified if not already). These are, however, not separately colored on the zoning plan. This designation of roads allows for the legitimate continued use of all public roads, including their maintenance and upgrade (from time to time).

Strategic upgrades to the main north-south highway connection (Subic to Morong) through the SBPA can be accommodated through a formal process of approval requiring an EIA. This EIA should address specific environmental protection requirements and design limitations, according to the SBPA Management Zone through which the road passes. These are described in Strategy 12 (Section 6.3.12) and in Volume 3.

Sub-Definitions – Sub zones

For practical reasons some additional SPZ sub-zones are identified. These include the following:

SPZ: Vegetation protection sub-zone
This is the area south of the international airport that supports holiday residences/accommodations. This pocket of land use has high amenity landscaping and benefits from the presence of relatively dense vegetation cover/landscaping. Because it is a critical landscape element, forming an important part of the overall visual setting on the north side of Triboa Bay, retention of the high amenity values and existing vegetation cover is very important in maintaining the overall landscape integrity of the wider bay landscape/seascape.

SPZ: Park Infrastructure and Administration sub-zone
This is the area immediately south of the bat roost area in the Triboa River site (main gate to NavMag). The location is ideal for siting a central control point for SBPA management purposes. Additionally, the existence of several modified sites and buildings also provides practical space and useable structures for park purposes (e.g. administration, research, interpretation and visitor center, storage and depot, etc).

Figure 16. Special Use Zone – SPZ

Area and Boundaries

The area and spatial definition of the boundaries of each SPZ-T are provided in the following table:

Table 20. Area and Location for Special Use Zones (Main Zones)

Zone	Area	Boundary Definition (in meters)	
		x-coordinates	y-coordinates
SPZ 1	64.44	426,803.40	1,637,558.00
SPZ 2	31.97	427,127.00	1,637,033.00
SPZ 3	181.61	425,009.50	1,636,663.00
SPZ 4	80.00	424,432.30	1,636,354.00
SPZ 5	26.50	423,784.30	1,635,682.00
SPZ 6	33.24	422,334.10	1,635,736.00
SPZ 7	9.17	420,585.50	1,635,669.00
SPZ 8	2.88	420,060.30	1,634,016.00
SPZ 9	1.36	424,902.80	1,634,816.00
SPZ 10	13.70	425,415.50	1,634,282.00
SPZ 11	1.83	423,674.30	1,634,172.00
SPZ 12	6.13	423,134.30	1,633,984.00
SPZ 13	10.38	422,185.10	1,632,459.00
SPZ 14	13.35	421,897.90	1,631,769.00
Total	**476.57**		

Table 21. Area and Location for Special Use Sub-Zones

Zone	Area	Boundary Definition (lat long)	
		x-coordinates	y-coordinates
Vegetation protection Sub-zone	23.55	421,349.30	1,634,152.00
Park administration and infrastructure Sub-zone	7.52	422,876.90	1,634,957.00

Management Prescriptions

The management prescriptions for the SPZs are principally oriented to:

- land use development control;
- environmental impact assessment/protection procedures; and
- pollution control regulatory compliance procedure.

These are normal land use control mechanisms as practiced in the wider region. The difference is that in the SPZ these controls will be attuned to ensure that the SBPA management objectives will be supported and integrated as much as possible. The areas of most concern to be addressed include the following:

- height restrictions;
- architectural design standards;
- appropriate landscape treatment, including restrictions on the use of inappropriate exotic plant species, low impact lighting, retention of existing/remnant natural vegetation, etc;
- appropriate traffic management (access and egress, and parking provision);
- ensuring appropriate scale of development and intensity of activity, according to site context and condition;
- appropriate (restricted) hours of operation if appropriate;
- appropriate provision for management of surface run-off, containment of contaminants and surface water (stormwater) treatment;
- control of air emissions; and
- appropriate perimeter controls, adequate development boundary setbacks, and buffer treatment (i.e. screening, security, manageable edge, etc).

Details of permitted and prohibited uses are provided in the following table.

Table 22. Management Prescriptions for Special Use Zones

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
Special Use	**Consumptive –eradication oriented**: • site transformation, limited or no natural environmental values, limited or no habitat value, modified or introduced landscapes, built structures and non-protected area activities	• acceptance of existing land use activities that must be incorporated within the Protected Area boundary, and that cannot (should not) be terminated or removed. • emphasis on minimizing environmental risk, maximizing visual integration, and providing for functional practicality
	Permitted: • historically inherited land use activities that cannot be terminated or removed despite incompatibility to PAMP objectives (airport, port related functions, storage, depots) • historically inherited sites and activities that are compatible with PAMP objectives (e.g. commercial tourism nodes, golf courses,	• providing adequate design and development provisions for surface water drainage/run off control, acceptable air emissions standards (noise, particulates, odors), visual amelioration, contaminated site remediation • prescribed premises with controls on subsequent use changes, and subject to ongoing environmental

ZONE CATEGORY	USE TYPE/CATEGORY	PERFORMANCE CRITERIA
	equestrian centers, residential precincts) • mining/basic raw material quarrying only as specified in existing approvals	management provisions • allowable within specified 'basic raw material excavation zones' and approval subject to full EIA • road upgrades subject to EIA process and compatibility of engineering solutions with environmental protection requirements of the SBPA Management Zone through which each section of the road passes. (see also Strategy 12, Section 6.3.12)
	Prohibited: • any use with either air pollution/emission contours or risk and hazard contours that are unacceptable for protected area/national park/human use and human presence localities (by accepted international standards) • dumping of wastes on the marine environment	• any toxic, polluting or dangerous activity.

5.6. Buffer Zone (BF)

5.6.1. Introduction

The Buffer Zone is a major zone in the NIPAS guidelines. The NIPAS Act defines Buffer Zone as: "areas outside the protected area but adjoining it that are established by law (Section 8 of the Act) and under the control of the DENR through the Park Area Management Board. These are effectively multiple-use zones that are to be managed to provide a social fence to prevent encroachment into the protected area by outsiders. Land tenure may be granted to occupants who qualify. Buffer zones should be treated as an integral part of the protected area in management planning."

5.6.2. Guidelines and Policy

Guidelines on the 'Establishment and Management of Buffer Zones for Protected Areas' are also provided by the Department of Environment and Natural Resources (DENR) in Dept. Administrative Order (DAO) No. 28. S-1992 pursuant to Republic Act No. 7586.

Section 4 of the DAO No. 28 refers to both 'buffer zones' and 'tenured migrant community'. The latter is intended in particular to protect the interests of indigenous peoples closely associated with protected areas, i.e. the Pastolan Aeta.

Section 2 of DAO No. 28 states that it is the government policy to preserve the biodiversity and sustain the use of its components within the protected areas through the establishment of Buffer Zones outside their boundaries. This gives an added layer of protection to the areas while at the same time providing regulated benefits and livelihood opportunities to the local communities

Section 3 of the DAO provides objectives for the establishment and management of Buffer Zones. These are to:

- serve as protective layer of the resources of the protected area against encroachment, destruction and other illegal activities detrimental to livelihood programs for communities within the Buffer zones;
- provide compatible use of areas and resources as well as development of alternative livelihood programs for communities within Buffer Zones; and
- surround the protected area with natural habitats of some plants and animals whose activities may extend beyond its boundary, and at the same time allow the continuity of ecological processes that may influence the state of the protected area.

5.6.3. Selection of Buffer Zones

Section 5 of the DAO provides a basis for selection of the Buffer Zones. In section 5.1 there is reference to the type and extent of suitable buffers. These include the

- need of a threatened wildlife species for additional habitat that extends beyond the protected area boundary;
- need for additional protective functions, such as soil and water conservation and fire protection;
- need to provide sustainable use of land and resources by local communities;
- need to protect marine and coastal protected areas that may be exposed to the effects of pollution and other forms of disturbances;
- presence of land and water resources such as grassland, brushland, agricultural land, reforestation areas, settlement site, forested land, fishpond, mangrove area and other wetlands;
- suitability of the area for production of crops preferred by the local communities and those adapted to the prevailing biophysical conditions in the area.

The PAMP strategy as applied in the SBPA situation divides the buffer into a series of sub-zones. The use of sub-zones is provided for in NIPAS. However, in the SBFZ context there has been a need to recognize a broader approach to overall buffer protection objectives, and consequently a number of policy zones in the wider region are also advocated.

The next section commences with an explanation of the overall buffer framework, and then identifies and describes the Buffer Zone and various Buffer Sub-Zones.

5.6.4. Buffer Zone: Development Framework

The SBFZ PA buffer zone concept has evolved the basic NIPAS/DENR Buffer Zone definition in the following way.

External Pressures on the Protected Area

The PAMP recognizes that environmental resource management pressures/impacts do not stop at the SBPA boundary, or at any internal management zone boundary. Successful management of the SBPA requires a strategy that extends beyond the boundary(s). This requirement gives recognition to a designated buffer zone, which provides a 'social and land use barrier' around the perimeter of the SBPA. Within this buffer a variety of natural area management and other tools/mechanisms/techniques are used to achieve environmental protection and other complementary objectives. These include:

- flora and fauna protection techniques/activities;
- land care techniques;
- forestry practices and reforestation;
- erosion control;
- environmental rehabilitation and site remediation;
- pest and weed control;
- fire control;
- land use planning policy and strategy implementation;
- development control;
- alternative livelihood programs/community development programs; and
- surveillance, monitoring, control and enforcement.

Regional Continuum of Environmental Protection Practices

Even though the SBPA is a discrete area of land identified by a gazetted boundary, surrounded in turn by a defined buffer zone, the PAMP framework recognizes that the dictates of ecosystem protection and management ideally (and of necessity) extend well beyond these prescribed but essentially artificial limits. For example:

- the marine environment is an 'open system' and will be adversely affected by distant impacts on the ecosystem and sources of pollution/contamination;
- surface drainage catchments are complete natural systems, and are functionally linked throughout, irrespective of land use change and legal boundaries; and
- many fauna have habitats that range beyond a designated protected area or nature reserve (e.g. Giant Fruit Bat, 'pelagic' fish species).

Hence, the PAMP framework requires that a diverse range of existing and potential instruments, practices, laws/regulations, policies and strategies are applied in the wider region to secure a high level of environmental protection.

5.6.5. Buffer Definitions and Categories

Within the buffer zone a variety of instruments and tools can be used to achieve

- protection of the Protected Area (as intended in the definition of NIPAS Buffer Zone function); and
- protection of flora and fauna in a broader sense.

The first of these is the traditional approach to buffer zone function and management. The second includes a more flexible 'regional environmental protection' approach, which is explained in the separate 'Flora and Fauna Protection Guidelines' report. The term 'buffer' is therefore used in several ways in the PAMP report, denoting differing buffer concepts. The following describes the different types of 'buffer' applied in the Subic Bay PAMP.

Buffer Zone

DENR Memorandum Circular No. 16 (Section 4, 'Definition of Terms') states that the term buffer zone "refers to identified areas outside the boundary of a protected area pursuant to Section 8 of the NIPAS Act of 1992, that needs specific management consideration in order to prevent destruction of the said protected area."

Buffer Sub-zones

DENR MC No. 16 states that a Buffer Zone may be divided into management sub-zones whenever appropriate. The sub-zones can be based on the nature of the land use and landscape involved, for example:

- built-up
- economic
- forest
- multiple-use
- aquatic
- terrestrial

As indicated above, because unique conditions occur in Subic Bay a new set of sub-zone categories have been used. One new category, 'terrestrial sub-zone 4 (complementary buffer Bataan National Park)', has been introduced for the area where the desirable buffer to the SBPA coincides with a portion of the Bataan Natural Park. The intent of this sub-zone is to ensure that management activities in each park system are

integrated/coordinated. Approximately half of the Bataan National Park 'sub-zone' is forest environment.

Other differences include the use of alternative terminology, for example:
- 'marine' rather than 'aquatic' (because it more aptly describes the Subic Bay environment)
- 'urban' rather than 'built-up'
- 'rural/agricultural' rather than 'economic'

The final Buffer Sub-Zone categories adopted for the Subic Bay PA are as follows:
- Terrestrial Sub-zone 1
- Terrestrial Sub-zone 2
- Terrestrial Sub-zone 3
- Terrestrial Sub-zone 4
- Marine Sub-zone 1
- Marine Sub-zone 2

Information, Education and Communications Area (IECA)

The IECA refers to the northern 'inner' embayment of Subic Bay. It is not part of the defined Buffer Zone and is not a sub-zone. This portion of the marine environment is nevertheless part of the functioning marine ecosystem, and hence there is a recognized need for active environmental protection. Controlling mechanisms are required because this portion of Subic Bay is subject to high intensity human use and relatively significant impacts from the adjacent coastal fringes (small enterprise fishing, effluent and waste disposal, aquaculture, etc.). However, a regulatory approach alone will not be sufficient, hence the PAMP recommends a policy of information, education and communications programs to be undertaken in the area in order to change community attitudes, understanding and behavior.

Integrated Catchment Management Policy Areas (ICMPA)

The ICMPA refers to the areas of terrestrial catchment that flow into Subic Bay (see Figure 4). Activities within these catchments will have material effect on the environmental quality of Subic Bay marine environment. Hence, the PAMP advocates the need for environmental protection measures to be undertaken within the ICMPA. As with the IECA, the ICMPA is not part of the defined Buffer Zone and is not a sub-zone.

5.6.6. Combined Protected Area Buffer System

An integrated buffer system is advocated by the PAMP, including both the formalized buffer components recognized under NIPAS, and the additional designations outlined above. The combined buffer system consists of the following (see Figure 17):

- Buffer zone in total, both terrestrial and marine;
- Buffer sub-zones, including;
  - Terrestrial (Urban) sub-zone 1
  - Terrestrial (Economic and Multiple Use) sub-zone 2
  - Terrestrial (Settlement/multiple use) sub-zone 3
  - Terrestrial (Complementary buffer Bataan National Park) sub-zone 4
  - Marine (Outer Bay) sub-zone 1
  - Marine (Inner Bay) sub-zone 2
- Information, Education and Communications Area;
- Integrated Catchment Management Policy Area (Subic location);
- Olongapo Watershed and Integrated Catchment Management Policy Area; and
- Other portions of the SBFZ.

In the Guidelines for the Protection of Flora and Fauna document, a further set of sub-categories is used (e.g. Urban, Rural/Agricultural, Forest, Marine/Coastal) in order to allow easy definition of the various guidelines and techniques.

Table 23 illustrates the relationship of the varied terms in use, and the various categories identified.

Figure 17. Integrated Catchment Management Policy Area

Table 23. Relationship of Specific Area Guidelines to Buffer Zone Categories

Subic Bay PAMP Buffer Zone – Subzones (DENR guidelines)	Outer Buffer Areas (not DENR guidelines)	DENR Management Sub-Zone	Broad Land Use type	Flora Fauna Protection Guidelines Report - terms (Section 4 Specific Area Guidelines)
Terrestrial Sub-zone 1		Built up	Mixed built urban (residential and industrial)	Urban Areas
Terrestrial Sub-zone 2		Economic, Multiple-use and Terrestrial	Settlements, grassland, plantation agriculture, traditional activities, etc.	***Rural Agricultural Areas***
Terrestrial Sub-zone 3		Economic and Multiple-use	Settlements, fishing, intensive irrigated agriculture, grasslands, plantation agriculture	***Rural Agricultural Areas***
Terrestrial Sub-zone 4		Forest, Multiple-use, and Terrestrial	Open grassland, plantation agriculture, forest clearing, forest gathering, alternative livelihoods	***Forest Areas, and Rural Agricultural Areas***
Marine Sub-zone 1		Aquatic	Navigation, shipping, fishing and recreation, grasslands, and forest clearing.	***Marine Coastal Areas***
Marine Sub-zone 2		Aquatic, terrestrial	Navigation, shipping, fishing and recreation	***Marine Coastal Areas***
	IEC Area		Fishing, shipping, recreation, aquaculture	***Marine Coastal Areas***
	ICMP Area		Farming, forest clearing, timber felling, settlements, industry, aquaculture, etc.	***Forest Areas, Marine Coastal Areas, Rural Agricultural Areas***
	Olongapo Watershed ICMP Area		Urban, farming, timber felling, clearing, plantation agriculture, watershed	***Urban Areas, Marine Coastal Areas, Forest Areas, Rural/Agri***

The various Buffer Zone Sub-zones are described in Section 5.6.8

5.6.7. Buffer Zone Criteria

The DENR, in Administrative Order (DAO) No. 28. S-1992 provides criteria for identifying and designating Buffer Zones. These are listed under the headings of ecological, economic, social and other. These are summarized as follows:

Ecological Criteria

- Importance of threatened species – presence of habitats necessary for survival of threatened species inhabiting the SBPA.
- Importance of wildlife corridors – the availability of an area which can serve as a migratory route for wildlife during local or seasonal movements.
- Importance of wetlands:
  - existence of adjacent watershed areas;
  - catchment basins;
  - tributaries;
  - human settlements; and
  - threats.
- Other ecological parameters e.g. ability of a site to increase protection value of the SBPA in terms of preventing flood, landslides, pollution, etc.

Economic Criteria

Potential capacity of the area to prevent community encroachment of the SBPA through the provision of alternative supply of resources such as forest and marine products for subsistence and livelihood. Economic opportunities shall include (among others) production of cash crops, establishment of nurseries, orchidaria, plantation forests, wildlife farms, and aquaculture activities.

Social Criteria

Potential of an area to enhance local community participation for the purpose of increasing level of support to, and acceptance of, the principles of buffer zone management.

Other Criteria

Existence of traditional practices within the area, the degree of awareness of local communities of conservation and the presence of relevant non-governmental organizations.

5.6.8. Description: Zones and Sub-Zones

The six buffer sub-zones are described below. In several terrestrial sub-zones additional sub-areas are identified. For each sub-zone/sub-area the following sections provide a brief description of the natural resource and land use character.

Terrestrial Sub-Zone 1 (Urban – built-up)

Terrestrial Sub-zone 1 is predominantly an urban land use environment (See Figure 18). Due to the complexity of the environment type, for description purposes it is divided further into four sub-areas. These are:

- Subic Industrial Park and Subic Gateway
- East Bajac-bajac
- Kalayaan Residential Area
- Linear Highway Development Corridor

Subic Industrial Park and Subic Gateway

Resource/land Use Character
Mainly mixed commercial and large-scale industry. The area is partially developed with a significant area of land still vacant. The area features large lots, generally of high quality developed to accepted town planning standard, with industrial park layout and amenities. The terrain is flat, with remnant scrub growing on vacant land parcels.

East Bajac-bajac

Resource/land Use Character
A steep narrow residential enclave on the hillside adjacent to this section of the SBPA. Generally consists of low standard residential structures. Tenure is uncertain (alienable and disposable lands). A good quality fenced perimeter (SBFZ restricted area) exists, with vehicle accessible maintenance track on the SBPA side of the fence. A reasonably dense vegetation/tree cover occurs throughout much of the area. Surface drainage from the area is direct to the nearby river and no sewerage system or urban effluent treatment exists.

Kalayaan Residential Area

Resource/Land Use Character
A high quality, well planned and maintained residential area. Good perimeter fencing and control exists. The areas are spacious, exclusive and with excellent amenities. Rainforest environment contributes an important part to urban setting and character.

Figure 18. Terrestrial Sub-Zone 1 (Urban)

Linear Highway Development Corridor

Resource/Land Use Character
Mixed urban uses are located along the Olongapo-Gapan highway and land use corridor that coincides with the course of a major tributary of the Santa Rita River. Strip development without effective 'planned' breaks continues. The area is characterized by variable quality of property development and maintenance.

Terrestrial Sub-Zone 2 (Economic, Multiple Use)

This sub-zone is an area dominated by rural settlements, general agricultural land use and plantation agriculture (See Figure 19). Identifiable land use/environment 'sub-sets' of this sub-zone fall into the following categories:

- Remnant vegetation areas
- Agricultural/rural land use
- Cropping areas
- Major river valleys
- Roosevelt National Park

It is to be noted that apart from Roosevelt National Park, these sub-sets or areas do not have tightly defined spatial areas. Their areas tend to merge where transitional change to a different land use/landscape type occurs.

Remnant Vegetation Areas

Resource/land use character
Characterized by a mixture of open canopy forest and open brushland landscape. Remnant patches of mature trees form important residual habitat niches.

Agriculture/Rural Areas

Resource/land use Character
Extensive agricultural and mixed farming (cropping) include orchards and plantation agriculture. A relatively dense/intense farming pattern occurs, with numerous habitations, structures and small settlements.

Cropping Areas

Resource/land use Character
'Cropping areas' are characterized by a mixture of agricultural activities including orchards, plantation agriculture and extensive open grassland. The latter merges into extensive areas of similar landuse/landscape in the adjoining area of Bataan Natural Park, as well as the nearby upland barangays, as well as extensive areas of open grassland.

