

A GUIDE TO PROTECTED AREA TYPES IN PAPUA NEW GUINEA

PNG Protected Area Management Guideline No.PA1 Version 1

Pasin lukaut blo bus na wara

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The guide has been prepared in advance of the finalisation of the Protected Area Bill. Therefore, a number of topics have not yet been finalised, the most important of which is the inclusion of the protected area type ‘Locally Managed Protected Area’. This guideline needs to be reviewed when further clarification is available. In this draft we refer to ‘the protected area legislation’ which is the Protected Area Bill at present.

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Glossary

Acronym	Term in full
CARR	Comprehensive, adequate, representative and resilient
CEPA	Conservation and Environment Protection Authority
CCA	Community conservation area
CLO	Customary landowner
IUCN	International Union for the Conservation of Nature
LMCA	Locally managed conservation area
LMMA	Locally managed marine area
NEC	National Executive Council
NP	National park
NGO	Non-government organisation

NHA	National heritage area
NMS	National marine sanctuary
OECM	Other effective area-based conservation measure: defined conservation areas other than protected areas
PNG	Papua New Guinea
PPA	Private protected area
SMA	Special management area
IUCN Category	The category of protected area under the system described in the IUCN guidelines (Dudley 2008)
PNG protected area type	The type or designation of protected area included in PNG's national protected area network and gazetted under PNG's legislation

Executive summary

Under the 2014 Policy for Protected Areas, Papua New Guinea (PNG) is committed to establishing a protected area network that is relevant to the PNG community, comprehensive, adequate, representative and resilient. The network across land and sea will consist of eight primary types of protected areas designed to be appropriate in PNG. They are also in line with the variety of protected area categories, management arrangements and governance types developed by the International Union for the Conservation of Nature (IUCN)¹ and accepted as the international standard. Other protected areas and conserved sites, including traditional sacred sites *ples masalai* will also be protected under the proposed new protected areas legislation².

Commercial logging and mineral and resource exploration and extraction are not permitted on any protected area types. However, other activities are allowed and encouraged in different protected area types, depending on their objectives and on the laws and regulations applying to them. Protected area declaration should not result in displacement of any people from their customary lands, and some level of human habitation and traditional resource extraction is allowed in at least some parts of all protected areas. Activities need to be in keeping with the primary aim of conservation and protecting the culture and livelihoods of customary landowners, and should always be conducted in a sustainable manner.

Five types of protected areas will be registered under the legislation as **national protected areas**, and their management will be a cooperative responsibility between customary landowners and the Conservation and Environment Protection Authority (CEPA), and in some cases other agencies and non-government organisations. The other protected area types, **regional protected areas**, will be registered as part of the national network and recognised by national legislation, but will be managed through a variety of arrangements among parties including regional, district and local level government, civil society, customary landowners and private landowners. CEPA will have only an overseeing role in their management.

¹ Day, J., et al. (2012) Guidelines for applying the IUCN Protected Area Management Categories to Marine Protected Areas. IUCN, Gland, Switzerland.

² At the time of publication, the Protected Areas Bill is yet to be finalised, but this guideline is written assuming that the Bill proceeds as intended, with the addition of Locally Managed Conserved Areas. This guideline needs to be reviewed at the time when it becomes an Act. The Bill should be consulted for legal details relating to the protected areas.

The protected area legislation will also give protection to areas protected under any other legislation: some of these are protected areas while others fall under the definition of “**other effective area-based conservation measure**”³ as they make an important contribution to conservation though this might not be their primary purpose.

National protected areas

National parks are mostly in terrestrial and freshwater ecosystems, and may extend into nearshore waters. These are IUCN Category II protected areas, declared primarily for the protection of habitats and species. They should usually be relatively large and self-sustaining areas, and play a significant role in the reserve network.

National heritage areas can be marine or terrestrial and are IUCN Category III protected areas. They are declared to protect special features of national importance, and may be relatively small in size. The special features may be historical, cultural, geological or biological and could include caves, shipwrecks, archaeological sites and any sites of special customary significance.

Special management areas are terrestrial or marine IUCN Category IV protected areas. These protected areas will have a high level of protection and in some cases special active management to protect particular species or ecosystems.

National marine sanctuaries are large marine areas, where statutory zoning is used to create a mosaic of protection. They are IUCN category VI overall, but the statutory zoning means that zones within the protected area can be designated as different IUCN categories including II, III, IV and V. Some commercial activities including commercial fishing and aquaculture can be allowed in certain zones, while other zones are strictly for conservation.

Community conservation areas are primarily terrestrial and freshwater, and may extend into nearshore waters. These conserve large and significant areas while sustaining traditional livelihoods. They are IUCN category VI protected areas, but if statutory zoning is used other zones may also be recognised. Some zones within community conservation areas may include commercial activities such as small-scale agricultural plantations.

Regional protected areas

Locally managed marine areas are IUCN category V areas. They are managed by customary landowners to conserve traditional marine livelihoods and to protect biodiversity and culture and tambu sites.

Locally managed conservation areas are IUCN category V areas. They are managed by customary landowners to conserve traditional livelihoods on land and freshwater and to protect biodiversity and culture and tambu sites.

Private protected areas can be assigned to any category depending on their objectives. Their distinguishing feature is that the land is freehold or leasehold, but as with all protected areas the primary objective must be conservation.

Other protected and conserved areas

³ IUCN-WCPA. (2019) Recognising and Reporting Other Effective Area-based Conservation Measures. Technical Report. IUCN, Switzerland.

The protected area legislation will also recognise areas protected under any other legislation, including Marine Protected Areas under the Maritime Zones Act and the Law of the Sea. Places set aside by the community, such as *ples masalai*, are also recognised, whether or not they are on the national register of protected areas.

1. Introduction

1.1 Background

In 2014 the Government of Papua New Guinea (PNG) published the Policy on Protected Areas (PA Policy)⁴ to guide revitalisation and effective management of the country's protected area network. The PA Policy outlines a new set of protected area types (to be designated under law), as well as principles for design and management of the expanded protected area network. The vision in the PA Policy for PNG's protected area network is *"Our protected area network across land and sea safeguards our precious and outstanding natural and cultural heritage. Together we manage these areas effectively for all the people of Papua New Guinea"*. The desired outcomes in the PA Policy include *"The PNG protected area network consists of a range of protected area types which form the cornerstone of an integrated approach to conserve nature and provide resilience to climate change on both land and sea"*.

Based on the PA Policy and on extensive consultations with communities, government agencies and stakeholders throughout the country, the Protected Areas Bill has been prepared. At the time of publication, this legislation is still in the process of finalisation⁵. Once enacted, the Protected Areas Act will create the protected area types described in this guideline and will outline governance and management provisions.

It is important to note that both the PA Policy and the proposed legislation fully recognise landowners' rights, and that none of the protected area designations imply that ownership of lands or waters should change.

This guide is prepared to help implement the PA Policy and legislation by providing detailed descriptions of each protected area type. In addition, it will give guidance to help communities and managers allocate both existing and proposed areas into the most appropriate protected area type.

1.2 Purpose

⁴ Independent State of Papua New Guinea. (2014) Papua New Guinea Policy on Protected Areas. (ed Conservation and Environment Protection Authority), Waigani, National Capital District, Papua New Guinea.

⁵ Throughout this guideline we refer to 'the protected area legislation', being the PA Bill and proposed Protected Areas Act.

This guide aims to:

- Clearly explain the national and international context for PNG's protected area types;
- Update and expand the definitions of protected areas in the PNG Policy on Protected Areas, with the addition of three protected area types that were not included in the PA Policy (locally managed conservation areas, private protected areas and other protected and conserved areas);
- Set criteria and minimum standards for each protected area type; and
- Assist decision-makers to select the appropriate protected area type for each proposed or existing protected area.

This chapter of the guide includes a definition of protected areas, an explanation and summary of categories according to the International Union for the Conservation of Nature (IUCN), an outline of protected area types in PNG, a discussion about different models of governance and ownership, and a summary guide to choosing the most appropriate protected area type. Chapters Two to Eight provide more detail about each protected area type, including definitions, objectives and selection criteria. Chapter Nine presents an overview of the uses that are permitted in each protected area type. Attachment One contains the principles for selecting new reserves, and is extracted from the PA Policy.

This guideline is written for PNG's specific conditions, in particular with the landowners ownership and stewardship of land and water in mind. However, much of the information in the guide draws on definitions and discussion in the IUCN guidelines for protected area categories⁶ and their application to marine areas⁷. For a more in-depth understanding of protected area categories, readers are invited to consult these documents, which are available for download from the IUCN website⁸.

1.3 What is a protected area (pasin lukau)

⁶ Dudley, N. (2008) Guidelines for Applying Protected Area Management Categories. IUCN, Gland, Switzerland.

⁷ Day, J., et al. (2012) Guidelines for applying the IUCN Protected Area Management Categories to Marine Protected Areas. IUCN, Gland, Switzerland.

⁸ <https://www.iucn.org/theme/protected-areas/about/protected-area-categories>

*Lukautim abus, graun na wara b'long nau na bihain taim
Eda uda, tano bona davara naridia hari bona nega vaira*

Protected areas in PNG are places where we protect people's cultural and historic values; wisely look after land and sea; and use natural resources, including plants and animals, carefully now and for the future. Protected areas assist local communities to manage people's activities to allow for renewal (breeding up) of wildlife or marine resources, and regeneration of the natural environment.

As an estimated 97% of PNG's land and 90% of near-shore marine areas are owned and managed by customary landowners⁹, the PNG protected area network can be built only with their full involvement, support and cooperation. Many customary landowner and communities are keen to establish and manage protected areas on their lands and waters, to ensure that future generations enjoy the benefits of healthy and properly managed natural resources. It is important that we build on this customary practice in its many forms and that protected areas support local livelihoods and natural resource sustainability.

