

Bio

Diversity

a strategy for Jersey

States of Jersey



**Forward by Senator Nigel Quérée
President, Planning and Environment Committee**

This document succeeds in bringing together all the facets of Jersey's uniquely diverse environmental landscape. It describes the contrasting habitats which exist in this small Island and explains what should be done to preserve them, so that we can truly hand Jersey on to future generations with minimal environmental damage. It is a document which should be read by anyone who wants to know more about the different species which exist in Jersey and what should be done to protect them. I hope that it will help to foster a much greater understanding of the delicate balance that should be struck when development in the Island is considered and for that reason this is a valuable supporting tool for the Jersey Island Plan.

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“By and large , our present problem is one of attitudes and implements . We are remodeling the Alhambra with a steam shovel and we are proud of our yardage. We shall hardly relinquish the shovel , which after all has many good points, but we are in need of gentler and more objective criteria for its successful use” .

Aldo Leopold



ARTICLE 1 OF THE CONVENTION EXPLAINS THE OBJECTIVES:

The objectives of this convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

The United Nations Conference on Environment and Development (the “Earth Summit”) held at Rio de Janeiro in 1992 was the largest ever gathering of world leaders. It was evidence that environmental issues should receive the highest priority on the world’s political agenda.

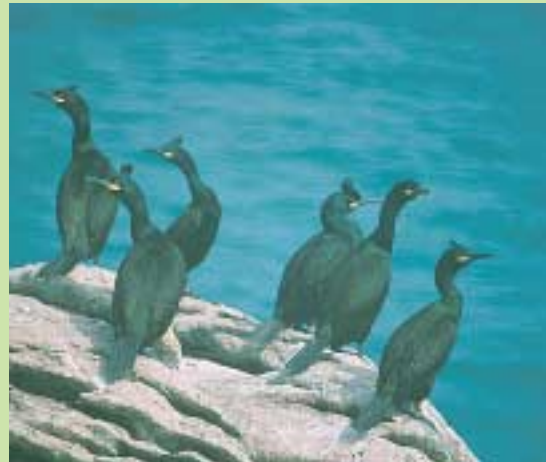
The signing by over 150 Heads of State or Governments of the Convention of Biological Diversity (The Convention) was a major outcome of the Earth Summit. This action reflected a shared belief that measures were necessary to halt the worldwide loss of animal and plant species and genetic resources. The Convention requires Governments to draw up national plans and programmes for the sustainable use and conservation of biological resources.

Other major initiatives emanating from the Earth Summit included a Statement of Principles, which addressed the need to balance the protection of our environment with the need for sustainable development, and Agenda 21, an action plan for the next century aimed at the integration of environmental concerns across a broad range of activities. Also a Convention on Climate Change which seeks to contain greenhouse gas emissions.

These Rio initiatives, and their related national responses, are inter-connected. Thus, although many Governments are producing separate action plans to respond to each initiative, they are structured in a manner to complement one another, and this Biodiversity Plan should be seen as complementary to the Island Sustainable Development Strategy.

Each section of this strategy is specifically linked to the relevant international commitment. Boxes quoting from the Convention precede each section which places the subject in a local context.

Introduction



Section 1

Biodiversity

Biodiversity and Jersey

Methodology

Approach

Process

Key International Obligations

Current Legislation

Evaluation of Natural History Sites

The structure of the strategy

OVERALL GOAL

To conserve and enhance biological diversity in Jersey and to contribute towards the conservation of global biodiversity when appropriate

OBJECTIVES FOR CONSERVING BIODIVERSITY

To conserve and where practicable to enhance:

- a) The overall populations and natural ranges of native species and range of wildlife habitats and ecosystems;
- b) Internationally important species, habitats and ecosystems;
- c) Species, habitats and natural and managed ecosystems that are characteristic of local areas;
- d) The biodiversity of natural and semi-natural habitats where this has been diminished over recent past decades;
- e) Increase public awareness of, and involvement in, conserving biodiversity; and to contribute to the conservation of biodiversity on a European and global scale.

The Strategy has taken into account best international practice as well as incorporating the substantial work carried out to date within the Island by local naturalist groups and Government bodies. Principles enshrined by the Bern and Bonn Conventions and EC Directives are also adopted.

A consultation process has been conducted involving nearly 30 individuals from the main relevant NGOs.

The aims will be to:

- Identify the major issues and key concerns affecting Biodiversity in the Island.
- Clarify the location of expertise on Biodiversity issues.
- Confirm areas of responsibility for Biodiversity issues among States' departments and other groups.

This strategy also represents an opportunity to compare existing local practices against our commitments. Each section of the Rio Convention will be considered in terms of achievements to date.

BIODIVERSITY

Biodiversity is the variety of life forms that we see around us. It includes the whole range of mammals, birds, reptiles, amphibians, fish, insects and other invertebrates, plants, fungi and microorganisms. Biodiversity also encompasses ecosystem variation and genetic variation.

No organism lives in isolation from other living things. The inter-dependence of species, including man and the successful functioning of all its components is vital to the health of the planet as a whole. Moreover our understanding of ecosystems remains inadequate and we are not certain of the impact of removing any component.