Figure 19. Terrestrial Sub-Zone 2 (Economic, Multiple Use)

Major River Valleys

Resource/land use Character
Within this sub-zone occur pronounced river valleys, deeply incised into undulating terrain. The river channels are associated with river terrace floodplains at regular intervals down the course of the river. Portions of the river flats, and in particular the steeper riverbanks and floodplain river escarpments, tend to have substantial cover of fringing and riverine vegetation types.

Roosevelt National Park

Resource/land Use Character
An extensive, established area of forest park and conservation reserve, containing some mixed uses (recreation node, park infrastructure, etc).

Terrestrial Sub-Zone 3 (Built up/settlement, economic, rural/agricultural, forest)

This sub-zone is an area of mixed land use ranging from significant enclaves of remnant forest, to intensive irrigated agriculture and coastal settlements (See Figure 20). The corresponding land use sub-sets in this buffer sub-zone include:

- open woodland/brushland rural landscape
- open grassland
- agricultural rice paddies
- fishing settlements
- major ridgelines and escarpment
- sand beach
- surface water course/river valley

These are each discussed in the following sections.

Open Woodland/Brushland Rural Landscape

Resource/land Use Character
This includes open rural landscape with extensive areas of unplanned agricultural land use, with low density mixed uses. Agricultural land use productivity is low. The tenure of large parcels is uncertain, but these are thought to be sizeable areas of alienable and disposable lands. River channels are exposed with significant clearing of riverbank vegetation, hence exposure to agents of erosion.

Figure 20. Terrestrial Sub-Zone 3 (Settlement/Multiple Use)

Open Grasslands Areas

Resource/land Use Character
Open grasslands occur in the eastern margins of the Sub-zone, and in an area near the coast. The landscape is open and undulating with very little tree cover remaining. Land use activities appear to be miscellaneous, dispersed and low intensity. Soils are extensively exposed to various agents of erosion. The area is moderately sloping to undulating, with slopes varying between 8 and 18%.

Intensive Agriculture (e.g. Rice Paddies)

Resource/land Use Character
This refers to the flat low lying land area inland of Port Binanga Bay and to the immediate south of Binanga River. This area of intensive agriculture, mainly rice paddies, extends inland for about 1.5 kms. This area was originally proposed for inclusion into the SBPA but was re-designated into the Buffer Zone due to the permanent and intensive nature of the land use. The rice paddy area is a legitimate, historical landscape and has value as such.

Ridgeline and Escarpments

Resource/land Use Character
Notable landscape feature with significant slope factor (> 18 %), and generally (as identified) with substantial/dense tree cover. Forms important landscape/visual catchment boundaries, and also defines near and middle distance viewsheds. Ridgeline that is referred to extends back from the shoreline of Port Binanga Bay directly inland and forms a pronounced physical divide between the area of intensive agriculture (rice paddies) on the northern side and the fishing village on Port Binanga Bay to the south. The escarpment lies along the southern shoreline of Port Binanga Bay. It forms an important physical shoreline of distinct character, and is steep to sheer in parts, and well vegetated where conditions allow.

Fishing Village

Resource/land Use Character
The fishing village of Mabayo at the head of Port Binanga Bay is an established settlement on the low-lying coastal foreshore strip at the foot of the coastal escarpment. It has a population of approximately 2,000. A large but partly dilapidated jetty/pier structure exists at the western edge of the village. The village has some character and charm that is of value in it for potential tourism industry development. Observation suggests a balanced community, not yet experiencing the pressures of change from outside forces. If correct, the village is potentially vulnerable to the social impacts of change.

Sand Beach

Resource/land Use Character
The inner shoreline of Port Binanga Bay provides a sand beach of good quality that is backed by a belt of vegetation in the north and the fishing village in the south. This beach is a relatively scarce resource in the general area for possible growth in recreation and tourism activities, and offers a good potential substitute for use to those in the SBPA which have very high environmental and habitat (e.g. turtle nesting) value.

Surface Water Course/River Valleys

Resource/land Use Character

There are two principal surface watercourses in this sub-zone of which the Binanga River is the more important. It flows directly into Port Binanga Bay. The river valleys associated with them are important landscape features, with important habitat value and environmental processes. Both rivers have extensive lengths (segments) of their banks cleared of vegetation cover, and both are observed to support various uses (open drain, site for disposal of organic farming waste, water supply abstraction, livestock watering, etc.).

Terrestrial Sub-Zone 4 (Bataan Natural Park)

Bataan Natural Park lies adjacent to the southern and eastern edge of the SBPA boundary (See Figure 21). Consequently, the adjacent management zones of Bataan Natural Park (BNP) form a natural buffer to the SBPA and vice versa. The adjacent SBPA management zones can be considered buffers to the BNP.

Resource/land Use Character

Within the BNP buffer sub-zone are different natural resource and environment types. These include the following:

- open grasslands in rugged terrain south of Mt. Santa Rita;
- dense rainforest adjacent to the boundary of the Ecological Core Management Zone; and
- agricultural clearings (plantations, swidden, grassland, etc.) along the southern boundary of the SBPA.

Within the latter in particular, there are a number of small, established communities that are participants in formal 'alternative livelihood programs' run by/with the cooperation of the Bataan Natural Park administration. These are aimed at preventing the further establishment of inappropriate activities, stabilizing existing activities and preventing further expansion of population in the locality.

Figure 21. Terrestrial Sub-Zone 4 (Complementary Buffer - BNP)

Marine Sub-Zone 1 (Outer Bay)

Marine Sub-zone 1(Outer Bay) is composed of both terrestrial and aquatic/marine areas.

Marine Area

Resource/Use Character
The outer bay portion of the Buffer Zone extends from the boundary of the SBPA (from north of Grande Island) to the western shoreline of Subic Bay (Redondo Peninsula), and south to the seaward 'entrance' of Subic Bay (see Figure 22). This portion of the marine sub-zone extends from relatively shallow waters in the vicinity of the eastern coastline, Port Binanga Bay and Grande/Chiquita Islands, to the relatively deeper waters of the open Bay. Valuable marine habitat (e.g. coral reef, coastal platforms, seagrass meadows) are located in various portions of the sub-zone where depths allow. Some good quality coral reef habitat occurs on the Redondo Peninsula coastline.

Terrestrial Areas

Resource/land Use Character
The terrestrial portion of the sub-zone extends over all relevant surface water catchments on the west side of Redondo Peninsula and drain directly into this 'marine' buffer sub-zone. The land area is relatively steep and rugged, extending upwards to maximum elevations of 900 meters. All but the higher slopes have been cleared of former rainforest cover and are now mainly open grassland. Land tenure is uncertain. However, mining exploration leases extend over portions of the area.

Marine Sub-Zone 2 (Inner Bay)

Marine Sub-zone 2 (Inner Bay) is composed of both terrestrial and aquatic/marine areas.

Marine Area

Resource/Use Character
The marine sub-area extends from north of Marine Sub-zone 1 and the northern marine boundary of the SBPA on an east west alignment with Mayanga Island. The area extends eastward to Olongapo Bay, including the Subic Harbor area (See Figure 23). This area is of similar depth in the open water zones but due to greater degree of physical 'enclosure', subject to lower levels of natural flushing and mixing, especially in the vicinity of Olongapo Bay. The water quality is also lower, being influenced by pollutants entering the marine system from intense land use catchments, and from varying levels of marine habitat modification due to various human activities (fishing, extraction of materials, removal of seagrass and coral, navigation channels, anchorages, etc).

Figure 22. Marine Sub-Zone 1 (Outer Bay)

Figure 23. Marine Sub-Zone 2 (Inner Bay)

Terrestrial Areas

Resource/land Use Character
The terrestrial portion of the sub-zone extends over all relevant surface water catchments on the west side of Redondo Peninsula that drain directly into this 'marine' buffer sub-zone. The land area is relatively steep and rugged, extending upwards to maximum elevations of 1000 meters. All but the higher slopes have been cleared of former rainforest cover and are now mainly open grassland. Land tenure is uncertain, however mining exploration leases extend over portions of the area. There is also an increase in coastal development including settlements and industry.

5.6.9. Description: Outer Buffers

This section provides a brief description of the Information, Education and Communications Area (IECA), and the Integrated Catchment Management Policy Areas (ICMPA).

Information, Education, Communications Area (IECA)

The Information, Education, Communication Area (IECA) is referred to in Section 5.6.5. Though not within the formal Buffer Zone, the need to address the management implications of this area as part of the overall management of an 'open aquatic system' is necessary. The IECA extends over the innermost, northerly portion of Subic Bay, immediately adjacent to Marine Sub-zone 2 – Inner Bay.

Resource/Use Character
The IECA is similar in many respects to Marine Sub-zone 2, except with tending shallower benthic contours, and a greater proportion of coastal foreshore to open water area compared to the remainder of Subic Bay. Owing to the morphology of this portion of the Bay, there is generally poor flushing and dilution/mixing with correspondingly poorer water quality. Remaining natural resource values in this zone (i.e. fisheries) have been severely depleted and are now subject to excessive pressure by mainly small subsistence operators. A key characteristic of the IECA is the higher population and higher density of coastal foreshore land use of the adjacent land areas. Land use activity includes urbanization and settlements, aquaculture, industry and miscellaneous agriculture.

Integrated Catchment Management Policy Areas (ICMPA)

Integrated catchment management policy areas are designated over the six identifiable integrated catchments that feed surface drainage from the surrounding land areas into the receiving waters of Subic Bay. It is to be noted that several of the catchments on the Redondo Peninsula are included in Marine Sub-Zones 1 and 2. For purposes of the PAMP, the remaining ICMPAs are divided between the portion included under the statutory Olongapo Watershed area. However, in policy terms both should be treated as one.

The watersheds included in the overall ICMPA are as follows:

- watershed of the Binictican River and other smaller rivers/streams that have their headwaters on Mt. Silanguin on the southern tip of Redondo Peninsula;
- Agusuhin River basin and headwaters in Mt. Maybe, in the central part of Redondo Peninsula;
- all watersheds of rivers flowing into the Subic bayhead from the western and eastern parts of the municipality of Subic. These include the Basilio River, Cawag River, Redondo Creek, and various other intermittent streams collecting off Mt. Cawag, Mt. Basilio, and Mt. Redondo; and
- all watersheds of the Kalaklan and Sta. Rita rivers originating in the Mt. Balakibok area and that drain principally into Olongapo Bay.

Resource/Use Character
Part of the Redondo Peninsula ICMPA is occupied by the military reservation, hence there is very little ongoing human activity. Should the reservation be abolished a rapid increase in unplanned uses could be anticipated. The upper slopes of Mt. Silanguin are still covered with forest vegetation. However, the same areas are currently subject to extensive mining claims. The overall terrain is steep and extremely rugged. The potential for significant soil erosion and landform instability is high, especially with the onset of uncontrolled and poorly managed land use.

Other parts of the catchment are threatened by siltation from possible mining developments on both sides of the bay. Of more immediate concern to the environmental quality of Subic Bay is the diffuse and point source water pollution originating from domestic and industrial waste from the major concentrations of population and industrial activity. Olongapo City is the biggest source of waste effluent pollution. The uncontrolled or poorly planned expansion of future urban or industrial activity with insufficient provision of basic infrastructure (effluent waste treatment, solid waste disposal, etc.) a severe threat to the future of Subic Bay marine environment, so is the potential development and spread of non-urban activities such as aquaculture and agriculture.

5.6.10. Buffer Zone Areas And Boundaries

This section provides the relevant information on the spatial areas and boundaries of the various Buffer Zone Sub-zones, including the informal buffer areas (e.g. Information, Education and Communication Area, Integrated Catchment Management Policy Areas).

Table 24. Area and Location of Buffer Zones

Buffer Zone	Buffer Sub-areas	Informal Buffer Areas	Spatial Area	Boundary Definition
Terrestrial Sub-zone 1	• Subic Industrial Park • East Bajac-bajac • Kalayaan Housing • Linear highway development			
Terrestrial Sub-zone 2	• Remnant vegetation areas • Agricultural/rural areas • Cropping areas • Major river valleys • Roosevelt National Park • Pastolan Aeta community			
Terrestrial Sub-zone 3	• Open woodland and brushland rural landscape • Open grasslands • Intensive agriculture (rice paddies) • Ridgelines and escarpment • Fishing villages • Sand beach • Surface water course and river valleys			
Terrestrial Sub-zone 4				
Marine Sub-zone 1				
Marine Sub-zone 2				
		Information, Education, Communication Area		
		Integrated Catchment Management Policy Area		
		Olongapo Watershed Integrated Catchment Management Policy Area		

6.0 MANAGEMENT PRINCIPLES AND STRATEGIES

6.1. Introduction

This Chapter presents a summary of management principles, as well as the key strategies for implementation, as part of the overall establishment, administration and ongoing management of the SBPA.

The strategies may be considered primary and over-arching in nature; that is, they are strategies to be pursued and implemented irrespective of detailed changes in ongoing management prescriptions and programs over the years. They are therefore 'macro' in nature and content. Buffer zones are treated as an integral part of the SBPA for this purpose.

The strategies range in focus from administrative and functional matters to technical and strategic matters. All these 'domains' are important to the successful operation of the SBPA.

The chapter begins with a re-statement of the overall purpose and strategy of the SBPA, followed by a statement of management principles. The chapter is therefore divided into the following:

- introduction
  - purpose of the management plan
  - overall strategy
- management approach and principles
- strategies

6.1.1. Purpose of the Protected Area Management Plan/Manual – A Re-Statement

The purposes of the SBPA, and the Management Plan/Management Manual, are as follows.

In general, to protect the biological and ecological values of SBFZ (the rainforest ecosystem, mangroves, beaches, seagrass meadows, coral reefs and the various fauna they support).

Specifically, to:

- identify and set aside the remnant terrestrial and marine environments of value in a designated Protected Area;
- identify and delineate the different resource attributes of the PA;
- set in place appropriate SBPA management zones and sub-zones for the purposes of systematic management of the overall protected area system;

- prescribe appropriate permissible uses for each zone and sub-zone commensurate with protection needs, management imperatives, resource carrying capacity and/or land use character of each zone/sub-zone; and,
- provide appropriate management prescriptions for the overall SBPA and the various zones and sub-zones, based on each of the above.

6.1.2. Statement Of Overall Strategy For The Protected Area

The **overall strategy** is to secure in perpetuity (forever) the outstanding natural values of the Subic Bay Freeport Zone. This includes the terrestrial (rainforest ecosystem, coastal and mountain landscapes) and marine (coral reefs, seagrass meadows, soft benthic habitat, beaches, seascapes) ecosystems together with the unique flora and fauna species they support. The overall strategy is to be achieved through the designation and ongoing management of a Protected Area Natural Park system. The Protected Area Strategy elements are as follows.

1. Achieve the protection of core environmental values (terrestrial and marine) remaining in the SBFZ.
2. Establish a 'sustainable use' zone with appropriate use levels around the core to both strengthen and protect the core areas.
3. Integrate and connect the core zone values functionally/biologically with the adjacent Bataan National Park.
4. Retain and protect the integrity of representative and ecologically sustainable transects from the ridge tops to coral reefs.
5. Maintain interconnected natural processes throughout the natural area.
6. Ensure that the critical food webs, as the basis to ecological sustainability and maintenance of biodiversity throughout the SBPA and wider region, are maintained.
7. Allow for appropriate levels of 'nature based activity' and provision of facilities in appropriately designated zones.
8. Allow for the continuation of appropriate land use activities in designated areas;
9. Encourage/undertake the relocation of inappropriate activities from within the SBPA to suitable land use zones outside the SBPA.
10. Ensure the progressive restoration/rehabilitation of formerly degraded sites within the SBPA, where and when the opportunity becomes available.

6.2. Management Approaches and Principles

The boundaries and location of the PA as illustrated in Figure 3, and as described and explained above, necessarily involves the consideration and application of a number of important approaches and principles. These are derived in response to the recognition of the various physical characteristics of the PA, and are explained in the following sections.

6.2.1. Management Approaches

Physical Characteristics of the Protected Area – Ecosystem Linkage and Biological Continuum

The first important characteristic of the PA is that it provides the opportunity to protect a 'structural/biological continuum' running from the uppermost ridge lines located in the CEZ-T down to the coral reefs of the CEZ-M. This means the PA can contain an intact and continuous transect, along a wide geographic front, and hence retain a virtually 'complete' environmental system (see Figure 24).

The value of this in scientific, educational and heritage terms is extremely high. It is also the last opportunity to achieve protection of a biological continuum associated with this particular and unique rainforest ecosystem.

Protection of physical continuum in the landscape also allows for the protection of an integrated system of continuous or inter-linked natural processes. This includes the spatially and functionally linked foodwebs of the overall ecosystem. As the PAMP framework presented in Section 4.2 indicates, there is a need for integrated management over a wide area employing a range of appropriate techniques and approaches. Hence management must be well coordinated throughout the PA, and not be separated into isolated activities in discrete areas.

Core Terrestrial Zone to Core Marine Zone

The unique strength of the Subic Bay PA is a high environmental value core terrestrial and core marine zone, which are connected. This is illustrated graphically in Figure 25.

However, the greatest long-term risk to the existence of an intact ecosystem transect connecting marine and terrestrial core zones is the potential for severance of the two due to development and the spread/intensification of land use activity between the two. This severance could be both physical (i.e. uncontrolled spread of physical development, whether tourism/park oriented or not) and functional (i.e. disruption, severance or destruction of vital connecting natural processes).

There is therefore an essential need for the PA management to permanently retain the two core areas and their linkages. This should not be compromised by any other decision affecting the management of the PA or development within it.

Figure 24. Ecosystem Linkage and Biological Continuum

Figure 25. Core Terrestrial and Core Marine Connectivity

Table 25. Criteria for Selection of PA Boundary

Criteria/Term	Essential	Desirable	Supplementary	Priority
BIOLOGICAL				
Biodiversity	•			3
Integrity	•			3
Representative	•			2
Heritage (physical)		•		1
Security		•		2
FUNCTIONAL				
Spatial		•		2
Proximity		•		2
Linkage, connectivity		•		2
Manageability	•			3
SOCIAL				
Heritage	•			3
Useability		•		2
Visual, landscape			•	1
Icon, image			•	1
INSTITUTIONAL				
Institutional	•			3
Stakeholder interest		•		2
ECONOMIC				
Committed developments			•	1
Affordability		•		2
Marketability		•		3
LEGAL				
Law	•			3
Policy	•			1
Tenure		•		2

Ecosystem Functions and Food Web

The core of the PA environmental values is the continued existence of the interconnected ecosystems, and the complex inter-linked food web (Figure 26). These are in turn the outcome of a 'whole' geographic/landscape environmental system of sufficient spatial area to support the degree of ecological complexity that exists. The establishment of the Subic Bay PA was based on an approach and methodology that placed special emphasis on these theoretical and practical underpinnings.

The boundaries of the whole PA and the designation of specific management zones is concerned with protecting the foodweb linkages, particularly as they relate to the landscape continuum from ridge top to seafloor and the associated natural processes. The inter-connectivity of foodweb through the ecosystem is illustrated diagrammatically in Figures 27. .

It is essential, therefore, to protect these values as a key aspect at achieving the long-term integrity of the PA.

Scenic Implications of the Seascape, Coastal Fringe and Lower Slopes

The nature of the landform and landscape configuration of the PA is such that much of the visual and aesthetic value experienced by both residents and visitors is dependent on the visual integrity of the lower slope/coastal portions. This should not detract in anyway from the very unique landscape values of the rainforest in the more easterly, upper slope portions of the CEZ-T.

It is important to preserve the coastal landscape because the visual qualities of the area indicate to visitors how intact and special the PA is. Erosion of these values will devalue the tourist/visitor experience and see a diminishing of the attraction. To preserve these unique landscape values, it will be necessary to resist the inevitable pressure arising from investors and special interest groups who seek preferential treatment for their development proposals.

Character Precincts of the Protected Area

An outcome of the above is that the overall physical character of the PA combined with the dominant patterns of land use development results in a convenient split of the PA into two main 'character precincts' (types of areas based on their characteristics).

The two precincts by virtue of a natural divide run from east to west along the ridge immediately north of the Bat Roost area (in the vicinity of Cubi-Triboa) and out into Subic Bay on an alignment running past the southwestern end of the airport (see Figure 28).

To the north is a 'development oriented precinct' of the PA, with the majority of existing major land use and development that must be accommodated within the PA management objectives. This 'precinct' relates strongly, both visually and functionally, to the wider land use and activities of the SBFZ. This is demonstrated by the construction of an

additional route through valuable remnant mangrove swamps connecting the Freeport zone to the airport and container terminal. To a large degree the needs of this 'economic zone' must be met, providing there is adequate protection for the essential biological/environmental values on which the wider natural system depends.

