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Final Draft

**GUYANA**

**FIRST NATIONAL REPORT  
TO THE CONFERENCE OF THE PARTIES (CoP)**

**of the**

**Convention on Biological Diversity (CBD)**

**Environmental Protection Agency  
Office of the President**

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## ACRONYMS AND ABBREVIATIONS

BDG	Biological Diversity of the Guianas Programme
CARICOM	Caribbean Community
CBD	Convention on Biological Diversity
CHM	Clearing House Mechanism
CoP	Conference of the Parties (to the CBD)
CSBD	Centre for the Study of Biological Diversity
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
GEF	Global Environment Facility
GFC	Guyana Forestry Commission
IUCN	World Conservation Union
Iwokrama	Iwokrama International Centre for Rain Forest Conservation and Development
MoU	Memorandum of Understanding
NARI	National Agricultural Research Institute
NBAC	National Biodiversity Advisory Committee
NBAP	National Biodiversity Action Plan
NDS	National Development Strategy
NEAP	National Environmental Action Plan
NFAP	National Forestry Action Plan
NFP	National Forest Plan
NGO	Non-Governmental Organization
NPC	National Parks Commission
NPAS	National Protected Areas System
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
SCBD	Secretariat of the Convention on Biological Diversity
TAC	Treaty for Amazonian Cooperation
UG	University of Guyana
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WRI	World Resources Institute

## EXECUTIVE SUMMARY

Guyana is the largest country of the English speaking Caribbean and the largest member of the CARICOM integration movement. It possesses the largest national biological diversity for any country in this grouping and therefore occupies an important position in maintaining regional biodiversity and in potentially serving in demonstration, training and research. She is also a member of the Treaty for Amazonian Cooperation which integrates the countries of the wider Amazon basin who collectively account for more than half of global terrestrial biodiversity. Together with Suriname and Ecuador they make up the smaller countries of this integration grouping though, like Suriname, Guyana ranks among the top five most forested countries in the world. FAO figures indicate a net deforestation rate in Guyana of 0%.

Guyana was among the countries that signed the Convention on Biological Diversity during the United Nations Conference on Environment and Development in June 1992. Subsequently, on August 29, 1994, it ratified the Convention as have some 175 countries to date. Biodiversity is of particular importance to Guyana, playing an integral role in maintaining the extensive forest cover of the country, the savannas, and the various aquatic habitats. The agricultural sector is the major economic beneficiary of biodiversity and the industry contributes more than 35% of the GDP and about 43% of foreign exchange earnings. Two of the top three sources of foreign exchange and employment in the country are Agricultural crops (rice and sugar). Fisheries and forestry contribute an additional 6% and 5%, respectively to GDP, but there is potential for development in both these industries along with that of wildlife. The biological resources of the country are therefore fundamentally important in the future development of the economy and the population.

The national land area of Guyana is 215,000 square kilometres. In addition, the country's territorial sea extends 12 miles from the coastal limit and its granted Exclusive Economic Zone extends 200 miles into the Atlantic Ocean, making up an area of 138, 270 km<sup>2</sup>. Of that land area referred to, the larger part (about 78 %) is covered by natural forest, 17% consists of savannah and scrub, and 5% comprises areas under cultivation, settlement or that was cleared of forest<sup>1</sup>. The Coastal Plain is situated north of the Guiana Shield which has yielded most of the country's soils consisting of deeply weathered Precambrian rocks. The Coastal Plain itself is of sedimentary origin and accounts for about 7% of the national land area. It is on this strip that most of the industrial cultivation of sugarcane, rice and other crops is carried out. The richest soils, consisting of clays and interspersed with sand ridges, are found here and occur for the most part below sea level. The rest of the coastal plain consists of mangrove forests and swamps. The former constitute the forest type in the country most threatened with conversion.

Guyana's location is important in three respects. It occupies part of the northern seaboard of South America, connecting the Caribbean with South America. It overlies the central part of the Guiana Shield and has vegetation and soil that are characteristic of this geologically old area. In addition to this, its southern part falls within the northern boundary of the Amazon region and because of this it shares many bio-physical characteristics with the Amazon region. The country's ecosystem types consist of marine environments, a coastal zone largely shielded by a fringe of mangrove forests, lowland moist forests, dry evergreen forests, montane forests, grasslands, and scrubs. A reasonable postulate is that the country has many healthy natural habitats supporting large and diverse populations of species, with significant endemism for that size of territory, and a number of internationally protected species living under *in situ* conditions in still good numbers. Species such as *Panthera onca* (Mammalia), *Melanosuchus*

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<sup>1</sup> National Development Strategy (draft). 1996. Ministry of Finance.

*niger* and *Podocnemis expansa* (Reptilia), *Harpia harpyja* (Aves), *Arapaima gigas* (fishes) are still found in Guyana in good numbers under *in situ* conditions, even in the absence of a protected areas network. The Country Study on Biological Diversity tabulated the number of species recorded for each broad taxonomic group, but the information is very much incomplete, as indicated in the study. Appendices I and II show the number of known species as per broad taxonomic group.

The biodiversity of Guyana is an important asset both in the roles it presently plays and its potential roles. Rice and sugar are two of the major national income earners while significant potential lies in areas of forestry, tourism, fisheries, wildlife, and bioprospecting. The biodiversity of the country is in good state in the overall sense. Knowledge of the biodiversity of the country is very far from complete and therefore a complete and sufficiently detailed account of this asset cannot be given.

### **THE NATIONAL VISION FOR BIODIVERSITY**

Guyana's policy position on the value of its biodiversity, as contained in the national strategy for the biodiversity, provides guidance on how this resource is viewed:

*Biological diversity and its components have value for agricultural, genetic, social, economic, scientific, ecological, cultural and aesthetic purposes.*

The Plan manifests a recognition of and support for the values identified in the Strategy. The economic role of biodiversity in Guyana (both real and potential) is considered to make it an essential component of the engine of growth. For it to contribute to national development it would be necessary to use it in a way that would allow its continued availability into the future with viable representative units of its components being conserved as part of the country's development strategy.