Thus the conservation of biological diversity is an issue which is in all our interests and must be taken seriously.

Genetic diversity provides the variability, which enables a species to adapt to changing conditions. It was genetic variability that enabled early man to develop the crops and livestock, which is the foundation of settled agriculture. It facilitates the development of new varieties and the continued success and stability of agriculture, especially in the long term, is likely to depend on our capacity to maintain these opportunities. It is a point of some significance in Jersey where agriculture plays an important role in Island life.

The loss of genetic diversity within small island populations is also a matter for concern. Genetic drift describes the random fluctuations of gene frequencies due to small population sizes. In an island it is likely that populations are adapted to local conditions.

ARTICLE 6 OF THE CONVENTION ON BIOLOGICAL DIVERSITY

Each Contracting Party shall, in accordance with its particular conditions and capabilities:

- (a) Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes which shall reflect, *inter alia*, the measures set out in this Convention relevant to the Contracting Party concerned; and
- (b) Integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectorial or cross-sectoral plans, programmes and policies.

Although less tangible, the moral and aesthetic reasons for conserving biodiversity are of great importance. The culture of a nation is closely allied to its landscapes and wildlife. All those who care about the countryside, who notice when a butterfly visits their garden, when a bird sings or when the autumn tints colour our woods and hedgerows are, whether they know it or not, appreciating biodiversity. The quality of our lives is closely bound up with the maintenance of biodiversity.

BIODIVERSITY AND JERSEY

Despite its relatively small size, Jersey is highly prized for its rich and diverse habitats. The variety of the Island's landscape supports a myriad of wildlife and the particular mix of wildlife is unique.

Jersey's geographical position and favourable climate allows many species normally restricted to either Britain or the European continent to extend their range, resulting in an overlapping mixture of animals and plants found only in the Channel Islands.

Jersey has a responsibility to protect and promote its unique biological heritage for all the environmental reasons already indicated. Our landscapes, seascapes and wildlife not only enrich our lives but they constitute a valuable component of the Island's tourist resource base.

The Island also has a responsibility beyond its shores. The inter-dependence of ecosystems knows no political boundaries. Some migratory birds, for example, depend on habitats in Jersey for 'refuelling' along their migratory route. Our contribution to their welfare may be critical. Their welcome and valued presence here is dependent on the continued existence of suitable ecosystems on their migratory paths thus demonstrating our shared responsibility on a global scale.

Jersey's responsibilities are a requirement of its own ratification, through the UK, of the Convention on Biological Diversity agreed at the Earth Summit. These responsibilities were recognised by the States of Jersey when in September 1993 various objectives of the Strategic Policy Review were agreed which confirmed the States' commitment to the Convention of Biological Diversity (2000 and Beyond). A draft Biodiversity Strategy was produced in 1993. This has been refined, taking into account international experience in implementing such strategies.

METHODOLOGY

Section 2 - introduces and explains the concept of Sustainable Use. General Principles are defined, the underlying influences on biodiversity are explained and issues are discussed.

Section 3 - presents a brief account of the main habitats in Jersey. The criteria adopted to identify key species and habitats are explained.



Section 4 - looks at the causes of the loss of biodiversity and explains the way in which conservation is furthered in other ways in Jersey, for example by means of Species Action Plans.

Section 5 - deals with site-based conservation in Jersey and how it will be furthered.

Section 6 - deals with the requirements for information and data gathering and storage. Proposals are made for the setting up of The Jersey Biological Database and progress to date is outlined.

Section 7 - covers the requirements for public awareness and involvement. The development of consultation with the public is outlined and measures to involve key sectors in the population in the maintenance and enhancement of biodiversity are proposed. It also describes progress to date and the way forward.

APPROACH

Biodiversity is not only about preserving rarities. This Strategy provides an approach, which links Species, Habitats and Land Use and subordinate issues in a consistent fashion. It demonstrates the process adopted to ensure that Jersey fulfils its commitments under the Convention on Biological Diversity and the international obligations to which Jersey through the UK government is a signatory. Table 1.1. Demonstrates how the range of individual issues and processes involved in biodiversity are integrated.

PROCESS

Key International Obligations. Jersey wishes to comply with:

- The Convention on Biological Diversity
- The “Bern” Convention on the conservation of European Wildlife and Natural Habitats
- The “Bonn” Convention on the Conservation of Migratory species of Wild Animals
- The “Ramsar” Convention on Wetlands of International Importance especially as Waterfowl Habitat (Command 6464)
- The Convention on International Trade in Endangered Species (CITES)
- EC Council Directive on the Conservation of Wild Birds-The Birds Directive (79/409/EEC).
- EC Directive on the Conservation of Natural Habitats of Wild Fauna and Flora, adopted by the Council in May 1992-The Habitats and Species Directive (92/43/EEC)
- Agreement on the conservation of small cetaceans of the Baltic and North Seas (ASCOBANS)
- Agreement on the conservation of European Chiroptera (EUROBATS)
- OSPAR annex V

In the light of these key international obligations, Habitat and Species Action Plans for Jersey will be drawn up and implemented.