To the south of this divide is a 'natural environment, landscape and eco-tourism precinct'. While this area contains some key development nodes (e.g. marine exploratorium, holiday chalets/apartments, miscellaneous commercial activities in the NavMags and former navy installations, etc.), it is predominantly an intact rainforest zone of exceptional biological and landscape value. Hence, the emphasis should be to preserve these values 'in perpetuity' and to retain only approved PA oriented uses (eco-tourism, nature-based tourism, park recreation activities, park administration and management, etc.).

Importance of Buffer Protection

The land use complexity and intensity of the area surrounding the PA are such that the establishment of a buffer is extremely necessary. Increasing population, land use and development pressures will continue to be exerted on the PA and these can only intensify and increase over time. The successful administration and management of this zone will be a significant factor in the successful protection of the PA over the long-term.

6.2.2. Management Principles

The principles of effective management provide the basis for determining the boundaries, categories of protection, and buffer zones for the SBPA. They also form the basis for developing effective management strategies (section 6.3). It is to be noted that there is not necessarily a direct correlation between principle and strategy subject titles. The key management principles that apply to the Subic Bay Protected Area are as follows:

Principle 1: Management of the PA requires the adoption of a long-term strategy incorporating the principles of sustainable ecosystem management, financially secure management capability, ongoing benefit to society, and custodianship for the benefit of future generations.

Principle 2: Management of the Subic Bay PA requires the adoption and implementation of:

- management strategies;
- management zones;
- management zone guidelines;
- programs and projects;
- budget and financing; and
- monitoring and enforcement.

Figure 26. Generalized Functional Foodweb for Subic Bay

Figure 27. Foodweb Linkages within the Environment

Figure 28. Natural Divide

Principle 3: Management of the Subic Bay PA must be undertaken within the administrative, legal and political framework of the Philippines.

Principle 4: Ecosystem values supported by biological diversity, functional integrity, nutrient and energy cycling and other ecosystem attributes are essential to the long term sustainability of the PA and must be maintained.

Principle 5: Ecosystem functions, and in particular the texture of habitats and the foodwebs supported by the diverse flora and fauna species that are the foundation of a healthy ecosystem, must be protected and maintained.

Principle 6: Core areas of undisturbed ecosystem of adequate spatial dimensions must be maintained and not allowed to diminish for any reason.

Principle 7: The physical continuum/transect from the terrestrial core ecological zone to the marine core ecological zone is a critical attribute of the Subic Bay PA and its preservation is essential to the long term sustainability of the PA.

Principle 8: The portions of the PA coastal zone with intact forest cover have a direct influence on the perception of the quality of the PA and must be protected as a matter of the highest priority.

Principle 9: The unbroken rainforest of the lower slopes of the PA forming a visual backdrop to the PA coastal/foreshore landscape is a vital element of the "visible" landscape of the PA and must be retained.

Principle 10: Degraded and damaged portions of the PA must be rehabilitated and restored to appropriate condition in accordance with accepted PA management objectives, whenever and wherever possible.

Principle 11: The most intensively used and modified coastal fringe of the PA can be divided into to two strategic management (or character) precincts for the purposes of land use policy formulation, which are:

- north of Triboa Bay to Olongapo a development and environmental enhancement oriented management precinct; and
- south of the airport/bat roost area a natural environment, landscape and ecosystem protection oriented management precinct.

Principle 12: The establishment, management and administration of an effective buffer zone are essential to the sustainability of the PA in the long term.

Principle 13: The incorporation of indigenous peoples (Aeta) values, interests/needs and advice into the management strategies and objectives of the PA is essential, and recognizes the legitimate contribution of the Aeta to its overall heritage value of the PA.

Principle 14: Notwithstanding all preceding principles, successful management of the Subic Bay PA requires the right balance between:

- ecosystem protection and conservation;
- providing opportunities for appropriate human use and experience (eco-tourism, recreation, education, science research, etc);
- development of suitable commercial activities within the PA in order to derive direct economic benefit for the wider community and generate income to sustain management of the PA; and
- allowing the continued existence of appropriate land uses within the designated Special Use Zones of the PA.

6.3. STRATEGIES

This section presents a number of strategies to be undertaken as part of SBPA implementation and management. It is anticipated that further strategies will be identified and formulated over time, as situations and needs change, and as opportunities arise. The strategies are the following:

- balancing resource protection and development
- restoration and rehabilitation of degraded habitats
- research and monitoring
- information, education, and development communication
- establishment of non-destructive livelihood and investment alternatives
- community based resource management
- promotion of indigenous people's rights
- participatory planning in PA management systems
- traffic management strategy
- financial management strategy
- capability building
- institutionalization of PA management systems

The strategies are concerned with ecological/resource management (strategies 1-3), stakeholder and community involvement (strategies 4-8), and organizational management (strategies 9-12). The strategies are important areas of endeavor that should be implemented progressively by the PAMB as funding becomes available. Some strategies are in effect ongoing SBPA management requirements while others are focussing on specific initiatives.

Each strategy is presented in three parts. First, there is an **objective**, which indicates the reason for the strategy and broadly what it meant to be achieved. Second, there is the **background** to the strategy providing explanation and relevant context. Third, there is the **strategy statement**. This is an action recommendation, and is intended to outline what action the PAMB, or others, should take to advance, initiate or carry out the strategy. Many of the strategies are complex with many action sub-components to be implemented over a number of years. Further formulation of the strategy

implementation details are required in most cases, and to undertake this work will be an early initiative of the PAMB after establishment of the SBPA and commissioning of the organization.

6.3.1. Balancing Resource Protection and Development

Objective:

To ensure the ongoing protection of natural ecosystems within the Protected Area and the protection of native flora and fauna throughout the Subic Bay Freeport Zone while encouraging economic development that is supportive of good environmental management and benefits from high environmental quality.

Background:

One of the salutary principles underlying the re-use of the Clark and Subic military reservations and their extensions is the pursuit of "sound and balanced" development. As stipulated in the "Bases Conversion and Development Act of 1992" (RA 7227), the development plans that shall be prepared, adopted and implemented for the former military bases shall be "consistent with ecological standards…to promote economic and social development of Central Luzon in particular and the country in general" [Sec. 4(b)].

Sound and balanced development envisioned in the Act rests firmly on three pillars: economic growth, social development, and environmental health. These three pillars in turn shall be established on the recognition of and encouragement to private sector enterprise as the driving force of economic growth and on local empowerment through effective and meaningful coordination and consultation among national and local government agencies and the affected communities. It also includes implicit awareness among the development actors that socio-economic growth can be sustained only by keeping the natural environment in perpetual state of health. Thus, RA 7227 adds a Philippine voice to the growing global discourse on "sustainable development". Concern for maintaining environmental health is even more pronounced in the case of Subic Bay Freeport Zone (SBFZ) where a variety of ecosystems exist.

Into this rich environmental host, the SBFZ through its management body, the SBMA, has been implanted. The aim is to develop it into a "self-sustaining industrial, commercial, financial and investment center to generate employment opportunities in and around the zone and to attract and promote productive foreign investments" [Sec. 12(a)].

To realize the potential of SBFZ as a center for regional economic growth the SBMA shall undertake, among others, construction, maintenance and management of major infrastructure and utilities projects such as the ship repair and ship building facility, container port, oil storage and refueling facility, airport and related facilities, and tourism-related activities. All these public sector interventions are calculated to lay the basis for productive private sector investments. Taken together, the output of public and

private sector investments will spur accelerated economic growth. The overall adverse impacts of public and private investments on the environment and natural resources will likewise be intensified, if no safeguards were put in place. Happily, such safeguards do exist.

The safeguards are built into the powers and functions of the SBMA, as explicitly provided for in Sec. 13(b) of RA 7227, to wit:

> "(9) To protect, maintain and develop the virgin forests within the baselands which will be proclaimed as a national park and subject to a permanent log ban…;
>
> "(10) To adopt and implement measures and standards for environmental pollution control in all areas within its territory including, but not limited to all bodies of water and to enforce the same…."

The idea of balancing resource protection with development reflects the growing perception that sensitivity to the environment makes good business sense. That resource protection ***actually*** results in greater production or productivity is a thesis that the framers of the SBMA charter must have thought of when they included among the powers and functions of SBMA the protection of natural resources and the environment. Convinced of the necessity to preserve simultaneously the ecological and human use values of the natural resources, the SBMA charter framers mandated the protection of the forest as well as marine ecosystems within its territorial jurisdiction.

Strategy

The strategy is to incorporate into the overall management planning tasks for the PA and the administration of the buffer zone, a philosophy, set of principles, policies, statutory controls and operational procedures that achieve both regional environmental protection as well as sustainable economic development.

Implementation of this strategy will require agreed procedures for examining the content of all policies and plans prepared and implemented by the PAMB, the SBMA and local government authorities to ensure that environmental protection is incorporated in all aspects of regional development.

Forest Ecosystem Protection

Objective

To ensure that the forest ecosystem within the SBFZ is maintained at least at current levels of quality and spatial extent, and that the further clearing of old growth and high quality forest ecosystems due to various agents of destruction, both natural and man made, is prevented.

Background

- Forests provide a wide variety of products and services useful to both man and animals. The Flora Resource Inventory (RIR Vol. II) has determined, for example, that of the 150 species of plants identified as economically important, 26% are used as source of food especially by the resident indigenous people; 35% as medicinal plants; 53% as source of construction materials; and 13% for other purposes.

- Forests serve as wildlife habitat. The SBFZ harbors many species of animals that are found only in the Philippines and that a high percentage of these are threatened or endangered (RIR Vol. III).

- Forests contain a pool of genetic resources that, though still largely unknown and untapped at present, may be needed for the basic requirements of future generations. The flora inventory (RIR Vol. II) has found that close to one-third (31.3%) of the 806 plant species recorded in the SBFZ are endemic to the Philippines. Of these at least 48 species are endemic to Luzon Island. Moreover, the inventory has ascertained that of all rattan species considered as endangered, at least seven are found in SBFZ. One species that is rare occurs in only two areas in Central Luzon, Mt. Arayat in Pampanga and the study area. One guiding principle in conservation is that "areas especially rich in species or containing rare, endemic, unusual, or keystone species (species that play a special role in maintaining a particular ecosystem) deserve protection" (RIR Vol. III).

- Forests play a vital role in regulating global warming by consuming or sequestering large amounts of carbon.

- Being strategically located in the uplands, forests strongly influence the lowland, coastal, and marine ecosystems. According to the hydrologic assessment (RIR Vol. XIII) the northern watersheds (Sta. Rita, Matain, Calapandayan) and the Redondo Peninsula which have relatively sparse vegetation are vulnerable to severe flooding. Floods cause considerable damage to life and property in low-lying areas. On the other hand, the flood levels of rivers with heavily forested watersheds (Binictican/Malawaan, Minanga) are shallower.

Similarly, the areas with sparse forest cover lying in very steep slopes (Sta. Rita watershed, Redondo Peninsula) experience severe erosion (RIR Vol. XIV). Among other things, soil erosion contributes to the sediment load of rivers and the final receiving water body, especially at the northern part of Subic Bay (RIR Vol. VIII).

Finally, forest cover plays a crucial role in increasing the volume of rainwater that enters the aquifer that supplies most of the freshwater needs of human settlements. Its thick layer of mulch provides the overlying absorptive cover that increases the opportunity for rainwater to infiltrate and recharge the groundwater. Maintaining and even increasing the

area under forest cover results in increased storage capacity for freshwater to meet the growing requirements of the human and animal population.

These observations should provide strong arguments for preserving the remaining intact forests and even rehabilitating the residual ones.

The SBMA Charter [RA 7227, Sec. 13(9)] explicitly provides for a policy of "permanent total log ban". This means that no cutting of trees of whatever species shall be allowed in the protected area. Zones of limited utilization may, however, be established where harvesting of non-timber products shall be allowed provided that such harvesting privileges are extended only to the local residents whose support shall be enlisted in protecting and conserving the area.

Totally prohibiting logging does not make the forest ecosystem unproductive. On the contrary, it opens up opportunities for alternative non-exploitative uses which potentially have higher returns such as nature-based tourism, environment-friendly recreational activities, scientific researches, and cultural activities.

Strategy

The strategy involves a number of broad actions. First, it is necessary to identify all agents of forest ecosystem destruction.

Secondly, there should be a systematic examination of the reasons those agents of forest destruction exist, and an investigation of the possible solutions that might be applied, over time, to resolve and eliminate them. Attention should be given to those factors that are unique to the Subic situation, and consideration given to locally specific solutions.

Thirdly, the PAMB and SBMA, in combination with all other relevant agencies and stakeholder groups, should develop a forest protection action plan for joint/cooperative implementation across the wider region. The plan should incorporate the management zone prescriptions and management objectives of the PA as part of the overall strategy, to ensure a comprehensive approach to the problem.

Marine Environment Protection

Objective

To achieve the protection of the marine environment of Subic Bay through protective measures and active management and allow the natural regenerative potential of the marine ecosystem takes its course so that valuable marine habitats and resources are restored and re-established.

Background

Declaring parts of the marine area within SBMA as protected areas is in itself a strategy for effectively managing its ecology and laying the groundwork for projected social and economic benefits. The Marine Protected Area (MPA) initiative is premised on its possible contribution to improving fish populations, conserving the status of the benthic environment, reversing the effects of fishing pressure, promoting sustainable tourism and safeguarding ecosystem integrity.

Studies have shown that MPAs established in favorable areas have been reported to contribute to increases in mean body size, density and biomass of target fish species. Adult fish within MPAs are also known to contribute to yields in neighboring fishing grounds. Moreover, studies have shown that there are drastic reductions in fish populations as soon as protective measures are relaxed.

Throughout the moratorium on fishing, non-extractive, non-motorized but supervised forms of recreation in identified nearshore zones may be allowed. Such activities are: supervised scuba diving, kayaking, swimming, and snorkeling. To achieve maximum effectiveness specific areas or ecosystems found within the Bay should be provided with specific conservation guidelines as each area has its own specific needs. These areas are:

- ***Coral reefs.*** Within the Bay, reefs identified with high live coral cover include NW Chiquita Island with 39.4% and Sueste Point with 60.94%. NW Chiquita is found within the ecological core zone while Sueste Point is located in the buffer zone. These areas should be conserved not only as a showcase for Subic Bay's growing tourist population but also to maintain the local coral diversity and serve the whole bay as a source for repopulating depauperate reef areas. Markers should be deployed to delineate these areas indicating activation of protective policies organized for non-extractive modes of recreation. Likewise, continuous monitoring through acceptable methods like the line transect method or the Aquanaut Survey method should be employed continuously to keep track of coral recruitment and overall reef health.

- ***Fish populations.*** 2000 survey found a significant reduction in the abundance of the blackspot damsel *Pomacentrus stigma* in Chiquita and Sueste Points while its populations at Camayan Point may have completely been obliterated. This trend threatens this fish species with extinction. This species thus needs immediate protection. A first step would be to protect its natural habitat from destructive activities. In addition to coral protection, Chiquita and Sueste should likewise be delineated for this additional purpose.

- The biomass of other species was likewise assessed to be quite low compared to other areas of the country. To date, given the limited biomass of fish existing in the locality, closing the area to any form of fishing for at least three years from the onset of the declaration is the only viable management tool. This approach is better termed as 'fully protected reserve' where areas are completely closed to

fishing and all other types of exploitation or harmful use (Roberts and Hawkins, 2000). Closed areas should, however be limited to specific, identified and delineated areas in Chiquita, Sueste, Miami and Agusuhin. Other areas of Subic Bay should have fishery management zones devoted to multiple use to allow a compromise between different uses, to reduce conflict and to gain acceptance of protective measures by stakeholders (Pipitone. et al. 2000).

- Several target or food fishes are present in Subic Bay but not in sizes and catch volumes commercially acceptable. Fully protected reserves implemented at the onset of the management duration of 3 years will simultaneously protect these target species, their habitats and the ecological processes that dictate the consequences of their productivity. This type of protection may be eased after a thorough fish population evaluation is conducted and their size and volume have met the desired levels.

- Throughout this three-year period, continuous biophysical monitoring, personnel training in integrated coastal management, and research on sustainable yields may be undertaken. After this three-year period, a reevaluation of the state of fishing in the area will be conducted based on data collected from continuous monitoring efforts and the moratorium lifted when found practicable.

- ***Seagrass meadows and seaweeds.*** High diversities of seagrass and seaweed species in nearshore areas within Subic Bay have been observed to support populations of fish such as bangus (*Chanos chanos*) and *rabbitfishes (Siganus sp*.). Ilanin Bay that is located in the protected area and Miami Beach and Agusuhin that are in the proposed buffer zone are such areas that should be protected to help conserve the sources of food fish and assure the long-term sustainability of Subic Bay fisheries. The recommended strategy is to institute a three-year full protection at Ilanin, Miami and Agusuhin, concurrent with annual observation of the fish population behavior. Outside these designated areas, outer or secondary areas may be open to collection in allowable volumes.

- Seagrasses also serve as food for marine turtles and mammals. A turtle was spotted near Grande Island during the survey where it was reported to have lain eggs. Thus the seagrasses of Grande have to be protected for this purpose.

- ***Mangrove areas.*** Mangroves of Subic help prevent upstream flooding and serve as waterfowl feeding grounds and natural habitats. These areas have likewise been historically the source of food (small fish, mollusks and crustaceans) and firewood of indigenous communities nearby. Thus, the mangroves of Triboa, Ilanin, Binictican and Boton are recommended to be strictly conserved. These areas should be delineated with ground markers and paths or catwalks that should be built to conserve the state of the bottom sediment.

Strategy

The strategy involves the following actions:

First, to develop environmental protection policies and management programs that treat the marine environment as an 'open system' and recognize that no part of the marine environment can be isolated from the wider system.

Second, to implement research and investigations into critical aspects of the marine environment and surface water systems in order to identify the critical aspects of the system requiring protection, and hence determine priorities.

Third, to develop controls on land use development and polluting activities in the terrestrial catchments that affect water quality entering the marine environment.

Fourth, to implement programs engaging local fishermen and coastal communities in the re-stocking, management and protection of fisheries.

Fifth, to implement community and industry educational and awareness changing programs in order to gain support for marine protection and fishery management programs.

Protective Buffers

Objectives

To initiate and implement progressively over time a wide set of policies, controls and programs to improve overall land management and planning within the buffers, so that they function as effective 'social buffers' and assist in the protection of the PA.

Background

Areas peripheral to the protected area the uses of which have the potential to influence or affect the character of the protected areas both terrestrial and marine, will also be placed under varying degrees of limitation of use. This is to ensure consistency with the objectives for the protected area. On a more positive note, placing the buffer zones under a protective regime extends the benefits of protection to a wider area. In some cases the buffers extend beyond the territorial jurisdiction of SBMA and therefore management of these areas will entail some new institutional linkages that will enrich the experience in protected area management.

Strategy

The strategy involves the PAMB undertaking specific actions to consult, liaise and coordinate with all organizations and stakeholder groups having control or influence over

activities within the buffers so that agreement can be reached on practical ways in which better environmental protection can be achieved.

After agreements are reached, the PAMB will seek to encourage and coordinate the preparation and subsequent implementation of strategic environmental protection programs for the buffer zone.

Strategy on Corporate Commitment to Balanced Development

Objective

The objective is to encourage innovative and environmentally aware management practices within the SBMA and other institutions that would result in the adoption of 'best practice' approaches for ensuring 'environmentally friendly' development and economic growth in the SBFZ.

Background

The function of SBMA to protect the environment and natural resources within its territorial jurisdiction comes with a management structure to match. The Act directs SBMA to create the Ecology Center. The Ecology Center is the body within SBMA that exercises oversight functions regarding the proper protection of the environment and sustainable use of natural resources. Its principal responsibility is to implement all environmental and natural resources conservation and protection programs assumed or adopted by SBMA.

One evidence of the commitment of SBMA to maintain a "high degree of environmental quality as a precursor to the sustainable economic development of the areas under and adjacent to its jurisdiction" (RA 7227 IRR, Sec. 95) is the commissioning of the Subic Bay Protected Area Management Planning Project. The project, to prepare the management plan for the identified protected area, is remarkable in that it is way ahead of the preparation of the comprehensive development plan of SBFZ. This is to ensure that areas earmarked for conservation are excluded from consideration as sites for development projects and that projects selected for implementation are of the right type and are properly located.

Ultimately, a less apparent but far-reaching agenda of the SBMA experience is the formation of a new breed of development managers who are not only driven by the pursuit of growth targets but are equally unrelenting in their observance of social responsibility and environmental sensibility.

