The Technical Approach to Model Management for Pidaung Wildlife Sanctuary

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Introduction

"Myanmar is also endowed with about 7,000 plant species"

The various forest types of Myanmar are home to nearly 300 known mammal species, 360 reptile species, 68 species of swallowed-tailed butterflies, and about 1,000 bird species (about 12% of the total bird species of the world). Some 45 species of mammal, 39 species of birds, and 36 species of reptiles have been listed as endangered species. Myanmar is also endowed with about 7,000 plant species. Out of these wildlife species, quite a number of them are in 'red data categories' as defined by the International Union for Conservation of Nature and Natural Resources (IUCN). It is likely that there are also many wild flora and fauna species not yet recorded in Myanmar.

By energetic cooperation with the United Nations Convention on Biological Diversity (UNCBD) and the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Myanmar, like other member countries, gives much attention to the protection of biodiversity and the prevention of illegal trade in wildlife, wild plants, and their parts.

Policy and legislation on biodiversity conservation

Protection of biodiversity is one of the major imperatives of the National Forest Policy, 1995. This policy seeks to extend the protected area system (PAS) by 5% of the total land of the country, from 2.2% at present, with a goal of 10% in the long run. The National Forest Policy also introduces a system of environment pricing based on the 'polluter pays' principle to compensate for environmental and ecological degradation.

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Highlighting environmental and biodiversity conservation, forest law encourages community forestry and people's participation in environmental and forest management.

In 1879, the Elephant Preservation Act was promulgated and it was amended in 1883. In 1902, the Burma Forest Act was promulgated in which wild animals and their parts were declared 'forest produce'. Under this act, the Forest Department was responsible for wildlife protection and provided regulations to control hunting and fishing in the reserved forests. Specific legislation to protect wildlife was enacted in 1912 under the Wild

Birds and Animal Protection Act and further regulations with the same aim, covering both forest reserves and public forests, were made in 1917. In 1936, to consolidate and amend the laws relating to the protection of wildlife, the first comprehensive Wildlife Protection Act was enacted.

The Burma Wildlife Act, 1936, with minor amendments from time to time, was in force until 1994 and issues addressed included

- the establishment of wildlife sanctuaries,
- the prohibition of hunting within reserved forests without license,
- the protection of certain species including elephant, rhinoceros, tapir, gaur, banteng, goral, serow, thamin, masked finfoot, pea-fowl, and argus pheasant,
- closed seasons for the hunting of various other species of mammals and birds,
- the prohibition of certain hunting methods, and
- wide powers of enforcement including arrest and seizure and confiscation of weapons and other articles used in committing the offence.

However, the protection required for the conservation of wild flora and fauna and their ecosystems or habitats was missing. The old wildlife act was outmoded and did not address the important issues within the present concepts of biodiversity conservation. Hence, new legislation (the Protection of Wildlife, Wild Plants and Conservation of Natural Areas Law) was promulgated in 1994, filling gaps in the 1936 Burma Wildlife Protection Act. Issues addressed included

- habitat or ecosystem protection;
- the control of activities, in addition to hunting, within a wildlife sanctuary, such as trespassing, establishing settlements, and damaging vegetation;
- the protection of endangered carnivores, including tiger, leopard, clouded leopard, wild dog, and bear;
- the protection of certain other species clearly in need of either complete or partial protection, such as red panda, gibbon, and dusky leaf monkey;
- the addition of more species to the list of completely protected, normally protected, and seasonally protected wildlife species;
- the establishment of national parks and other categories of protected area as well as wildlife sanctuaries; and
- the legal control of activities harmful to wildlife outside protected areas.

Biodiversity conservation needs and potential in Myanmar

Challenges in biodiversity conservation

Pidaung Wildlife Sanctuary, established in 1918, was the first game sanctuary in Myanmar and the first to generate awareness about the protection of wildlife.

The Wildlife Protection Act, 1936, prevented the hunting of wild animals, but the conservation of habitats or ecosystems was not addressed. The wildlife population in Myanmar has declined in past years due to indiscriminate killing, hunting, and habitat destruction. Two species of rhinoceros (Javan and Sumatran) are now feared to be extinct. Elephant habitats and numbers have also dwindled in recent years through hunting and the destruction of forests. Flora and fauna have gradually decocased due to the increase in agricultural croplands, human dwelling areas, habitat destruction, and illegal gathering and hunting for trade.