The internationally accepted definition of a protected area is "*a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values*"¹⁰. Key guidelines for determining whether an area is a protected area are:

⁹ Figures quoted are 2010 data as reported in the Department of Environment and Conservation. (2014) Papua New Guinea's Fifth National Report to the Convention in Biological Diversity. Government of Papua New Guinea

¹⁰

- “For IUCN, only those areas where the main objective is conserving nature can be considered protected areas; this can include many areas with other goals as well, at the same level, but in the case of conflict, nature conservation will be the priority;
- Protected areas must prevent, or eliminate where necessary, any exploitation or management practice that will be harmful to the objectives of designation;
- Protected areas should usually aim to maintain or, ideally, increase the degree of naturalness of the ecosystem being protected;
- Protected areas should be managed in perpetuity and not as a short-term or temporary management strategy.”

Within the protected area definition there is great flexibility for different areas to be designed and managed in ways that are appropriate to national and local circumstances. Modern protected area networks consist of a flexible variety of protected areas, working together and with other natural and near-natural areas to create landscapes and seascapes that can protect and replenish ecosystem services, culture and biodiversity and sustain customary landowners and communities.

1.4 Other effective area-based conservation

Recently a lot of attention has been given to the role of effective conservation where sites do not meet the protected area definition. An “other effective area-based conservation measure” (OECM/conserved area) has been defined by the Convention on Biological Diversity (CBD) in decision 14/8 as: *“A geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in situ conservation of biodiversity with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values.”*¹¹. These areas are now commonly referred to as conserved areas

OECMs can be included in country reporting on the CBD targets¹², and are a way to recognise the important conservation efforts that take place in PNG outside currently designated protected areas, such as where communities set aside land to protect sacred sites. OECMs can contribute to ecologically representative and well-connected conservation systems and have a range of conservation outcomes (see Section 9.6). More details on OECMs can be found in the recently published guideline¹³.

¹¹ Convention on Biological Diversity. (2018) Decision 14/8. Protected areas and other effective area-based conservation measures.

¹² Targets for protected area coverage and management for 2020 are included in the “Aichi Targets” CBD COP 10 (2010) Decision X/2, Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets. Convention on Biological Diversity <http://www.cbd.int/decision/cop/?id=12268>. New targets will be set in 2020.

¹³ IUCN-WCPA. (2019) Recognising and Reporting Other Effective Area-based Conservation Measures. Technical Report. IUCN, Switzerland.

The IUCN protected area category system (Table 1) was devised to accommodate a wide range of approaches to conservation, from very strict protection to community-based approaches that also allow for a range of sustainable uses. The category system recognises that people across the world have different ways to look after biodiversity and culture, and that all these ways can contribute on a national and international scale. In this guideline, we consider how these categories can best be applied to the diverse cultures and environments of PNG.

The IUCN category is based on the primary **objective(s)** stated for each protected area, rather than on any other criteria such as size or values. The IUCN has also provided guidelines outlining ‘distinguishing features’ and the contribution to the landscape and seascape of each category¹⁴.

Table 1: Categories of Protected Areas outlined by the IUCN¹⁵

IUCN category	Description
I	Ia. Strict Nature Reserve: strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphological features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of conservation values. Such protected areas can serve as indispensable reference areas for scientific research and <u>monitoring</u> .

¹⁴ Dudley, N. (2008) Guidelines for Applying Protected Area Management Categories. IUCN, Gland, Switzerland.

¹⁵ ibid

	Ib. Wilderness Area: to protect large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.
II	National Park: to protect large natural or near natural areas set aside to protect large scale ecological processes, along with the complement of species and ecosystem characteristics of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities.
III	Natural Monument or Feature: to protect a specific natural monument, which can be a landform, seamount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.
IV	Habitat/Species Management Area: to protect particular species or habitats and management reflects this priority. Many category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.
V	Protected Landscape/Seascape: where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.
VI	Protected Area with sustainable use of natural resources: conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.

Important points when considering categories are:

- The IUCN category system is *not* intended to be hierarchical – that is, category I is not superior to category VI.
- It is useful for countries to have a range of protected areas, reflected in a range of categories, but it is not necessary for any country to use all of the categories¹⁶.
- Any IUCN category can exist under any governance type and vice versa (for example, national parks can be owned and managed by any combination of governments, customary landowners and non-government organisations). This is a critical point for PNG: declaration of a protected area does not affect rights in the land and does not mean a government take-over.
- Generally, categories are allocated to an entire protected area. However, if there are management zones defined in a statutory management plan or in legislation, it is possible to

¹⁶ In PNG, given that most of the country is owned by customary landowners, it is not considered beneficial to create protected area types under categories 1a or 1b.

allocate different categories to these zones. This approach has been taken in some very large protected areas, such as in the Great Barrier Reef Marine Park, Australia^{17, 18}.

- IUCN guidelines allow for up to 25% of land or water within a protected area to be managed for purposes other than the primary objective, so long as these are compatible with the primary objective of the protected area. This means, for example that national parks could include defined zones for village occupation, gardens and traditional hunting. In PNG these 'exceptional' zones should generally occupy no more than 10% of large protected areas, but there may be exceptions to this. Activities such as creation of new mines or logging concessions are incompatible with conservation and would not be permitted within protected areas¹⁹.
- Each country or jurisdiction develops a protected area network with its own range of protected area types to suit its own circumstances and needs, while meeting its national and international obligations.

1.6 I n t e r n a t i o n a l c o

¹⁷ Day et al (2012) explain "One or more protected areas are sometimes "nested" within another protected area with a different category. The most common model is a large, less strictly protected area (e.g. a category V or VI protected area) containing smaller, more strictly protected areas (e.g. category III or IV protected areas) which have different objectives. In such cases distinct protected areas nested within larger protected areas can have their own category.

As explained in the 2008 Guidelines (Chapter 4, pages 36-38), categorisation of different zones within a protected area is allowed provided three specific requirements are met:

- (a) the zones are clearly mapped;
- (b) the zones are recognised by legal or other effective means; and
- (c) each zone has distinct and unambiguous management aims that can be assigned to a particular protected area category.

¹⁸ Day, J., et al. (2012) Guidelines for applying the IUCN Protected Area Management Categories to Marine Protected Areas. IUCN, Gland, Switzerland.p. 24

¹⁹ This is clarified in the legislation

In addition to the protected areas discussed in this guide, areas of land or sea can be proposed to relevant international bodies for listing under international conventions to be registered as Ramsar sites, Biosphere Reserves or World Heritage Sites. The relevant Conventions have their own very strict criteria and processes which must be followed for areas to be listed, and also have requirements for management and reporting.

Day *et al*²⁰ explain “One or more protected areas are sometimes “nested” within another protected area with a different category. The most common model is a large, less strictly protected area (e.g. a category V or VI protected area) containing smaller, more strictly protected areas (e.g. category III or IV protected areas) which have different objectives. In such cases distinct protected areas nested within larger protected areas can have their own category. Essentially this situation is a variation on zoning, but in this case each “zone” meets the status of an MPA [marine protected area] itself.

As explained in the 2008 Guidelines (Chapter 4, pages 36-38), categorisation of different zones within a protected area is allowed provided three specific requirements are met:

- (a) the zones are clearly mapped;
- (b) the zones are recognised by legal or other effective means; and
- (c) each zone has distinct and unambiguous management aims that can be assigned to a particular protected area category.

Two Wetlands of International Importance (Ramsar sites) in PNG have been declared under the Ramsar Convention (formally known as the Convention on Wetlands of International Importance), and there is potential for more sites to be designated with the expansion of the protected area network.

There is currently one World Heritage Site in PNG, while another seven proposed areas are on the “tentative” list. All properties inscribed on the World Heritage List (i.e. under the World Heritage Convention) must have adequate long-term legislative, regulatory, institutional and/or traditional protection and management to ensure their safeguarding. This protection should include adequately delineated boundaries. Adequate protection needs to be demonstrated at the national, regional, municipal, and/or traditional level for the nominated property.

International designations can include or overlap any kind of national protected area. Subject to the wishes of the customary landowners, it is desirable that Ramsar sites, World Heritage Areas and the core area of any future Biosphere Reserves are covered by some form of national protected area type. Thus, any existing or proposed lands and waters within the declared or

²⁰ Day, J., et al. (2012) Guidelines for applying the IUCN Protected Area Management Categories to Marine Protected Areas. IUCN, Gland, Switzerland.p. 24

tentative international agreement areas will be considered a very high priority for designation as national or regional protected areas.

PNG has exceptionally high biodiversity and cultural values, and a unique system of land tenure, most land is owned and managed by customary landowners. People have long practiced sustainable management to ensure a consistent supply of food and water and other materials, to protect their culture and *ples masalai*, and to maintain their lands and waters. The international category system was considered in relation to PNG’s values and its legal, socio-economic and cultural environment. After extensive public consultation, eight types or designations of protected areas were defined for PNG, and other areas are also recognised in the protected area legislation. These are listed in Table 2 and detailed in later sections.

Table 2: PNG's Protected area types

PNG Protected area type	IUCN Cat	Notes	National or Regional PA
NP: national park (primarily terrestrial and freshwater, may extend into nearshore waters)	II	Primarily for protection of habitats and species – relatively large.	National Protected Area ²¹
NHA: national heritage area (marine or terrestrial)	III	Protects special features of national significance (historical, cultural, geological or biological) – may be small areas.	National Protected Area
SMA: special management area (terrestrial or marine)	IV	Area where special management or a high level of protection is needed to protect particular species or ecosystems.	National Protected Area
NMS: national marine sanctuary (marine)	VI with zones of II, III, IV and V	Statutory zoning used to create a mosaic of protection – near-shore and off-shore. May include seascapes and marine protected areas under the Maritime Zones Act.	National Protected Area
CCA: community conservation area (primarily terrestrial and freshwater, may extend into nearshore waters)	VI with zones of II, III, IV	Conserves large and significant areas while sustaining traditional livelihoods.	National Protected Area ²²
LMMA: locally managed marine area (marine)	V	Conserves traditional marine livelihoods; protects biodiversity, culture, tambu sites and <i>ples masalai</i> .	Regional Protected Area
LMCA: locally managed conservation area (primarily terrestrial and freshwater, may extend into nearshore waters)	V	Conserves traditional livelihoods on land; protects biodiversity, culture, tambu sites and <i>ples masalai</i> .	Regional Protected Area
PPA: private protected area	Ia, Ib, II, III or IV	Objectives to be determined on an individual basis.	Regional Protected Area
Other protected or conserved areas: includes <i>ples masalai</i> , cultural sites	No category.	Objectives to be determined on an individual basis. Will often relate to local culture, special sites and sustainable management.	Other

A general guide to the characteristics of each type is shown in Figure 1 .