The following statement reflects the national perspective on the role and importance of the country's biodiversity, as described in the Plan:

*Biodiversity and its components provide a wide range of benefits to society, representing life support and existential value, in addition to those already articulated in the national strategy for biodiversity. The importance of biodiversity lies in its use and non-use values, both known and unknown, tangible and intangible.*

*While it is acknowledged that some of these values are presently difficult to define fully in economic terms and that there is a severe paucity of information on some of these values of the country's biodiversity, these ought not to delay the use of policy, administrative and other measures to safeguard or maximise the retention of as many of the values as possible of biodiversity (the precautionary principle). For example, removal of incentive measures that have a negative impact on biodiversity can proceed, even in the absence of information on the economic value of biodiversity. (The provision of economic incentives for promoting conservation, on the other hand, will be aided by valuation of biodiversity and its components).*

### **APPROACHES ADOPTED**

The National Biodiversity Action Plan of Guyana adopts the following principles into biodiversity planning and management in Guyana:

1. Biodiversity considerations are to become integrated into the agenda at the local, regional, sectoral, and national levels. This is by no means a simple task and requires commitment, time, resources, and skills. There are to be strong linkages between Biodiversity Action Plan and those in other sectors and Regions. At the level of macro-development, the Plan should be seen in harmony with the National Development Strategy.
2. All planning and management efforts that either use or impinge on biological diversity should, as far as possible, consider and be based on three approaches/principles:
  - *The Participatory Approach*
  - *The Cyclical/Adaptive Planning Approach*
  - *The Precautionary Principle*

## **GENERAL MEASURES FOR THE CONSERVATION OF BIODIVERSITY**

Guyana developed a national strategy for biodiversity in 1997 as a foundation step towards the conservation and use of the country's biodiversity resources. In 1999 it prepared a national biodiversity action plan to address a number of the thematic areas of the convention and to develop capacity for future work in biodiversity planning and management.

## **IDENTIFICATION AND MONITORING**

In the absence of national capacity, identification of the species diversity of Guyana is being conducted mainly through programmes of collaboration with foreign consortia and institutions. These are the Smithsonian Institution's Biological Diversity of the Guianas Programme and the Flora of the Guianas Programme of Utrecht University. Much of the identification at the genetic and ecosystem levels are still to be undertaken.

## ***IN SITU* CONSERVATION**

Much of the national territory has been subjected to little pressure from economic exploitation and human settlement. Therefore, conservation of biodiversity occurred by default in a large part of the country. The Government of Guyana, through the World Bank, has prepared a project for the establishment of a national system of protected areas in the country as a first major step towards In situ conservation of the nation's biodiversity.

## ***EX SITU* CONSERVATION**

Ex situ conservation measures have been carried out mainly for economically important crops. There is a network of physical infrastructure in place to carry out similar work with other species, but due to resource deficiencies many economically and biologically important species have not been supported by Ex situ conservation measures. This requirement is addressed in the NBAP.

## **SUSTAINABLE USE OF COMPONENTS OF BIOLOGICAL DIVERSITY**

Sustainable use has been an underlying theme of many of the policies, plans and programmes developed or modified in Guyana since its ratification of the Convention. The adoption and use of this theme is spreading at different levels and into various sectors.

## **INCENTIVE MEASURES**

Guyana recognises the role of incentive measures in the conservation of biodiversity. Their use as a mechanism for promoting conservation is new to the Guyanese context. However, it's use is recommended in both the national strategy and the action plan. Incentive measures are the focus of one of the Programme Areas of the Plan. For purposes of the Plan, the interpretation of incentive measures includes economic alternatives.

## **RESEARCH AND TRAINING**

Research is one of the key areas related to the conservation of biodiversity and has been treated as such in the Action Plan. Local undertakings in research have been limited due to lack of financial, technical and human resources and as such much of the activities in this area is conducted by expatriate scientists and institutions. In the area of training, a number of new programmes and courses have been developed at tertiary and lower levels relating to the conservation of biodiversity.

## **PUBLIC EDUCATION AND AWARENESS**

Public awareness and education on the environment has been recognised as one of the areas of great need in Guyana. Work in the area of conservation awareness gained an important push with the establishment of the Information and Communication Division of the EPA and the development of a National Environmental Awareness Strategy. A number of activities that advance public awareness of conservation are listed as part of that strategy. A formal public awareness programme on biodiversity commenced during the preparation process for the Action Plan and is to be followed by supplementary programmes.

## **IMPACT ASSESSMENT AND MINIMISING ADVERSE IMPACTS**

Environmental impact legislation is in place nationally which addresses impacts on biodiversity. These are to be further developed under the Plan by the elaboration of detailed guidelines for impact on biodiversity.

## **ACCESS TO GENETIC RESOURCES**

As part of its work, the National Biodiversity Advisory Committee provides guidance on facilitating and regulating access to Guyana's biological resources for academic and commercial purposes.

## **ACCESS TO AND TRANSFER OF TECHNOLOGY**

Guyana's role in this area is more as a beneficiary. Therefore, national policies are aimed at facilitating the transfer of new and appropriate technologies to Guyana for the better management and use of biological resources. Technology transfer is identified in the Plan as a source of capacity building.

## **EXCHANGE OF INFORMATION AND TECHNICAL AND SCIENTIFIC COOPERATION**

National policy facilitates the exchange of information and the promotion of scientific cooperation. Various partnerships with scientists and their institutions have helped contribute to the exchange of information as well and the simultaneous need to collate existing information.

## **FINANCIAL RESOURCES AND FINANCIAL MECHANISM**

Though listed among the developing and the small island developing states, Guyana's financial commitment to the conservation and sustainable management of global biodiversity has been significant. The dedication of 360,000 ha of pristine forest towards an international programme for research on sustainable management of forests was made with the need for developing methods for conservation in mind. The spirit of this ideal is embodied in the Iwokrama International Centre for Rain Forest Conservation and Development. Roughly half of the site dedicated to this centre will be designated a strict nature reserve and the other half will be used to research and demonstrate sustainable management methods. Among the four programmes of the Centre are biodiversity conservation, sustainable human development, and information and communication. In addition, Guyana established a Centre for the Study of Biological Diversity, which is the only of its kind in the Caribbean and in the Guianas. These initiatives are to be complemented by a trust fund for biodiversity conservation which will be established under the National Biodiversity Action Plan.



# 1.0 INTRODUCTION

## 1.1 BACKGROUND

Guyana is the largest country of the English speaking Caribbean and the largest member of the CARICOM integration movement. It possesses the highest biological diversity among this grouping and therefore occupies an important position in maintaining regional biodiversity and in potentially serving in demonstration, training and research. She is also a member of the Treaty for Amazonian Cooperation which integrates the countries of the wider Amazon basin and who collectively account for more than half of global terrestrial biodiversity. Together with Suriname and Ecuador, Guyana is among the smaller of the countries of this integration grouping, but like Suriname, ranks among the top five most forested countries in the world. FAO figures indicate a net deforestation rate in Guyana of 0%.