Strategy

The PAMB and its offices will take all actions necessary to support the implementation of strategic organizational change initiatives currently underway in the SBMA, and to

provide advice and training to staff and management of the SBMA so that environmental management and protection capabilities are improved throughout the organization. Particular emphasis should be directed to assisting and helping the Ecology Center as the planning and development control arm of the SBMA.

6.3.2. Restoration And Rehabilitation Of Degraded Habitats

Objective

To undertake a systematic restoration and rehabilitation of degraded habitats throughout the SBPA.

Background

Degraded terrestrial habitats include grasslands and brushlands where the original forest vegetation have been destroyed by excessive cutting, kaingin making and fire. These areas will be re-vegetated to restore these to their original condition as soon as possible.

To accomplish this objective, **Assisted Natural Regeneration (ANR)** will be mainly employed**.** In areas where ANR is not practical, regular reforestation techniques by planting seedlings will be adopted using indigenous species. No exotic species will be introduced. These areas will also be protected from fire and other destructive agents.

ANR relies on the ecological concept of natural succession, e.g., grass to shrubs and woody, pioneer species, to climax vegetation. As was established in the flora inventory, there is adequate natural regeneration of trees even under brush and grass vegetation. ANR facilitates and shortens natural succession through effective fire protection and application of appropriate silvicultural interventions it enhances the forest' ecological functions.

ANR promotes regeneration of indigenous species and hence biodiversity. It results in multi-storey, multi-species forest stand, which is ecologically stable and more effective for watershed and wildlife habitat protection. It ensures species-site compatibility since species are already well established and adapted to site. The technique is applicable the whole year round and is not constrained by climatic conditions. It is cheap. Costs of seedlings, transport, planting and associated infrastructure are eliminated or greatly minimized. It causes no or has very minimal destructive impact to already degraded land.

Strategy

The principal components of the strategy in achieving the stated objective are to:

- undertake a systematic identification and assessment of degraded habitats;
- prioritize those habitats for restoration/rehabilitation on the basis of habitat significance, suitability for Assisted Natural Regeneration, and cost;
- secure budget provision to undertake restoration/regeneration activity; and
- implement restoration programs on a continuing basis.

6.3.3. Research and Monitoring

Objectives

The objectives are to:

- Obtain information necessary to identify and manage threats to sustainable ecosystems
- Develop information that can be used to enhance the economic value of ecological resources and their value to local communities

Background

The protected area encompasses terrestrial, marine, and mangrove ecosystems that are essentially intact but are exposed to various levels of disturbance. Much of the bay and surrounding lands were buried under several centimeters of volcanic ash as a result of the Mount Pinatubo eruption in 1991. Food and building materials are harvested from forest and mangrove areas on the east side of the bay by local communities and the indigenous Aeta and human development is occurring in areas immediately adjacent to intact ecosystems. Protected Area management will have to change through time to adjust to changing needs. This approach, termed adaptive management, will require research and monitoring information in order to recognize and quantify changes in various indicators of ecological health in order to sustain natural ecosystems and the services they provide. This strategy is particularly important for the protection of native flora and fauna, when such protection is intended to span decades.

Additional information on the life history of key species or ecosystem processes will be needed to ensure their survival. Threats such as the introduction of exotic species, disease outbreaks, typhoons, volcanic eruptions should be addressed and recovery programs for species whose populations have reached critically low levels may be needed at various points in time.

Strategies

Strategy 1: Research and Monitoring

This strategy has several components aimed at collecting information necessary to identify problems and make management adjustments as problems arise. Components of this strategy include the following:

- Developing a comprehensive monitoring program that focuses on key ecological values and processes.
- Using the GIS database to compile information on changes in resource qualities (e.g., water quality), populations of key species, and human use of ecological resources. Monitoring goals will differ in each PA and buffer zone.
- Enlisting the support of development proponents within the PA to assess development impacts and conduct appropriate compliance monitoring.

Strategy 2: *Research to Enhance the Economic Value of Ecological Resources to Local Communities*

Research can also be initiated to discover or enhance the economic value of components of the natural ecosystem. Research investigations can range from cloning of orchids to the discovery and commercialization of drugs. Development based on such discoveries could provide direct and economic incentives for preservation of natural ecosystems within the protected area. Existing legislation provides the framework for deriving economic value from such discoveries (Regulating Access to Biological and Genetic Resources in the Philippines, A Manual on the Implementation of Executive Order No. 247, Foundation for Philippine Environment, 1997).

Research programs can provide additional benefits if they can be established with long-term support. Such programs can collect data on terrestrial and marine ecosystems that are important for monitoring environmental changes. The International Long Term Ecological Research (ILTER) Program of the U. S. National Science Foundation and Philippine universities conduct such programs in the region. Existing infrastructure and designation of protected area boundaries and management zones provide an attractive basis for developing this strategy for Subic Bay protected areas. Ocean Adventure also plans to support the establishment of research and monitoring facilities in the Ilanin area of the SBPA.

6.3.4. Information, Education, and Development Communication

Objective

One of the objectives of PAMB is to develop information, education and communication practices that will invest on the community, through all effective modes of communication, the maximum amount of information possible concerning its activities and the opportunities for nature-based tourism/ecotourism. PAMB then could educate the community and stakeholders on the principles of ecosystem management, the heritage values of the Protected Area, and the need for environmental protection in the wider region.

Background

In general terms, the successful long-term protection of the PA is highly dependent on the success with which the PAMB is able to effectively communicate with the widest audience possible. The central message content should be the nature of the resource assets contained within the PA, the opportunities they offer, and their importance to society. Part of this will be to effectively 'market' the PA to a wide range of existing and potential users which is the ultimate key to establishing a constituency of supporters for the PA. This constituency should come from the local, national, and international

communities, the best possible approach to ensuring the long-term survival of the PA, administratively, fiscally and politically.

Information

An important dimension of the PA and the function of the PAMB is the information dimension. Firstly, the PA may be a physical entity but the reality to much of the wider community is information about it – where it is, what it contains, its special attractions, etc.

Secondly, managing the PA requires large amounts of information, both descriptive of the resources and various land uses, and also current information concerning changes and events within it. The latter is the core material of land management, surveillance and monitoring.

Thirdly, there is the scientific and educational information domain. The PA is of great scientific and conservation importance and as such, it is an international 'living laboratory' of great value. The international educational and scientific communities have increasing interest in all remnant enclaves of biodiversity, remnant tropical rainforest/coral reef ecosystems in particular, as those remaining on the planet continue to dwindle in size and quality. A well managed/conserved rainforest resource such as is found in SBFZ will eventually be of inestimable value in this regard – a value that will also translate into enormous financial value.

Fourthly, there is information concerning the administration and financial management of the PA. This concerns the fiscal viability of the PA and the various economic enterprises and activities related to the PA's existence. It is concerned with how well the PAMB is able to resource its management responsibilities and hence how successfully the PA is being protected. It is this information domain that is most concerned with providing the substantiation for seeking and obtaining funds and/or financial assistance from external sources.

Education

One of the most important values of largely intact remnant natural environments is the research and educational value of 'transect' terrestrial/marine ecosystems of sufficient size and varied habitats. These are still 'functioning systems' and as such offer unparalleled opportunity for understanding how they work and how to protect and re-construct ecosystems in other places.

Through this prime research/education function is derived a living case study for educating the wider community as to the importance, the beauty and fascination, and the inspiration such environments evoke. These are important in capturing the imagination of the general community and of 'selling' the conservation message.

In this way the PA, and everything about it, becomes a vital instrument for changing basic societal values concerning a prime imperative for the human race. This imperative is to conserve the last vestigial enclaves of biodiversity on the planet before it is too late and this particular tropical rainforest gene pool has ceased to exist.

One of the key areas of environmental education is through 'interpretation'. Community compliance in relation to park management controls is directly related to the community's understanding of both the natural resource values and what certain regulations aim at. It is therefore critical to engage the community's interest in such a way that through 'experiential learning' as many of the community as possible achieve basic understanding of the natural system being protected.

'Interpretative' education opportunities are limitless, but are usually built into the visitor experience in one of the following ways:

- interpretative walks or trek trails;
- interpretative dive trails;
- interpretative centers (displays, information pamphlets, continuous video film, etc);
- signage giving both specific information (information boards, tree species name plates), and indirect/subliminal cues (signage/nomenclature changes according to vegetation/ecotone changes, different geographic precincts, etc.);
- observation 'hides'; and
- direct experiential learning experiences (jungle survival course, animal handling, tree planting, deliberate exposure to natural elements, etc.).

Communication

The mechanism by which information is transferred and education values are realized is through expert communication. This involves both the techniques of communication (message content for specified audience), and the modes of communication (oral, written, visual, mass media, Internet, etc). The choice of communication technique and mode are dependent on the intention of any given communication. Technique and mode are also interlinked. For example, to reach mass audiences necessarily involves use of mass media while highly sensitive communication may be restricted to face-to-face and written communications.

The communication needs of an organization are determined by its principal purpose and activities. In the case of PAMB there is a need for an extremely broad band of communication capability. PAMB will have to communicate with

- PA visitors and tourists (day/overnight visitors, local and foreign visitors, mass tourists, travelers, eco-tourists, researchers);
- Squatters and dispossessed families/communities; etc.
- Government agencies national and local;
- Business interests;

- Educational institutions;
- Funding agencies;
- Research organizations;
- Local, national and international NGOs;
- The Aeta community; and
- Business interests

Consequently, the PAMB must establish and maintain appropriate techniques and modes of communication. These include, in no particular order, the following.

Modes of Communication/Equipment:

- telephone systems, mobile phone systems;
- specialized/dedicated two-way radio communications system (for remote rangering, search and rescue, policing);
- computer internet connections and web site (including satellite link up for remote sensing, etc);
- audio-visual equipment;
- PO Box and conventional mailing addresses;
- Information infrastructure (built shelters, signage, and structures with facilities/displays);
- Interpretation and education center (at least one);
- Conference/workshop facility (at least one high quality venue strategically located);
- Suitable range of manual communications and information gathering/conveyance equipment (e.g. whiteboards, digital and conventional cameras, video cameras, etc.);
- Publications of all types (e.g. scientific, marketing, historical/heritage, descriptive, explanatory, design, annual reports, strategy plans, design guide manuals, best practice manuals, educational); in various formats (pamphlets, flyers, poop sheets, etc.)

Techniques of Communication:

- Mail and Email;
- Consultative, survey, information gathering, visitor monitoring, etc, both remote (handouts, mail outs, phone calls) and direct (visitor interviews);
- Information for specific purposes (e.g. signage denoting permitted and prohibited activities, directional, guidance, location specific, etc);
- Incidental engagement of visitors in information provision (e.g. rangers and guides and information centers to provide information to visitors);
- Active targeted information forums for visitors (e.g. supervised walks, trails, treks, visitor exhibits, etc);
- Soft or incidental communication (e.g. making pamphlets and information brochures available within the PA and at various other venues – libraries, schools, hotels, tourist bureaus, etc);

- Hard or targeted communications (e.g. school talks, lectures, workshops, information days/open house days, public meetings, radio talk back, radio announcements, media advertising, television segments, etc.);
- International conference papers;
- Published literature promotion and sales;
- Commercial/aid funded short films (documentary, travel, science and education, promotional, etc.);
- Web site facilities (proactive, interactive information servicing);
- Interpersonal, direct 'specific stakeholder' public relations/counseling/negotiating;
- Field extension and training on land management, fishery management, habitat management and restoration, etc; and
- Ranger enforcement, activity prevention, crisis communication, etc.

Strategy

The principal strategies for information, education and development communications include the following:

1. PAMB will, as soon as possible, prepare a comprehensive information, education and communications strategy, to focus on the following key areas:
   - visitor use and attractions;
   - stakeholder interests and issues;
   - science and research information;
   - public relations and promotion;
   - publications and international education/learning mediums;
   - crisis aspects (enforcement, search and rescue, etc);
   - PAMB management and administration;
   - Funding procurement;
   - Coordination with national and local governments;
   - Commercial investors and the business community (tourism, ecotourism infrastructure, etc);
   - Indigenous peoples issues.
2. The PAMB shall recruit and maintain staff specialists (one or more) in the areas of:
   - public relations and information dissemination through various media;
   - natural science education and interpretation (text preparation, information presentation, teaching/instruction/public speaking and demonstration);
   - workshop and interactive teaching/instructional techniques;
   - field extension and advisory services; and
   - solicitors of national and international funds
3. The PAMB shall recruit and maintain staff specialists (one or more) in the areas of:
   - information systems technology (librarian, data assimilation/storage/retrieval, archival, email, etc.);
   - computers and computer systems networks;
   - web site design and operation; and

- computer aided design and desktop publishing (with operational skills on Corell Draw, Power Point, CADD, ArcView, etc.)

4. The PAMB shall recruit and maintain on staff specialists (numbers to be determined) in the areas of:
   - ranger communications, enforcement, displays;
   - visitor supervision, direction and control; and
   - crisis communication (controversy, outrage, rescue, injury/loss, etc).
5. The PAMB shall acquire and maintain equipment suitable for various aspects of developing a comprehensive information, education and communications strategy. This will include a variety of hardware and computer software listed earlier.

6.3.5. Establishment of Non-Destructive Livelihood and Investment Alternatives

Objective

The objective is for the PAMB and the SBMA to encourage and support the development of alternative means of livelihood that are environmentally sustainable, and to replace existing means of livelihood that are intrinsically harmful to the environment, or unsustainable, or both. In addition, the objective requires the development and provision of new and accessible forms of financial assistance and investment opportunity that are appropriate to the needs and capabilities of the target communities and enterprises.

Background

The remainder of material included under 'non-destructive livelihoods and investment alternatives' is dealt with under a series of sub-headings relevant to the overall subject. These include a combination of background discussion and outline of relevant strategies.

Formal Business Sector Investment Strategies

Some project and investment promotion strategies are proposed that will allow the formal business sector to take an active role in the development of the SBPA.

Guiding Principles for Investments in the Subic Bay Protected Area

Investments in the SBPA and its buffer zones should be guided by the following principles:

- Respecting and promoting the ***culture, traditions,*** and the ***way of life*** of ***local communities*** that are compatible with conservation of the protected area and the buffer zones;

- Promoting the development of ***community-level education programs*** especially those that deal on the uniqueness of the resources in the protected area and buffer zones;

- Fostering ***cooperation***, especially ***commercial joint venture*** activities, between the protected area and buffer zone communities to develop sustainable use projects that demonstrate the ***value of the forest and marine resources***; and

- Assisting in the ***development of markets*** and ***promoting access*** to those markets on favorable terms for the products of the forest and marine resources.

The PAMP aims to achieve a balance between these four approaches, reflecting the fact that none of them alone is likely to be sufficient in a seriously threatened place like the Subic Bay Freeport Zone.

Strategy 1: Creation of an Investments Promotion Office

It is proposed that an Investment Promotions Board working under the direction of the Subic Bay Heritage Society be created to be responsible for the following:

- Identify the preferred areas of investments consistent with the guiding principles.

- Draw up incentives that will attract investors to do business in the Subic Bay Protected Area and its environs.

- Develop the awareness and interest of investors in the various investment opportunities available in the protected area and its environs, particularly development projects where private sector participation is encouraged.

- Provide support and assistance to investors in the gathering of pertinent information, liaison with government offices, and other activities that will facilitate their entry and setting up of operations.

Strategy 2: Provision of Special Incentives to Enterprises with Direct Community Participation

Incentives should be provided to the following:

- Joint ventures between the communities and investors;

- Community owned and managed enterprises; and

- Enterprises that provide profit sharing to the community.

These types of businesses encourage the active participation of the communities and allow them to directly share in the social and economic benefits to be derived. Experience in other nature parks and protected areas in the world has shown that these types of enterprises provide the communities with greater benefits than if they were to be merely employed.

The enterprises can be related to nature tourism activities, the provision of services in support of tourism, and livelihood projects for the communities.

Strategy 3: Development of Information Materials and Marketing Collaterals

Materials providing information on Subic Bay, the Protected Area, the communities, and preferred investments would be useful for prospective investors. These may include:

- Fact Sheet on the Subic Bay Metropolitan subregion
- List of preferred investments
- Investment incentives offered
- Primer on the natural resources of the Protected Area (can be culled from the various technical studies on flora and fauna)
- Primer on the culture of the Aeta communities showcasing their indigenous knowledge in forest management

Strategy 4: Intensive Market Development

The ***wide range*** of tourist products that will capture different segments of the tourism market should be emphasized especially their varied natural attraction that distinguishes Subic Bay from other tourist destinations in the Philippines.

Linkages with local and foreign travel agencies and local transportation operators should be established to encourage the inclusion of the Subic Bay Protected Area in organized group tours. Different types of itineraries should be offered with varying duration, tourist products, and bed-and-breakfast packages.

Linkages should likewise be made with restaurants and resort operators in Bataan and Zambales to ensure their cooperation in the marketing of Subic Bay Protected Area as a tourist destination.

Potential Community Benefits

The implementation of the investment and livelihood package is expected to generate the following benefits for the communities within and around the protected areas.

- **Local Manpower Development:** This is to ensure that the locals will look after their own resources. In terms of capacity building, the training that the communities will receive reinforces local empowerment that is crucial to sustainable communities. It is training they require and which is relevant to their daily work. Skills also ensure sustainability when government/donor support is withdrawn.

- **Infrastructure Development:** Projects if selected by the local communities on a demand-driven basis represent choices that the local people make in order to improve their living standards. The chosen projects also represent a firm commitment by locals to take their destiny in their own hands.

- **Increased Incomes and Co-Management of Benefits:** By increasing revenues without drastically increasing natural resource exploitation within the protected areas, the local communities can improve their economic returns while ensuring conservation of the protected areas. This is the very basis of sustainable development. Their enhanced economic status also improves their bargaining position vis-à-vis their LGUs and the national government agencies in the utilization of the protected area and its resources.

Community and Non-Formal Livelihood Alternatives

Objective

The primary objective of livelihood development in both upland and coastal communities is to generate alternative sources of income especially for residents that are affected or included within the protected area and buffer zones. Based on some broad opportunities that are available for their income generation, activities will be geared toward: (1) providing households their subsistence needs including minimum amount to pay for household expenses, (2) generating major source of income or supplemental income and (3) replacement of destructive livelihood with other less extractive activities specifically in protected areas.

Overall, the generation of livelihood activities will consider the integrated need of households for resource use, cash income and alternative sources. Ultimately, it should be able to reduce poverty and enable households to access their basic necessities (food, clothing, shelter, education, and health) and other opportunities for quality life.

Livelihood Issues and Opportunities

The generation of livelihood options has to consider current issues of the upland and lowland communities particularly in terms of destruction, poaching, fires, population encroachment and pressure in the uplands as well as overfishing, cyanide and illegal fishing methods utilized by fishermen.

On the other hand, it is also worthy to recognize beginning efforts of upland communities in tree planting activities and the sustainable indigenous practices of Aetas in forest utilization and care for their natural environment. There are also positive developments in coastal communities' effort at protecting and upgrading coastal environment through 'Bantay Dagat' Program (FARM-Cs) and the organization of cooperatives to respond to the multiple needs of their members.

Ocean Adventure's efforts to retrain fishers to secure jobs at their facility and to establish cooperatives provide important training and education opportunities for sustainable alternative livelihood.

General Approaches

In the design of livelihood projects and activities, there is a need to look at some crucial factors.

- Program design should be holistic and integrated. This means that various needs on livelihood financing, marketing, production and technology and capability building should be addressed simultaneously. Failure of livelihood initiatives will be likely if assistance is provided on a fragmented and piecemeal basis.

- Livelihood options should be so designed to consider the absorptive capacity of participants or beneficiaries. It will also consider the availability of resources to be developed. Thus, the approach should be progressive and ladderized. Operationally, livelihood goals could be subdivided into short-, medium- and long-range objectives. The idea is to generate result in the short-term to further motivate to target participants.

- Since there is a need to generate enough support and involvement of upland and coastal communities in the affected buffer zones and protected areas, they should also be involved in the planning stages. They could provide significant insights as to how they can be supported and what type of livelihood options are most feasible depending on their knowledge, attitude and skills.

Strategies

Based on observed opportunities and issues in buffer areas/communities the following strategies are worthwhile considering;

Upland

a. Strengthen and expand regenerative approaches and activities of communities, specifically fruit trees plantation, agro-forestry activities including reforestation and cash crops production, orchards, etc.

   The fruit trees plantation and orchards provide permanent vegetative cover for the open grass lands and existing patches of tree stands as well as continuing sources of income for residents.