Table 1.1:
Integration of the range of individual issues and processes involved in biodiversity

| | SPECIES | HABITATS | LANDUSE |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| INTERNATIONAL OBLIGATIONS | CBD Bonn Convention CITES EC Birds Directive Eurobats | CBD Bern Convention EC Habitats Directive Ramsar | CBD |
| LEGISLATION & POLICY | Conservation of Wildlife (Jersey) Law 2000 Biodiversity Strategy | SSI Designations Island Planning (Jersey) Law 1964 (as amended) | Island Plan |
| SURVEY Broad Scale <i>(Data Collection)</i> | Species Survey, (Vascular plants, lichens and bryophytes, animals invertebrates) <i>(ESU, Société Jersiaise, RSPB.)</i> | Habitat Survey Phase I and II Intertidal Zone Surveys | Countryside Character Assessment |
| RESEARCH Detailed Scale <i>(Data Collection and analysis)</i> | Rabbits Squirrels Small Mammals Bats Herring gulls Agile Frog Plant recovery Invertebrates | Heathland Restoration Trials Vegetation Surveys Sand Dune Grazing Wet Meadows | St Ouen's Bay Planning Framework Phase 1 Habitat Survey |
| MONITORING <i>(Data Collection, Storage and analysis)</i> | Invertebrate Population Studies Bird Population Studies Botanical Studies Biodiversity Action Plans Species Action Plans | Woodland Survey Biodiversity Action Plans Photo-monitoring | Aerial Photography Geographical Information Systems Satellite Imagery |
| AWARENESS | School Visits Nature Walks Leaflets, videos etc Members of NGOs | School Visits Nature Walks Leaflets, videos etc | School Visits Nature Walks Leaflets, videos etc |



CURRENT LEGISLATION

Implementing legislation will provide the legal powers:

- the Conservation of Wildlife (Jersey) Law 2000 for the protection of species and
- the Island Planning Law for the protection of Habitats through powers to designate Sites of Special Interest (SSIs)

EVALUATION OF NATURAL HISTORY SITES

A Site of Special Interest may be designated due to its special zoological, ecological, botanical or geological interest.

Justification criteria for the designation of SSIs include the following (Ratcliffe 1977):

a) Size - In general nature conservation value increases with size. Large sites in general contain more species and larger populations of animals and plants than small ones. Chance extinction of species, either as a result of natural or man-made factors, is reduced if a species is present in large numbers. Some species require a large territory size or home range and, consequently, large sites are required to support reasonable populations.

b) Diversity - large numbers of species, particularly when represented by large populations are to be valued. A high species diversity is usually also reflected by a high diversity of different communities which show variation in environmental conditions.

c) Ecological Continuity - a site which has been occupied by a semi-natural habitat for a long time is usually more valuable than one which has only recently arisen. Ancient habitats, and particularly those, which have been subject to a uniform management regime, will have had the time to acquire rich assemblages of plants and animals.

d) Naturalness - the application of inappropriate management regimes, pollution or other damaging influences by man, is deleterious to ecological quality. Sites supporting largely native plants and animals are of greater merit than those with significant populations of non-native or introduced species.

e) Rarity - the presence of rare species adds to overall ecological value, especially when the habitat ranks highly on other criteria as well, and the populations are of a reasonable size. Habitat types too may be rare nationally or regionally.

f) Position in an ecological unit - the presence of other areas of semi-natural habitat adjacent or close to a site, enhances the value of both habitats. This factor is especially important in an island context,

where individual sites are small, and fragmentation high. The close proximity of different habitats allows for the existence of species, which are particularly adapted for life at such interfaces. Each habitat also acts as a buffer zone for the other through which the impact of damaging external influences can be reduced. Contiguity with other habitats of a similar type can be useful as links for the more mobile species. Isolated habitats do not share these advantages.

g) Potential value - the potential value of a site is related to the possibility of managing it in such a way that the wildlife interest can be substantially enhanced. This depends usually on the availability of resources and the practicalities and extent of the measures required.

h) Fragility - sites which are highly sensitive to environmental change are usually highly valued, in that they so often represent ecosystems which are highly fragmented, dwindling rapidly, difficult to recreate or perhaps threatened with total disappearance.

i) Typicalness - as well as choosing the best examples of particular ecosystems, it is also necessary to represent the typical and commonplace within a field of ecological variation which contains habitats, communities and species that occur extensively or commonly.

j) Intrinsic appeal - some sites, habitats or species may be regarded as more intrinsically appealing than others from a non-scientific point of view. Similarly, some sites are more appealing and valuable as places where people may experience and enjoy wildlife and the natural world.

Anthropogenic factors while not criteria for selection are extremely important. These biological features associated with human activities have important implications for management of semi-natural areas, but also are important culturally as a part of social history.

To qualify as a SSI the area should rate highly according to as many criteria as possible. However, few sites will rate highly in all qualities. Due to the lack of choice of important habitats in Jersey, some sites may be selected for a combination of factors, while others may be chosen for a single important attribute.