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The national land area of Guyana is 215,000 square kilometres. In addition, the country's territorial sea extends 12 miles from the coastal limit and the national Exclusive Economic Zone extends 200 miles into the Atlantic Ocean to make up an area of 138, 270 km<sup>2</sup>. Of that land area referred to, the larger part (about 78 %) is covered by natural forest, 17% consists of savannah and scrub, and 5% comprises areas under cultivation, settlement or that was cleared of forest (NDS 1996). The Coastal Plain is situated north of the Guiana Shield which has yielded most of the country's soils of deeply weathered Precambrian rocks. The Coastal Plain itself is of sedimentary origin and accounts for about 7% of the national land area. It is on this strip that most of the industrial cultivation of sugarcane, rice and other crops is carried out. The richest soils, consisting of clays and interspersed with sand ridges, are found here and occur for the most part below sea level. The rest of the coastal plain consists of mangrove forests and swamps. The former constitute the forest type in the country most threatened with conversion.

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for each broad taxonomic group, but the information is very much incomplete, as indicated in the study. Appendices I and II show the number of known species as per broad taxonomic group.

The country's attempts at implementing its obligations under the CBD occur against the backdrop of low human and institutional capacity and for the most part unavailability of baseline data for monitoring purposes. In 1999 it prepared the National Biodiversity Action Plan to help it develop the capacity to implement its obligations under Article 6 of the Convention. This Report is prepared in keeping with the provisions of the Convention on Biological Diversity and related decisions taken at meetings of the Conference of the Parties (CoP). Article 26 of the Convention states that each Party shall present to the Conference of the Parties reports on measures it has taken for the implementation of the provisions of the Convention and their effectiveness in meeting the objectives of the Convention. Decisions II/17, III/9 and IV/IV addressed the content and presentation of National Reports to the CoP. The report derives mainly from the National Biodiversity Action Plan of Guyana which was prepared in 1999 and well as the precursor document, the National Strategy for the Conservation and Sustainable Utilization of Guyana's Biological Diversity, both of which are the main implementing mechanisms for the Convention in Guyana. It does not attempt to report on the effectiveness of measures in these documents for the conservation and sustainable use of biodiversity since it is too early to conduct an assessment of their implementation. This will be addressed in subsequent national reports.

This Report has three objectives:

- Providing information to the highest forum of the Convention on Biological Diversity in accordance with Article 26 of the Convention and decisions of the same
- Completing one step of the cyclic planning process as indicated in the cyclic planning proposed in the National Biodiversity Action Plan
- Providing information and serving to improve public awareness in Guyana on the country's biodiversity.

Its potential audience is therefore relatively wide and includes members of the public. The objectives of the National Biodiversity Action Plan as indicated in the Plan, are as follows:

Overall goal: To promote and achieve the conservation of Guyana's biodiversity, to use its components in a sustainable way, and to support national development through the fair and equitable sharing of benefits arising out of the use of Guyana's biodiversity

- Evaluate the state of capacity nationally to achieve the above goal
- Identify gaps and needs relating to achieving the above goal
- Propose actions to achieve this goal and close the gaps
- Develop activities in a number of priority areas relating to the overall goal
- Identify the roles and responsibilities of the various stakeholder groups in the implementation of the Plan
- Obtain and harness stakeholder involvement and support for the development and implementation of the Plan
- Increase public awareness of biodiversity

## **1.2 MANDATE**

This report has been prepared in fulfillment of Guyana's obligations under Article 26 of the Convention which was signed and ratified by Guyana. Article 26 states that:

*Each Contracting Party shall, at intervals to be determined by the Conference of the Parties, present to the Conference of the Parties, reports on measures which it has taken for the implementation of the Provisions of this Convention and their effectiveness in meeting the objectives of the Convention.*

The second Conference of the Parties meeting, in Decision II/17 and held in November 1995, decided on the first national reports as follows:

*The first national reports by the Parties will focus in so far as possible on the measures taken for the implementation of Article 6 of the Convention, General Measures for Conservation and Sustainable Use, as well as the information available in national country studies on biological diversity, using as a guide the Annex to this Decision.*

Decision II/17 of the CoP provided the following guidelines on the contents of the first national reports of the Parties:

- Scope – the first national reports are to focus in so far as possible on the measures taken to implement Article 6 of the CBD
- Goals and objectives – determine “the specific targets to meet the local, national, and international goals in terms of protecting, assessing, utilizing and benefiting from biodiversity and its components” (Section d of Annex to II/17)
- Schedule: “Present a timetable for implementation of the various tasks, reflecting the priorities that have been assigned. Note signposts to help signal progress or delay.” (Section h of Annex to II/17)
- Monitoring and evaluation: Give the indicators that will be used “...for tracking the results of the action plan and for monitoring changes in the economy, environment and society.” Also, present the individuals and organization who will carry out these responsibilities. (Section j of Annex to Decision II/17).

Decision III/9 of the CoP called for the setting of “measurable targets”. It has been proposed that national reports could include such targets, and indicators to follow and document progress towards such targets.

## **1.3 GUYANA'S BIODIVERSITY**

The biodiversity of Guyana is an important asset both in the roles it presently plays and its potential roles. Rice and sugar are two of the major national income earners while significant potential lies in areas of forestry, tourism, fisheries, wildlife, and bioprospecting. The biodiversity of the country is in good state overall. Knowledge of the biodiversity of the country is very far from complete and therefore a complete account of this asset cannot be given. While there is no biogeographic classification for the country, the following gives an indication of ecosystem components of the country's biodiversity:

#### Forest ecosystems

- a) moist lowland
- b) dry evergreen scrub
- c) white sand forest
- d) brown sand forest
- e) swamp
- f) lower montane
- g) montane

#### Agro-ecosystems

- a) Coastal
- b) Riverine
- c) Forest patch
- d) Savannah – Berbice; Rupununi

#### Inland Aquatic

- a) Riverine
- b) Lacustrine

#### Marine/Coastal

- Marine
- Littoral
- Estuarine
- Mangrove
- Palustrine

The draft Country Study on Biodiversity, which was conducted in 1992, summarised the known information on Guyana's biodiversity. More than reflecting the statistics and other information on the national biodiversity asset, it indicated the need for further studies in the majority of taxonomic groups as these have not been insufficiently catalogued, and therefore have been underestimated. Significant endemism is a feature of Guyana's biodiversity, but this too needs additional study. Overall, for its size, the diversity in components of biodiversity for Guyana is considered significant. Appendices I and 2 present the information on the species diversity for Guyana based on the draft Country Study on Biological Diversity.