   High value crops and agro-forestry products provide cash incomes for residents.

b. Extraction activities should be limited to plantation areas developed by communities and in some areas where limited extraction are allowed by government (buho extraction, honey gathering, hunting, fishing etc.)

c. High value crops with potentials for processing and value added should be promoted. This will minimize over extraction of forest resources as these activities could provide adequate employment for the residents.

d. There is a need to promote and utilize appropriate technology to increase production. This will address the issue on low productivity. It will specifically systematize and increase production yield in their fruit trees plantation, i.e., mango, jackfruit, etc. Pest and disease management is also crucial in increasing production yield.

e. Distribution and marketing centers should be established for varied products in strategic areas in SBMA, Subic and Olongapo. This needs the identification of sites where tourists, local visitors, communities usually flock. The concept of "Pasalubong Centers" will be explored to attract intended customers. In relation to this strategy, products should be packaged in such a way that it will be attributed as coming from Subic communities.

Lowland Communities

- Land-based enterprises will be generated to decrease dependence on forest resources and consequently, minimize further encroachment on protected areas. It will involve light manufacturing and processing, trading and service oriented activities. Strategic locations of some communities along the highway will make possible the establishment of such enterprises and will attract entrepreneurial activities among residents and cater to needs of tourists and local visitors.

- Livelihood skills of residents will be strengthened to access the employment opportunities offered at the SBMA and other areas. Current livelihood skills of residents barely match the skills requirements of companies in the area.

- In terms of enhancing the skills of residents, the needs of companies and industries within SBMA will be considered.

- Non-formal education for adults and out-of-school youths will be initiated and which will be gradually picked up by TESDA, TLRC and other institutions.

- Self-employment will be the most logical option for residents who would not be able to compete for jobs at the SBMA and other areas. There is therefore a need for developing their entrepreneurial traits, values and skills.

  Exposure to on-going livelihood projects will also provide residents insights on

how they will manage their businesses effectively.

Lowland-Upland Communities

- While intervention on livelihood assistance is on going, IEC activities will be intensified to promote the value of buffer zones as well as environmental laws and regulations.

- In undertaking this activity, there is a need to identify the most appropriate medium – print, radio, TV, advocacy campaigns, community theatres, etc., that will send effectively the message across to intended recipients. The interpersonal approach through the use of Community Organization (CO) workers in upland communities also proved to be very effective among some NGOs.

- Access to formal education will also be improved to enable residents to reach highest educational attainment possible and gain quality employment.

  Scholarships should be provided to deserving students in high school and college levels. Cooperative training/scholarship programs with Brent School, for example, could produce mutual benefits to the Aeta and international communities of Subic Bay.

Coastal Communities

- The identification of non-destructive livelihood should be focused on activities that do not deplete resources further. They should be able to rehabilitate and conserve coastal and marine resources.

  Specific livelihood activities may include:

  - Eco-tourism activities such as boat riding, sailing and controlled camping, recreational fishing, etc.

  - Community-based resort management will be explored putting emphasis on natural beauty and less emphasis on land development and building construction.

    Management of these activities may be undertaken by associations, cooperatives, or joint ventures between barangay councils, their constituents and LGUs.

- The coastal areas are nearer trading and commercial centers including public markets. Residents will have the option to avail of opportunities in service-oriented enterprises such as beauty parlors, food outlets, tourist guides, welding,

vulcanizing, repair shops (e.g. air condition, refrigeration), etc. These activities respond to growing demands for such services due to tourism potentials, population and industrial growth in the central communities of Olongapo and Subic including the Subic Free Port Zone.

- Appropriate vocational and technical skills training will be developed and implemented at the SBMA, TESDA, TLRC, and other technical schools in the area. These should match existing demands of growing population and industries.

- Employment could be both through the formal and informal sectors, depending upon the capabilities and competence of target residents.

- Linkages will be forged with industries and companies to capture possible business arrangements in the form of sub-contracting activities. Companies may decide to sub-contract part of a production process to nearby residents and communities.

- In both upland and coastal communities, the presence of NGOs and other foundations will strengthen any support provided to residents. The NGOs have proven to facilitate the formation of POs, cooperatives, and community associations that will ensure the sustainability of livelihood support. Advocacy efforts will also enhance the awareness of residents on sustainable development strategies.

- The support of the LGUs to various livelihood projects (financial, personnel, logistics, etc.) will have to be considered in any livelihood activity. In the implementation of the PAMP, the role of the LGUs could not be over emphasized.

- The establishment of the project mechanism and organizational support will be critical in ensuring the flow of resources and more efficient livelihood assistance to all residents within affected protected areas and buffer zones.

6.3.6. Community Based Resource Management

Objective

The objective is to develop and implement community based resource management (CBRM) programs in order to strengthen local community interest in the conservation of natural resources of the region, provide tangible benefits resulting from wise use and good management of natural resources, and encourage sustainable use of those natural resources.

Background

CBRM is giving local communities the right and the responsibility to manage natural resources – to protect, rehabilitate, develop, nurture, utilize, enjoy and benefit from. It also means recognizing, respecting and protecting property rights – "ownership" of lands, forests, coastal waters or other resources therein, and ceding control and management of these resources to communities that occupy and/or utilize them. CBRM is a way to protect intellectual property rights of local communities over indigenous genetic resources, knowledge and practices. It institutionalizes community participation and strengthens people and government partnership in environmental management. It further means enhancing the capability of local communities to chart and realize their vision of a sustainable environment and natural resources.

CBRM aims to promote the socio-economic upliftment of resource-dependent communities and to achieve sustainable management of natural resources. It is based on the concept that people are the cause of, and the solution to, the destruction of environment and natural resources. Only when communities in and near the resource commit themselves to undertake sustainable management will the resource be protected, managed and rehabilitated.

Key activities in CBRM include:

- community organization and organizational strengthening;
- provision of long term security of tenure;
- formulation and implementation of a resource management plan; and
- provision of technical, legal, financial, marketing and other assistance.

Strategy

The PAMB will appoint staff, initiate studies and take steps to implement CBRM programs for the benefit of the natural resource dependent communities in and around the PA.

The PAMB will implement this strategy in conjunction with programs associated with strategies for community participation, capability building, information/education and communication, and establishing alternative livelihood projects.

6.3.7. Promotion Of Indigenous People's Rights

Objective

The objective is to achieve recognition and promotion of indigenous people's rights to ensure that they take an active part in the development process as well as sustain forestlands their forefathers have lived in and nurtured through their sustainable practices. The objective further seeks to reinforce the benefits from NIPAs in recognizing the

ancestral privileges and rights of the indigenous peoples (IPs) living within the designated protected and buffer zone areas.

Background

- The most significant recognition of ancestral rights was made through RA 8371 known as the Indigenous People's Rights Act of 1997. This act paved the way for the granting of ancestral lands and customary rights to IPs.

- The creation of the National Commission on Indigenous Peoples (NCIP) which implement the provisions of the Act is crucial in establishing the necessary mechanisms to enforce and guarantee indigenous peoples rights. Under the office of the President, the agency is responsible for the formulation and implementation of policies, plans, and programs to recognize, protect and promote the rights of indigenous cultural communities (ICCs) and IPs.

- The Act also recognizes and guarantees respect for their cultural integrity and grants equal benefits and opportunities which national laws and regulations grant to other members of the population such as education, health, and other services responsive to the needs of their communities.

- The Pastolan Village Aetas (within the proposed protected area and buffer zone) was awarded Certificate of Ancestral Domain Title (CADT) in February 2, 2001 under the RA 8371 to 4,387.4 hectares of forests, built-up areas and agricultural lands.

- The Development of the Indigenous Peoples Development Plan (IPDP) was designed by the SBMA through its Ecology Center to ensure that the Pastolan Aetas will benefit from the development process and industrial growth obtaining within the SBMA. This paved the way towards the comprehensive development planning of the area specifically to (a) enhance agricultural productivity, (b) ensure greater access to forest resources in a sustainable manner, and (c) facilitate organization of community associations as a mechanism for implementing identified socio-economic and livelihood projects.

  Objectives of the IPDP include the following: (a) secure legal and formalized land tenure for the Aetas in the Subic Bay Freeport; (b) implement community development activities that will support and strengthen the economic and social status of the Pastolan Aetas and their access and control over their natural resources, and improve the productivity of their agricultural land and their management of the forest in a sustainable manner; (c) provide the residents with skills to develop sustainable livelihood that will improve their standard of living; (d) empower the Pastolan Aetas to develop their capabilities to link with government agencies in securing services for their

community and to determine the direction of their future; and (e) implement community organization and social integration activities that will enhance community identification and cohesiveness.

- As a result of the recognition and awarding of the CADT, Pastolan Aetas have since participated in crucial developments within the ancestral domain, such as their representation and inputs in the development of the PAMP as well as have made recommendations on land uses covering (a) built-up areas, (b) forest areas, (c) water resources, (d) grass lands, (e) tourism, (f) agriculture and (g) employment.

  Specific demands as well as suggestions on how these areas should be developed and how the Aetas should participate in various socio-economic activities were underscored and critically considered.

- The Aetas also benefited from the DENR's various initiatives that helped them secure access instruments on lands that they had been occupying or tilling for years. These include the Certificate of Stewardship Contracts (CSCs) to individual upland farmers and the Community Forest Stewardships Contracts (CFSAs) to organized upland communities. These were made possible through the Community Forestry Program (CFP) that ensured protection, management, rehabilitation and utilization of products from natural forests. This has generated much interest among upland communities in the continued planting of fruit trees, orchards, cash crops and sustainable harvesting of the forest resources, including the 'buho' which are abundant in the SBFZ forests.

- The commitment of the national government through its government agencies (DENR, NCIP, DAR, etc.), NGOs and SBMA which have made possible the passage of various access instruments and legal acts must be continuously pursued towards the realization and implementation of the various mechanisms that have been designed for the development of the IPs.

- Dedication of financial resources for the implementation of identified Indigenous People Development Plan (IPDP) will be most critical to achieve defined goals and targets.

- Continuing consultation and dialogues with the Aetas of Pastolan Village, including those tribes surrounding the SBFZ will further strengthen acquired confidence and security in handling issues and problems that directly affect them.

- Continuing capability building by strengthening their knowledge and skills in managing sustainable forest resources within their jurisdiction will contribute increased growth and productivity of Aeta communities.

- Development of agreements and contracts with SBMA and other entities toward sustainable development practices will further enhance the realization of continuing working relationships.

The creation of the Task Force CADT will further strengthen partnerships toward balanced development of Subic. With membership composition from the SBMA, NCIP and SKAP representatives, the task force sought to; (a) formulate an Ancestral Domain Management Plan as required by the NIPAS Law and the Indigenous Peoples Rights Act (IPRA) consistent with the land use plan of the SBMA; (b) define the guidelines for the sustainable use of resources in the area based on scientific information; (c) serve as venue for cooperation and coordination of development and environmental protection efforts in the area; (d) provide mechanism for settling issues and conflicts that may arise between or among the stakeholders in the pursuit of their respective development agenda; and (e) institutionalize the partnership among the stakeholders through a Memorandum of Agreement.

Strategy

The strategy is for the PAMB to take all reasonable action to advance the cause and interests of indigenous people. This includes giving continued support to the varied initiatives of the national government of the Philippines to advance the welfare and rights of indigenous people. In particular, the PAMB will implement the provisions of the law in connection with the recent granting of Ancestral Land Title to the Pastolan Aeta.

The strategy also involves the PAMB and the SBMA in undertaking the following actions:

- dedicating the appropriate financial resources to implement the Indigenous Peoples Development Plan;
- continuing to consult and dialogue with the Aeta and other indigenous communities;
- continuing to implement capability building programs both within the PAMB and SBMA aimed at 'best practice' techniques in dealing with indigenous peoples issues and interests; and
- formulating agreements and contracts that incorporate sustainable development and management practices, particularly with regard to the protection of natural resources that are an important part of indigenous peoples' livelihoods, customs and beliefs.

6.3.8. Capability Building

Objectives

The objective is to create a Protected Area Management Board (PAMB) with appropriate operational/organizational characteristics, staffed by personnel capable of successfully administering the Protected Area Management Plan and various related statutory

responsibilities in the context of a rapidly changing land use, socio-economic and political setting.

Background

Any new organization must accommodate one essential requirement - to successfully carry out its charter of responsibilities while maintaining equilibrium between stability and change in response to both internal and environmental pressures. The PAMB is created in a political context of great change with strong forces of interest vying for influence over significant and alluring assets - namely the overall attractions and investment opportunities in the Subic Bay Freeport Zone.

The essential ingredients for such an organization are that it be an organization with a balance of **closed** (i.e. bureaucratic) and **open** organizational structure and functions. The former, a common organizational structure, while successful in the past and in some of its performance attributes, is essentially outmoded and in its pure form is highly incapable of responding to the rapid need for change and adaptation required in today's world.

Closed or Bureaucratic Organization Characteristics

The strength of bureaucratic organizations is that they provide internal certainty, stability and clarity of function and performance for staff through strongly codified behavior and task prescriptions. Bureaucracies are typified by:

- division of labor based on functional specialization;
- well-defined hierarchy of authority;
- system of rules defining the rights or duties of members, employee, or participants; and
- system of 'standard operating procedures' for dealing with work situations.

Bureaucracies have achieved great things historically and had much to do with the successful outcomes of the industrial revolution. However, these strengths can easily be weaknesses today. The main areas of difficulties facing today's bureaucracies are:

- a tendency toward dysfunctional internal rigidity;
- increasingly diverse workers; and
- dealing with a complex, rapidly changing environment.

These generalities concerning the characteristics of closed/bureaucratic organizations ultimately lead to the core concern of capability building in staff. Closed organizations or bureaucracies are extremely poor in capability building for their staff resources and developing functional capabilities.

Open Organizations

The key characteristic of open organizations is that they are more flexible, both internally and externally, while maintaining stability and purpose.

The open organization model is in fact based on general systems theory and the basic criteria of an 'open system'. This is philosophically appropriate for a Protected Area organization because all ecosystems, organism physiologies, and indeed the natural world, must operate as 'open systems' with respect to themselves and the environment upon which they are dependent in order to survive.

There are many characteristics of an open organization. One is that internal responsiveness is developed and maintained through collaboration rather than through force of authority alone. Focused on achievement of accepted goals, this collaboration involves managers and staff participating together in planning and implementation. This process assumes and believes that people have the capacity for creativity, responsibility, and growth, given opportunities to develop. Here lies the core of capability building undertaken through internal positivist mechanisms.

Three key characteristics are used to describe an organization, and its sub-systems (component parts). They are:

1. Unity
2. Internal responsiveness
3. External responsiveness

These characteristics can be considered at three levels: the individual, the work group, and the entire organization. It is then possible to identify the interchanges or relationships between these different levels and characteristics:

Table 26. Levels of Open Systems.

	UNITY	INTERNAL RESPONSIVE	EXTERNALLY RESPONSIVE	OVERALL OPENNESS
INDIVIDUAL	Self-integration Organization (mental) Selfhood Congruence Integrity	Self-realization Self-acceptance Self-awareness Assimilation Freedom	Accommodation Consideration, service Involvement Self-determination Friendship	Adaptability Personal openness Autonomy Being and becoming
GROUP/TEAM	Unity Synergy (group, personality)	Sensitivity and coherence Cohesiveness (interpersonal, attraction)	Linkage and cooperation Permeable boundaries	Open group Interactive Responsive organic

	UNITY	INTERNAL RESPONSIVE	EXTERNALLY RESPONSIVE	OVERALL OPENNESS
ORGANIZATION	Management Mission, Charter Planning Organization Implementing Controlling	Organization development and human relations Communications Problem solving	Socially relevant Profitability Productivity	Open organization

Note: columns one to three present three characteristics of openness. Column four defines the overall degree of openness. The first three horizontal levels represent an organization composed of group and individual subsystems. The words in each square describe qualities manifest in that aspect of the organization. Each cell is connected to the next cell by virtue of complementary relationships between different levels, or by the need to maintain balance of the characteristics at the same horizontal level.

Individual Considerations in the Open Organization

The first characteristic, **unity**, for an individual is concerned with self-concept – "I know who I am and appreciate my uniqueness". Internal responsiveness on the individual level is awareness of one's wants and needs and permission/approval to fulfill them. External responsiveness at the individual level is defined as interaction with others in the environment that produces mutually beneficial results. External responsiveness at the individual level is reaching out, listening, responding, being open, attracting clients and colleagues, positive feedback and empathy.

Team Considerations in the Open Organization

Unity for the next level down, the group or team involves concern for team goals. These can be best illustrated with the following performance questions:
- Are all team members moving in the same direction?
- Are there team goals and objectives?
- Are team members committed to these goals?

Internal responsiveness for teams, on the other hand, is concerned with team relationships. These can be summarized by the following questions:
- Are team members sensitive to other members' wants and needs?
- Are there good relationship skills in the team?

External responsiveness for teams is concerned with relationships with other teams or components of the organization. These are summarized by the following questions:
- Does the team link with other teams?
- Does the team gather information relevant to team problem solving from other sources?
- Does the team support institutional goals?

Organizational Considerations in the Open Organization

Unity for the organization involves organizing according to purpose. An indicative questions is "Is there a sense of where the whole organization is moving?".

Internal responsiveness at the organizational level is concerned with the way different components within the organization interact. This can be summarized by the following questions:
- Do departments/sections gather information from other departments/sections?
- Do they share data?
- Do units seek relevant information from outside sources to help in solving problems?

Finally, external responsiveness is concerned with the way the organization interacts with the wider community. This can be summarized by the following questions:
- Does the organization gather information from its environment for planning and setting goals?
- Does it provide data to other organizations?
- Does the organization provide relevant services to constituent groups/stakeholders?

The various behavior and characteristics that maintain and enhance open systems at each level of an organization are summarized in the following table.

Table 27. Open Organization Behaviors

	UNITY	INTERNAL RESPONSIVENESS	EXTERNAL RESPONSIVENESS
INDIVIDUAL	Identification of basic beliefs; 'who am I?"; uniqueness; self concept, perceived self. Values: "Am I open and other oriented or closed and self-oriented?"	Awareness of personal feelings, personal needs, personal defenses; freedom to fulfill personal wants and needs.	Hearing and responding to others; active listening; openness to ideas, experiences, persons; ability to empathize with others and establish enduring relationships; interpersonal attraction and involvement
GROUP/TEAM	Identification of team goals and objectives; Building the team. Group achieves syntality (personality) and synergy (group output is greater than the sum of individual outputs)	Interpersonal skills: facilitation of interaction among team members; process observation; sensitivity and coherence; interpersonal cohesiveness develops	Gathering and relating external information relevant to task team; linkage with other individuals and groups; cooperation for achievement of common purpose with other systems

	UNITY	INTERNAL RESPONSIVENESS	EXTERNAL RESPONSIVENESS
ORGANIZATION	Development of common goals of organization to purpose and mission.	Ways components within organization react to and impact each other; data sharing; organization development and human relations. Linkages between individuals and groups	Organization responsiveness to larger community; social relevance, profitability

Establishing an Open Organization in the Subic Bay Context

Given the inherited organizational structures already existing within Subic Bay, capability building facilitated through the formation of an 'open organization' structure to administer and manage the PA will require, in part at least, adaptation and change from the existing bureaucratic organizational structures which are in place. This is particularly so if the Subic Bay Metropolitan Authority (SBMA) is the principal organization into which the Protected Area management organization is to be incorporated.

If so, then a **change process** will be required that is significantly different to traditional organizational formation/establishment approach. The key characteristics include the following:

1. **Leadership versus authority**: emphasizes use of informal influence, communications, goal setting, and involvement of various constituents in decision making.
2. **Socio-cultural development versus tangible development**: rather than just focus on tangibles (finances and facilities), focus is on the entire socio-technical (sociopolitical, socio-cultural) system.
3. **Full versus partial change strategies**: focus on comprehensive 'whole of organization' design, rather than incremental, piecemeal innovation/change.
4. **Knowledge application systems versus individual knowledge items**: introducing generic methods and mechanisms for using knowledge and tools.
5. **Sophisticated versus simple change models**: recognize that change and developing open organizations involves complexity but essential if a responsive, adaptable capability is to be created.
6. **Change weighted versus stability weighted organizations**: essential if the organization is to cope with on-going change and need to be flexible.

From the discussion it will be apparent that an appropriate generic organizational structure is essential for the organization itself, the sub-groups/teams within it, and the individual technical, professional and administrative support - if staff are to truly operate effectively. The notion of 'effectiveness' is clearly dependent on the ability of all levels

to address constant external challenges and continued adaptability. This includes not just skills and training, but processes and procedures for achieving results.

Strategies

The principal strategies for capability strengthening through establishment of appropriate organizational structure and function, include the following:

1. Employ a theory or model as a basis for diagnosing organization and capacity needs, for deciding how to proceed, and for evaluating progress.

2. Identify and examine the values of the organization and its members (including stakeholder memberships).

3. Build a climate of truth and trust within the organization and the key member/stakeholder groups that form part of the overall structure – an essential feature of open organizations.