²¹ For an explanation of the national and regional protected areas, see the protected area Policy and the protected area legislation

²² Classified as a Regional Protected Area under the current draft of the PA Bill, except where a CCA overlaps more than one province. However, this guideline reflects CEPA's wish to recognise CCA as a National Protected Area.

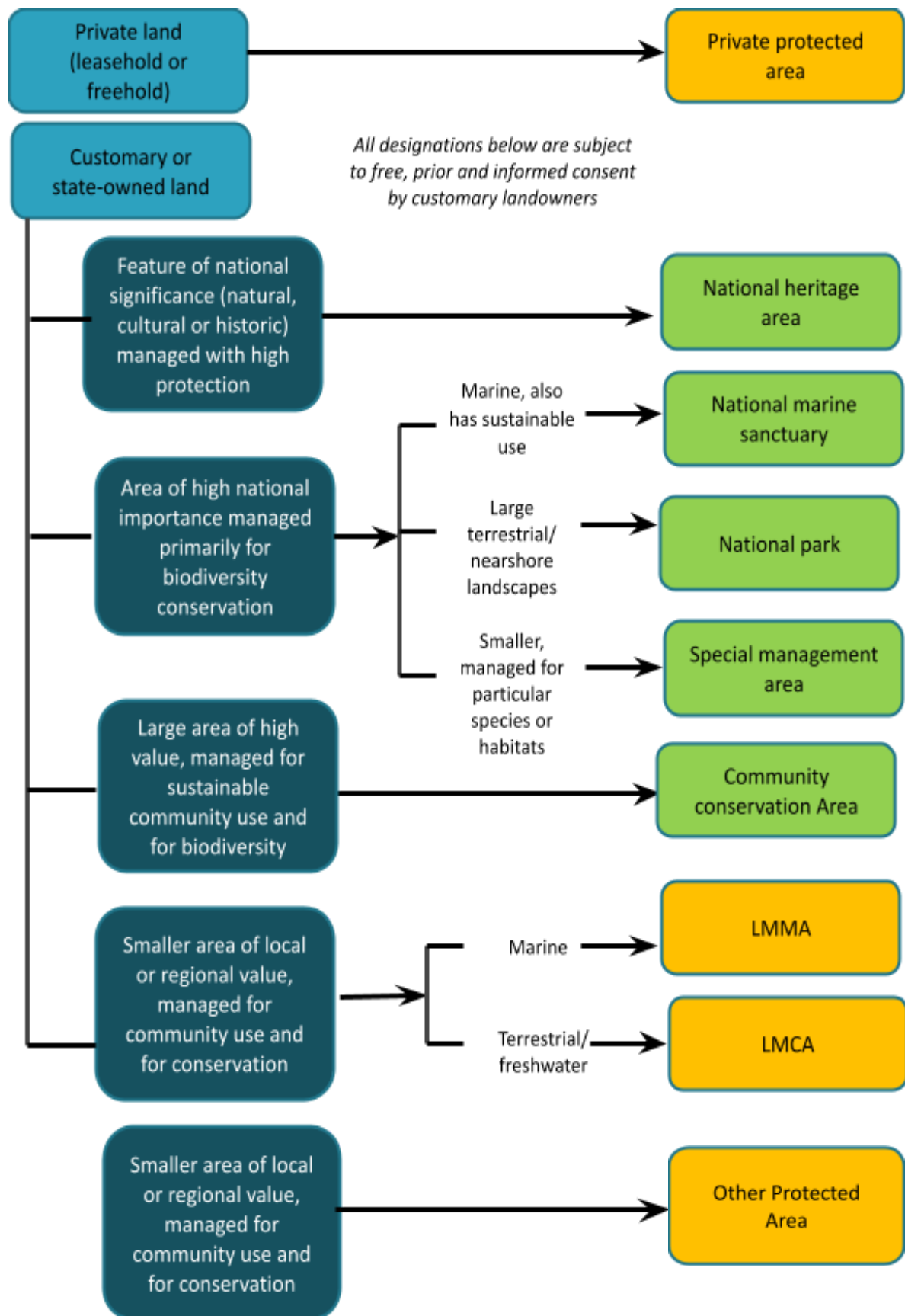


Figure 1: General characteristics of PNG's protected area types

IUCN categories can apply to any kind of ownership, governance or management²³ (see Section 1.5).

Ownership relates to *who holds the tenure* to the land or sea. In PNG, this is mostly customary landowners, with some owned by the government or held by private entities in leasehold or freehold. The ownership **will not change** with declaration of protected areas.

Governance for protected areas determines *who makes the decisions* about the protected area and *how the decisions are made*. It relates to how power is exercised and how citizens are involved. Governance has been defined as the “interactions amongst structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken and how stakeholders have their say”²⁴. *Quality of governance* includes aspects such as accountability, fairness and effectiveness.

Four *kinds of governance* for protected areas are recognised internationally²⁵:

- Government – this may be national, provincial or local level government;
- Community – in PNG this refers to customary landowners. In many protected areas, a number of customary landowner groups will be involved and a management committee will need to include representation of these landowner groups;
- Private – may be individuals, non-government organisations, civil society bodies such as universities or museums, and corporations; and
- Shared – any combination of the three groups above.

For most protected areas in PNG, customary landowners will remain as primary decision-makers, though in some cases governance will be shared with government or other stakeholders. Management boards (for national protected areas) and committees (for regional protected areas) play a central role in governance, and the membership of these bodies is defined in legislation. Customary landowners are always included.

Management relates to *who carries out actions to protect the land and water*; it has been defined as “the process of assembling and using sets of resources in a goal-directed manner to accomplish tasks in an organisation”²⁶. People who manage protected areas are not always the

²³ Good discussions on these subjects can be found in Worboys et al. (2015) Protected area governance and management ANU Press, Canberra.

²⁴ Graham, J., et al. (2003) Governance principles for protected areas in the 21st century, a discussion paper. Institute on Governance, in collaboration with Parks Canada and Canadian International Development Agency, Ottawa.p. 2

²⁵ Dudley, N. (2008) Guidelines for Applying Protected Area Management Categories. IUCN, Gland, Switzerland. ; Borrini-Feyerabend, G. and Hill, R. (2015) Governance for the conservation of nature. In: *Protected area governance and management* (eds Graeme L. Worboys, Michael Lockwood, Ashish Kothari, Sue Feary and Ian Pulsford). ANU Press, Canberra.

²⁶ Hitt, M. A., et al. (2011) Management, 3rd edn. Pearson Education, Upper Saddle River, NJ.p. 11.

same as the people who have governance responsibility and power. For example, decision-making might be shared between customary landowners with government, while day-to-day management is carried out by community rangers, funded by a non-government organisation.

1.9 Deciding on a protected area type

Proposing a new protected area or re-allocating an existing protected area to a protected area type will include considerations of:

- Intended objectives of management in the future;
- Wishes of customary landowners, in particular their vision for the protected area and the types of activities that will be undertaken;
- Fit of the proposed area with criteria outlined for each protected area type in Sections 2 to 8 of this guide;
- Values of the area, and the existing or potential contribution of the area to the principles for establishing the protected area network (Attachment one);
- Size and configuration of the area;
- Ownership and boundaries of the area;
- Current uses.

The principle of free, prior and informed consent means that customary landowners have the final say about the inclusion of any of their lands or waters in a protected area. Their willingness to set aside areas as no-take zones will determine the practicality of declaring national parks or special management areas, where at least a proportion of the protected area needs to be protected from hunting and fishing.



Customary landowners of Balek Wildlife Sanctuary, are keen for their local area to receive official protection and support. They attempt to enforce total protection of the forested hills above the village area. Photo: Ann Peterson

2. National park

2.1 Description and objectives

National parks (NPs) are **iconic areas of national and international importance**, where the customary landowners and communities agree to their declaration and management with a **high level of protection**. They consist of natural or near-natural terrestrial or freshwater areas or a combination of these, and may also extend into estuarine and near-shore marine areas to enable integrated and consistent management.

They are reserved primarily for the protection and conservation of large-scale ecological processes, and of species and ecosystems characteristic of the area, and also provide for ecologically and culturally compatible spiritual, cultural, scientific, educational, and recreational and visitor opportunities.

Management objectives of national parks in PNG are²⁷:

- To protect natural biodiversity along with its underlying ecological structure and supporting environmental processes (primary objective);
- To manage the area in order to keep, in as natural a state as possible, representative examples of ecoregion, plants and animals, genetic resources and unimpaired natural processes such as catchment protection;

²⁷ Adapted from Dudley, N. (2008) Guidelines for Applying Protected Area Management Categories. IUCN, Gland, Switzerland.

- To maintain sustainable populations of native plants and animals;
- To contribute to conservation of wide-ranging species, regional ecological processes and migration routes;
- To manage visitor use for inspirational, educational, cultural and recreational purposes at a level which will not cause significant degradation to the natural or cultural resources;
- To take into account the needs of customary landowners and local communities, including subsistence resource use, in so far as these will not adversely affect the primary management objective;
- To contribute to local economies through tourism or livelihood options that are compatible with the conservation objectives;
- To encourage continuation of customs and traditions.

2.2 IUCN category

National parks will be allocated to IUCN Category II.

“Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities”²⁸.