### **1.4 MAJOR CAUSES OF BIODIVERSITY LOSS**

The known loss of biodiversity in the country is believed not to be significant in quantity. Table 1 indicates the major likely causes of *in situ* biodiversity loss, and the targets and objectives that have been identified for addressing these and monitoring their change. Information on the major "driving forces" of *in situ* biodiversity loss is also included. Under the framework of the Treaty for Amazonian Cooperation, criteria and indicators for sustainability of the Amazon forest are being developed for the region and to meet country-specific conditions. Among these

Indicators are the conservation of biological diversity, the conservation of forest cover and the conservation and integrated management of water and soil resources.

In addition to these, Guyana proposes to address as part of the priority actions in the National Biodiversity Action Plan, the development of criteria and indicators to measure sustainability. This effort will involve consultation with stakeholders, including the private sector and public regulatory agencies, on the development and adoption of criteria and indicators, bearing in mind appropriateness, practicability, and cost effectiveness.

Table 1. Major direct causes and “driving forces”(underlying causes) of *in situ* biodiversity loss and possible indicators, targets, and objectives for measuring this loss and monitor change.

BIODIVERSITY COMPONENT	RELATIVE MAGNITUDE*	POSSIBLE INDICATORS	OBJECTIVES	TARGETS	ACTION
FORESTS					
Natural forest conversion	L	- Annual natural forest conversion rate as a % of baseline measurement. - Total extent (ha) of natural forest converted to non-forest land uses	- To maintain the proportion of natural non-conversion forest in the forest estate - To achieve representative, adequately sized representation of forest types in NPAS	- Natural forest maintained above 60%. - All major forest types included in NPAS	- Development of a national system of protected areas
Forest degradation due to large scale logging	M	- Annual industrial timber production per species as a % of annual yield for the given species - Extent and proportion of production forest logged under sustainability principles	- To achieve adoption of sustainable forest management principle in all commercial logging operations	- Sustainable forest management achieved for all commercial logging operations	- Adoption of Forestry Code of Practice, implementation of revised national policy on forests (current initiative)
Unregulated and illegal logging from chainsaw operations	H	- Estimated number of unlicensed chainsaw operators as a % of baseline measurement - estimated annual log volume cut by unlicensed chainsaw operators	- To achieve greater regulation of illegal and damaging chainsaw logging operations	All chainsaw operations to come under a licensing requirement Reduction of chainsaw operations by at least 50%	Strengthening of enforcement and institutional capacity of the Guyana Forestry Commission (current initiative)
Large scale mining activities	M	Total extent of forest (ha) impacted by large-scale mines as a % of postulated baseline	- To realise significant reduction in adverse biodiversity impacts of large scale mines in forested ecosystems and watersheds	-Guidelines for assessment of biodiversity impacts incorporated into EIAs -All large scale mines to be subject to EIA procedures	- NBAP recommendation  - Current sectoral plan

Unmanaged and unregulated exploitation of resources in Amerindian areas	M	Percentage of Amerindian-owned forests subjected to unmonitored commercial logging	- The adoption of principles of sustainability and of the national forestry regulations by Amerindian communities	-Adoption of principles of sustainability and national forestry regulations by Amerindian communities	Inclusion of forests in Amerindian under the provisions of forest legislation and encourage management (NBAP recommendation).
AGRO-ECOSYSTEMS					
Use of agrochemicals	H	Total annual use (tonnes) of agrochemicals as a % of baseline measurement	- To realise speedy transition to the use of safe and sustainable crop protection practices	- Reduction in agrochemical use - Increase in adoption of IPM strategy by farmers	Strengthening of capacity of Ministry of Agriculture to promote environmentally responsible practice in the sector (current initiative)
Depletion of crop genetic pool	M	-Number of local cultivars/varieties as a % of baseline number. -number of gene types lost	- Re-establish the collection, storage and use of plant genetic resources	- Establishment of a plant genetic collection of local cultivars/ varieties - Integration of the various breeding and collecting programmes nationally	Further development of current initiative by NARI into a project
Depletion of animal genetic pool due to outbreeding and substitution	M	-Number of local breeds as a % of baseline -number of gene types lost	- Establish the collection and preservation of animal genetic resources	- Maintenance of genetic diversity in local breeds/strains through breeding and maintenance work	Subsequent cycle of Action Plan
Loss of primary agricultural production land to urban land expansion	M	Total area (ha) of primary agricultural land converted to urban land uses as a % of baseline measurement	- To realise maximum use of primary agricultural land for agricultural production	- Increase in urban and rural land assigned for human settlement outside of coastal belt	Subsequent cycle of Action Plan
INLAND AQUATIC					
Water quality degradation from mining, soil erosion, agrochemical use, etc.	M	% of inland waterways classified as swimmable and fishable (based on national water quality degradation criteria)	- To realise significant reduction in adverse inland water biodiversity impacts from mining, agriculture, etc. - To maintain minimum discharge of targeted toxins and harmful substances	- Development of criteria for determination of fishable, swimmable, and potable waterways - Phasing-out the use of missile dredging of rivers and the use of mercury in fluvial mining operations	Subsequent cycle of Action Plan