Section 2

Introduction

General Principles

Scope of Concern

Sustainable use

ARTICLE 10 OF THE CONVENTION ON BIOLOGICAL DIVERSITY SAYS:

‘Each Contracting Party shall, as far as possible and appropriate:

Integrate consideration of the conservation and sustainable use into national decision making;

Adopt measures relating to the use of biological resources to avoid or minimise adverse impacts on biological diversity;

Protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements;

Support local populations to develop and implement remedial action in degraded areas where biological diversity has been reduced; and

Encourage co-operation between its governmental authorities and its private sector in developing methods of sustainable use of biological resources.’

Under sustainable use we aim to pass on land in as good condition or better than it was before.

INTRODUCTION

Although the preservation of important species and habitats contributes to the conservation of biodiversity there is also a need to influence what happens in the wider environment. Most uses of land and water have some impact on biodiversity. In addition, patterns of resource consumption, energy use and transport have an impact on biodiversity.

For all natural resources the aim should be to ensure that through their wise use biodiversity is not only protected but is conserved and enhanced for current and future generations.

GENERAL PRINCIPLES

Carrying Capacity - The environmental carrying capacity of a site is the amount of environmental use (recreation, tourism etc) an area can sustain without damage. If biodiversity is to be conserved use must be kept within sustainable limits.

Precautionary Principle - Interactions between human activity and the environment are complex. Our knowledge of natural systems is incomplete. In line with the precautionary principle, when the available evidence suggests that there is a significant chance of damage to the Island’s natural heritage, conservation measures should be taken even in the absence of conclusive evidence that damage will occur.

Polluter Pays Principle - Biodiversity is treated as a free gift. We may fail to put a sufficiently high value on conserving it. Processes, which consume natural resources, cause pollution or involve the loss of wildlife habitats, are undercosted. Costs of measures to prevent, control and reduce damage to biological and landscape diversity shall be borne by the responsible party, as far as possible and as appropriate.

Long Term Policy Integration - Integration of States Committee’s policies requires close co-operation between committees. Currently various reforms are underway and may have considerable implications on future biodiversity.

Demand Management - When considering developments affecting biodiversity, consideration should be given as to whether the demand for an activity or product should be limited through pricing or regulatory measures.



Careful Decision-Making - Decisions should be made on the basis of the best available information; economically and socially sound measures that act as incentives for the conservation of biological and landscape diversity should be adopted.

Avoidance - Environmental Impact Assessment should be introduced for projects that are likely to have significant adverse effects on biological and landscape diversity. This would include projects concerning introduction into the natural environment of exotic species, or of the release of genetically modified organisms.

Translocation - Those activities that are exceptionally harmful to biological and landscape diversity, and cannot be avoided, will, where possible or practicable, be relocated to areas where they will cause less impact.

Ecological Compensation - The harmful effects of physical changes in areas with high biological and landscape diversity value, which cannot be avoided, must be balanced by compensatory conservation measures by the user.

Ecological Integrity - The ecological processes responsible for the survival of species should be protected and the habitats on which their survival depends maintained.

Restoration and (Re)Creation - Where possible biological and landscape diversity should be restored and/or (re)created if it can be demonstrated by reference studies that the original state could be re-established where practicable, and thereby adopting measures for the recovery and rehabilitation of threatened species and for their reintroduction into their habitat under appropriate conditions.

Best Available Technology and Best Environmental Practice - As defined by the Paris Commission regarding activities that affect biological and landscape diversity. Both access to and transfer of technology are essential elements for the attainment of the Strategy, and where possible measures will be taken to provide and/or facilitate access for, and transfer to others of, technologies that are relevant to the conservation and sustainable use of biological and landscape diversity.

Public Participation and Public Access to Information - It is intended to create sufficient and active public support for measures regarding biological and landscape diversity by involving public and private landowners, the scientific community, and other individuals and groups using land and sea resources in decision making processes. This will be achieved through local news media and the inclusion of these topics in education programmes as well as with better networking with groups such as the Société Jersiaise, National Trust for Jersey and Action for Wildlife.

Wise use - The exploitation of marine zones will be according to the principles of wise use. Wise use of wetlands is defined by the Ramsar bureau as “their sustainable utilisation for the benefit of humankind in a way

compatible with the maintenance of the natural properties of the ecosystem”. Sustainable utilisation is defined as “human use of a wetland so that it may yield the greatest continuous benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations”.

SCOPE OF CONCERN

This section describes the factors that have determined and continue to exert influence on the nature of Jersey. Geology, geomorphology, climate and human influence are all major determinants, albeit operating on vastly differing timescales, of the diversity of species, the genetic variation within species and the assemblages of species which together make up the Biodiversity of Jersey.

‘Natural’ habitats, which have never been exposed to human influence, are very rare in Western Europe, and Jersey is no exception. The degree of human influence can often be difficult to determine; Lester-Garland, in his *Flora of the Island of Jersey* (1903) notes:

“In a meadow near Samarès, in which a trench had been opened for the purpose of laying a drain and which looked on the surface like an ordinary, natural field, I came upon the following interesting geological section. (a) An excellent thick turf, (b) a few inches of very good soil, (c) about six inches of broken crockery and glass. It was all ‘made’ land.”

