

EXECUTIVE SUMMARY

This document provides an overview of the status of Bermuda's biota, identifies the most critical issues facing the conservation of the Island's biodiversity and attempts to place these in the context of the social and economic needs of our highly sophisticated and densely populated island community. It is intended that this document provide the framework for discussion, establish a baseline and identify issues requiring resolution in the creation of a Biodiversity Strategy and Action Plan for Bermuda.

As human use or intrusion into natural habitats drives the primary issues relating to biodiversity conservation, societal factors are described to provide context for analysis.

- The Island's human population demographics, cultural origin and system of governance are described highlighting the fact that, with 1,145 people per km², Bermuda is one of the most densely populated islands in the world.
- Bermuda's highly developed infrastructure is described along with comments on some of the inevitable stresses placed on natural systems when providing such sophisticated support systems on such a small land base.
- The effects of the Island's limited space on development opportunities, property prices and housing issues are discussed.

- The Island's principal industries and trends are briefly described.
- Statistics addressing the socio-economic situation including income, employment and issues of racial equity are provided along with a description of Government policies to address these issues and the Island's health services.

A major portion of this document describes the current status of Bermuda's biodiversity placing it in the biogeographical context, and describing the Island's diversity of habitats along with their current status and key threats. Particular focus is given to the Island's endemic species.

- The combined effects of Bermuda's isolation, climate, geological evolution and proximity to the Gulf Stream on the development of a uniquely Bermudian biological assemblage are reviewed.
- The effect of sea level change in shaping the pre-colonial biota of Bermuda along with the impact of the early colonists on this unique system is briefly explained.
- Of the 21 habitat categories described, the marine habitats have fared the best as, with the dramatic exception of Castle Harbour, they are buffered from the impacts of development. However, it is noted that the open ocean is becoming increasingly fouled with plastic debris, coral reefs are threatened by global warming and seagrass habitats are being

eroded by the proliferation of moorings in protected bays.

- On land the impacts of development and invasive species have been severe. Remarkably, a full 13.7% of the Island is covered in concrete (the area of Devonshire and 1/3 of Smiths Parish). There are very few remaining pristine habitats and these occur in small isolated patches. Development and invasive species are identified as the key threats to Bermuda's terrestrial native and endemic species.
- A review of Bermuda's marine and terrestrial biodiversity is provided noting that over 8,000 species occur locally of which 3% are endemic. The majority of the Island's endemic species are found in the caves, which are, in many instances threatened by development and pollution.
- Identified threats to biodiversity include: a) habitat destruction through hurricanes, shipwreck, development and dumping, b) pollution through dumping, improper use of pesticides, waste disposal, c) invasive species especially introduced plants, insect pests and feral animals, d) over-harvesting particularly of fisheries resources, e) and climate change.

The status of biological resources is reviewed with particular attention to the existing and future economic activities based on those resources such as tourism and fishing. A framework for the valuation of these resources is provided.

The values of biodiversity section deals with ecosystem services and provides examples of

particular components of the Island's ecosystems and the services that they provide. Mention is also made of the non-monetary traditional, cultural and aesthetic values of these resources.

The Island has several conservation agencies, both Government and NGO, which fortunately display a high level of co-operative spirit. These agencies are listed along with their primary areas of focus. The potential of a restructured environment section of the Ministry of the Environment, Development and Opportunity to build on this spirit of co-operation in order to promote effective conservation is noted.

Existing conservation programmes and the agencies involved are described. The legislative protection afforded to species and habitats are reviewed along with contingency plans, information management systems and education programmes. Although there is evidence of a highly organised system of programmes to promote conservation, an outstanding lack of protection for Bermuda's terrestrial endemic species is uncovered.

The final section of this report deals with an analysis of the underlying issues affecting the conservation of Bermuda's biodiversity.

INTRODUCTION

Since its discovery in 1503, humans have viewed Bermuda from a series of divergent perspectives: a treacherous island to be avoided, a land of plenty, a strategic outpost, a beautiful place to vacation, a secure place to do business. Today, like many island communities, Bermuda's economy, through tourism, recreational activities and international business, is intrinsically dependent on the health of its natural habitats. But Bermuda is perhaps unique amongst island communities in that its affluence coupled with an educated populace have created an environment in which nature's intrinsic value can indeed be appreciated.