Introduction of exotic species for food, sport	L	- Total # of known introductions by category - List of most significant introductions with known or suspected adverse biodiversity impacts	- To realise significant reduction in rate of unintentional introductions of exotic species - To prepare mitigation plans for all exotic species with known/suspected adverse biodiversity impacts	- Development of a policy for dealing with exotic species	Adaptation of draft Fisheries Management. Development Plan and Development of a Fisheries Policy (NBAP action)
MARINE/COASTAL					
Industrial scale over-harvesting of specific species	M	- Number of species under threat of over-harvesting/ extinction	- Reduction of number of species under category of "threatened" as a result of over-harvesting	- Reduction in annual trawl production of threatened species - Increase in number of species utilized from trawl catch	Implementation of recommendations of NDS and NBAP
SPECIES					
Poverty-based pressures at local levels	H	Number and amount of protected, endangered, or threatened species being harvested for sale to traders	- To effect a rapid shift in dependence on threatened or protected species for economic livelihood	- A number of economic alternatives provided to harvesting endangered or protected species. - A number of alternative non-consumptive methods of use adopted per species under pressure of extinction	Implementation of an incentive and alternative scheme for conserving biodiversity (NBAP action)
Perverse economic incentives	H	Amount of direct and indirect incentives having a particularly adverse impact on wild fauna and flora	- to bring about the replacement of perverse incentives	- Implementation of a plan of incentives and disincentives	Implementation of an incentive scheme for conserving biodiversity (NBAP action)

H= High; M= Medium; L= Low

### **1.5 PARTICIPATION IN THE PLANNING AND REPORTING PROCESSES**

As a first step in the fulfillment of its obligations under Article 6 of the CBD, the *National Strategy for the Conservation and Sustainable Utilization of Guyana's Biodiversity* was prepared by Guyana in 1997. This document articulated elements of national policy on Biodiversity and national strategic positions regarding assessing, utilizing, and benefiting from biodiversity and its components. In follow up to the strategy document, a National Biodiversity Action Plan was developed in 1999. The preparatory task, in the case of both of these documents was undertaken by a team of technical specialists in areas relevant to biodiversity management under the guidance of the National Biodiversity Advisory Committee (NBAC). This is a broad based committee comprising representatives of a number of natural resources agencies and professionals. The preparation of both the Strategy and Plan followed a participatory process involving consultation workshops and meetings at the national and regional levels. In addition to these, there were interviews with key individuals and groups in sectoral areas and meetings with the

private sector and national advisory bodies. These consultations added up to a cross-sectoral representation of government agencies, non-governmental organizations, members of the academic community, private sector representatives, youth groups, women’s groups, and school children, and reflect the principle of the participatory approach to biodiversity management adopted in the Action Plan. The process of the preparation of the Plan was supported by a public awareness programme in the press and on television and radio, which were interactive with the public and allowed for it to better appreciate issues relating to biodiversity and make suggestions on priorities and actions to be included in the Plan. Table 2 shows the various participating groups agencies and their involvement in the preparation of the document.

TABLE 2. Agencies, Ministries, and other stakeholders that participated in the development of the national biodiversity strategy and the national biodiversity action plan.

AGENCY OR GROUP	FORM OF PARTICIPATION		
	Technical or Planning inputs	Stakeholder Workshops	Review and policy guidance
Policy and planning committees	X		X
Research and training institutions	X	X	
Non-governmental Organizations	X	X	
Donor agency		X	
Private sector groups			X*
Government agencies	X	X	
Political Parties		X	
Regional administrative agencies		X	
Community groups		X	
Youth groups		X	

\* Roundtable meeting

The preparation of the National Report was also the responsibility of the technical team and was reviewed and approved with advise from the National Biodiversity Advisory Committee.

## 2.0 INSTITUTIONAL RESPONSIBILITIES AND CAPACITIES

The biodiversity of Guyana is an important asset both in the roles it presently plays and its potential roles. Rice and sugar are two of the major national income earners while significant potential lies in areas of forestry, tourism, fisheries, wildlife, and bioprospecting. The biodiversity of the country is in good state overall. Knowledge of the biodiversity of the country is very far from complete and therefore a complete account of this asset cannot be given. The institutional responsibilities are indicated in the Table 3.



Table 3. Institutional responsibilities, objectives and programmes relating to biodiversity in Guyana.

RESEARCH INSTITUTION	MANDATE, OBJECTIVES OR PROGRAMMES
National Agricultural Research Institute	Research and analytical services on soils. Germplasm collection and maintenance.
University of Guyana	Training and research in areas relevant to the development of the people and natural resources of Guyana
Centre for the Study of Biological Diversity	Maintenance of a national collection of biological specimens, database management, taxonomic research, collection and analysis of information for identifying areas for conservation
Tropenbos Guyana	Research into methods for the sustainable management or tropical rain forests; non-timber forest products assessment.
Iwokrama International Centre for Rain Forest Conservation and Development	Research and development relating to sustainable management of tropical forests. Specific programme areas in forest utilization; conservation of biodiversity; information and communications; sustainable human development.
Institute of Applied Science and Technology	Focal point for research, development and technology transfer; database development on research and technology innovations; facilitate training; provision of analytical services.
GOVERNMENT AGENCY	
Environmental Protection Agency	Biodiversity protection; environmental public awareness and information; environmental regulation and monitoring
Guyana Forestry Commission	Sustainable utilization and protection of forest resources; policy development, enforcement and monitoring in forestry sector
Fisheries Department	Fisheries policy, planning, regulation; extension; aquaculture; enforcement and regulation
Ministry of Agriculture	Administration of agriculture sector, including crops and lands, hydrometeorology and climate change
Wildlife Unit	Censuses; regulation of wildlife trade.

## 2.1 GAPS IN CAPACITY AND INFORMATION

The National Biodiversity Action Plan indicates that there is severe weakness of institutional, professional and technical capacity to meet the long-term commitments of the Convention and national needs regarding conservation and use of biodiversity. Not exempted from this weakness is the area of monitoring and enforcement which requires considerable human, physical resources and financial resources. Capacity building has been identified in the NBAP as being top priority. This capacity building is fundamental to the taking of action to meet the commitments under the Convention and also for successfully undertaking initiatives at the national level. Table 4 summarises some of the present gaps.

Table 4. Gaps and capacity needs relating to biodiversity in Guyana.

FOCAL AREA	GAP/NEED	INSTITUTIONAL RESPONSIBILITY
Identification and monitoring	Non-existent pool of taxonomy skills locally. Fuller identification of species of flora and fauna needed. Need for population censuses.	Centre for the Study of Biological Diversity, Wildlife Unit
Research and training	Human resources capacity in several areas of biodiversity management lacking, e.g. wildlife, fisheries, protected areas management, conservation biology, research and development	University of Guyana, IAST.
Access to and transfer of technology	Transfer of technology relevant to the sustainable use and conservation of biodiversity	Wildlife Unit, Environmental Protection Agency, University of Guyana
Scientific and technical cooperation	Need for collaboration in researching and development of relevant technology	University of Guyana, IAST, international research institutions
Sustainable use	Greater cooperation between government, the private sector and research agencies in developing methods for sustainable use of biodiversity	University of Guyana, National Agricultural Research Institute, international research institutions
Public education and awareness	Improvement of overall level of public awareness on biodiversity	EPA, sectoral agencies, private sector, NGOs
In situ and ex situ conservation	Absence of a national system of protected areas. Need to significantly expand ex situ conservation programme.	EPA, GNRA, Ministries of Crops and Livestock and Agriculture
Incentive measures	Need to develop a formal incentive regime.	Ministry of Finance, private sector, local communities
Policy and legislation	Policy framework incomplete. Need to update and expand focus of legislation in many areas.	