4. Work through the existing internal and external power structures – official power structures are essential to regional park (protected area) management and must be incorporated into overall organizational structure and functions.

5. Take account of and use existing management structures – it is essential to take into account all existing or necessary (mandatory) structures, and rather than automatically replace or change them, concentrate instead on making them function more efficiently.

6. Generate energy for change through shared goal setting and progressive achievement of goals.

7. Use action research teams to resolve problems and make changes – this is a group of key organization members selected to study a problem and initiate appropriate solutions. Its function is to define problems or needs, collect data, interpret data, make recommendations, and implement or facilitate recommended changes. Action teams are high impact, low cost means for effecting solutions or change. They should be 'insiders' who must live with the outcomes, hence they will have focus and ownership of the process and outcomes. They will also be well informed of the real issues, needs and potential solutions.

8. Develop open system managers – organizations must be able to develop supportive and flexible climate able to deal with uncertainty. In a complex, changing environment, capable leaders will be able to mobilize an organization's resources in accordance with its purpose. This includes an ongoing commitment and ability to strengthen all aspects of an organization's capability.

Focused Capability Strengthening Strategy

Staff

1. Ensuring that the correct range of skills and training form the basis for recruitment.
2. Attracting suitably trained professional and technical staff capable of meeting the challenges of managing the SBPA.
3. Providing training of staff, including short-term technical courses, and long-term qualification training on either 'leave with pay' (i.e. scholarships/fellowships) or 'leave without pay'.
4. Ensuring that staff are able to participate fully in operational and technical innovation in the functions of the organization, particularly with respect to the need for new techniques and operational approaches.
5. Ensuring that staff are constantly exposed to and made aware of the interests and needs of all external stakeholder and member organizations.
6. Providing staff with appropriate equipment and technical support of a standard suitable for meeting the responsibilities of the organization.
7. Setting in place 'state-of-the-art' mechanisms that fully allow, and encourage staff to communicate all advice, views, and contributions concerning the administration of the organization.

Equipment

1. Provide all staff with office accommodation and related equipment that enables effective carrying out of all prescribed duties.
2. Provide all field staff with appropriate field equipment that allows them to perform their prescribed roles, with particular reference to:

- vehicles and four wheel drives
- pursuit and rescue marine craft
- underwater diving and support equipment
- fire fighting equipment
- survival and emergency rescue equipment
- surveillance and law enforcement equipment
- directional and path finding equipment (e.g. GPS, satellite navigational aids)
- appropriate maps and geographic data
- establish and implement an appropriate Business Management System (BMS) and quality assurance procedures, with staff involvement, which facilitate and assist work functions

Procedures

- Map required functions and procedures and identify all logistical requirements and support services and equipment needs
- Undertake a gap analysis of processes and procedures and organizational capabilities
- Evaluate adopted approaches and determine which are outmoded and in conflict with 'open organization' objectives

- Focus on effective 'manual' procedures, especially in view of funding limitations for high-technology based processes (e.g. information management systems, archiving, monitoring and research, etc)
- Ensure all due-diligence procedures are suitably in place to protect both organization and staff interests
- Focus on effective data and information gathering, use and sharing (timeliness, openness, accuracy, validation, recording/archiving, retrieval, etc.)
- Arrange for appropriate skill capabilities in team/group arrangements and provide for easy transfer, multi-skilling, on an adaptive/needs basis
- Organize staggered programs for staff training/capability strengthening
- Ensure all activities and procedures are client/resource management oriented

6.3.9. Institutionalization of PA Management Systems

Objective

The principal objective for the institutionalization of Protected Area management systems and networking is to enable the PAMB to carry out its mandate/function effectively and in an orderly and accountable manner.

Background

Institutionalization: getting a system up and running in an acceptable, recognizable and formal. Institutionalization is based on provisions of Philippine law. In SBFZ there are existing structures in place which set constraints on the creation of new or radically different institutional structures or systems. Placement of the PAMB under the administration of SBMA is an example.

Aids to institutionalization: participation in devising organizational form/structure, establishment of business management system, designing quality assurance procedures, establishing email system, etc.

Other tools for achieving institutionalization:
Staff training, on-the-job coaching, management support, process improvement, user-friendly tools, organization change management, establishment of 'open organization' features/characteristics.

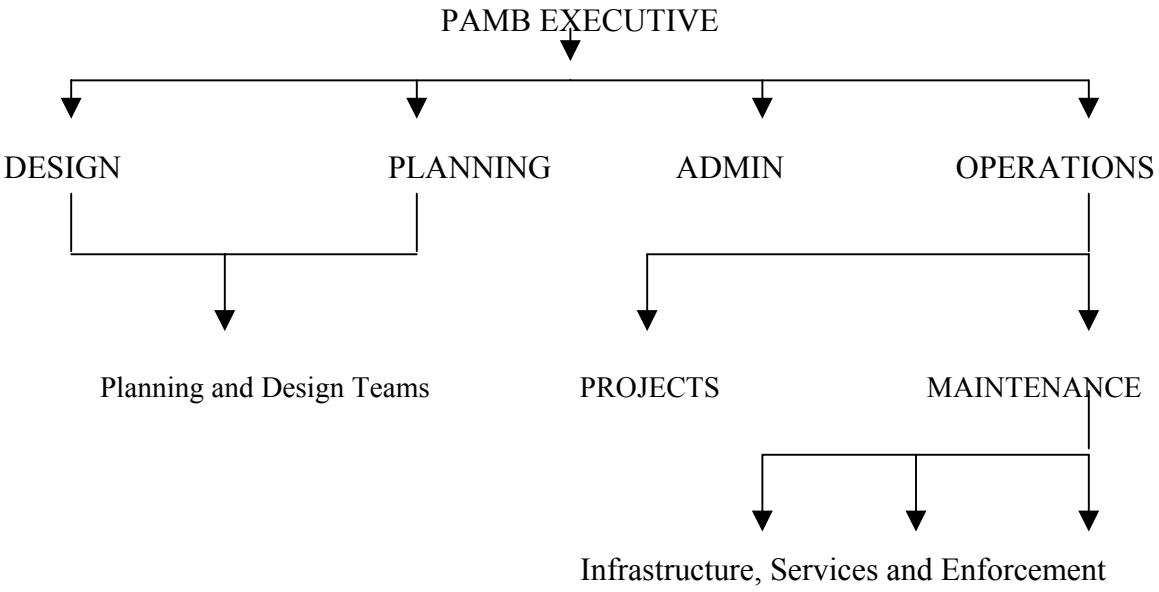
Organizational Management Systems

This involves making the functions of the PAMB in such a way that operational procedures are accepted by all users and followed and applied as intended. Various tools and applications are critical to establishing these functions. They include setting in place a Business Management System (BMS), quality assurance procedures, due diligence procedures, and duty of care procedures. It also requires mechanisms for communicating, verifying and auditing these procedures – in effect a 'chain of custody' and decision

making documentation to ensure that the organization can account for its actions and decisions.

There should be an internal decision making structure that will delegate responsibilities/ duties of PAMB to various prescribed units/teams, management authority/responsibility, and committees to make these procedures operational. A critical operational aspect of this system is that reporting and communication protocols exist and are in place.

PA Internal Organizational Structure



PA PLANNING PROCESS

The 'park management planning' is a specific process in itself. There are many models, but most have in common a series of hierarchical steps, from the strategic level to the implementation planning level.

The implementation planning level generally deals with each of the park activity (e.g. recreation, fire, pests, rehabilitation, commercial contracts/leases, etc.). Each of the plans is then tailored for implementation at a specific site. Finally, the site plan is implemented through an operational action plan, which organizes and supervises the administration and supervision of the site.

Strategic Level	MANAGEMENT PLAN				
Implementation programs	**Implementation programs** (5 year implementation program, annual works program)				
Implementation planning level	Recreation Master Plans	Fire Response Plans	Weed Control Plans	Rehab Plans	Business and Lease Plans
Plan content	Recreation sites Links Access Amenities	Fire control Strategic support	Flora study priorities Sites Areas	Flora studies Priorities Sites Areas Species	Leases Options
Site Planning Level	Site development plan, enhancement plan		Site weed control plan, animal pest control plan	Site Rehabilitation plan	
Detailed Design	***Detailed design,*** documentation and specifications		Detailed design, documentation and specification	Detailed design, documentation and specification	
On-ground Implementation	Operations and calling of contracts		Operations and calling of contracts	Operations and calling of contracts	

Planning Grid For Short-Term Events Involving Internal or External Participants

All organizations face the need to design and undertake change in their structures and functions. Sometimes this is associated with organization wide activities. Mostly there is a need to address specific functional activities, or evolve a new program or operational procedure. To undertake 'change' successfully requires the adoption of a systematic approach. An appropriate tool for 'change design' is the **planning grid**. It is a generic planning framework that can be adapted to a proposed project/program. More complex projects/programs can use many planning grids; hence it is a highly flexible framework.

Establishing a Planning Grid

1. Identify the participants and the project intentions for all concerned.
The first requirement is to know exactly who is involved (i.e. determine whether there are 'hidden' interests) and exactly what the objectives of various participants are (i.e., are there unstated objectives?).

2. Specify the final outcome
How will you know when the project or task is successfully completed and will all parties agree on the same completion point? What will have been accomplished? These points should be agreed upon and put in writing.

3. Identify the starting point and its product/outcome
What will be (or was) the first action to indicate the beginning of this project or program? For example, writing the first draft announcement, convening the first meeting between participants, preparing draft letter of agreement to proceed with a joint project.

4. Brainstorm a list of separate, distinct activities that will take place between the starting point and the agreed end point.
Brainstorming should be used here to encourage full scoping of all possibilities and eventualities. It is necessary to elicit as many ideas as possible and not to pre-judge their appropriateness at this point.

5. Refine the brainstorm list of ideas and options.
Clarify aspects that are vague. Eliminate redundancies and impracticalities. Subdivide the project/program into appropriate sized tasks, or combine those that are too small.

- Enter as a single item activities that cluster together by virtue of occurring in uninterrupted chronological sequence, are dependent on each other, and probably being done by the same person/team/organization.
- Enter as a separate item any sequence of activities in which there are lengthy interruptions, or different deadlines that may be concurrent but not dependent on each other for completion, or that could be divided up among different individuals/teams/ organizations without harming the sequence of the effectiveness.

6. Prepare a Planning Grid
- Look over the categories of information described and decide whether they are complete, or need adding any optional categories to the grid.
- Divide a flipchart page into columns, one for each category included. Enter the titles (see Grid format) into the column headings. Replace generic titles with ones appropriate to the project/program under consideration.

Planning Grid Format

Step No	Sequential steps or individual activities	Product or outcome	Responsible individual, team or group	Due date	Whom to involve, contact	Budget and cost	Other categories

7. Arrange the list of tasks/steps in sequence

8. Fill in the product column for each item

9. Enter a tentative date for each item

The step should be completed before others because time available will affect the design of the project and have a significant influence on the planning schedule. Often tight time frames will be imposed due to externalities (e.g. close-off dates for funding). It allows for substitute team members to be identified if key personnel or groups are unavailable in a particular time period. If an inflexible deadline is involved for part of the project/program, the overall time frames must be worked backwards from the fixed endpoint.

10. Revise items as required.

After deadlines are set it may be necessary to rework some items.

11. Complete remaining columns

Missed deadlines.
A most common occurrence in planning tasks of all types is that deadlines are missed. This is not surprising, because planning activity deals with uncertainty and many variables are outside project management control. If a deadline is missed the options are:

- delete some steps
- get the deadline moved which may involve sensitive negotiation with external parties
- redefine the steps so that they can be finished in less time
- redeploy personnel and/or resources to accelerate activities
- ignore the deadline

Two important principles apply to the issue of meeting deadlines. The first is that good planning and project management will identify the likelihood that a deadline will be missed This can be avoided with early notification, and appropriate action taken.

The second principle is that in a 'quality focussed' organization, seldom should a deadline be allowed to override the quality of the work or product. Time deadlines are, for the most part, arbitrary. Product quality is not.

Strategies

The principal strategies for achieving institutionalization of PA Management Systems are as follows.

1. Establish an organizational management system for the PAMB as outlined above which allows for the core PA management activities of Design, Planning, Operations and Administration.
2. Organize the internal structure, function and procedures in accordance with the current (2000 – 2002) strategic planning being undertaken for the SBMA.
3. Establish within the PAMB a PA Management Planning capability that is structured in a systematic way as outlined above.
4. In undertaking organizational 'change design', and when engaging either internal and external stakeholders as project participants (joint partners, etc.) in joint initiatives, employ a systematic participation planning process such as the Planning Grid approach.

6.3.10. Participatory Planning and Management

Objective

The objective is to describe the participatory and consultative processes employed in the preparation of the PAMP. This is to effectively engage or be influenced by the full range of stakeholder and community interests that have the potential to impact on the protected area and thus gain for all concerned the most positive results.

Background

In the Subic Bay context there are various stakeholders with interests associated with either the Protected Area itself or the surrounding environment. These stakeholders include:

- local government organizations
- national government organizations with direct statutory responsibilities associated in some way with the PA
- business interests with current investments within the PA (e.g. Subic Bay Marine Exploratorium)
- business interests outside the PA and the Buffer Zone
- external business interests to the region but with direct interest in the overall economic performance of the SBFZ

- local fishing industry
- local recreational/livelihood fishermen
- local indigenous Aeta people
- local communities within the PA buffer zone, with or without recognized land tenure
- local and regional (national) recreationists and tourists
- national and international NGOs
- international funding agencies such as JBIC and World Bank
- Bataan Natural Park
- timber industry
- regional fruit farmers and plantation owners
- scientific and educational institutions, both local and national

A number of stakeholders are pivotal to the long term success or failure of the Protected Area. Many of them have been involved in the plan preparation and their continued involvement in the initiatives of the PAMB is essential. Their involvement will be achieved through both formal and informal channels of communication. However, much depends on the effectiveness of participation/consultation capabilities developed and practiced by the PAMB. The following sections outline the principles of a sound approach to participatory planning and management. But first, why encourage participation?

Rationale for Participation/Consultation

Participatory development is the process through which stakeholders can influence and share control over development initiatives and over the decisions and resources that affect themselves. Participatory processes in development planning and management can yield the following benefits:

- More appropriate development activities that fit the needs of the community.
- Better implementation and sustainability of development initiatives.
- More complete utilization and increased ownership of the services provided.
- Greater efficiency, understanding, and better planning, based on the concerns and ideas of a wide range of participants.
- Better match between human capabilities and capital investments.
- Improved institutional performance because of greater transparency and accountability.
- More efficient functioning of markets because of improved information flow.
- Increased equity and empowerment through greater involvement of the poor, women, and other disadvantaged groups.
- Strengthened capacity of stakeholders to initiate other development activities as a consequence of their involvement.
- Increased commitment for policies and projects, including a willingness to share costs and an interest in sustaining the benefits.

Encouraging participation may, however, involve some risks such as the following:

- The process may be time and resource intensive.
- May be too taxing in organizational and logistical terms.
- The groups that are consulted may not truly represent or express the views or interests of those whom they purport to represent.
- Conflicts may be aggravated among groups with differing priorities and interests.
- Expectations may be raised that cannot be fulfilled.
- Methodologies may not be seen by some as "scientific" thereby exposing the outcomes to criticism by experts.
- Co-option of participatory processes by the more powerful and more articulate elite may effectively exclude the poor and the disadvantaged.

Principles of Participation and Consultation

Stakeholder consultation inevitably involves human sensibilities as to fairness, thoroughness and the representative nature of the consultative process. No matter how carefully devised a program of consultation may be, criticisms and controversy will still arise. It is therefore essential to set in place sound principles of procedure that will provide good guidance and withstand subsequent scrutiny. The essential principles to be employed in the consultative program are as follows:

- **Use existing materials and knowledge** – it is important to recognize the substantial work already undertaken by others and the reservoir of knowledge and wisdom already attained.
- **Be inclusive** – within the time and budget restrictions of the project there is the need to involve all stakeholders that can be defined. This includes the interested public, industry, conservation, recreation and community groups. This will require rigorous scoping of possible stakeholders, and provision of some level of iterative inclusion of further stakeholders in the early stages of the program.
- **Provide appropriate mechanisms for feedback** – it is essential to allow stakeholders to give feedback and be reassured that it is a two-way process 'bottom up' as well as top down.
- **Printed information/reports/drafts to stakeholders as soon as practical –** it is important to minimize the time taken from initial stakeholder consultation to release of reports for review and discussion purposes.
- **Progressive evaluation of the process –** it is important to evaluate the effectiveness of the consultative process as it takes place.
- **Open information –** except where specified by participants, information gathered through public involvement will be publicly available.

Stakeholder Identification

The most important single activity in any consultative process is the effective identification of stakeholders. It is necessary to develop good experience in stakeholder

analysis to identify the vital stakeholders of concern to the project. Initially, three different yet integrated stakeholder groups will be identifiable:

- **Key stakeholders** – having expert knowledge and/or a particular vested interest in the subject area.
- **Stakeholder reference groups** – composed of individuals and groups with connections to wider stakeholder 'audiences' and who greatly assist in evaluating/determining both the views and involvement of all/other stakeholders and interest groups. They provide important advice on the consultation process itself, and provide a community wide perspective on issues at hand.
- **Others** – agencies, organizations and members of the wider community considered important targets for the public involvement process.

A further important consideration in identifying stakeholders, particularly when resource constraints exist, is the availability of stakeholders and the likely effectiveness/efficiency of 'face to face' contact. The ideal is to get to everyone and spend the time to properly understand the essential stakeholder concerns. In reality this is often not possible. Effectiveness of contact and effort will guide work and the design of the program itself. This is particularly important if client needs are to maintain a tight project schedule and meet essential time-lines.

Standard Approach to Participation and Consultation

The following summarizes key points in a standard approach to participation and consultation:

First, ensure that key issues are brought out. It is important that stakeholders feel the issues they are most concerned about are indeed identified and addressed.

Second, there should be openness in reporting so that the outcomes of consultation are adequately verified by the stakeholder.

Third, ensure that unintended bias is avoided in the technical solutions and that the focus of the stakeholders interest is carried through to strategy.

Fourth, ensure with care stakeholders are aware that in addressing environmental quality issues it is necessary to consider 'trade-offs'. For example, to achieve a certain environmental benefit may involve a short-term economic penalty, and vice-versa.

Program of Consultation

A detailed program of consultation should be designed following confirmation of the expectations and requirements of the intended consultation program/project. This is in view of the need to agree on a consultative program that is practical within the budgetary constraints placed on the organization. Agreement of all parties is required. Generally, a program of consultation will be planned on the basis of the following steps.

The **first step** is to undertake an 'in-house' scoping exercise of the possible range of stakeholders that should be considered. This exercise will involve direct discussion with the appropriate government agencies to gain their insights as to whom should be consulted. The scoping exercise should be assisted by any identifiable expert or 'insider' on the issue/topic under consideration in order to draw upon specialist experience and knowledge of stakeholder sensitivities associated with the area, or issue, and of both formal and informal stakeholder groups/entities.

The **second step** is to communicate the intent of the study/program/project to the widest possible relevant audience. This information will include the intended program of consultation, advice on public meetings, locations at which information is available, and modes of contact. Specific invitations/requests for meetings should be included. Venues for meetings should take into account the ability of the intended audience to reach the proposed venue. Advertising the meeting and venue should be undertaken to reach as many stakeholders as possible. The modes of communication to reach the potential stakeholder audience include the following options:

- personal 'face-to-face' oral advice by messenger, particularly in the case of isolated communities;
- correspondence, containing circulars and pre-prepared information;
- public notices, circulars and letter drops;
- interviews or notices given out over local radio;
- articles in the local press;
- 'shop front' information display at a suitable venue;
- email;
- establishing a web site to be maintained over the duration of the study; and
- specific contact by remote mode (i.e. telephone).

The emphasis is to raise the interest of stakeholders, particularly those not previously identified by the scoping exercise. Emphasis should be placed on inviting those with an interest to 'register' themselves and to become involved in the appropriate mode of participation offered.

Specific attention should be given to the needs of two groups in particular. These are firstly, government organizations and agencies with specific statutory responsibilities that must be taken into account, and secondly local indigenous peoples with specific claims and connection to the environment or issue involved.

The **third step** is to hold a limited number of public meetings/workshops. Open meetings based on a one-way flow of information are not favored. In the absence of a strong program agenda and tight control the assembled audience will quickly dominate proceedings with grievances that, if there is any substance, will focus proceedings on controversy which in turn will quickly get out of control. The event will become a forum

for malcontents, and outrage is likely to develop. A public relations disaster can result from such a situation.