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The more recent concept of biodiversity conservation differs from traditional nature conservation. Biodiversity conservation entails a shift from defensive efforts towards seeking to meet people's needs from biological resources while ensuring the long-term sustainability of the nation's biotic wealth. In sum, biodiversity conservation seeks to maintain the human life support system provided by nature, and the living resources essential for development.

Strengthening biodiversity conservation

To address biodiversity conservation and sustainable utilisation of forest resources, the Forest Department, under the Ministry of Forestry, has implemented the PAS in addition to the reserved forest system.

With the assistance of the United Nations Development Programme (UNDP) and the Food and Agriculture Organization (FAO), the Nature Conservation and National Park Project was carried out, from 1981 to 1984. Its objectives addressed the conservation of natural ecosystems, the protection of endangered species of wild flora and fauna, and the development of a system of national parks and nature reserves. When this project finished the present Nature and Wildlife Conservation Division was formed, as one of the directorates of the Forest Department, with responsibility for biodiversity conservation.

Actions to be taken for conservation of biodiversity

Problems

- Although Myanmar's forest cover is still in good shape in about half of the country, and 30 protected areas have been established, the protected area percentage is the lowest in Asia. Currently it is 2.2% of the total land area of the country.
- The increasing population has placed heavy stress on biodiversity to the point of endangering some species.
- Destruction and fragmentation threaten habitats of migratory and resident species.

"the protected area percentage is the lowest in Asia"

- Loss of species due to the uncontrolled capture of wildlife for the illegal market, fragmentation of habitats through forest destruction, and poaching are due to a weak institutional framework of human resource allocation, the need for suitable facilities to monitor and patrol, and lack of funds. These aspects must be examined thoroughly.
- The motive behind the use of natural resources is personal gain. An increase in awareness about conservation problems and in people's roles in causing the problems is required.
- Two levels of biodiversity conservation (species and ecosystem) have been addressed. The genetic diversity level has yet to be addressed through the establishment of totally protected areas (TPAs) as an insurance against genetic loss and erosion, as part of the Myanmar conservation strategy.
- In 1994, the Law for the Protection of Wildlife, Wild Plants and

Conservation of Natural Areas was promulgated. The legislation now addresses issues of habitat conservation neglected by the old legislation. However the new legislation still uses the old classification of species protection (totally protected, protected, and seasonally protected). This does not reflect the real status of species as classified internationally under the IUCN red data system and CITES appendices and thus the threats they face.

However the new legislation has underscored the need for wider scope in protecting species and includes the following.

Wildlife Protected under the New Legislation

Wildlife	Totally protected	Protected	Seasonally protected
Mammals	39	12	2
Birds 50	43	13	
Reptiles 9	6	0	

The effective protection of these species in the context of global conservation concepts and management strategy, in practical terms, is the most imperative issue. Wild plant protection now falls under the domain of the new legislation. Those that are endangered or threatened with extinction have to be classified, as the existing protection categories (for example, seasonally protected), cannot be applied to endangered plants.

- The intricate relationship of ecologically fragile species with particular forest ecosystems must be thoroughly understood. Management plans must take this into account when considering the effective conservation of species and habitats.
- The management of biodiversity in Myanmar is largely ineffective and suffers from inadequate scientific direction and weak enforcement. A lack of funds has always hampered effective management.
- As a developing country, Myanmar faces issues like unsustainable land-use practices, lack of clear-cut land-use policy, encroachment, deforestation, poaching, illegal transboundary trade of wildlife resources, weakness of law enforcement, insufficient trained staff and human resources, lack of available funds and equipment, and lack of expertise and researchers.

Major issues to be resolved

The fundamental issues to be resolved to prevent loss of biodiversity in terms of the various ecosystems and their constituent species and populations are:

- conflicts in land use with conservation given the least priority,
- a gap in the knowledge required about biodiversity in order to plan properly for its conservation and management,
- a low protected-area percentage of the country,
- unbalanced representation of biodiversity in the protected network,
- lack of protected area coverage in major watershed areas,
- ineffective management and conservation of biodiversity and weakness of law enforcement both inside and outside protected areas, especially for illegal transboundary trade in wildlife and their parts,

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- insufficient institutional and legislative provisions for biodiversity conservation and management of protected areas, and
- lack of environmental awareness among the public and decision-makers.