## 3.0 THE NATIONAL VISION FOR BIODIVERSITY

Guyana's policy position on the value of its biodiversity, as contained in the national strategy for the biodiversity, provides guidance on how this resource is viewed:

*Biological diversity and its components have value for agricultural, genetic, social, economic, scientific, ecological, cultural and aesthetic purposes.*

The Plan indicates a recognition of and support for the values identified in the Strategy. The economic role of biodiversity in Guyana (both real and potential) is considered to make it an essential component of the engine of growth. For it to contribute to national development it would be necessary to use it in a way that would allow its continued availability into the future with viable representative units of its components being conserved as part of the country's development strategy.

The following reflects the national perspective on the role and importance of the country's biodiversity, as described in the Plan:

*Biodiversity and its components provide a wide range of benefits to society, representing life support and existential value, in addition to those already articulated in the national strategy for biodiversity. The importance of biodiversity lies in its use and non-use values, both known and unknown, tangible and intangible.*

*While it is acknowledged that some of these values are presently difficult to define fully in economic terms and that there is a severe paucity of information on some of these values of the country's biodiversity, these ought not to delay the use of policy, administrative and other measures to safeguard or maximise the retention of the total value of biodiversity (the precautionary principle). For example, removal of incentive measures that have a negative impact on biodiversity can proceed, even in the absence of information on the economic value of biodiversity. (The provision of economic incentives for promoting conservation, on the other hand, will be aided by valuation of biodiversity and its components).*

### **3.1 NATIONAL TARGETS FOR BIODIVERSITY**

The national targets for biodiversity are based on the raising of awareness, development of capacity, generation and dissemination of information, and the development of policy, legislative, and financial environment to achieve these targets. Accordingly, the targets relating to the conservation and use of the national biodiversity patrimony are as indicated in Table 1 below:

Table 5. The medium term targets for biodiversity conservation and institutional strengthening in Guyana

BROAD OBJECTIVE	TARGETS
1. A high and supporting level of public awareness of the country's biological diversity and its role and values.	<ul style="list-style-type: none"> <li>▪ Integrating biodiversity into the school curriculum</li> <li>▪ Implementing a multi-agency public awareness programme on biodiversity</li> </ul>
2. The creation of an enabling environment for the conservation and use of biodiversity through development of a policy, legislative and administrative framework to bring about desired improvements	<ul style="list-style-type: none"> <li>▪ Incorporating biodiversity into policy and planning of relevant sectors/regional organs</li> <li>▪ Revising and drafting of legislation in relevant areas; completing sectoral policy statements</li> </ul>
3. An adequate level of institutional capacity to execute biodiversity research, development, management, and conservation programmes	<ul style="list-style-type: none"> <li>▪ Developing institutional capacity at EPA for coordinating national biodiversity initiatives</li> <li>▪ Improving skills pool by training specialist personnel in key areas of expertise</li> </ul>
4. The generation of information on national biodiversity through research activities	<ul style="list-style-type: none"> <li>▪ Strengthening of the CSBD</li> <li>▪ Developing and implementing a prioritised research plan</li> <li>▪ Integrating the national herbarium and museum collections</li> </ul>
5. The compilation, dissemination and analysis of biodiversity information for planning, management, conservation and monitoring	<ul style="list-style-type: none"> <li>▪ Creating evolving national databases on key areas of biodiversity</li> </ul>
6. Using economic measures to conserve biodiversity	<ul style="list-style-type: none"> <li>▪ Initiating innovative long term financing</li> <li>▪ Reviewing of incentives and implementing of alternatives</li> </ul>
7. The ultimate achievement of the conservation of the country's biological diversity in support of the national objective of sustainable development and to protect the national biodiversity from misuse, degradation and damage	<ul style="list-style-type: none"> <li>▪ Guidelines/Code of Practice for sustainable resource use adopted by relevant sectors</li> <li>▪ Continuation of cyclic biodiversity planning process</li> <li>▪ Maintaining natural forest cover of Guyana above 60%</li> <li>▪ Designating approximately 10% of Guyana under protected status</li> <li>▪ Establishing mechanisms to address biosafety and benefit sharing</li> </ul>

## 4.0 PROPOSED PROGRAMMES

The NBAP comprises a number of programme areas under which various tasks and actions are proposed. A number of strategic principles of importance to the conservation of biodiversity and, as indicated below, have been adopted:

- a. Biodiversity considerations are to become integrated into the agenda at the local, regional, sectoral, and national levels. This is by no means a simple task and requires commitment, time, resources, and skills. There are to be strong linkages between this Plan and those in other sectors and Regions. At the level of macro-development, the Plan should be seen in harmony with the National Development Strategy.
- b. All planning and management efforts that either use or impinge on biological diversity should, as far as possible, consider and be based on four approaches/principles:
  - *The Participatory Approach*
  - *The Cyclical/Adaptive Planning Approach*
  - *The Precautionary Principle*

By combining the participatory, ecosystem and cyclic/adaptive approaches, biodiversity planning will be a dynamic process, promoting the biological patrimony of the country, involving and considering its people, and evolving over time. Through the principle of integration, biodiversity planning will be incorporated as an element of the planning efforts of the relevant productive sectors and levels of administration. The Plan, in addition to adopting a number of strategic principles, establishes targets relating to biodiversity conservation.

Many of the actions identified will require new and additional financial resources and technical support, both from external sources and from local inputs. The majority of the actions are project-oriented, but some are non-project in nature. The overall timeframe for the Plan is five years and the tasks Plan is divided into two phases. Phase I is for the first two years whereas Phase II is for the remaining period.