2.3 Permit

²⁸ Ibid., p.16

Uses within national parks will reflect the very high value of these areas to conservation. However, they are *not* 'locked up' areas with no access or activities allowed. A range of sustainable non-extractive activities can be undertaken. Cultural uses, education, local recreation and research can be encouraged in national parks.

Except in specially declared zones, agriculture or resource extraction should be limited to fishing and collecting of non-timber forest resources by customary landowners and communities for their own use, not for sale in markets, and this extraction should be subject to a conservation agreement and management plan. Hunting and tree felling are not generally permitted in national parks (except as below).

However, parts of the national park (usually no more than 10%) may be zoned as villages or traditional use zones, which can be defined in the gazettal process or in the management plan. In these zones, people will continue to live in villages with gardens, and sustainable hunting and harvesting can continue²⁹. Small sustainable industries that can contribute to livelihoods of the customary landowners and are compatible with conservation objectives will be encouraged within the village zones. This zoning should also include enough space for future expansion of villages due to natural population growth.

No mining or large-scale commercial use, apart from tourism, will be allowed.

2.4 O w n e r s h i p , g o v e r n a

²⁹ If more than 10% of the area is needed for village activities, or if more intensive use is planned, the protected area should be declared as a category VI (community conservation area) rather than national park.

National parks can be owned by government, customary landowners or other parties as long as their free, prior and informed consent is given to the gazettal.

National parks will be declared under national legislation and governed by a management board. They will be managed by a cooperative effort between customary landowners and CEPA, and sometimes with provincial governments and other stakeholders such as universities or non-government organisations under a contract agreement. The arrangement will vary across national parks in the network. CEPA will set and monitor standards and provide co-funding and capacity building. National parks may require a high level of support and input from technical experts.

2.5 S e l e c t i o n c r i t e r i a

- National parks will be selected to make a substantial contribution to the protected area network as outlined in the principles defined in PNG's Policy on Protected Areas, especially

to contribute to PNG’s comprehensive, adequate, representative and resilient protected area network (Principles 6, 7 and 9 in Attachment One); and

- Each national park will be of sufficient size, design and ecological quality to maintain ecological functions and processes that will allow the native species and communities to persist for the long term with minimal management intervention (Principle 8 in Attachment One)³⁰; and
- The composition, structure and function of biodiversity will be to a great degree in a “natural” state or have the potential to be restored to such a state, with relatively low risk of large-scale invasions by non-native species; and
- The area may have cultural values and may be suitable for public access and recreation; and
- National parks will have the ‘distinguishing features’ of an IUCN category II protected area³¹ (see Table 3); or be an extension to an existing national park such that the functioning of the expanded national park will be substantially improved and enable it to better meet the criteria above.

Former national parks will become national parks under transitional arrangements under the new legislation; their future designation will depend on whether they meet these criteria and the customary landowners give their consent.

Table 3: Distinguishing feature of Category II protected areas

³⁰ If a proposed national park is adjacent to another protected area, the need for adequate size and design can be considered over the natural area as a whole.

³¹ Dudley, N. (2008) Guidelines for Applying Protected Area Management Categories. IUCN, Gland, Switzerland.

Distinguishing feature of IUCN Category II PA ³²	Notes for application to national parks in PNG
The area should contain representative examples of major natural regions, and biological and environmental features or scenery, where native plant and animal species, habitats and geodiversity sites are of special spiritual, scientific, educational, recreational or tourist significance.	<ul style="list-style-type: none"> Identified in the land-sea conservation assessment³³ as being in a high priority area; or Identified in previous studies as being of conservation priority³⁴; or Known by experts to include features of outstanding interest; or Identified as a potential World Heritage Area for its natural heritage values.
The area should be of sufficient size and ecological quality so as to maintain ecological functions and processes that will allow the native species and communities to persist for the long term with minimal management intervention.	Preferably more than 10,000ha (100sq km), <i>OR</i> has the design and size to be ecologically viable (for example, an island) <i>OR</i> is connected to another protected or conserved area which ensures long-term connectivity so that the whole of the protected area complex is ecologically viable.
The composition, structure and function of biodiversity should be to a great degree in a “natural” state or have the potential to be restored to such a state, with relatively low risk of successful invasions by non-native species.	<p>Generally, for consideration as a national park an area would also need to meet ‘condition’ criteria as follows:</p> <ol style="list-style-type: none"> Contain at least 75% of its area covered in original vegetation (not including water and other unmapped areas); Contain at least 75% of its area in ‘very good’ condition³⁵; and Be substantial enough to be considered ecologically self-sustaining and manageable. <p>Exceptions to the condition criteria might be where an area is shown to be critical habitat for threatened species, where no more suitable area exists.</p>

³² Ibid. p. 16

³³ Adams, V. M., et al. (2017) Land-sea conservation assessment for Papua New Guinea. A report on the work undertaken to fulfil the terms of the project Review and Integration of the Terrestrial and Marine Program of Works on Protected Areas. University of Queensland, PNG Conservation and Environment Protection Authority

³⁴ e.g. Lipsett-Moore, G., et al. (2010) Interim National Terrestrial Conservation Assessment for Papua New Guinea: Protecting Biodiversity in a Changing Climate. In: *Pacific Island Countries Report No. 1/2010*. Papua New Guinea Department of Environment and Conservation, The Nature Conservancy, UNDP ; Alcorn, J. B. (1993) Papua New Guinea Conservation Needs Assessment Vol. 1. Biodiversity Support Program, Government of Papua New Guinea, Department of Environment and Conservation, Corporate Press Inc, Landover, Maryland.

³⁵ Parrish, J., et al. (2003) Are we conserving what we say we are: measuring ecological integrity within protected areas. In: *BioScience* pp. 851-60

Key roles for national parks include³⁶:

- Protect larger-scale ecological processes that will be missed by smaller protected areas or in cultural landscapes;
- Protect ecosystem services;
- Protect particular species and communities that require relatively large areas of undisturbed habitat;
- Provide a “pool” of such species to help populate sustainably-managed areas surrounding the protected area;
- Integrate with surrounding land or water uses to contribute to large-scale conservation plans;
- Inform and excite visitors;
- Support compatible economic development, mostly through recreation and tourism that can contribute to local and national economies and in particular to local communities;
- In some cases, become a ‘hub’ for continuation and celebration of local customs and traditions.

In the PNG context, some national parks will also have people living within the boundaries, managing the area, practicing customs and maintaining their traditions

³⁶ Adapted from Dudley 2008

3. National heritage area

3.1 Description and objectives

National heritage areas (NHAs) are declared to give a high level of protection to places containing features of outstanding international or national significance for natural, cultural or historic values. Features could include geological features (caves, cliffs, karst areas or volcanoes), natural features such as an unusual reef or forest, tambu sites or places of special historic or archaeological significance. National heritage areas will be important for conservation of geodiversity and national culture.

National heritage areas are usually relatively small in size and designed to protect specific features rather than extensive landscapes or seascapes. Management could be shared with other national agencies such as the National Museum and Art Gallery or with international bodies where relevant.

Objectives of management are³⁷ :

- To provide protection for plants and animals in landscapes or seascapes that have otherwise undergone major changes;
- To protect specific outstanding natural, cultural or historic features and their associated biodiversity and habitats (primary objective);
- To protect specific natural sites with spiritual and/or cultural values;

³⁷ Dudley, N. (2008) Guidelines for Applying Protected Area Management Categories. IUCN, Gland, Switzerland.p. 17

- To conserve traditional spiritual and cultural values of sites in accordance with the wishes of customary landowners and others who have strong links with the site.

3.2 I U C N C a t e g o r y

National heritage areas will be allocated to Category III (natural monument or feature). “Category III protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value”³⁸.

Some historic sites with very little biological value may be gazetted as NHAs and will be part of the PNG protected area network but might not be considered or reported to international bodies as protected areas under the IUCN criteria.

3.3 P e r m i t t e d u s e s

Education and research, sustainable uses as agreed by local communities, and visitor use will be allowed, as appropriate to the values being protected. Uses will often be decided in conjunction with the customary landowners, communities or interest groups for which the site has special significance.

³⁸ Ibid.

In general, hunting and felling of trees will not be allowed, except in areas zoned for traditional use.

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National heritage areas can be owned by customary landowners, government or other parties.

National heritage areas will be gazetted under national legislation. Governance will be through a management board. They may be managed by customary landowners and communities, CEPA, or other entities. The day-to-day management may be delegated, shared with or contracted to another body such as an NGO or the National Museum and Art Gallery.

**3.5 S
e**

National heritage areas can be relatively small and focus on one or more prominent natural or cultural features, but these features should be of national significance. They will contribute to Principle 2 and Principle 7c of the PNG protected area network as defined in the Policy on Protected Areas.

The areas may be of any size and may not be in a natural condition. National heritage areas *might* meet the criteria for Category III protected areas (Table 4) but will be regarded as protected areas under the IUCN definition only where they are of significance for biodiversity and are primarily managed for conservation. Consequently, some historic sites may not be included as protected areas in national reporting.

Table 4: Distinguishing features of Category III protected areas

Distinguishing feature of IUCN Category III PA ³⁹ Dudley, (2008) p. 17	Notes for application to national heritage areas in PNG
Category III protected areas are usually relatively small sites that focus on one or more prominent natural features and the associated ecology, rather than on a broader ecosystem.	Examples include special geological features (caves, karst landscapes, volcanoes, fiords etc), lakes, or reefs; and areas of national archaeological, historic and cultural importance.
Category III is really intended to protect the unusual rather than to provide logical components in a broad-scale approach to conservation, so that their role in landscape or ecoregional strategies may sometimes be opportunistic rather than planned. In other cases (e.g. cave systems) such sites may play a key ecological role identified within wider conservation plans.	These may include areas not identified in systematic conservation planning.
Cultural sites should always have some biodiversity values if they are to be included as protected areas.	In PNG, historic or cultural areas may be gazetted as national heritage areas due to the cultural or

³⁹ Ibid.

	historical value only. However, these areas might not then be included as protected areas in reporting to international conventions.
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3.6 Role in the landscape / seascape

National heritage areas will comprise an important part of the PNG protected area network for *geodiversity* and for conservation of PNG's *cultural and historic heritage*. In many cases, these will be a hub for education and for celebration of culture and heritage.