This is why habitats, which may superficially appear to be untouched, are normally referred to as semi-natural. The marine environment might be considered to be unaffected by the factors which impact the land, but the effects of human activities and terrestrial processes impact on the marine environment, just as marine processes affect the land. In essence, the preservation of biodiversity needs to address all types of habitats and species on the planet. Only by addressing the problems in a holistic fashion can progress be made towards a solution.

Semi-natural habitats

The rocks of Jersey and geomorphological processes have a fundamental influence over the species and their distribution, which we find today. Noury, in his *Géologie de Jersey* (1886) remarked of the minerals:

“L’Isle de Jersey offre dans le voisinage immédiat du Cotentin un massif éruptif du plus haut intérêt et riche en types vraiment exceptionnelle”

This might equally apply to the natural history, and the two are intimately related. Add to this the changes in sea level due to global climate changes and the more recent maritime climate and the richness and diversity of plants, animals and lichen and we begin to understand the reasons for the unique assemblage of plants, lichen and animals in the Island.



Fig. 2.1.
Geological maps from countryside character appraisal



Fig. 2.2.
Geological maps from countryside character appraisal

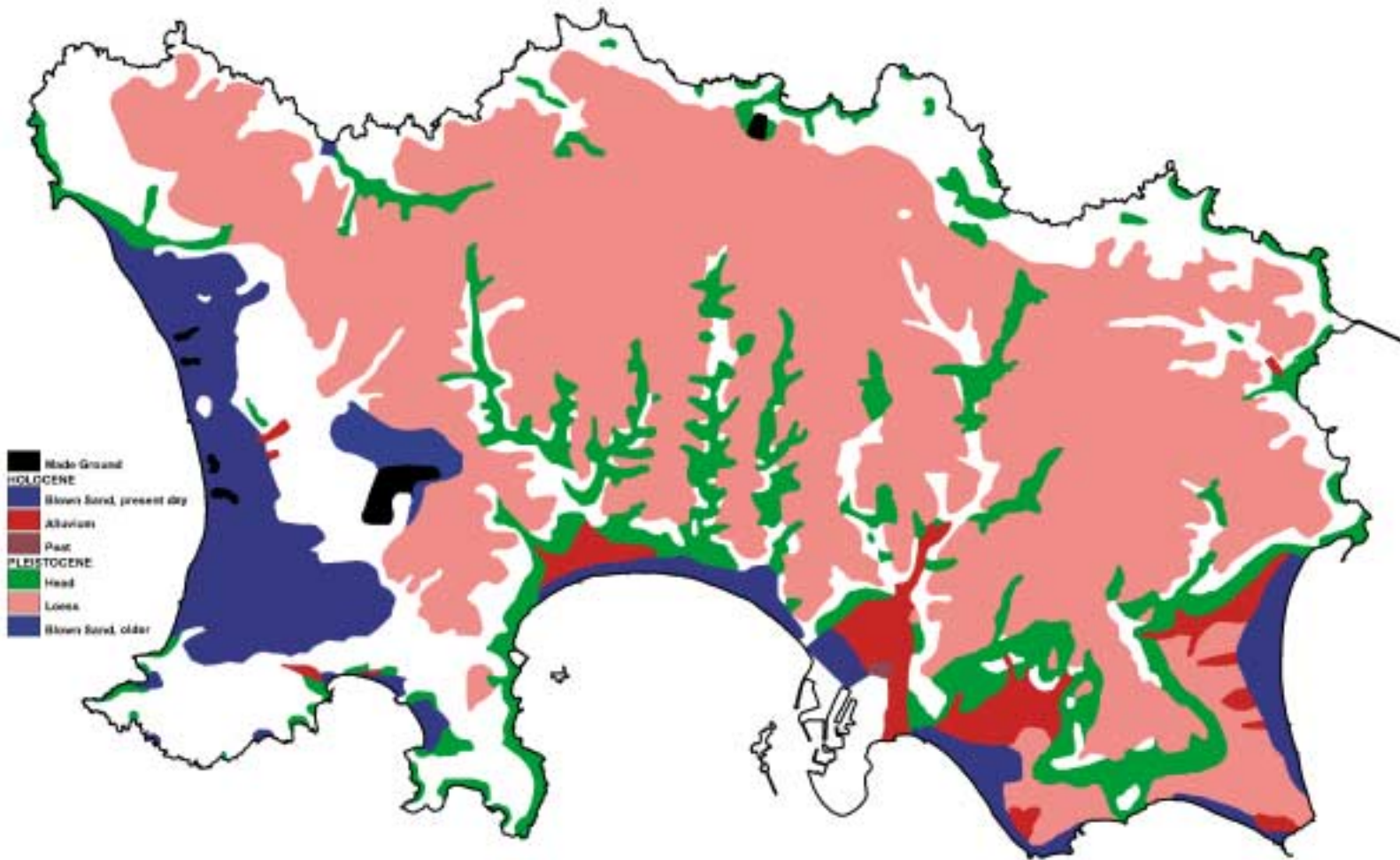