### **PHASE I: FOUNDATION PROGRAMMES**

Phase I stresses priority interventions that are essential in laying the foundation for sustainable biodiversity planning and management in Guyana; hence it focuses on filling critical gaps in existing activities, initiating capacity building, and raising awareness. This Phase includes the following Programme Areas:

#### **Programme Area 1: Mobilization of Financial and Technical Resources**

The state of the national economy makes it necessary for the commitment of financial resources from new sources to develop the capacity necessary to implement the Convention and the Action Plan. The achievement of this target will require the mobilization of considerable financial and technical resources; hence this Programme Area is highly critical for the implementation of the entire Plan and has been given absolute priority in the early stages of this Phase. The Programme will seek to source funding for the activities making up the Plan and establish mechanisms for financing the conservation and management of biodiversity in the long run.

#### **Programme Area 2: Human Resources and Institutional Capacity Building**

Guyana's public, private and NGO sectors experience an acute shortage of expertise in areas related to the management of biodiversity. Institutional capacity is weak throughout the relevant sectors. Together, these two realities combine to present a serious obstacle to the achievement of the national goals relating to the management of biodiversity.

The programme will seek to address these weaknesses by developing human resources and institutional capacity for the management of biodiversity. This capacity development will be conducted at the central and Regional levels and will be complemented by a programme of public awareness and education, as well as career guidance efforts which will encourage to adoption of careers in biodiversity-related areas. A more fundamental purpose of the activities under this programme is to help ensure that capacity is available for the implementation of the Action Plan.

#### **Programme Area 3: Research and Information on Biodiversity**

The many gaps in knowledge of Guyana's biodiversity is associated with the insufficient research. Also, the choice of areas for research has not been conducted in any systematic way, so that many of the national priorities are still not addressed. This Programme Area will set priorities for biodiversity research, indicators for monitoring, and identify mechanisms for the collection, analysis and dissemination of information.

#### **Programme Area 4: Consolidation of the Policy, Legal and Administrative Framework**

The policy framework on biodiversity at the sectoral level is incomplete, with policy absent in many areas. The legislation relating to biodiversity is old, incomplete in coverage, and inadequate in so far as recent developments in the field of biodiversity. The policy and juridical foundations are basic to the development of other initiatives and, therefore, would require priority attention.

The programme aims to address protection and compensation of local knowledge on biodiversity, access and benefit sharing, biosafety, and the comprehensive review and reconciliation of national legislation on natural resources with a view to making them compatible with national needs relating to biodiversity.

#### **Programme Area 5: Public Awareness and Education**

Levels of public awareness in Guyana are very low and pose a serious threat to the realization of the general objectives relating to biodiversity. Increased public awareness is needed, not only for the wider understanding of biological diversity, but also for reducing threats to it, and for human resources development.

The programme will support activities leading to the preparation of instructional material, formal and informal training of citizens, the training of trainers, and career guidance efforts and will build on current efforts.

#### **Programme Area 6: *In situ* and *Ex situ* Conservation of Biodiversity**

Priority attention to the *in situ* conservation of biodiversity is highlighted in the CBD, which advises that species are best studied and conserved in their natural or naturalised habitats. The programme encompasses the *in situ* conservation of biodiversity through the establishment of a national system of protected areas and measures for expanding the *ex situ* conservation of biological diversity.

#### **Programme Area 7: Incentive Measures and Alternatives**

Incentive measures are seen as a complement to legislative and administrative measures for the conservation of biodiversity. The Guyana context of difficult enforcement makes the use of incentive measures particularly attractive. Viable economic alternatives will be considered for reducing poverty-based threats to biodiversity and thereby serve as incentives in their own right.

The programme involves initiatives leading to the review of national policies affecting biodiversity with a view to identifying and removing perverse incentives, and to examining the possibility of using incentive measures as a mechanism to encourage the conservation of biodiversity. It would also lead to the identification of economic alternatives that could replace poverty-driven practices that threaten biodiversity.

### **Programme Area 8: Measures for the sustainable use of biodiversity**

The philosophy of sustainable use is at the core of the Convention on Biological Diversity and reflects the many priorities facing the biodiversity-rich but economically poor developing countries. Under this Programme Area, criteria and indicators for sustainable use will be developed as a first step towards seeking sustainability.

### **Programme Area 9: Monitoring, Evaluation and Reporting of implementation**

The successful implementation of the Plan and its appropriateness to changing circumstances and needs will depend on monitoring and evaluation of implementation. Monitoring and evaluation are seen as essential parts of the cyclical and adaptive planning approach.

This programme area will lead to the institution of a programme of monitoring and evaluation of implementation of the Plan, national reporting, and the submission of recommendations for modifications/improvements to the CBD. These would be achieved through the National Report and participation at CoP and SBSTTA.

## **PHASE II: CONSOLIDATION OF PHASE I AND INITIATION OF ADDITIONAL INTERVENTIONS**

Phase II will essentially involve a continuation of many of the action tasks initiated in Phase I, with the exception of the following new initiatives:

### **Programme Area 1: Mobilization of Financial and Technical Resources**

Actions in this programme area will involve the identification and accessing of new sources and the continuation of existing support

### **Programme Area 2: Human Resources and Institutional Capacity Building**

The programme will involve new actions for the strengthening of agencies not targeted in Phase I and the development of a programme of support for national biological collections.

### **Programme Area 3: Research and Information on Biodiversity**

In this Phase, research on the genetic characterization of economically important species of Guyana, valuation of biodiversity and habitats, and a revision of the Country Study on Biological Diversity will be undertaken.

### **Programme Area 8: Planning Biodiversity Action Plan Cycle 2**

This Programme Area will involve the initiation of planning for the second cycle of the Plan.

## **5.0 BUDGET AND FINANCING**

The overall estimated budget for the Plan is US\$ 3 million. The bulk of the funding for the activities in the first cycle of the Plan is to come from external sources. For subsequent cycles, this dependence will decrease significantly with the establishment of the sustainable financing mechanism. A range of means are proposed for financing biodiversity conservation, including user fees and penalties and the development of a trust fund for biodiversity.

## **6.0 MONITORING AND EVALUATION**

An overall framework for monitoring implementation of the Plan is presented in the Plan itself. Monitoring of Plan implementation will be a continuous process and overall responsibility for this is with the Environmental Protection Agency. Responsibility for monitoring of individual projects will reside in the respective implementing agencies. Evaluation on the other hand, will be periodic, and will be carried out by independent consultants hired by the EPA .