4. Special management area

4.1 Description and objectives

Special management areas aim to protect particular plant or animal species or habitats, and management reflects this priority. Priorities of special management areas include critically endangered and endangered species with very restricted ranges. Many special management areas will need a high level of protection and some need regular, active interventions to protect particular species or to maintain habitats and biodiversity.

Special management areas could be used for introductions or translocations of endangered species and for revegetation or rehabilitation of damaged or fragmented landscapes. These can include terrestrial and estuarine and near-shore habitats.

Under the protected area legislation, special management areas can also be declared rapidly and have temporary status – for example to protect a species in a crisis or one that has recently been discovered. They can also be used for biodiversity offsets.

Special management areas can be declared as smaller areas of high protection within a wider landscape (for example a coordinated conservation area) where multiple sustainable uses are carried out.

Objectives of management are⁴⁰:

⁴⁰ adapted from ibid. p. 19

- To maintain, conserve and restore species and habitats;
- To protect vegetation patterns, coral reefs, estuaries or other biological features through traditional management approaches;
- To protect or restore fragments of habitats as components of landscape or seascape-scale conservation strategies;
- To develop public education and appreciation of the species and/or habitats concerned;
- To undertake research to assist in maintaining and restoring biodiversity.

4.2 IUCN Category

Special management areas will be allocated to IUCN Category IV (habitat/ species management areas).

“Category IV protected areas aim to protect particular species or habitats and management reflects this priority. Many category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category”⁴¹ (Dudley 2008, p. 19).

⁴¹ Ibid.

Any permitted uses must contribute to the survival or rehabilitation of the species or habitat for which the area was declared, or at the least, must do no harm. Permitted uses will depend on the targets for conservation.

In most cases, mining, hunting, removal of trees and natural vegetation, and commercial uses apart from ecotourism will not be allowed. In the case of marine areas, there should be no removal of coral or substrate except where the environment is being manipulated to improve or restore habitat. Sustainable fishing for local consumption might be allowed, if this does not detract from the purpose of the area.

Special management areas can be owned by customary landowners, government or other parties as long as their free, prior and informed consent is given to the gazettal.

Special management areas will be declared under national legislation and governed by a management board. Management usually will be undertaken by customary landowners and communities, non-government organisations or civil society and be overseen by CEPA. In some cases, through agreement with CEPA, SMAs might be under private management– for example where these are being restored or managed by a private company.

Note: within regional protected areas such as community conservation areas and locally managed marine areas, special management zones may be created by gazettal, a special regulation or management planning. If they are declared by legislation, they can be legally enforced and will be regarded as category IV areas.

4.5 C r i t e r i a f o r s e l e c t i o n

- Special management areas should be an important component of the PNG protected area network, for example for the conservation of rare or threatened species or habitats (See

Attachment One: Principle 6d, 7b), or for protection of identified climate refugia where these cannot be part of a larger protected area (Principle 9a);

- Areas can vary in size and might be relatively small areas;
- It is preferable that special management areas are in a largely ‘natural’ state in good to very good condition, but some special management areas may include sections that need rehabilitation. This is the most appropriate protected area type for areas which are recovering from past uses and for offset areas that require rehabilitation;
- Proposed areas should have ‘distinguishing features’ of Category IV protected areas (Table 5).

Table 5: Distinguishing features of Category IV protected Areas

Distinguishing features of IUCN Category IV PA ⁴²	Notes for application to special management areas in PNG
<p>Category IV protected areas usually help to protect, or restore:</p> <ol style="list-style-type: none"> 1) flora species of international, national or local importance; 2) fauna species of international, national or local importance, including resident or migratory fauna; and/or 3) habitats. 	<p>Contains plants, animals or habitat of high priority (including threatened or range restricted); or is identified as a refuge for climate change resilience.</p>
<p>The size of the area varies but often can be relatively small; this is however not a distinguishing feature. Management will differ depending on need. Protection may be sufficient to maintain particular habitats and/or species. However, as category IV protected areas often include <i>fragments</i> of an ecosystem, these areas may not be self-sustaining and may require regular and active management interventions, for:</p> <ul style="list-style-type: none"> • Protection of particular species • Protection of habitats • Maintenance of target species • Maintenance or restoration of natural or semi-natural ecosystems <p>Active management might include rehabilitation, halting natural succession, providing supplementary food or artificially creating habitats.</p>	<p>Special management areas can include places being actively managed for restoration of species or habitats. Active management might also include rehabilitation of ecosystems and restoration of connectivity.</p>

⁴² Ibid.

Dudley⁴³ states that Category IV protected areas “frequently play a role in “plugging the gaps” in conservation strategies by protecting key species or habitats in ecosystems. They could, for instance, be used to:

- Protect critically endangered populations of species that need particular management interventions to ensure their continued survival;
- Protect rare or threatened habitats including fragments of habitats;
- Secure stepping-stones (places for migratory species to feed and rest) or breeding sites;
- Provide flexible management strategies and options in buffer zones around, or connectivity conservation corridors between, more strictly protected areas; or
- Maintain species that have become dependent on cultural landscapes where their original habitats have disappeared or been altered.

In PNG, special management areas will be among the most strictly protected areas, for example where customary landowners have agreed to set an area aside for breeding of endangered species. These will complement other types of protected area where a wider range of uses continue to occur.

⁴³ 2008, p. 19

5. National marine sanctuary (marine protected area)

5.1 Description and objectives

National marine sanctuaries (NMS) are nationally important marine protected areas that conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where such use of natural resources, compatible with nature conservation, is one of the main aims of the area.

National marine sanctuaries can include offshore areas in the exclusive economic zone, as well as territorial waters. Other marine protected areas such as LMMAs and special management areas can be contained within national marine sanctuaries, so areas of special protection or use are ‘nested’ within them.

Marine protected areas under the Maritime Zones Act and under United Nations Law of the Sea (UNCLOS)⁴⁴, are recognized under the protected area legislation and may be part of a NMS. In addition, the Coral Triangle Initiative is committed to creating regional, national and transboundary Seascapes, which have a similar concept to national marine sanctuaries⁴⁵. Work is

⁴⁴ Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397. Enacted as: entered into force as the “United Nations Convention on the Law of the Sea” on Nov. 1, 1994.

⁴⁵ A seascape is a geographic area where multiple uses and sectors, as well as multiple management designations and governance mechanisms, can be integrated and coordinated. The area is often ecologically valued, politically relevant and logistically practical to manage, and can serve multiple purposes, such as fishing, tourism, recreation, and

underway to ensure conservation of migratory marine species through international cooperation, and the NMS concept might be used as a tool in this effort.

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National marine sanctuaries are allocated to Category VI as they will maintain ‘predominantly natural habitats but allow sustainable collection of some species (e.g. food species, ornamental coral or shells)’⁴⁶. Statutory zones within the sanctuaries will be used to manage activities such as fishing for local livelihoods, commercial fishing, shipping and tourism, and these zones can be allocated to different categories. Zones can be allocated to different categories under certain conditions (refer to Section 1.5).

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Sustainable use of marine resources will be permitted in national marine sanctuaries, with limitations set according to an agreed zoning plan. An example of statutory zones from the Great Barrier Reef Marine Park in Australia is shown in Table 6.. No fishing or collecting will be allowed in zones equivalent to categories I to IV, except for sustainable use by customary landowners according to the limits they set.

protection from some of the effects of climate change. As the countries of the Coral Triangle move forward, seascapes can offer benefits at the regional and national level.” Coral Triangle Initiative on Coral Reefs, F. a. F. S. (2017) Seascapes General Model and Regional Framework for Priority Seascapes. CTI-FFS.p. 7

⁴⁶ (Day *et al*, 2012, p. 23).

Large-scale commercial extractive industries such as undersea mining and oil extraction, and dumping of mining waste and spoil, will not be permitted. Shipping may be restricted to ensure that marine resources including coral reefs are not put at risk.

Table 6: Management zones used in the Great Barrier Reef Marine Park⁴⁷

Zone Name	Equivalent IUCN category	Objectives
Preservation Zone	Ia	to provide for the preservation of the natural integrity and values of areas of the Marine Park, generally undisturbed by human activities.
Scientific Research Zone	Ia	(a) to provide for the protection of the natural integrity and values of areas of the Marine Park, generally free from extractive activities; and (b) subject to the objective mentioned in paragraph (a), to provide opportunities for scientific research to be undertaken in relatively undisturbed areas.
Commonwealth Islands	II	(a) to provide for the conservation of areas of the Marine Park above the low water mark; and (b) to provide for use of the zone by the Commonwealth; and (c) subject to the objective mentioned in paragraph (a), to provide for facilities and uses consistent with the values of the area.
Marine National Park Zone	II (a)	to provide for the protection of the natural integrity and values of areas of the Marine Park, generally free from extractive activities; and (b) subject to the objective mentioned in paragraph (a), to provide opportunities for certain activities, including the presentation of the values of the Marine Park, to be undertaken in relatively undisturbed areas.
Buffer Zone	IV	(a) to provide for the protection of the natural integrity and values of areas of the Marine Park, generally free from extractive activities; and (b) subject to the objective mentioned in paragraph (a), to provide opportunities for: (i) certain activities, including the presentation of the values of the Marine Park, to be undertaken in relatively undisturbed areas; and (ii) trolling for pelagic species.
Conservation Park Zone	IV	(a) to provide for the conservation of areas of the Marine Park; and (b) subject to the objective mentioned in paragraph (a), to provide opportunities for reasonable use and enjoyment, including limited extractive use.
Habitat Protection Zone	VI	a) to provide for the conservation of areas of the Marine Park through the protection and management of sensitive habitats, generally free from potentially damaging activities; and (b) subject to the objective mentioned in paragraph (a), to provide opportunities for reasonable use.
General Use Zone	VI	to provide for the conservation of areas of the Marine Park, while providing opportunities for reasonable use.