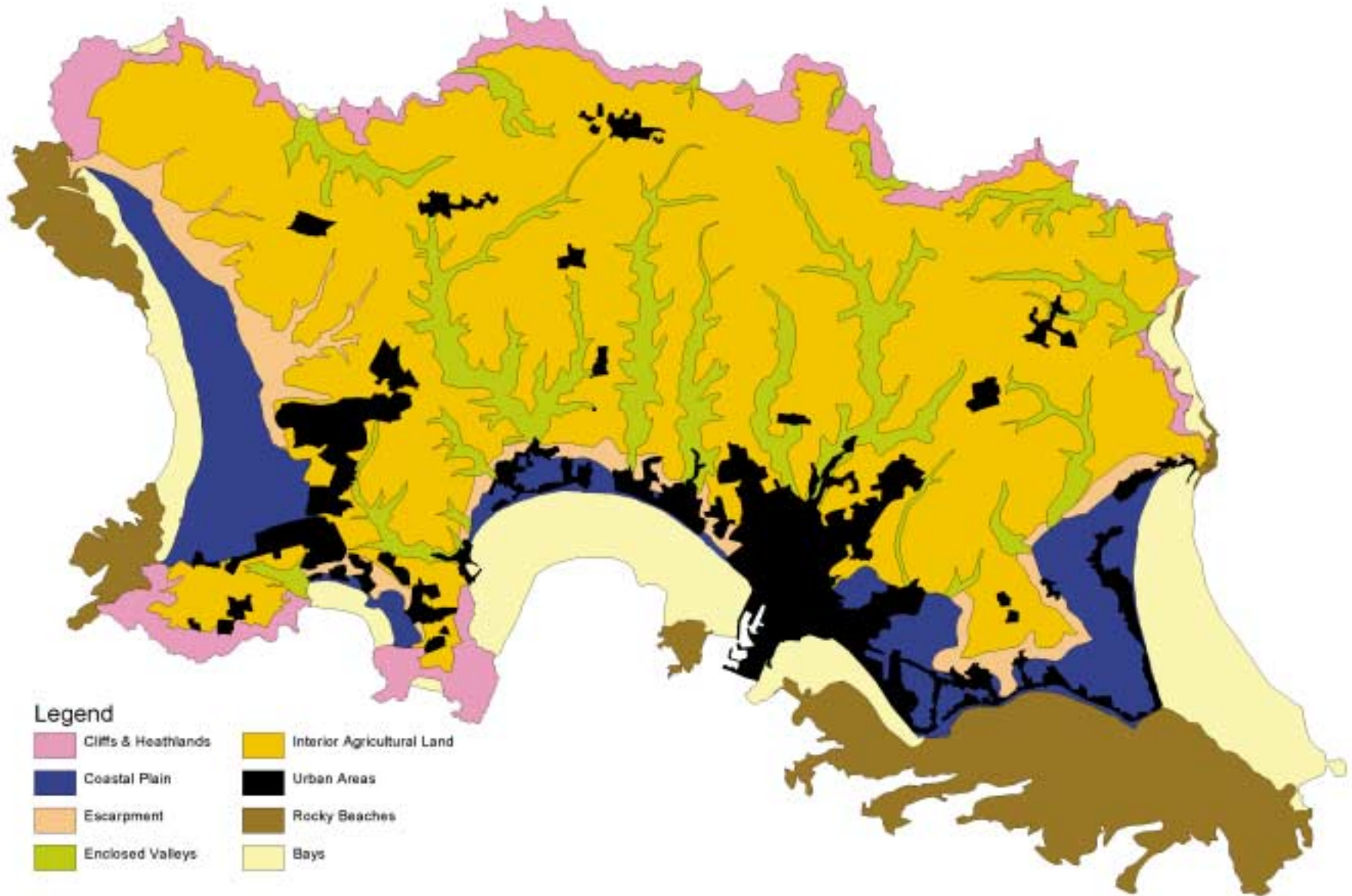


Fig. 2.3.
Habitat types /Land use map



Habitat Preservation

The long time spans characterised by geological, geomorphological and climatic changes allowed wildlife to adapt without necessarily becoming extinct. Throughout most of human history, changes were also slow enough to allow wildlife to continue to survive. For the last 200 years however, the acceleration of the changes caused by human activities is outpacing the ability of natural systems to adapt. People are now the major regulators of the biodiversity that still exists.



By causing relatively swift changes to the climate, and simultaneously restricting the natural movement of species through development whilst facilitating the introduction of species from other countries through trade and vastly improved transport, people are pushing wildlife to the limits of survival in many areas. It is therefore essential that existing habitats are preserved and if possible enhanced. Conservation management is essential to minimise the negative effects of human activities on wildlife, and if possible restore habitats to functioning systems where needed.

Cultural Landscapes

Cultural landscapes, which are the result of a long history of human management, can give valuable clues to future conservation. The destruction of cultural landscapes should be resisted. Enlightened policies concerning agricultural improvement can do much to preserve important landscape features.