Objectives

The long-term development objective is the conservation of a nature system that is the life-support system of mankind. This includes purifying water, recycling oxygen, carbon and other essential elements, maintaining the fertility of soil, and providing food from the land, fresh water, and sea.

The National Forest Policy requires protected area land coverage of 5% of the country, while the total area so far established is just over 2% (there are 25 sanctuaries and 5 parks within 6 bio-units, out of 10 delineated in the country). In addition, the protected area network is still far from representing the whole spectrum of ecosystems. A comprehensive and well-designed network is required speedily to reach the targeted 5% land coverage in the short term and 10% in the long term for the protection of wild flora and fauna that might otherwise be in danger of extinction.

Immediate objectives should be

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- in the short term, to establish a network of protected areas covering 5% of the country's area, encompassing representative samples of various ecosystems that exist in Myanmar,
- to check loss of biodiversity outside protected areas,
- to strengthen the capacity and institutional capability of the Nature and Wildlife Conservation Division of the Forest Department,
- to promote a conservation education programme,
- to promote effective management of all wild species of flora and fauna in general and endangered species in particular,
- to promote biodiversity research and data collection,
- to introduce buffer-zone management in areas peripheral to protected areas,
- to promote ecotourism,
- to strengthen the ex situ conservation and research roles of botanical gardens and zoological gardens,
- to undertake initiatives on national biodiversity inventories, strengthen the national database, and produce periodic national biodiversity assessments, and
- to control illegal trade in wild flora and fauna.

The technical approach to model management for Pidaung wildlife sanctuary

Model management of the protected area system (PAS)

Model management is sustainable management of biodiversity resources within a specific working scale. It represents the environmental, social, and economic forces at play within the land base fully through a partnership among the interested parties that operates transparently and on the basis of consensus. The model PAS partnership works to identify, develop, and apply innovative biodiversity resource management options to the prescribed territory.

A model PAS identifies goals, sets priorities, and establishes policy guidelines for the overall programme. It is inclusive and key land users and other stakeholders represented in the geographic region are included in the partnership.

A model PAS uses and demonstrates community-based, environmentally appropriate practices and techniques. The overall objectives and programme of work are based upon ecosystem approaches and reflect a vision of sustainability.

A model PAS will have the support of the appropriate national, regional, and/or local governments that have jurisdiction over the land and other interested communities and private-sector representatives related to natural resource management. A model PAS programme of work should also relate to a national or regional forest sector plan.

Scope of activities

A model PAS must be of a size that includes the full range of forest uses and values in the surrounding geographic region. The activities undertaken reflect the realities and needs at local and national level and need to focus on supporting an increase in the knowledge base, assessing impacts, and supporting new approaches to sustainable development.

A governance structure to address a broad range of values

A model PAS is managed in an integrated manner for all natural resource values identified as important by the partnership. The management process is both participatory and transparent. The governance structure reflects the cultural, social, political, and economic realities of the region. Additionally, the governance structure supports consensus building amongst the partners.

Cooperation/sharing

A model PAS partnership agrees to share its experiences and knowledge throughout the course of planning and implementation. At local, regional, national, and global level, a model PAS shares with other model PAS experiences of successes and lessons learned on critical aspects of PAS management that underlie the search for new models of sustainability. A model PAS also provides opportunities for urban-based interested parties to participate and to have an impact on the evolutionary processes supporting sustainable forest management (SFM).

Model protected area system implementation

To implement a model PAS, three aspects need to be considered

- the initial steps taken to create a model PAS,
- the options for organisation, government, and management, and
- the operation of a model PAS (or what the model PAS does).

"the model PAS should have a diversity of flora, fauna, and ecosystems"

There is no standard template for creating or operating a model PAS. The creativity of the local partnership, and specific regional, cultural, or other circumstances will all influence the form and function of the model PAS that is ultimately created.

Major considerations in developing a model protected area system

- Sustainable development of biodiversity and its ecosystems
- Basic concepts of, and formation of, criteria and indicators
- Institutional strengthening
- Field-level application of SFM with the participation of all stakeholders, particularly local people
- Addressing the diverse local nature, social, cultural, and economic conditions
- Coordination, cooperation, and information exchange among model PAS activities through networking

Selection of a model protected area system

The model PAS should have a diversity of flora, fauna, and ecosystems, with the inclusion of existing endangered species and fragile habitats being particularly important. The more representative of the richness of flora and fauna, and the entire ecological zone, the better qualified the site is to be selected as a model PAS. The size of the potential site should be sufficient to support integrated management for the protection of natural resources.