Within the standard format of each project summary in the Plan information of objectives, performance indicators, means of verification, risks and assumptions and the local parties in collaboration and implementation are presented.

## **7.0 LESSONS LEARNED**

During the planning process a number of lessons and further insights were learned. It is not possible to present at this stage lessons learned from implementation as implementation had not commenced at the time of preparing this report. Among the lessons, insights and experiences were:

- a) Lack of awareness of biodiversity as a unified concept, together with issues relating to biodiversity, served as a constraint in the meaningful and effective involvement of the general public and some stakeholder groups. Participatory biodiversity planning requires adequate time, information and consultation to allow the public to participate meaningfully in the process and represent their interests and experiences. In the Guyana context, it was necessary to mount a simultaneous public awareness programme on biodiversity. Ideally, it would have been better for this process of public awareness to be initiated in advance of the planning process.
- b) There is a low level of experience nationally in conservation and natural resources planning and therefore the planning process was a learning opportunity in national policy and priority setting.
- c) Present capacity being very weak, and given the present state of knowledge of the country's biodiversity, there is a monumental list of interventions required in the area of biodiversity management. Given the level of planning experience prior to the exercise, together with the potential list of needs, the proposed approach to national biodiversity planning is one that is cyclical and adaptive. With this approach, allowance is made for the gaining of experience in the process and for the large number of needs to be spaced over some realistic and longer-term time frame.
- d) While planning at the national level was a new experience, the planning that must be carried out at the sub-national levels (especially regionally), is projected to be equally challenging. Technical and financial capacity to conduct planning of such nature is universally absent in the regions and, save for one case in its early stages, there have been few attempts at regional planning and policy development in the past. Planning at the regional level must therefore overcome several weaknesses and establish a precedence of its own.



- e) Any biodiversity planning initiative will mean little unless if, through it and other initiatives at bi-lateral, regional and global levels, capacity is developed in the countries that have within their jurisdiction most of the world's biodiversity, and where economic and capability needs are the greatest. This is not a new recognition, but one that needs restating.

## **8.0 RECOMMENDATIONS**

1. The absence of a definition of the term “Conservation” in the Convention proved challenging and problematic in the national planning process. While “Sustainable Use”, as one of the philosophies at the core of the Convention, is defined the same does not apply to “Conservation”. The Convention goes beyond the basic term and defines “In Situ Conservation” and “Ex Situ Conservation”. It would be helpful for the concept of “Conservation” to be defined in the Convention so that countries can be consistent in its interpretation for practical and planning purposes.
2. Guyana has adopted the cyclical/adaptive planning approach. Given the novelty of biodiversity planning and the instructive nature of cyclical/adaptive planning, a number of lessons and experiences are likely to arise from the implementation of the first planning cycle. To capture and integrate these benefits, every effort should be made to ensure that they are taken advantage of and internalised in the second cycle, indeed that planning does not stop at the first cycle due to lack of financial. Guyana recommends that the Secretariat consider the provision of funding to developing countries for them to make the transition from the first cycle, where most lessons will have been learned and experiences gathered, to the second planning cycle. Thereafter, these countries should be able to undertake and fully fund the planning exercise.

## APPENDIX 1 Species Diversity Data (Plants)

Biodiversity	Major Sub-Divisions	English Names	Global Total No. of Described Species	Country No. spp.		Remarks Global Status
				Total	Described	
Virus		Viruses	1,000	30	30	Further Studies needed
Monera	Bacteria Myxoplasma Cyanophyta	Bacteria Bacteria Blue-green algae	3,000 60 1,700	53 - 4	33 - 1	"
Fungi	Chytridiomy Acrasimycota Myxomycota Oomycota Ascomycota Zygomycota Basidiomycota	Chytrids Cellular slime moulds Plasmodial slime moulds Water moulds Cup Fungi Zygomycete Basidiomycetes	575 13 500 500 10,650 665 16,000	6 3 12 25 193 6 258	2 1 1 19 185 4 214	" " " " " " "
Algae	Chlorophyta Phaeophyta Rhodophyta Chrysophyta Phrrhophyta Euglenophyta	Green algae Brown algae Red algae Chrysophyte algae Dinoflagellates Euglenoids	7,000 1,500 4,000 12,500 1,100 800	24 10 9 unknown unknown 1	- - - - - -	" " " " " "
Plantae	Bryophyta  Lycopodiophyta Filixophyta Gymnosperma Dicotylidona	Mosses, Liverworts, Hornworts Lycophytes Ferns Gymnosperms Dicots Monocots	16,600 1,275 10,000 529 170,000 50,000	186 28 100 6 4,238 1,109	186 28 100 6 4,218 1,108	Further Studies Needed " " " "
TOTAL				6,301	6,136	

Source: Guyana/UNEP Country Study of Biological Diversity (Draft) 1992. *National Strategy for the Conservation and Sustainable Use of Guyana's Biodiversity*.

## APPENDIX 2 Species Diversity Data (Animals)

Major Sub-Divisions	English Names	Global No. Described spp	Country No. spp.		Remarks
			Total	Described	
Porifera	Sponges	5,000	2	2	Further studies needed
Cnidaria Ctenophora	Combrellies Jellyfish, corals	9,000	5	5	"
Platyhelminthes	Flatworms	12,000	3	3	"
Nematoda	Nematodes (roundworms)	12,000	13	13	"
Annelida	Annelids (earthworms)	12,000	6	5	"
Mollusca	Molluscs (snails etc.)	50,000	18	17	"
Echinodermata	Echinoderms (starfish)	6,100	4	4	"
Arthropoda Insecta	Arthropods Insects	751,000 123,161	834 39	834 39	"
Chordata Tunicata	Tunicates	1,250	-	-	"
Cephalochordata	Acornworms	23	-	-	"
Vertebrata Agnatha	Vertebrates Lampreys Jawless Fishes	63	-	-	"
Chondrichthyes	Sharks, Cartilaginous fishes	834	9	9	"
Osteichthyes	Bony Fishes	18,150	352	352	"
Amphibia	Amphibians	4,184	77	77	"
Reptilia	Reptilians	6,300	102	102	"
Aves	Birds	9,040	711	711	Almost complete
Mammalia	Mammals	4,000	123	123	"
TOTAL			2,298	2,296	

Source: Guyana/UNEP Country Study of Biological Diversity (Draft) 1992. *National Strategy for the Conservation and Sustainable Use of Guyana's Biodiversity*