⁴⁷ Day *et al* 2012, p.25

National marine sanctuaries are declared and managed under national legislation. Governance will be through a management board. As the most iconic marine protected areas in PNG, national marine sanctuaries will have a high level of support and input from CEPA and technical experts. However, local level management of near-shore areas will be by local communities. If the CTI Seascapes approach is used, international cooperation will also be important, especially for conservation of migratory species within the area.

National marine sanctuaries will make an important contribution to the PNG protected area network, especially in relation to a representative network for biodiversity and geodiversity (see Principles 6,7,8 and 9 in Attachment One). In some cases, they will also be important for international protected area networks, such as Seascapes. Key areas for biodiversity conservation in the marine realm have been identified by experts and through conservation assessments⁴⁸.

The area should be of sufficient size and ecological quality to maintain ecological functions and processes that will allow native species and habitats to persist for the long term with minimal management intervention. The composition, structure and function of biodiversity should be to a great degree in a “natural” state.

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National marine sanctuaries will be large and important reserves, with a variety of management zones to allow for a range of sustainable uses while focusing on conservation. These areas will be designed to protect the habitat, breeding areas and migratory routes of a wide range of marine species, including fish, turtles, marine mammals and seabirds.

⁴⁸ Adams, V. M., et al. (2017) Land-sea conservation assessment for Papua New Guinea. A report on the work undertaken to fulfil the terms of the project Review and Integration of the Terrestrial and Marine Program of Works on Protected Areas. University of Queensland, PNG Conservation and Environment Protection Authority ; Government of Papua New Guinea. (2015) National Marine Conservation Assessment for Papua New Guinea Conservation and Environment Protection Authority

6. Community conservation area

6.1 Description and objectives

Community conservation areas (CCAs) conserve and sustain important landscapes and seascapes that people use to carry out their traditional management of land and sea. CCAs are large and significant areas that can incorporate villages and food gardens under sustainable use as well as less used forest lands and waters under customary land ownership.

In near shore marine areas, community conservation areas can include reefs, estuaries and seas managed by and for customary landowners and communities for multiple purposes.

Within community conservation areas can be zones of higher protection and zones of more intensive use: these could be zones defined in a management plan. In some cases other kinds of protected area might be 'nested' within the community conservation area.

Objectives of community conservation areas are⁴⁹:

- To protect natural ecosystems and use natural resources sustainably, when conservation and sustainable use can be mutually beneficial (primary objective);
- To promote sustainable use of natural resources, considering ecological, economic and social dimensions;
- To promote social and economic benefits to local communities;

⁴⁹ adapted from Dudley, N. (2008) Guidelines for Applying Protected Area Management Categories. IUCN, Gland, Switzerland.p. 22

- To facilitate inter-generational security for local communities' livelihoods – therefore ensuring that such livelihoods are sustainable;
- To integrate other cultural approaches, belief systems and world-views within a range of social and economic approaches to nature conservation;
- To contribute to developing and/or maintaining a more balanced relationship between humans and the rest of nature;
- To contribute to sustainable development at national, regional and local levels (in the last case mainly to local communities and/or customary landowners depending on the protected natural resources);
- To facilitate scientific research and environmental monitoring, mainly related to the conservation and sustainable use of natural resources;
- To collaborate in the delivery of benefits to people, mostly local communities, living in or near to the designated protected area; and
- To facilitate recreation and appropriate small-scale tourism (where appropriate).
- To sustain and encourage customs and traditions.

6.2 I U C N C a t e g o r y

Community conservation areas will generally be allocated to Category VI, with zones managed to the equivalent of any of the other categories.

“Category VI protected areas conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area”⁵⁰.

6.3 P e r m i t t

⁵⁰ Ibid.

Customary landowners will decide which uses are compatible with the objectives of management, and will formalize this through zoning and management planning.

Community zones will be defined for continuation of sustainable traditional or semi-traditional life, including villages, gardens, gathering, and sustainable hunting and fishing by customary landowners. Small cropping and low-scale industry can also be carried out in appropriate zones to support community livelihoods.

Recreation, education and scientific use will occur as allowed by the customary landowners.

Commercial hunting and large-scale industry will not be permitted, but some commercial fishing for and by customary landowners will be allowed. Artisanal mining might be permitted in a small proportion of the protected area, subject to strict environmental conditions. Sustainable small industries will be encouraged where these contribute to community livelihoods and are compatible with conservation objectives.

Community conservation areas could seek to maintain current practices, restore historical management systems, or maintain key landscape values while allowing for modern development and change. Decisions about this need to be made in management plans.

Community conservation areas will be owned by customary landowners and a number of customary landowner groups may be represented in one community conservation area. Governance will be through a management board.

The areas will be owned and managed by customary landowners and communities, assisted by local level government, Provincial Government, CEPA, non-government organisations or other bodies.

6.5 S e l e c t i o n c r i t e r i a

Community conservation areas will contribute to PNG's comprehensive, representative, adequate and resilient reserve network, and in some cases they will be a critical and irreplaceable component of the network. They can contribute to all of the Principles outlined in Attachment One, and may have an emphasis on Principles 2, 3, 4 and 5.

However, community conservation areas do not need to demonstrate unique values to the same extent as national parks. Where customary landowners and communities wish to create such areas and can demonstrate their values on a regional or national level, their establishment can be supported.

They will have the “distinguishing features” of category VI protected areas (Table 7).

Table 7: Distinguishing features of Category VI protected Areas

Distinguishing feature of IUCN Category VI PA ⁵¹	Notes for application to community conservation areas in PNG
Category VI protected areas aim to conserve ecosystems and habitats, together with associated cultural values and natural resource management systems. Therefore, this category of protected area tends to be relatively large (although this is not obligatory).	CCAs generally will be large (over 5000 ha) unless they have outstanding features in a smaller area; smaller areas (under 5000 ha) will be considered as other protected area types.
The category is not designed to accommodate large-scale industrial harvest.	Areas of plantation will not be included in community conservation areas, except where they are surrounded by the proposed areas and need to be accepted as a non-conforming use, with an agreement that the area will not be expanded.
In general, IUCN recommends that a proportion of the area is retained in a natural condition, which in some cases might imply its definition as a no-take management zone. Some countries have set this proportion of natural area at two-thirds of the total area; IUCN recommends that decisions need to be made at a national level and sometimes even at the level of individual protected areas.	Zoning will be an essential component of CCAs. Communities proposing to establish CCAs will be prepared to dedicate a proportion of the area as no-take conservation zones, and to ensure sustainability of hunting/fishing and harvesting throughout the area.

⁵¹ Ibid.

Dudley (2008, p. 22) notes that “Category VI protected areas are particularly adapted to the application of landscape approaches. This is an appropriate category for large natural areas, such as tropical forests... – not only by establishing large protected areas, but also by linking with groups of protected areas, corridors or ecological networks. Category VI protected areas may also be particularly appropriate to the conservation of natural ecosystems when there are few or no areas without use or occupation and where those uses and occupations are mostly traditional and low-impact practices, which have not substantially affected the natural state of the ecosystem.”

In PNG, community conservation areas are a very relevant approach to large-scale landscape management. This may involve cooperation among a number of groups of customary landowners. Through a landscape zoning approach, it is possible to achieve significant conservation goals while at the same time allowing for the sustainability of community livelihoods into the future. Customary landowners are the drivers in deciding and implement zones and rules about management.

Community conservation areas also play a very important role in sustaining and celebrating culture and traditions.

7. Locally managed marine area and locally managed conservation area

7.1 D e s c r i p t i o n a n d o b j e c t i v e s

Two types of protected area are discussed together in this section and can be referred to jointly as locally managed protected areas:

- Locally managed marine areas (LMMAs) are defined near-shore protected areas managed or co-managed by customary landowners/the local community for conservation and sustainable local use. These areas may include small land areas such as islands.
- Locally managed conservation areas (LMCAs) are defined terrestrial protected areas managed or co-managed by customary landowners/the local community for conservation and sustainable local use.
- Where a protected area spans substantial areas of both land and sea, it can be declared as a LMCA.

Locally managed protected areas are where people and nature have lived together over time to create places of significant ecological, biological, cultural and scenic value. Safeguarding the integrity of this interaction is vital to protecting and sustaining the area.

These areas may also include tambu places and *ples masalai*, where customary landowners have had rules and rituals relating to protection for many generations.

Objectives of management⁵² are:

- To protect and sustain natural and semi-natural places of spiritual, social and economic importance to customary landowners, including traditional and sacred forests and reefs, water sources, tambu places and *ples masalai*;
- To maintain a balanced interaction of nature and culture through the protection of land and water and associated traditional management approaches;
- To contribute to broad-scale conservation by maintaining species and habitats associated with cultural landscapes and seascapes, and by providing conservation opportunities in heavily used places;
- To sustain natural products and environmental services of value to customary landowners;
- To support active involvement by the community in the management of valued landscapes and seascapes and the natural and cultural heritage that they contain.
- To sustain and encourage customs and traditions including local language, song, dance and ceremonies.

7.2 I U C N C a t e g o r y

Locally managed protected areas (LMMAs and LMCAs) are allocated to Category V, defined as “a protected area where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values”⁵³.

7.3 P e r m i t t e

⁵² Ibid. p. 20

⁵³ Ibid.

Permitted uses are defined by the community. The emphasis is on community use for customary practices and for traditional or semi-traditional sustainable uses. Some commercial use by customary landowners (such as fishing and small-scale agriculture) can occur to support their livelihoods, but commercial use by outside parties will generally not be allowed.

Management planning by the customary landowners is critical. In many cases, customary landowners undertake some extractive uses, but use zoning to ensure that there are places with no hunting or fishing to allow for breeding to take place and to respect customary taboos and sacred sites.