The preferred approach is for workshops focussed on achieving specific outcomes in as efficient a way as possible. Such events must be well organized, effectively managed, and supported with suitably prepared information and materials. The 'Cherette' or 'Design by Inquiry' workshop are two optional approaches, these being outcome oriented and based on single occurrence, highly focussed events. The Cherette is, however, a highly sophisticated approach usually taking up to five working days, and requiring intensive preparation beforehand, and extensive follow through and documentation afterwards. The Cherette is intended to solve complex design or management challenges through a condensed but highly intensive work program, including critically important stakeholder interests.

The **fourth step** is to evaluate the effectiveness of the stakeholder representation, assess the substantive information received and analyze the findings. These findings are then written up as 'stand alone' report and incorporated into the preparation of the strategy, program or project.

As previously stated, emphasis should always be placed on maintaining a flexible response to changing circumstances and project needs throughout the consultation program.

Public Participation in the PAMP Project

The process and outputs of this planning project relied heavily on public consultations. The most widely used avenue for eliciting vital inputs from stakeholders is the workshop. Throughout the planning process no less than five consultative workshops were scheduled at various stages and milestones. (See Study Workflow.)

Workshop No. 1
The first consultative workshop was held at the inception of the project. Basically a scoping workshop, the consultation was intended to inform and explain to various stakeholders the nature and purpose of the project. More importantly, the workshop aimed to elicit from the participants responses to the following questions:

1. What environmental issues should be included in the study?

2. What resources of the forest and the bay do you rely on for your living and livelihood?

3. What other values do you gain from the forest? The bay?

4. What changes in the area have you noticed in the last 10 years?

5. What do you think are the threats to the forest/bay in the study area?

Workshop No. 1 was attended by 45 participants representing the Ecology Center and various offices of SBMA, the affected municipalities and barangays, resident indigenous communities, and DENR.

Workshop No. 2
The second consultation drew a large attendance of 131 from a wide representation which included the usual SBMA offices, SBMA locator firms, indigenous communities, DENR and other government offices, non-government organizations, and the donor community. The aims of the second workshop are:

1. To present the preliminary results of the resource inventory for reaction and validation.

2. To determine any additional information requirements from various groups.

3. To identify and summarize emerging issues and concerns.

4. To provide an overview and interpretation and analysis of the resource inventory data.

5. To involve stakeholders in assigning values to various identified resources.

6. To formulate a vision and broad goals for the management of the protected area.

Workshop No. 3
Consultation workshop no. 3 was held primarily to arrive at a consensus about the external boundaries of the proposed protected area as well as the internal boundaries of the management zones. In addition, it was used to refine the vision and goals formulated during the previous workshop, as well as validate the human and ecological values of identified resources.

Workshop No. 3 was attended by 113 participants coming from the same representation as in previous workshops.

Workshop No. 4
The fourth workshop was intended primarily to present the draft flora and fauna guidelines and to get reactions from the participants about the applicability of the guidelines to specific areas. A substantial portion of the time, however, was devoted to accommodating more issues and concerns arising from the delineation of protected area and management zone boundaries. As in previous workshops ample opportunity was given to exposition of background and rationale, including status reports on the project, to build up a sense of continuity and logical progression.

A total of 62 participants attended Workshop 4. The mix of representation is similar to those in previous workshops although there is a noticeable preponderance, this time around, of government officials and staff from the national down to barangay levels.

Workshop No. 5
The final workshop presented the completed plan document. Workshop No. 5 gave interested parties opportunity to see the PAMP in its entirety and air their objections, corrections and support for the whole plan. This public consultation represents the start of the formal approval and adoption process as required by law.

Participation during PAMP Implementation

The participatory and consultative processes are not confined to the plan preparation stage. Stakeholders participation is still considered critical to the success of implementing the PAMP in particular as well as effectively managing the entire influence region of the protected area in general.

Stakeholder participation during the PAMP implementation stage will be further enhanced by at least three sets of activities or programs: 1) information, education and communication program, 2) formal linkages with stakeholders, and 3) mainstreaming of PAMP policies into the local government units in the component, adjacent, and affected areas of the Subic Bay Protected Area.

Information, education, and communication
This is an integrated multi-media program to get across to all interested parties and potential users of the services and resources of the protected area the PAMP policies and prescriptions. Depending on their inclination, agenda and resources stakeholders may join the IEC program either on the giving or receiving end.

Formal linkages with stakeholders
This will involve a more systematic inventory, profiling and classification of stakeholders. The detailed characterization will provide the bases for negotiating formal arrangements through instruments such as memorandum of agreement, memorandum of understanding and the like. Such instruments will define the extent of privileges and responsibilities of participation in the plan implementation, monitoring of compliance with policies, and evaluation of performance for future reformulation of policies and revision of plans.

Mainstreaming of PAMP policies
To avoid unnecessarily creating and maintaining a large bureaucracy for PAMP implementation, the applicable PAMP policies will be mainstreamed into the planning and management functions of the involved LGUs. This will entail SBMA partnerships with each affected LGU to formulate and enact relevant and responsive pieces of local legislation and programs.

Strategy

The principal strategies for participatory planning and management are as follows:

1. Establish within the organization and its staff a high level of stakeholder awareness and suitable skills and mechanisms for engaging stakeholders in the objectives and operational programs of the Protected Area Management Organization (PAMB).
2. Undertake stakeholder participation and consultation according to the accepted principles of consultation, participation and community/stakeholder involvement.
3. Undertake programs of consultation using a series of generic steps (as appropriate) that make up a generic consultation procedure.

6.3.11. Financial Resource Mobilization

This strategy follows a different format. The financial resources mobilization strategy has four alternative distinct strategies as follows.

Strategy No. 1: Use of Resource Management Approach

The resource management approach utilizes the ***social and economic benefits*** from sustainable use of the protected areas as powerful ***incentives*** for the Subic Bay communities to ***conserve*** it by ensuring that:

- The people most likely to have a direct impact on the protected areas will receive what they perceive as a ***fair share of the benefits*** from the use; and

- There is a ***clear connection*** between the ***benefits*** obtained from using the environmental resources of Subic Bay and ***conservation*** of them.

Thus, the resource management approach taken by the overall proposed development project package would involve:

- Respecting and promoting ***traditions of local communities*** that are compatible with conservation of the protected areas;

- Providing ***economic, institutional, biological and other technical assistance*** on request;

- Developing ***community-level education programs*** especially those that deal on the uniqueness of protected area resources;

- Cooperating with the protected area communities and buffer zone communities to develop sustainable use projects that demonstrate the ***value of the*** Subic Bay area ***resources,*** and

- Assisting in the ***development of markets,*** and ***promoting access*** to those markets on favorable terms.

Success in setting up such a resource management system will heavily depend on the extent that the implementation mechanism of the Subic Bay PAMP can maximize:

- ***Use of local consultant services*** and limit foreign consultants to highly specialized and focused assignments,
- ***Use of local NGOs*** to perform services, instead of local commercial companies or government agencies; and
- ***Participation of local people*** within the project area as employees or volunteers in project activities.

Financially and economically, this resource management approach will ensure that scarce development finance resources will be spent effectively in safeguarding the protected areas and the areas affecting them that are threatened by factors which can be controlled and where investment will be likely to succeed and be cost effective.

This approach would tend to discourage major investments in areas that have become critically threatened and are likely to be destroyed in the immediate future despite the investment.

It would also discourage major investment in areas that are remote and under little threat; in such cases the role of monitoring and early warning of incipient threats is very important. Since this would not necessarily be expensive, such actions would be likely to be highly cost-effective.

Strategy No. 2: Creation of a Subic Bay Conservation Society

Conservation and enhancement activities should hinge around an ***empowered locally-based and run Subic Bay Conservation Society*** *that* will serve as a:

- ***Conduit*** for donor funding for conservation and education funds going to the area,
- ***Conservation*** organization, convening planning meetings with villagers, training field staff, demarcating boundaries, planting boundaries, running village nurseries, etc.,
- ***Information*** organization issuing press releases and news sheets and documenting issues,
- ***Policing*** and ***advocacy*** organization, increasingly and openly pushing Government to seek a solution, and
- ***Facilitator*** or networking organization, bringing together national/LGU administrations, villagers and the press.

Strategy No. 3: Financing Through a Subic Bay Heritage Fund

The proposed development project package could be financed through a ***Subic Bay Heritage Fund.***

The proposed fund could absorb substantial amounts of money from international and local sources, and release them as reliable, if modest, cash flows over a long period - theoretically in perpetuity. The potential fund sources could include various forms of debt conversion and debt swaps; the ***World Wildlife Fund (WWF)*** for technical assistance grants and endowment-type grant funds for the propagation of various forms of commercial wildlife management programs; the ***European Community*** through the Biodiversity Convention for technical assistance grants as well as endowment-type grant funds for species conservation; local ***agricultural credit lines*** from the Land Bank of the Philippines for the commercially viable agricultural and aquaculture projects.

A ***trust fund*** for the financing of research and the setting up of some of the prototype projects could also be set up through a ***check-off.*** (Check off fees may be collected by private businesses and deposited in a trust fund. The trust fund may be operated by a NGO managed by elected representatives of the group that pays the check-off.) Local businessmen interested in the commercial production/operation and marketing of some of the proposed product and service lines can contribute to the organization of such a trust fund and advance the required funds. The funds advanced by the check-off can eventually be recovered from the revenues generated by the prototype set-ups. By placing the check-off under the Subic Bay Heritage Fund, the contributors can save on management and operating costs.

Infrastructure loan packages can also be contracted by the national government from the World Bank, the JBIC of Japan, and the ADB.

Such a mechanism could ensure that local institutions and programs for the development of the communities within and around the protected areas are not flooded with a rapid, short-term influx of capital. The mechanism can develop according to a ***natural cycle*** that enables institutions and programs to grow over the long term.

A critical component of the concrete ***involvement of local people,*** NGOs, and the private sector in all project undertakings within the protected area will be their

- ***Resource contributions*** (funds, labor, contributions in-kind) to the initial project investments; and

- Periodic ***cost recovery payments*** for many of the projects that will individually and collectively benefit them.

In this manner, the proposed long-term financial mechanism should provide opportunities for local people and groups to participate in funding decisions that affect their communities.

Strategy No. 4: Fair Cost Sharing Mechanism

The proposed development project package will be financed through a ***fair cost-sharing*** mechanism.

The cost sharing will primarily be between ***Philippine government, private sector investors***, ***and international donors —*** the main contributors to the proposed "***Subic Bay Heritage Fund "***—- and ***the community beneficiaries.***

6.3.12. Traffic Management Strategy

Objective

The objective is to plan and implement a SBPA strategic transport and traffic plan that provides a low impact, environmentally compatible access and parking for park visitors/users. The strategy will also address the long-term requirements for intra- and inter-regional traffic through the Protected Area between Morong in the south to Subic/Olongapo in the north.

Background

Traffic and Transport Implications

There are significant traffic issues associated with the SBPA. They include the current transport needs and traffic flows associated with existing land uses, through northbound-southbound traffic, and visitor movement to and in the area. They also include requirements to accommodate significant growth in each of these transport needs.

Transport and traffic solutions will greatly influence the ultimate success and failure of the PAMP strategy. Poor transport and traffic management can result in;

- a diminished SBPA visitor experience – poor road layout and circulation, with undesirable traffic conditions to go so far as to dampen the visitor experience;
- create demand for facilities or services not intended in the overall SBPA strategy – poor road layout leading to unsuitable sites can result in the forced necessity to provide facilities in places where they were never intended and should never be located;
- direct physical impact on the forest environment – poor circulation and traffic conditions (e.g. congestion, queues, hold-ups) can result in visitors resorting to informal/unintentional roadside parking and incursions into habitats and environments unintended for such impacts;
- physical severance of important natural and biological linkages (processes) between different geographic portions of the ecosystem – major through routes can severe biological/physical systems by obstructing biotic and abiotic processes (surface

drainage, subsurface through-flow, wildlife feeding areas from roosting or breeding areas, interbreeding animal populations, predators from prey); and
- place considerable pressure on SBPA management resources and capability that could otherwise be avoided.

Minimizing traffic/transport related impacts can be achieved through a combination of good **design** and good **management**. The former is concerned with road, land use and facility layout, while the latter is concerned more with interactive control and direction of traffic flows, control of transport modes, etc.

Issues and Options

The main concerns to be dealt with by this strategy include:

- PA access and strategic control points
- Traffic circulation options
- parking and transport modes for different sectors of the SBPA
- provision for long term through-traffic requirements

PA access and strategic control points
A large 'regional park' must have established strategic access/egress control points. An entirely open and unrestricted park will prove unmanageable.

Strategic control points operated by the PAMB are required in suitable locations in order to be able to:

- limit access numbers if known carrying capacity is being exceeded at any given time;
- close off areas during critical periods (e.g. breeding seasons, special biological events, quarantining, moratorium to allow natural regeneration/recovery, etc.);
- monitor use levels;
- collect access fees and/or install 'user pays' access to given areas;
- control and apprehend offenders or illicit users of the SBPA; and
- implement emergency control procedures during forecasted or sudden emergency events (flooding, earthquakes, fire, volcanic eruptions, etc.).

The options to address this need include:

- retain the existing control gates (Triboa/Nav Mag and Morong localities) and establish a central control station at the site, the latter allowing the most effective control over both visitors and current through traffic;
- establish a central visitor/traffic monitoring system using these two control points;
- implement fee collection system at various points if adopted;
- establish internal control points at the turn-off points of the north and south branches of the Nav Mag access roads;

- install control/no go barriers with 'turn-arounds' at the end of 'dead-end' roads to prevent vehicle access further down vehicle tracks, etc.; and
- select control points where 'terminus' parking can be provided as part of implementing a 'park and ride' access plan in specific precincts.

Traffic Circulation Options

Traffic should not be allowed unrestricted access to all parts of the SBPA. The issues include the following:

- there should not be a series of two way dead-end road systems;
- there should be definite destinations and facilities for, or means of control over visitors; and
- existing roads and alignments may not enhance the 'visitor experience', and may miss out entirely on important visitor experiences (vistas, glimpses, 'arrival experience', etc).

The options to address these issues include:

One way traffic system:

The internal road system should be planned and re-designed to be a 'one-way' system. This particularly includes the Nav Mag area south of the highway between Ilanin and Port Binanga.

Nav Mag arrival loop:

Main arrival one-way circulation system at eastern end of Nav Mag precinct area (See Figure 29), with main visitor parking area and internal transport terminus would allow for the overall traffic management and accessibility to future venues/attractions within this area. An existing loop in the road system provides an exceptional opportunity.

Parking and Transport Nodes

The layout of the Nav Mag area provides the opportunity for developing 'park and ride' access strategy for future uses and developments within the area. The existing road system not only allows a circulatory one-way road system but also a site at which a major terminus parking/collecting point could be established. These would allow visitors to park their vehicles, board a dedicated internal transport system (mini-coaches, tramway system, narrow gauge rail system, etc.) that connect to the various venues in the park.

The options to address these issues include:

Nav Mag arrival/terminus node

The loop road in the vicinity of the satellite station and south Nav Mag area provides a possible location for a large capacity arrival car park with a terminus for SBPA to take/board dedicated internal transport system. The advantages of this system are that the area could service all Nav Mag areas west of the highway and south of Ilanin Bay and dispose of car park (hydrocarbons from surface runoff) and other pollutants (effluent from convenience).

Hill 394 arrival/terminus node: a car park and terminus for accessing the eastern recreation area (Nav Mag area Group 6) and 'Hill 394' could be provided in a similar manner in the westernmost portion of the two identified recreation nodes (see Figure 29). With the restoration of the disturbed sites leading from the through road to the nominated Recreation Zones, the visitor experience could be enhanced and the subsequent experience of accessing venues after leaving private vehicles further enriched.

Short Term through Traffic Requirements

It is recognized that in the immediate to short term it is intended to extend the upgrade of the north south route through the SBPA from Morong in the south to Subic in the north. This involves and intention to upgrade the Corregidor Highway, between the north and south gates of the NavMag area. At this point, (December 2001) engineering upgrade works on both the northern and southern approaches are underway.

This strategy argues initially that it would be better both economically and environmentally to wait until the SBPA is established and becomes operational before seeking substantial 'funding' (grants) for road works within the PA itself. The idea would be to use 'the leverage of the SBPA entity' in order to attract sufficient funds to be able to undertake a comprehensive new road solution that is of a very high environmental standard (see following sub-section 'Long Term Through Traffic Requirements').

However, if interim road upgrades are required or can not be delayed, then such works should be undertaken in way that integrates as fully as possible with the objectives of the SBPA Management Zone through which the road passes. The following is guidance in that regard for each relevant zone. The zones involved are:

- Sustainable Use Zone
- Forest Ecosystem Corridor Sub-zone
- Habitat Protection Zone
- Special Use Zone
- Restoration (Terrestrial) Zone

Sustainable Use Zone

All road upgrade and construction plans to be subject to full EIA procedures and to comply with environmental protection requirements appropriate to the Sustainable Use Zone.

Road planning and design through this zone should incorporate the following principles, requirements and approaches:

- minimum cut and fill (to be prescribed), involving cut/fill less than three meters height/depth to minimize earthworks and disturbance of existing vegetation;
- culvert underpasses for known/identified fauna movement pathways;
- major tributary streams and watercourses to be bridged;
- use of large sized culverts for all other water courses, of sufficient diameter to allow passage of fauna in low to medium flow conditions;
- directional roadside 'fauna diversion fencing' to guide fauna away from 'road kill zones' and towards fauna underpasses;
- hard curbs to carriageway shoulder, with substantial road drains (as per existing US Naval road construction design);
- road surface drainage to spoon drains and storm compensation basins;
- no split carriageway construction;
- prescribed emergency stopping zones for PA visitors ('no stopping' clearway for remainder); and
- carriageway edge vehicle barriers/bollards to prevent vehicle movement off carriageway in the absence of road culverts.

Forest Ecosystem Corridor Sub-zone

All road upgrade and construction plans to be subject to full EIA procedures and to comply with environmental protection requirements appropriate to the Forest Ecosystem Corridor Sub-zone.

Road planning and design through this zone should incorporate the following principles, requirements and approaches:

- full EIA process and compliance approval required for all road upgrade and major works programs;
- minimum cut and fill limited to within the existing cleared road reserve, and to involve cut/fill less than 3 meters height/depth to minimize earthworks and disturbance of existing vegetation;
- all watercourses to be bridged unless otherwise determined through the EIA process;
- installation of bridges or large diameter culvert structures for crossing ravines/micro valley features, to provide for major wildlife movement underpasses;
- directional roadside 'fauna diversion fencing' to guide fauna away from 'road kill zones' and towards fauna underpasses;
- combination of hard curbs and road drains (as per existing US Naval road construction design) and soft carriageway edges, according to the slope factor;
- surface run-off to be diverted directly into the adjacent forest environment on level ground, and via spoon drains and storm compensation basins with energy attenuation structures on sloping ground (as appropriate);
- no split carriageway construction;
- all road works to be confined to the existing cleared road reserve area, and should not result in the removal of any forest vegetation;

- no stopping 'clearway' carriageway for entire length of road through Forest Ecosystem Corridor zone;
- install 'feed-off' lanes for all major intersections to side-roads, in order to allow smooth traffic flow; and
- no roadside development (commercial or non-commercial) of any kind, other than that which currently exists – to be progressively moved to more appropriate zones.

Habitat Protection Zone (major waterways and rivers)
All road upgrade and construction plans to be subject to full EIA procedures and to comply with environmental protection requirements appropriate to the Habitat Protection Zone. Road planning and design through this zone should incorporate the principles, requirements and approaches as per the Forest Ecosystem Corridor zone.

Major waterways/river channels and their immediate foreshore environments should be bridged, in order to minimize impacts.

Special Use Zone
All road upgrade and construction plans to be subject to EIA procedures. Where the Corregidor Highway passes through the Special Use zones on only one side of the highway, proposed upgrade road modification plans should still comply with environmental protection requirements appropriate to the Sustainable Use Zone overall. However, concerning land within the Special Use zone itself, and for planning to incorporate the developed sites themselves, road design and construction can be flexible and devised to fit in with existing, future or intended uses and activities within these sites. Overall road planning and design through this zone should incorporate the principles, requirements and approaches as per the Sustainable Use/Forest Ecosystem Corridor zone/sub-zone.

Restoration (Terrestrial) Zone
All road upgrade and construction plans to be subject to EIA procedures and to comply with required environmental protection requirements appropriate to the zone into which the existing restoration zone is to be included. Most of the Restoration Zone occurs within the Sustainable – Forest Ecosystem Corridor sub-zone, hence requirements for this zone/sub-zone would apply. However, the PAMB may set in motion formal procedures to include small proportions in other than the Sustainable Use zone, for the purposes for accommodating park management related activities (e.g. ranger station, visitor parking turn around area beside existing road intersections, 'visitor information' center, etc). Such sites would be Special Use Zone – Park Infrastructure. Road upgrades in these precise locations would be more flexible, to accommodate feeder lanes, vehicle pull-off areas, parking areas, as well as adjacent visitor/park administration facilities.