"the potential site should be legally and practicably secured"

The potential site should be legally and practicably secured by implementing measures such as the notification of PAS status; the notification of protected wild flora and fauna; boundary demarcation of the core zone and buffer zone; law enforcement against illegal poaching and the trading of herbs, wildlife, and their parts; control of encroachment; fire management; and control of the rights and privileges of indigenous people. The site must be accessible and suitable for training, education, and research activities.

Reliable data concerning biological diversity, the social and economic conditions of local people, and forest conditions should be available along with records of past management activities natural regeneration, a biological diversity inventory, and other significant activities.

Although the area selected for establishing a model PAS does not need to be a perfect site from the biodiversity conservation perspective, it must, as much as possible, be representative of the richness of flora and fauna, and the entire ecological zone.

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Future considerations for the management of model protected area systems

Upgrading personnel and skills in protected-area and buffer-zone management

Requirements

- To recruit qualified scientists directly from the international pool and from other government organisations
- To promote skill development in various fields for staff of the Nature and Wildlife Conservation Division, Forest Department
- To establish wildlife training centres in appropriate areas
- To strengthen institutional capability by acquiring more office, field, and research equipment
- To implement protected-area and buffer-zone management effectively.

Action to be taken

- Recruitment of qualified professional people
- Overseas and local postgraduate and certificate training courses and overseas study tours to be undertaken
- An internal training programme to be conducted by expatriate scientists (from, for example, the Smithsonian Institution, the Wildlife Conservation Society, the Japan Wild Bird Society, and the California Academy of Sciences) including courses on biodiversity, ecology, entomology, herpetology, bird banding, and species surveys
- Reorientation course to be conducted
- The promotion of transparent exchange of biodiversity information and closer collaboration with international scientific organisations and non-government organisations.

Preparation of national biodiversity inventory inside and outside protected areas

Requirements

- To list known and recorded species of flora and fauna in Myanmar (about 300 species of mammals, 360 species of reptiles and amphibians, 1.000 species of birds, and 7,000 species of plants)
- To identify species recorded elsewhere but not recorded in Myanmar
- To identify scientifically new species (as yet unrecorded anywhere)

Action to be taken

A biodiversity inventory will be prepared by expatriate and national scientists. It will include checklists of species already recorded in Myanmar, species recorded elsewhere but not recorded in Myanmar, and scientifically new species and will indicate the invaluable species richness of the country. Periodic and timely biodiversity inventories and assessments will be used by researchers and decision-makers at all levels before making policies and decisions.

Development of programmes for conservation in situ

Requirements

- To increase the percentage of protected area coverage of the country
- To define the boundary of each protected area
- To initiate basic infrastructural development of the park
- To assess the status of known species of flora and fauna in each protected area and produce a checklist

"mobile education programmes in villages and around the protected areas"

- To promote conservation education programmes
- To promote ecotourism
- To introduce buffer-zone management

Action to be taken

- The establishment of networking amongst PAS areas
- Conservation in situ to be carried out by expatriate and national scientists along with trained staff of the Nature and Wildlife Division of the Forest Department
- Mobile education programmes to be conducted in villages in and around the protected areas along with socioeconomic surveys
- Basic ecotourism to be initiated with the introduction of facilities such as trails, board walks, sign boards, a minimal number of log cabins or chalets, and information centres
- Buffer-zone management activity including agroforestry, community forestry, nursery establishment for trees (including fruit trees), the introduction of income-generation activities for rural people, community development by improving village roads, ensuring a water supply, and supplying sustainable assistance to rural people for education and health care.

Assessment of the status of various species of flora and fauna under the international red data classification

Requirements

- To list known and recorded species of flora and fauna in Myanmar (about 300 species of mammals, 360 species of reptiles and amphibians, 1,000 species of birds, and 7,000 plant species)
- To sort the species in relation to endangerment according to the IUCN red data classification, the CITES appendices, and the protected categories of the Protection of Wildlife, Wild Plants and Conservation of Natural Area Law, 1994 and to compare endangerment among them.