7.5 S

They can be relatively small areas, but should meet the following criteria:

- | Distinguishing features of IUCN Category V PA ⁵⁴ | Notes for application to locally managed marine and conservation areas in PNG |
|--|--|
| Landscape and/or coastal and island seascape of high and/or distinct scenic quality and with significant associated habitat, flora and fauna and associated cultural features. | Traditional values of the land and seascapes are very important to customary landowners, and their scenic values are also appreciated. |
| A balanced interaction between people and nature that has endured over time and still has integrity, | LMMAs and LMCAs will generally be established in areas where traditional and sustainable building, harvesting and gardening are still practiced. |

or where there is reasonable hope of restoring that integrity.	
Unique or traditional land-use patterns, e.g. as evidenced in sustainable agricultural and forestry systems and human settlements that have evolved in balance with their landscape.	Much of PNG still practices these patterns of traditional use on land and the near-shore marine areas.

7.6 Role in the landscape and seascape

Dudley⁵⁵ states that “Generally, category V protected areas play an important role in conservation at the landscape/seascape scale, particularly as part of a mosaic of management patterns, protected area designations and other conservation mechanisms: some category V protected areas act as a buffer around a core of one or more strictly protected areas to help to ensure that land and water-use activities do not threaten their integrity. Category V protected areas may also act as linking habitat between several other protected areas”.

⁵⁵ Ibid.

In PNG, locally managed protected areas are also very important as natural ‘green spaces’ and as areas reserved for traditional uses, livelihood provision, catchment protection, and forest or marine resources. Zoning is used to protect breeding sites and populations of marine life and land animals, which can then be more sustainably hunted in other areas.

Areas of cultural importance are also protected, and locally managed protected areas will become focal points for sustaining and encouraging traditional and customary knowledge, skills and practices.

8. Private protected areas

8.1 Description and objectives

“A privately protected area (PPA) is a protected area, as defined by IUCN, under private governance (i.e. individuals and groups of individuals; non-governmental organizations (NGOs); corporations – both existing commercial companies and sometimes corporations set up by groups of private owners to manage groups of PPAs; for-profit owners; research entities (e.g. universities, field stations) or religious entities)⁵⁶.

In PNG, private protected areas can be declared over land on freehold or leasehold land by individuals, groups or corporations.

Management objectives for private protected areas will vary, as they can be allocated to any IUCN category. However, the primary objective must be conservation. To be considered a private protected area, the following are important⁵⁷:

- Protected area status should remain through changes of ownership, through easement, covenant, wills, etc.;
- Some form of long-term monitoring is needed, to ensure conservation intent is followed;
- Active or passive management practices are applied in order to safeguard the integrity of natural resources present in the private protected area.

⁵⁶ Stolton, S., et al. (2014) The Futures of Privately Protected Areas. In: *Protected Area Technical Report Series No.1*. IUCN.p. x.

⁵⁷ adapted from Stolton *et al.* 2104, p. 10

8.2 I U C N C a t e g o r y

Theoretically, private protected areas may be allocated to any of the protected area categories, depending on the objectives of management. They are most likely to be Category II (if very large and significant area); Category III (if protecting a particular feature of high importance); or Category IV (if less extensive, focused on conservation of particular species or habitats, or including areas needing rehabilitation).

8.3 P e r m i t t e d u s e s

Permitted uses will also depend on the objectives of management but are likely to include:

- Protection of natural habitat and species;
- Active management, where necessary, of species, especially rare or threatened species;
- Rehabilitation and revegetation, where necessary to restore high quality habitat;
- Tourism, environmental education and research;
- Customary non-extractive use by local communities; and
- Some use of non-timber forest resources by local communities.

Permitted uses will be defined in the management plan. PPAs are suitable for offset areas in the process of rehabilitation, provided the selection criteria are met.

8.4 O w

Private protected areas will be on freehold or leasehold land. They will be under the governance and management of private individuals, companies or non-government organisations.

8.5 Selection

Proposed private protected areas must demonstrate their contribution to the PNG protected area network, for example to Principles 3, 6, 7 and 8 (Attachment One).

The areas should be predominately in “good to very good” condition, with less than 25% having been cleared or seriously compromised. Where a proposed area has a greater proportion requiring rehabilitation, this should be undertaken before gazettal is finalized, to avoid downgrading of the protected area network as a whole. An exception to this guideline may be made if the area contains essential habitat for a rare or threatened species.

Proposed private protected areas should be compatible with the “distinguishing features” of the IUCN category for which they are intended.

8.6 R o l e i n t h e l a n d s c a p e a n d s e a s c a

Private land ownership in PNG is less common than in many other countries, and it is not anticipated that private protected areas will become dominant in the protected area network. However, they may play an important role in complementing other reserves, including through offset programs where land is freehold or leasehold.

9. Other protected areas and conserved areas

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The protected area legislation gives protection to other areas not included in the eight formal categories discussed above. These other areas include

- protected areas established by provincial and local level governments in consultation with CEPA;
- areas (at least 10% according to the codes of practice) set aside within logging and agricultural concessions, for which CEPA has primary management responsibility; and
- *ples masalai* and tambu areas set aside by communities;
- any area set aside for conservation or reserved for such, under any other Act, including the *Forestry Act*, the *Fisheries Management Act*, the *Mining Act*, the *Oil and Gas Act*, the *Maritime Zones Act* under Part XI Marine Environment Protection, and for other resource extraction.

Management objectives for these areas will vary, as they could be allocated to any IUCN category.

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‘Other’ areas *may* be allocated to any of the protected area categories if the primary purpose of the area is conservation of nature. As discussed in Section 1.4, some of them will not be protected areas as defined by the IUCN, but fall under the definition of OECMs. This will be the case where the primary objective is not conservation, but they are governed and managed in ways that achieve positive and sustained long-term outcomes for biodiversity and/or for cultural, spiritual, socio-economic, and other locally relevant values⁵⁸.

9.3 P e r m i t t e d u s e s

Permitted uses will also depend on the objectives of management and the arrangements for protection.

9.4 O w n e r s h i p , g o

⁵⁸ IUCN-WCPA. (2019) Recognising and Reporting Other Effective Area-based Conservation Measures. Technical Report. IUCN, Switzerland.

- Sacred sites, *ples masalai* and tambu places will be under the ownership, governance and management of customary landowners.
- Provincial government protected areas will usually be under customary ownership and managed cooperatively between landholders and government.
- Local level government protected areas will usually be under customary ownership and managed cooperatively between landholders and government.
- Any area set aside for conservation or reserved for such, under any other Act, including the *Forestry Act*, the *Fisheries Management Act*, the *Mining Act*, the *Oil and Gas Act*, the *Maritime Zones Act* under Part XI Marine Environment Protection, and for other resource extraction, will be owned and managed by the relevant customary landowners and/or agencies or lessees, but CEPA has the ultimate responsibility for governance and management.

These areas are not always selected pro-actively to become part of the national protected area network. They are selected according to the people or organisation responsible for their management according to traditional custom, local or provincial government priorities, or criteria under the various Acts under which they have been set side.

9.6 R o l e i n t h e l a n d s c a p e a n d s e a s c a p e

These other areas, including OECMs, can play an important role in the landscape and seascape, including as additional habitat, buffers and connecting areas to more formal protected areas.

In PNG, many of these areas both on land and under water are places of high traditional, cultural and spiritual significance subject to customary protection over long periods. To

the customary landowners, their role is primarily related to this significance, and it is impossible to separate natural from cultural values.

These areas might play a very important role in sustaining culture and traditions.

Other protected and conserved areas play roles defined for OECMs, namely contributions to: *“ecologically representative and well-connected conservation systems, integrated within wider landscapes and seascapes, and in doing so, generate a range of positive conservation outcomes, such as:*

- *Conserving important ecosystems, habitats and wildlife corridors;*
- *Supporting the recovery of threatened species;*
- *Maintaining ecosystem functions and securing ecosystem services;*
- *Enhancing resilience against threats; and*
- *Retaining and connecting remnants of fragmented ecosystems within developed landscapes.”*⁵⁹

⁵⁹ Ibid. p.8

10. Overview of permitted uses

An overview of permitted uses is shown in Table 8⁶⁰. (Note that this table does not include the 'other' protected area types, as their permitted uses will vary and be defined by the various legislation or arrangements under which they are declared and managed.

Some activities are not generally permitted, but can be allowed in certain zones or in special circumstances. All decisions regarding zoning will be made by management boards or committees in consultation with customary landowners and should be part of a management planning process. Access onto customary or private lands will require approval of the landholders, and could be subject to payment.

Table 8: Permitted uses in PNG protected areas

Activity	NP	SMA	NHA	NMS	CCA	LMMA	LM CA	PPA
Non-extractive traditional use	Y	Y	Y	Y	Y	Y	Y	Y
Traditional subsistence hunting and gathering	N,Z	N,Z	N,Z	N/A	Y,Z	N/A	Y,Z	Y,Z
Traditional subsistence fishing and resource collection (marine)	N,Z	N,Z	N,Z	Y,Z	Y,Z	Y,Z	Y,Z	Y,Z
Commercial fishing and marine resource collection by external groups	N	N	N	Y,Z*	N	N	N	N
Commercial fishing and marine resource collection by customary landowners	N, Z*	N,Z*	N, Z	Y,Z	N, Z	N, Z	N, Z	N, Z
Recreational fishing (other than customary landowners)	N,Z*	N,Z*	N,Z*	Y,Z*	N, Z*	N, Z*	N, Z*	N, Z*
Research	Y*	Y*	Y*	Y*	Y*	Y*	Y*	Y*
Commercial agriculture, plantations and aquaculture	N**	N	N	N,Z	N,Z	N**	N**	N**
Community agriculture – gardens, small-scale aquaculture	N,Z	N,Z	N,Z	N/A	Y,Z	N/A	Y	N,Z
Renewable energy generation with <i>small</i> footprint, eg small-scale solar, micro-hydro	Y*	Y*	Y*	Y	Y	Y	Y	Y
Habitation/ villages	N,Z*	N,Z*	N,Z*	N/A	N,Z	N,Z	N,Z	N,Z
Commercial logging	N	N	N	N	N	N	N	N
Commercial mining and oil extraction	N	N	N	N	N**	N	N	N**