<u>Long-Term Through Traffic Requirements</u>

There is a need to address the needs of long-term traffic flows passing through the SBPA between Bataan/Morong and SBFZ and northwards, on a north south inter-regional transport alignment. In the long term, one option is to upgrade the existing highway

through the protected area in such a way that it could accommodate potential future traffic flow without impacting the environment. Another option would be to construct a new road. However, it is important to emphasize that this road should be in the exact location of the existing highway location, or very close to it. This PAMP does not support any future road alignment other than through this portion of the SBPA, and definitely not through any portion of the core zone.

The environmental issues associated with either highway upgrade or new road construction is that if environmental impact mitigation design approaches/techniques are not incorporated in the basic project planning, these can have highly negative impacts on the environment.

If funds are not available to incorporate expensive planning and design requirements, then road upgrade is preferred over new road construction.

In case of road upgrade, traffic types (through traffic/freight traffic versus visitor/tourist) are managed to avoid conflict and sufficient environmental design requirements are implemented (minimizing cut and fill, bridging water courses, allowing animal wildlife underpasses, well maintained road reserve perimeter fencing, etc.).

In case of a new road design and construction should be well beyond conventional road engineering approaches. The environmental performance requirements/design guidelines for the new road should include the following:

- all natural water courses to be bridged;
- all deep ravines and narrow steep-sided valleys to be bridged;
- distinct ridges (steep and precipitous) to be tunneled;
- a minimum of large scale cut and fill; and
- fill to be removed and disposed outside the SBPA to avoid conventional cut and fill 'balance' calculations.

In essence, the proposed formula is for a 'tunnel and bridge' oriented design approach. The cost implications are significant; however, it is suggested that fund sourcing should commence early and targeted at international funding agencies.

Strategy

The principal strategies for traffic management in the Protected Area are as follows.

- Prepare a SBPA access plan that incorporates strategic control points allowing control over both visitor and through traffic for purposes of monitoring, 'user pays' fee collection, and traffic management and emergency response.

Figure 29. Nav Mag arrival/terminus node

- Develop and implement a traffic circulation strategy plan based on a number of options, particularly in the Nav Mag area, as described and explained above.

- Prepare a plan for parking and 'modal split' terminus points for a 'park and ride' access system for visitors to the major recreation zones in the SBPA, mainly the Nav Mag area, and to provide for the development of uses in the identified Recreation Zones.

- Consider options for addressing long-term 'through traffic' needs, with a preference for minimum degree of highway upgrade in the short-term, and an ecological/landscape based (tunnel and bridge) option in the very long-term.

7.0 Management Structures and Institutional Arrangements

This Section will specify the organizational structure and institutional arrangements necessary to implement the SBPAMP. It will describe the management and administrative structure for the SBPA including the institutional linkages necessary to promote stakeholder participation during the plan implementation stage.

7.1. Administration of the Subic Bay Protected Area

Taking into consideration the various legal and jurisdictional concerns overlaying the SBPA, several institutional and management options were drawn up as discussed with the SBMA Board of Directors and heads of concerned offices, other national government agencies and, local government units and other stakeholders. These options are discussed and provided in the Annexes of this Report. The preferred management and administrative framework for the SBPA is described and elaborated below.

Consistent with its mandates as stipulated in RA 7227 and pursuing the exemption provision under Section 15 of the NIPAS law, control and administration of the Subic Bay Protected Area and its buffer shall be under the SBMA. Within this legal framework, the following management and administrative structure for the SBPA is shown in Figure 30 and described below.

7.1.1. Overall Supervision and Policy Making

The SBMA Board of Directors (BoD) shall be the policy-making and overall management body for the Subic PA. The SBM-BoD shall assume all the functions and responsibilities of the PAMB as outlined in the NIPAS law.

7.1.2. SBPA Policy Advisory Committee

A Subic Bay PA Policy Advisory Committee (PAC) shall be created to assist the SBMA-BoD and provide policy review and advisory services. The SBPA-PAC shall serve as the venue to promote cooperation and support and coordinate the participation of the other stakeholders in the management of the SBPA and the implementation of the SBPAMP. This committee shall be composed of the following:

- Chairman – Senior Deputy Administrator for Operations (SDAO)
- Members – Senior Deputy Administrator for Support Services
  - Deputy Administrator (DA) for Public Works and Technical Services
  - DA for Trade and Tourism
  - DA for Ports
  - Representative of the Private Business Sector

- Representative of the Indigenous People (Pastolan Aetas)
- Representative from the Fisheries and Aquatic Resources Management Council
- One representative from the affected LGUs to be selected by and among the members
- Representative of the NGO community
- The Regional Technical Director for Operations of DENR Region III
- Head of the Ecology Center (ex-officio member)

7.1.3. SBPA Technical Working Group (TWG)

A SBPA Technical Working Group shall be created to provide technical support and assistance to the SBMA BoD acting as the PA management body and the SBPA-PAC. The TWG shall also advise the Ecology Center on matters that pertain to the latter's functions, which impinge on their office mandates and their technical competence. Table 28 illustrates the functional areas where their advice will likely be needed. The SBPA-TWG shall be composed of the following:

- Chairman: Head of the Ecology Center
- Members:
  Head of the Legal Department
  Head of the Ecology Center
  Head of the Engineering Department
  Head of the Strategic Planning Office
  Manager of the Seaport Department
  Head of the Tourism Department
  Head of the Land and Asset Development Department
  Head of Investment Processing Department
  Head of the Law Enforcement Department

Table 28. Matrix of Functional Areas of Assistance by the TWG Members

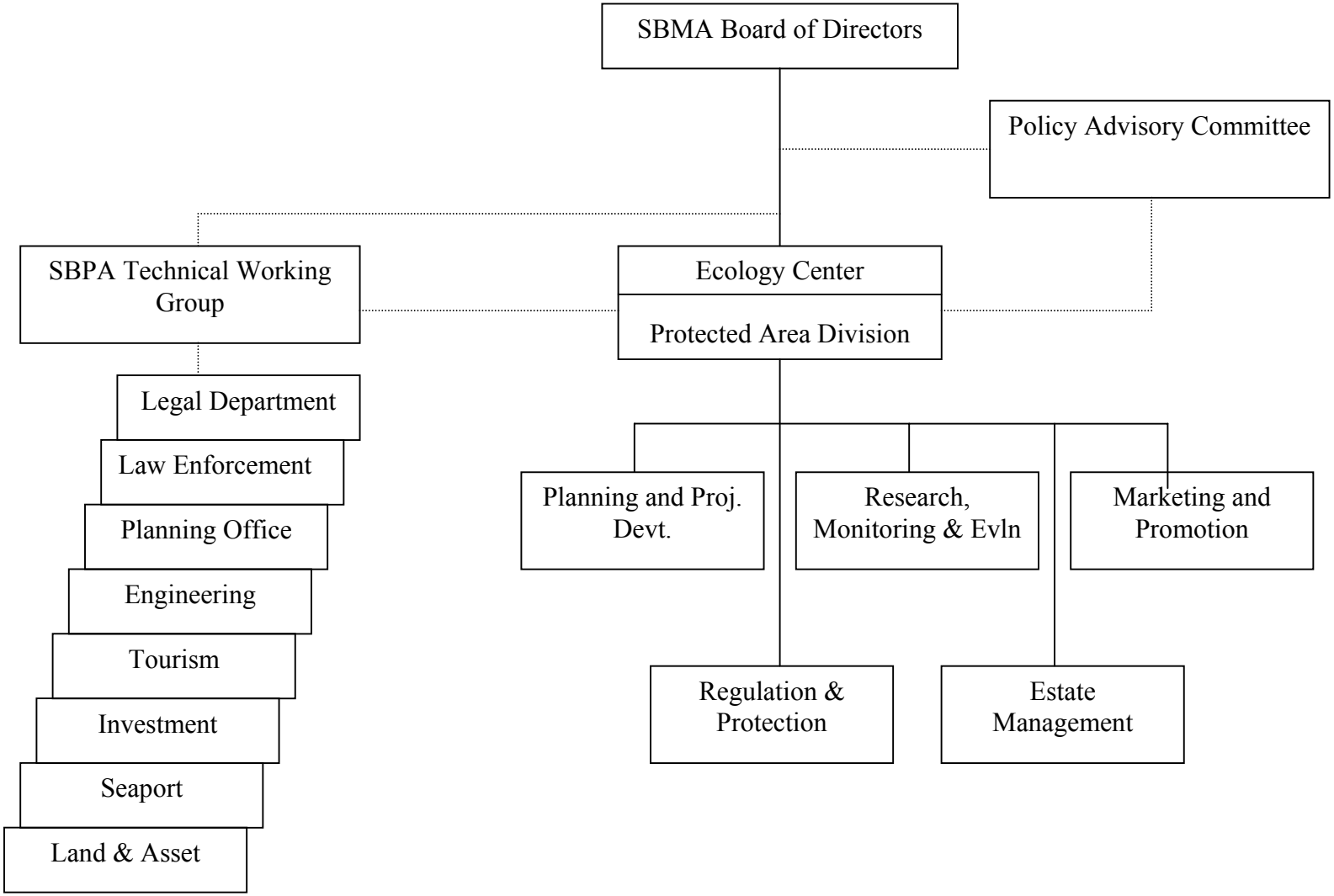
TWG Members/ SBMA Departments	Regulation & Enforcement	Provision of Services & Utilities	Estate Mgt. & Development	Marketing & Promotions
Legal	x			
Engineering		x	x	
Planning	x	x	x	x
Seaport		x	x	
Tourism		x	x	x
Land and Estate	x	x	x	x
Law Enforcement	x			
Investment Processing	x			x

7.1.4. Ecology Center

Consistent with the provisions of RA 7227 and its mandates specified in the law's Implementing Rules and Regulations, the Ecology Center (EC) shall be the lead implementing and operating unit for the SBPAMP. For this purpose, the Head of the EC shall assume the following functions:

- Serve as the on-site administrator for the implementation of the SBPAMP;
- Establish mechanisms to promote a broad-based participation in the management and development of the protected area;
- Ensure the proper utilization of budget allocations and the proper disposition of fees and other funds generated within the protected area;
- In coordination with the other offices develop and implement a PA IEC program;
- Formulate the rules and regulations to protect the area against trespassing, forest fire, poaching, illegal occupancy, and other causes of resource destruction;
- Coordinate the implementation of the PA management plan including the enforcement of rules and regulations;
- Prepare the annual work and financial plan to secure the required funds to support plan implementation;
- Monitor and evaluate the status of implementation of the SBPAMP including the attendant impacts and benefits; and
- Perform other functions as may be prescribed by the higher authorities and as may be necessary to attain the objectives of the management plan.

Figure 30. Management Structure for the Subic Bay Protected Area



The Protected Area Division (PAD) of the EC shall provide the technical staff support to the EC Head. The PAD shall also act as the secretariat for the PA management body to be created and for the above steering committee. The functions of the PAD shall expanded and categorized to reflect the four-fold objectives of park administration that include regulation and protection, planning and project development, research, monitoring and evaluation, marketing and promotion, and estate management.

The regulatory and protective functions of the PAD will include the following:

- Preparation of a comprehensive integrated forest and marine protection plan for the SBPA;

- Preparation of policies, rules and regulations for the protection of the resources within the SBPA;

- Together with the Strategic Planning Office, regulation and control of land and water uses in the SBPA;

- Coordination of all resource protection activities within the SBPA;

- In coordination with the Law Enforcement Department (LED), enforcement of the rules and regulations established to protect the SBPA and preserve the protected area from trespass, damage, injury and illegal occupancy;

- Review and processing of the necessary permits and clearances for all activities within the SBPA;

- With the assistance of the LED, summary removal or ejection from the area persons who have rendered themselves obnoxious by disorderly conduct or bad behavior or who have violated any of the regulations on the protected area;

- With the assistance of LED, seizure and confiscation timber or forest products, game birds, animals and fish including instruments, tools and conveyances used inside the protected area by unlicensed persons, or if licensed, in violation of protected area laws, rules and regulations; and

- Recommend the deputation of forest and marine protection officers to enhance the protection efforts for the SBPA.

  The planning and project development responsibilities of the PAD will mainly deal with the following:

- Review and update of the SBPAMP;

- Preparation of annual work plans and budget to implement the SBPAMP;

- Preparation and development of project proposals for possible funding of SBMA and other financial institutions;

- Implementation of development and livelihood projects inside the SBPA;

- Generation of support and assistance of NGOs, IPs, and the private sector in the implementation of development projects within the SBPA; and

- Monitoring and evaluation of the status of implementation of the SBPAMP including programs and projects

The functions of the PAD relevant to research, monitoring, and evaluation are as follows:

- Conduct of researches to improve the management, protection and development of the SBPA

- Development and implementation of a Protected Area Monitoring and Evaluation System

- Conduct of impact assessment to determine the benefits and other impacts of the implementation of the SBPAMP and other development activities within the SBPA; and

- Development and maintenance of an effective and efficient management information system for the SBPA

The marketing and promotions functions of PAD will include the following:

- Conduct of information and education campaign including the conduct of advocacy studies to promote awareness and generate support for the implementation of the SBPAMP;

- In cooperation with the Tourism, undertake activities to promote the SBPA as eco-tourism site and investment area; and

- Prepare relevant IEC materials and initiate activities to strengthen the linkage of SBMA with the media, the academe, the LGUs, and other stakeholders to obtain broad-based support for the SBPAMP.

The relevant estate management functions of PAD are as follows:

- Identification and assessment of suitable uses and development activities in each of the management zones of the SBPA;

- Monitoring and maintenance of all facilities and utilities in each of the designated management zones within the SBPA; and

- Develop guidelines to ensure the proper use of all the resources, facilities and utilities in the designated zones of the SBPA.

7.2. Institutional Linkages

While the stage of plan preparation promoted and utilized public participation as a basic avenue for deriving inputs to the plan, there will be the need at the plan implementation stage will seek to strengthen and establish permanent mechanisms for stakeholder involvement. This will be carried out by means of four clusters of activities: (1) profiling and analysis of stakeholders and forging agreements with them and developing a stakeholders' handbook, (2) integration of PAMP policies and prescriptions into the policy making functions of component, adjacent and affected LGUs; (3) establishing management links with the respective PAMBs of the Bataan Natural Park and the Roosevelt National Park; and (4) establishing co-management arrangements with the Council of Elders of the Pastolan Aetas.

7.2.1. Stakeholder Analysis

This will be a more systematic identification, classification and analysis of stakeholders according to their perceived dominant interests and their location in relation to the protected area and buffer zones. A refined inventory and profile of each stakeholder will be made. Stakeholders will be clustered around certain classification criteria. This will afford formal recognition to those who have shown sustained interest in the protected area.

On the basis of finer characterization of stakeholders, tools and mechanisms for multi-stakeholder participation in PAMP implementation will be developed. Memoranda of Agreement or Understanding will then be executed between the SBMA and individual or clustered stakeholders defining, among others, the extent of responsibility and sharing of benefits between the parties.

Finally, systems, procedures and processes will be designed to provide opportunities for various stakeholders to take part in monitoring and enforcement of PA policies and prescriptions. These could be published as a stakeholders' manual or handbook.

7.2.2. Integration of PA Policies

In order to do away with the need to organize and maintain a large bureaucracy within SBMA to administer the protected area and buffer zones, the PA policies and prescriptions will be integrated into the planning and policy making powers and functions of local governments straddled by, affected by, and adjacent to the protected area. The LGUs comprising the Subic Bay region will be assisted by SBMA in the formulation and enactment of protected area-friendly and water-sensitive local legislations. The bases for such local legislation include the following:

- Integrated Catchment Management (ICM) policies to be formulated with and implemented by the city of Olongapo and the municipality of Subic.

- Coastal resource management and water use zonation scheme of Subic Bay to be prepared with and implemented jointly by SBMA and Olongapo City and the municipalities of Subic and Morong.

- Environmental management programs to be prepared with and to be implemented by LGUs within the buffer zones and adjacent to SBFZ, namely, San Antonio, Castillejos and San Marcelino in Zambales and Dinalupihan, Hermosa and Pilar, in Bataan.

7.2.3. Linkages with Bataan PAMBs

A coordinating council composed of representation from the SBPA management body or the SBMA BoD, the Bataan Natural Park PAMB and the Roosevelt National Park PAMB shall be organized. Perhaps joint PAMB meetings could be conducted to decide on such items of common interest as, but not limited to, the following:

- Coordinated and physical/social fencing of common boundaries

- Coordinated installation of interpretive facilities

- Joint promotion of eco-tourism and recreational facilities

- Consciousness building among forest occupants and users

- Joint programs on alternative livelihood research and provision

7.2.4. Co-Management Arrangements with Pastolan Aetas

The SBPA overlaps with the ancestral domain of the indigenous people residing in the barangays of Pastolan and Tipo, Hermosa, Bataan. The ancestral domain had been granted a certificate of title (CADT) and therefore the Aetas have acquired a formal legal personality. In this sense, the SBPA will be a user of the ancestral domain. To ensure continued use of the ancestral domain as part of the protected area there is a need to negotiate the terms and conditions in accordance with Section 7 (b) of the Rules and Regulations Implementing RA 8371, quoted below:

> " b) Conditions for Continued Use of Ancestral Domains as Part of Reservations. ICCs /IPs communities whose ancestral domains or portions thereof continue to be used as parts of reservations, have the right to negotiate the terms and conditions thereof in a Memorandum of Agreement. The ICC/IP community may negotiate for such use, including the grant of benefits such as, but not limited to, preferential use of facilities in the area and free access to basic services being dispensed therefrom, through appropriate IP desks to be established by the administrator of the reservation."

Obviously, one of the first activities in the implementation of the PAMP is the forging of a MOA with the Council of Elders, or whatever decision-making body represents the Aeta community. The stipulations in the MOA shall include the Aeta representation in the policy and administrative bodies of the SBPA, enumeration of benefits that the IP communities will enjoy as well as their obligations to help preserve the integrity of the protected area.

7.3. Plan Approval and Adoption

The Plan approval and adoption process outlined in this section is built upon the two guideposts drawn from the provisions of Section 15 of the NIPAS law, to wit:

- That the SBPA is an exemption to the NIPAS law; and
- That the preparation of the Management Plan shall be coordinated with the DENR.

As such, it is important to stress that while the defined plan approval process is distinct to the SBPA, such process should still be consistent with the intent of Section 15, that is, the need to have DENR in the loop of the approval process.

The plan approval process starts upon completion of the Subic Bay Protected Area Management Plan. The following are the steps and activities involved in the plan approval process:

7.3.1. Public hearings on the proposed SBPA and Protected Area Management Plan

The SBMA, in coordination with the DENR-PAWB, shall take the lead in this activity and shall perform the following sequential steps:

- Notify the public of the proposed establishment of the protected area through publication in newspapers of general circulation and other media at least 30 days prior to the public hearing, making sure that all stakeholders are properly notified.

- Conduct public hearings at locations nearest to the affected area.

- Present the SBPA Management Plan highlighting the basic rationale for establishment and for the proposed boundaries including the buffer zones.

- Make a written record of the names of those who attended and of the proceedings of the public hearings.

- Allow everyone present an opportunity to state their views orally or in writing.

- Allow the further submission of views in writing for 30 days following the public hearings.

7.3.2. Regional Review and Recommendation

Following the public hearings the SBMA-Ecology Center shall make any modifications on the boundary and/or management plan and prepare and submit a report to the SBMA Chairman, copy furnished the Regional Development Council (RDC) and the Director of PAWB, including:

- A draft Presidential Proclamation designating the area as a protected area

- The SBPA Management Plan

- Photographs

- A map and technical description that includes buffer zones

- A record of public hearings and such other documents as may be required.

7.3.3. National Review and Recommendations

Based on the review and recommendations by the RDC, the DENR Secretary, upon recommendation of the PAWB Director, shall recommend to the President the proclamation of the SBPA as such.

Presidential Proclamation

Upon receipt of the DENR recommendation and supporting documents, the President shall issue a Presidential Proclamation designating the recommended area as a protected area and providing for protection measures until such time as Congress shall have enacted a law declaring the area as part of NIPAS.

Congressional Action

For areas recommended by the DENR Secretary and proclaimed by the President, a law pursuant to the NIPAS law shall be enacted by Congress.

Demarcation

Upon enactment of the law defining and establishing the protected area, the boundary of the said area shall be established and demarcated on the ground with concrete monuments or other prominent physical landmarks or features. Index and station numbers shall be engraved on the monuments or markers to serve as reference. In the case of marine protected areas, boundaries shall be marked where practicable with internationally accepted buoys.