The landscape of Jersey is a rich palimpsest (like an old manuscript in which old writing is rubbed out to be replaced with new), showing the range of processes, which have shaped the Island. The rich array of evidence of human occupation and past land uses gives valuable historical information which, combined with ecological knowledge can reveal how and why biodiversity has changed over past centuries. Old buildings can also be valuable for the assemblages of lichen and bryophytes and the study of the historical functions of buildings can give insight into past land uses and techniques of land management.

The examination of history as well as ecology is therefore essential. Continued co-operation with the Jersey Heritage Trust, National Trust for Jersey and the Société Jersiaise on management of the landscape of historical sites and the development of an interdisciplinary approach are an important factor in the implementation of this strategy.





Section 3

Key Habitat Types in Jersey

Coastal Heathland and Cliff Slopes

Sand Dune

Intertidal

Marine

Other Habitats

Wet Meadow

Woodland

Marsh and Freshwater

Walls and Banques

People-modified Habitats

Species

Habitats and species

KEY HABITAT TYPES IN JERSEY

While it may be easy to deplore the threat of extinction of species, it may not be so clear that an endangered habitat can be of equal importance. The long historical processes that have created our unique environment cannot be reproduced in short timescales, even if the complex interaction of events, which led to their creation, could be understood. The priority must be to sustain the surviving habitats and, if possible, extend them. The following are the key habitat types in Jersey:

Coastal Heathland and Cliff Slopes

The magnificent cliff and coastal slope of our north and southwest coast provide a valuable habitat for a wide range of species. Though in the past they were used for grazing, the gorse was cut for fuel and animal feed and the bracken for bedding. Walls can still be seen, which once kept stock from tumbling off the cliffs. This use of the cliffs would have maintained a short diverse sward. Today their floral diversity is maintained to some extent by the influence of the sea and by the grazing of rabbits. This is unfortunately not enough to stem the gradual encroachment by gorse scrub and bracken. Both factors help to maintain a mosaic of microhabitats and the small streams and wet flushes, which fall to the sea, provide extra interest. Topographical variation combined with the other factors to produce a rich collection of plants, birds and insects. The south-west cliffs are hotter and dryer than those on the north coast, and a distinct population thrives here. Cultivated fields extend to the top of the cliffs and it is important that the continuity of this habitat is maintained so that species can escape from fire. Even the bracken-covered slopes provide habitat for woodland species, such as the wild daffodil, which flower in spring and benefit from the bracken giving them shade which would normally be provided by trees. Adjacent to the coastal slopes are the important remaining heathlands of Les Landes, La Lande du Ouest, Portelet, Noirmont and Les Creux. The shallow, acid rocky soil has saved them from agricultural "improvement" and their status as SSIs or proposed SSIs reflects their value.