⁶⁰ Table slightly adapted from the PA Policy

Activity	NP	SMA	NHA	NMS	CCA	LMMA	LM CA	PPA
Mining and oil exploration	N	N	N	N	N**	N	N	N**
Water extraction (other than very small-scale domestic use by customary landowners)	N,Z *	N,Z*	N,Z*	N,Z*	N,Z*	N,Z*	N,Z*	N,Z*
Tourism and recreation	Y,Z*	Y,Z*	Y,Z*	Y,Z*	Y,Z*	Y,Z*	Y,Z*	Y,Z*

Key

* Subject to management plans and agreements, and may require permits or licences

** May be allowed in special circumstances as non-conforming use if for community livelihood or benefit, shown to be ecologically sustainable and a small zoned proportion of the protected area (<10%)

	Meaning	Notes
Y	Yes	
Y,Z	Yes, unless zoning or specific regulation does not allow	Will be allowed except where forbidden in management plan, regulation or special zone. May also be limited in other ways e.g. bag limits or hunting/fishing method, or require permits or licences
N,Z	No, except where zoning or specific regulation or agreement allows	Will be allowed only where specified in management plan, regulation or special zone
N	Not allowed in this category	See **

11. Attachment one: Reserve selection principles for the PNG protected area network⁶¹

Protected areas selection will be relevant to the community

1. **Support and involvement of customary landowners is essential.** People are an integral part of the PNG landscape and seascape, and nature is the basis of culture. Thus protected areas must be seen to be relevant and acceptable to customary landowners, other stakeholders and the nation as a whole. Local level, district and provincial governments also play an important role in decision-making relating to new protected areas.
 - a) Protected areas will be designed and established **with the agreement and full involvement of local customary landowners**, with consideration for their local needs and resource uses.
 - b) Where possible, boundaries of protected areas will take into account **language and cultural groupings**.
 - c) Where customary landowners take the initiative to propose new protected areas or to strengthen existing protected areas, the area should be assessed and their efforts supported even where the area is not a national priority for reservation for its biodiversity values.
2. **Cultural values and places will be protected.** Protected areas will be selected where possible to be culturally relevant and to provide protection to places of cultural and historic importance, including tambu areas of significance to customary landowners.
3. **Benefits from ecosystem services will be maximised.** Protected areas will be selected and designed to maximise protection of ecosystem services and resource sustainability for landowners, villages and towns, and to protect settlements from natural disasters. A host of ecosystem services can be derived from protected areas including buffering against the impacts of natural disasters (e.g. mangroves buffering against sea level rise events, safeguarding and providing clean water (fresh water security), providing bush and sea foods (food security) and stabilizing local climate.
4. **The need for sustainable rural livelihoods will be respected**
Most protected areas in PNG will continue to supply customary landowners and other community members with their basic needs for food, water, building materials and other resources. This continued supply will be necessary to allow continued occupation and management of the land and sea. Protected area types, management plans, zonings and management regimes will respect the needs of customary landowners.
5. **Potential social and economic benefits will be sought.** The REDD+ Framework for PNG (Reduced Emissions from Deforestation and Degradation) and emerging markets for payments for ecosystem services such as Carbon, Biodiversity and Water Credits create opportunities for payments to landowners who protect and manage their customary lands. In addition to these, conservation compatible business enterprises can be considered. Potential employment opportunities through tourism, research assistance and protected area management will be maximised

⁶¹ Independent State of Papua New Guinea. (2014) Papua New Guinea Policy on Protected Areas. (ed Conservation and Environment Protection Authority), Waigani, National Capital District, Papua New Guinea.

The protected area network will include the diversity of life, landscapes and seascapes

6. The protected area network will be comprehensive in conserving the range of ecosystems.

The protected area network will to be developed with the primary focus of including as much of PNG's landscape and biological diversity as possible.

- a) **Comprehensiveness** will be achieved first through conserving examples of the full range of natural terrestrial, freshwater and marine habitats and ecosystems, based on a consistent national approach to ecoregional and ecosystem classification. This classification will include representative geophysical settings that are the basis for regional biodiversity regardless of climate. This will help PNG maintain the capacity to support a diversity of life in the future, even if habitats are altered by climate change.
- b) **Conservation Priority Areas** identified through the analysis of land systems, forest inventory management units and restricted range endemic species with consideration of climate change refugia will be used to guide priorities for establishing terrestrial protected areas⁶².
- c) In the **marine** environment, the marine representative system should be used as a basis for setting priorities⁶³ Adams *et al.*, (2017) ; Government of Papua New Guinea, (2015) .
- d) **Rare and restricted habitats and ecosystems** should be included in the protected area network wherever possible.

7. The protected area network will be representative. Representativeness is the sampling of the full range of biodiversity at a finer scale than comprehensiveness, within the units of classification and including more specific elements of natural systems.

- a) Within broad habitats and bioregions, the protected area system will include the greatest possible **diversity of plants and animals**, especially where they occur across climatic gradients.
- b) Special consideration will be given to **endemic, rare and threatened species**, and efforts will be made to prevent extinctions of populations and species. Priority will be given to places where concentrations of threatened and endemic species occur, to centres of endemism and to important places for migratory species including flyways.
- c) The protected area system will, as far as practical, include representation of the variety of **geological features, freshwater ecosystems and wetlands**. In addition to ecosystems and species, the protected area system will include examples of landscapes including geological features (such as cliffs, sand-dunes, caves, peaks, rock formations and fossils) and of freshwater and wetland systems (such as rivers, lakes, freshwater and saline wetlands, ephemeral swamps and springs).

Protected areas and the network as a whole will be viable into the future

8. Individual protected areas and the network as a whole will be adequate in area and design to be sustained in the long term. Adequacy in the protected area network will be ensured at two levels:

- a) Across the whole network and within bioregions, adequate areas of each ecosystem will be conserved to allow for the survival and plants and animals which depend on these habitats. The protected area network will be well connected and will maximise the natural connections used by plants and animals
- b) Individual protected areas will be adequate in size and be designed using good design principles wherever possible, as summarised in Table 9.

⁶² Adams *et al.*, 2016 ; Lipsett-Moore *et al.*, 2010

⁶³ Adams *et al.*, 2017 ; Government of Papua New Guinea, 2015

Table 9: Design guidelines for protected areas

	General guidelines for protected area design – More desirable	Less desirable	Application in PNG
1	Larger	Smaller	No lower size limit will be set, but in general larger areas have better conservation potential. Balance with other considerations including costs and logical boundaries.
2	Includes whole catchment	Much of catchment in areas outside protected area management control or influence	Including the catchments of waterways means that managers have more control over water quality and also over invasive species.
3	Boundaries coincide with natural boundaries eg rivers, mountain ranges	Boundary is in a place that is difficult to mark or recognised	Natural boundaries are easier to manage and save money in boundary marking. Balance with guideline below.
4	Boundaries coincide with cultural and administrative boundaries	Protected area includes a large number of different customary land owner groups, especially where relationships are not cooperative	In PNG the boundaries of customary owner groups or larger clan groups may be logical protected area boundaries enabling easier negotiations and management
5	Shape is closer to round than linear	Shape is long and thin or with a very convoluted boundary.	The boundary to area ratio should be as low as possible to reduce ‘edge effects’ of invasive plants and animals. However, this is balanced with principles 3 and 4.
6	Roads and other infrastructure are outside protected area, so there is minimal internal fragmentation	Natural areas are highly fragmented by internal roads and communication facilities	IN PNG many Pas will include villages and local roads, and local communities aspire to better access and communications. Some access tracks are also desirable for management. However, major roads can cause high rates of road kill, prevent natural wildlife movement, and allow invasion of weeds, and are not desirable within protected areas.
7	Most of the area is in good to very good condition	Most of the area is in poor or fair condition, requiring major rehabilitation works	Ratings according to standard terminology. Exceptions where rehabilitation is desirable or where some area used for community gardens or hunting areas.
8	High level of connectivity to other natural areas	Isolated from other natural areas; no ability for wildlife to move in natural patterns	Includes flyways as well as terrestrial, freshwater and marine environments.

9. **The protected area network as a whole, as well as individual protected areas, will be designed to maximise resilience** to climate change impacts and other threats, by recognising new threats to the system, by increasing connectivity at both local and broad scales, and by identifying and protecting refugia areas.

- a) Potential wildlife refugia against climate change climate change can be on a large scale, such as high mountain ranges, or a small scale, such as a small caverns and rocky slopes. Protected areas should where possible include:
- Ecological refugia, such as where it is higher, cooler or wetter than surrounding lands, or where species can shelter in rocks, caves or deeper water
 - Evolutionary refugia , where many endemic species continue to survive as the surrounding landscape and seascape changes

- Human-induced refugia , areas of natural habitat where surrounding areas have been cleared or altered
 - “Trigger points”, habitats from which climate-adapted species may spread in the future.
- b) Restricted Range Endemic species - those species with limited geographic and climatic ranges most vulnerable to climate change – will be given special consideration.
 - c) The protected area network will strive to maintain where possible continuous connectivity along natural gradients across climatic zones, montane slopes, river basins, and from offshore to onshore and tidal areas.
 - d) Protected areas with similar habitats and wildlife will be duplicated where possible to reduce the risk of species extinctions at a single site and to provide ‘insurance’ against natural and manmade disasters.
10. **Protected areas and the network will be manageable and available.** Preference will be given to selecting protected areas where management can be practical, culturally appropriate and affordable. Where possible, a clear capacity for future management has been negotiated between customary landowners, governments and other partners such as NGOs and donors. The declaration of the protected area must be able to be negotiated with customary landowners and with other sectors such as the mining, forestry and plantation industries.

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United Nations Development Programme
304 East 45th Street,
9th Floor New York,
NY 10017 USA
www.undp.org

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