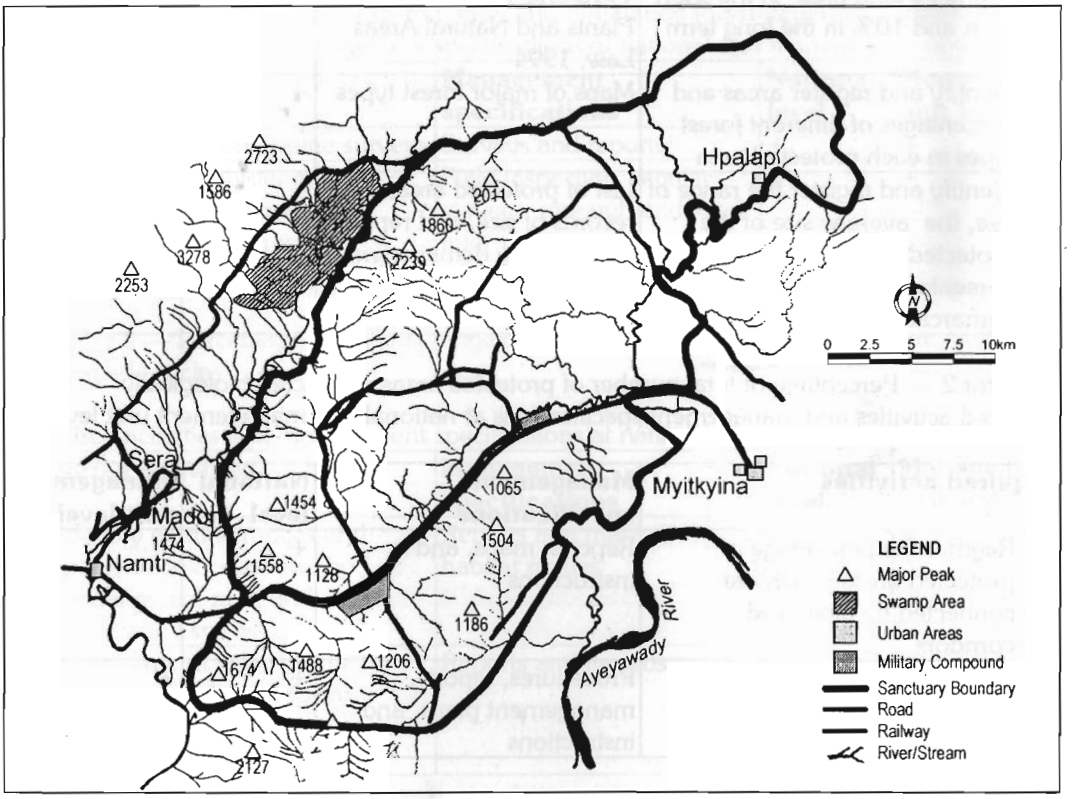
Actions to be taken

- Endangered species appearing in the IUCN red data classification and CITES appendices to be identified among the recorded species of flora and fauna in Myanmar
- Comparisons of species' endangerment between the IUCN red data classification, the CITES appendices and the protection categories of the Protection of Wildlife, Wild Plants and Conservation of Natural Area Law, 1994 would to be prepared.

Recommendations: criteria and indicators for biodiversity conservation

Whereas 'criteria' define the essential components of biodiversity conservation, 'indicators' are ways of describing a criterion. Together, they serve as the basis for monitoring and evaluating progress towards sustainable development in biodiversity.

To achieve proper establishment of a model PAS, several criteria related to the conservation and maintenance of biological diversity, including ecosystems, species, and genetic diversity need to be addressed (see below). At species' level, special attention should be given to the protection of endangered, rare, and threatened species. The establishment and management of a geographic system of protected areas of representative forest ecosystems can contribute towards maintaining biodiversity.



Criterion 1 — Ecosystem diversity

Indicator 1 — Statistics regarding the number of protected areas, the extent, range of size, and average percentage of different forest types of protected areas, and the percentage of boundaries demarcated

Required activities and management specifications at national and management unit level

Required activities	Management specifications	National level	Management unit level
1. Register the number of existing protected areas	Maps, reports, and registers	+	+
2. Identify representative areas suitable to be designated as protected areas and procedures, maps	Criteria to satisfy PAS	+	+
3. Extend the PAS up to 5% of the country's land area in the short term and 10% in the long term	National Forest Policy, 1995 and Wildlife, Wild Plants and Natural Areas Law, 1994	+	+
4. Identify and register areas and percentages of different forest types in each protected area	Maps of major forest types	+	+
5. Identify and register the range of size, the average size of the protected areas, and the percentage of boundaries demarcated	List of protected areas, records of size, and reports of boundary demarcation	+	+