Given its geographical isolation, Bermuda supports a surprisingly rich assemblage of plant and animal species, over 8,000 of which have been documented. In addition to its intrinsic value, this natural heritage is of ecological, social, economic, scientific, cultural and aesthetic importance. Many of the species found in Bermuda are at the extreme limits of their geographical distribution, and as such, the status of the Island's biodiversity is not only critical to the well-being of Bermuda and its people, but also serves as an important barometer of climate-driven global trends.

However, with a resident population of 60,000 inhabiting a total land mass of 50 km², and entertaining 500,000 visitors a year, the pressure for further development poses a rapidly escalating threat to the Island's fragile ecology, and to its underlying economy.

In an effort to promote more effective management of the Island's natural resources the Bermuda Zoological Society in partnership with the Bermuda Aquarium, Museum and Zoo, launched the Bermuda Biodiversity Project (BBP) in 1997. The BBP represents the first attempt to create a comprehensive information management system for Bermuda's natural resources. With this underlying goal, the project has focussed on the collation and dissemination of information, promotion of its importance and encouragement of its use. Information gaps identified during this process are being addressed in a collaborative effort by BBP staff and visiting scientists. Particular emphasis is being given to the detailed mapping of coral reefs, as well as to an island-wide vegetation survey, to provide a valuable baseline of information. A primary focus of the BBP has also been to target 'high priority' conservation issues and threatened endemic species.

In 2000, the BBP launched an initiative to develop a biodiversity strategy and action plan (BSAP) for Bermuda. Many Bermudians now recognise that there is an urgent need for a co-ordinated, community-based plan for the conservation of the Islands' unique natural heritage. The intent of the BSAP, is to develop a well-defined framework for conservation action, which sets realistic conservation targets, and establishes a series of prioritised, practical options for achieving these.

The success of this initiative will be entirely dependent on the extent to which the wider community has input into the plan. By engaging the whole community it is hoped that there will be a broader understanding of how environmental, social and economic issues are inter-related. This in turn should encourage more widespread

support for the development of an effective conservation strategy.

A necessary first step in the development of such a plan, is an assessment of the current status of the Island's biodiversity resources and their value. The Biodiversity Country Study has been compiled over the past four months, and follows general guidelines developed by the United Nations Environment Programme, and guidelines produced by Fauna and Flora International. Contributions from many organisations and individuals have been incorporated.

It is difficult to conceive of adequately assessing the importance of biodiversity to the Island. All life is contingent upon other life forms, and it is the very complexity of biological systems with their myriad species, that creates our stable life-support system. This document attempts to place Bermuda's unique biodiversity in context with the realities of a heavily developed urban landscape, and to highlight some of the services that nature provides for us. It aims to summarise existing information by drawing on the many valuable manuscripts that describe the Island's natural history; and through the work of the Bermuda Biodiversity Project, provide new data on the status and trends of Bermuda's species and habitats as well as the status of current conservation and use mechanisms. The Study identifies many of the potential threats to our natural communities as well as critical issues confronting their effective conservation.

This document is not intended to be conclusive, but rather to serve as a first iteration, identifying the opportunities and problems that we face in effectively

managing our resources, and serving to initiate a process of biodiversity planning. The Country Study should evolve through the acquisition of additional data. It should also serve:

- To provide a basis of determining priorities for the conservation and sustainable use of Bermuda's biological diversity
- As a benchmark to monitor the effectiveness of the BSAP
- To identify activities likely to have an adverse impact on the conservation and sustainable use of Bermuda's biological diversity
- To identify the economic benefits resulting from the conservation and sustainable use of Bermuda's biological diversity
- To identify appropriate measures for achieving effective conservation and sustainable use of Bermuda's biological diversity.

Although the intent in launching this initiative is to satisfy a recognised need within Bermuda, the development of this BSAP will be a major step for Bermuda towards committing to the principles of the 1992 Convention on Biological Diversity, which the UK has already signed on behalf of its Overseas Territories. This convention represents an agreement between nations to act co-operatively to protect habitats, species and genes, to adopt sustainable patterns of resource use, and to ensure that the benefits of natural resources are equitably shared across local regional, national and global societies.

For clarification, an important distinction needs to be made between “biological resources” and “biodiversity”. The latter refers to the variability among living organisms from all sources, and the ecological complexes of which they are a part; this includes diversity within species (at the genetic level), between species, and of ecosystems. Biological resources include organisms or parts thereof, populations or any other biotic component of an ecosystem which is harvestable or potentially harvestable or has some value or use for humanity.