Indicator 2 — Percentage of total number of protected areas connected biologically
Required activities and management specifications at national and management unit level

Required activities	Management specifications	National level	Management unit level
6. Register the percentage of protected areas which are connected by biological corridors	Reports, maps, and instructions	+	+
7. Protect and maintain the existing biological corridors	Procedures, reports, management plans, and instructions	+	+

Criterion 2 — Species' diversity

Indicator 3 — Existence and implementation of procedures to identify endangered, rare, and threatened species of forest flora and fauna

Required activities and management specifications at national and management unit level

Required activities	Management specifications	National level	Management unit level
8. Implement measures to identify, protect, and conserve endangered, rare, and threatened species	Procedures, instructions, list of endangered species, identification method, and existing laws	+	+
9. Review and monitor the list of endangered species and amend as necessary	Amend the list of endangered species as required	+	-
10. Designate and manage buffer zones	Buffer-zone management and reports	+	+

Indicator 4 — Number of endangered, rare, and threatened forest-dependent species
Required activities and management specifications at national and management unit level

Required activities	Management specifications	National level	Management unit level
11. Conduct flora and fauna surveys	Surveys and reports	+	+
12. Identify and register endangered, rare, and threatened species and endemic and indicator species	Field inspection, regular surveys, research and local information	+	+

Indicator 5 — Percentage of original range occupied by selected endangered, rare, and threatened species

Required activities and management specifications at national and management unit level

Required activities	Management specifications	National level	Management unit level
13. Identify existing ranges and percentage occupation by endangered, rare, and threatened spices	Reports and maps of habitat ranges	+	+
14. Maintain and enhance the percentage of the original ranges within the extent of the protected areas	Reports and records	+	+

Criterion 3 — Genetic diversity

Indicator 6 — Existence and implementation of a strategy for in situ and/or ex situ conservation of the genetic variation within commercial, endangered, rare, and threatened species of forest flora and fauna

Required activities and management specifications at national and management unit level

Required activities	**Management specifications**	**National level**	**Management unit level**
15. Strengthen conservation measures for key species and areas of natural habitats	List species, management plans, instructions, and reports	+	+
16. Retain undisturbed, unique, and critical areas in production forests	Maps, reports, and notification	+	+
17. Review and revise existing laws and strategies relating to conservation of the genetic variation within endangered, rare, and threatened species	Conservation strategies and related laws	+	-

Criterion 4 — Management guidelines

Indicator 7 — Existence and implementation of management guidelines to keep undisturbed parts of each production forest to protect endangered, rare, and threatened species

Required activities and management specifications at national and management unit level

Required activities	**Management specifications**	**National level**	**Management unit level**
18. Identify and undertake designation of areas to be retained undisturbed in production forests for the purpose of biodiversity conservation	Maps, list of flora and fauna, and reports	+	+
19. Disseminate information regarding endangered species of forest flora and fauna to be protected	List of endangered, rare, and threatened species. Maps, reports, and notification	+	-
20. Implement measures to protect seedling trees, nesting sites, niches, and other biologically significant features	Instructions, procedures, and reports	+	+
21. Designate other areas of national significance for biological conservation	Law, departmental instructions, and reports	+	+

Criterion 5 — Monitoring and evaluation

Indicator 8 — Existence and implementation of procedures for assessing changes in biological diversity of the production forest compared with areas in the same forest type kept free of human intervention

Required activities and management specifications at national and management unit level

Required activities	**Management specifications**	**National level**	**Management unit level**
22. Undertake flora and fauna surveys in production forests before and after human intervention	Flora and fauna surveys guidelines, instructions RS/GIS/GPS database	+	+
23. Implement guidelines and prescriptions of the environmental impact assessment report	Reports, departmental guidelines, and environmental impact assessment procedures	+	+
24. Introduce mechanisms to minimise the impact of human intervention on biodiversity	Reports, instructions, and code of practice for forest harvesting	+	+
25. Identify undisturbed areas as controls for comparison	Reports, maps, and records	+	+
26. Undertake research activities to monitor the impact of human intervention on biodiversity	Research activities, reports and results, and dissemination	+	+

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