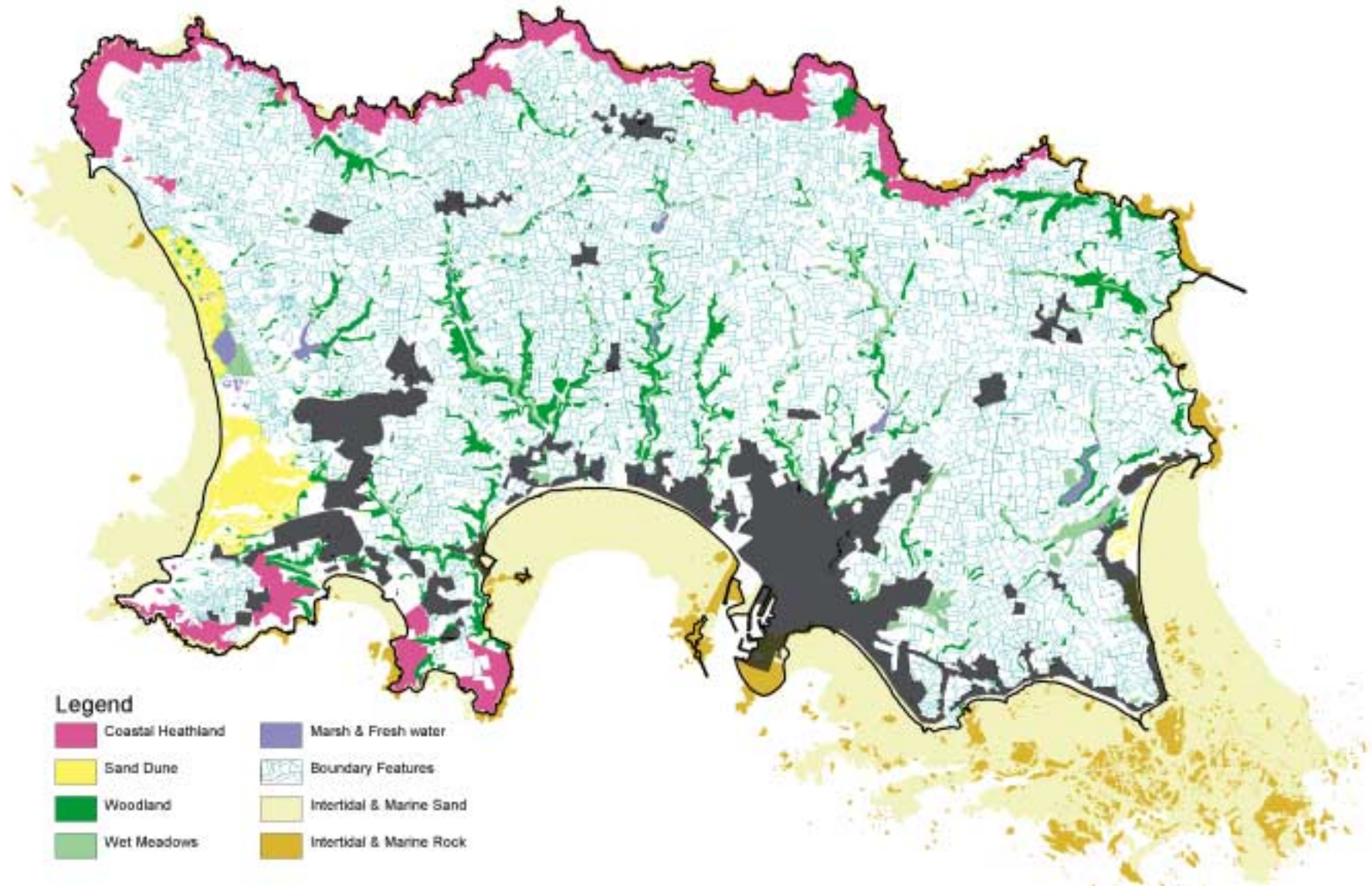
Sand Dune

The soils of the Island are predominantly acid, but in the west and south-east of the Island where blown sand of marine origin has accumulated since the quaternary, extensive areas of calcareous dunes have formed. The dunes of St Aubin's Bay have vanished under housing; as Lester-Garland (1903) says:

"The whole character of the sandy bays is being gradually altered by the sea-walls which are being built in various parts. An almost unbroken succession of houses and an imposing promenade now occupy the Bay of St Aubins, a great part of which within living memory was much as nature made it, is now occupied by an almost unbroken succession of houses, roads and shops. The process will doubtless continue."

The sand dunes at Grouville Bay are now lost beneath a golf course, so it is only in St Ouen's Bay on Les Blanchettes

Fig. 3.1 .
Key habitat types in Jersey



Banques that a rich and diverse sand dune habitat can still be found. Even here housing, golf courses and playing fields have destroyed or altered the original habitat, which once spread up to Red Houses and beyond. The late Frances Le Sueur would recall how in the 1950s one could stand at Red Houses and admire the sheet of pink thrift spreading across land now covered by houses, roads and shops. The dunes have 446 flowering plant species including 17 Red Data Book species, ten orchids and some special rarities. The remaining dunes are protected by an SSI designation, but as development spreads right to the boundaries of the designated area, the edge effects will undoubtedly cause further damage to this unique area.

Intertidal

The intertidal zone in Jersey is of international importance (Kindleysides 1995). The overall extent and character of the rocky reefs and intertidal sediment flats is found nowhere else in Europe (Laffoley and Bossy, 1994).

Threats include;

- a) Land reclamation and subsequent development with associated impacts of habitat loss, alteration of coastal processes, extraction of offshore aggregates for use as fill, increased pollution and generalised habitat degradation from activities linked to construction and maintenance such as tipping of spoil.
- b) Pollution and contamination including nutrient enrichment from treated and untreated sewage effluent and fertiliser run-off, effects of leachate from landfill sites, oil and chemicals etc.
- c) Coastal defence construction and maintenance
- d) Rising sea levels and other possible effects of global warming.
- e) Lack of baseline data on populations and coastal processes.



The value of the shore as a habitat for wildlife, and for the wildlife it contains, is widely acknowledged. Recognition of the importance of the shoreline is not, however, a recent development. In the late nineteenth century the Island was an important centre for the study of marine biology. The abundant and diverse life found on the shore invited study by many naturalists. Additionally, in 1893 two local biologists established the Jersey Biological Station, which was to achieve international acclaim for its studies of marine zoology. James Hornell, a founder of the Station, was one of the first and most eloquent to herald the special significance of the shore:

“On few coasts is there a richer fauna, both as regards number of species and number of individuals. Several factors contribute to this, such as the influence of the Gulf Stream, sunny skies, the constant scour of the great masses of food-laden water, passed continually up and down Channel, and finally, and most important, perhaps, of all, the greatest

vertical rise and fall of the tide. At the great spring tides, this is forty feet and more, and one has but to reflect a moment upon the effect this must have upon a very gradually shallowing sea, to recognize the wonderful difference upon life in the littoral zone, compared with the comparatively insignificant rise and fall of twenty to twenty-five feet common in most British localities. Upon the south-east coast of Jersey, where this factor has most effect, a good spring tide exposes more than twelve square miles of rock-pools, tangle-covered reefs abounding in caves and gullies, shady Zostera prairies, and long stretches of shell-sand beach.” [Hornell (1893) quoted in Heppell & West 1989]

The Jersey shoreline can be described as three main types:

■ **Steep rocky coast**

This is essentially an eroding shore-type with bedrock cliffs backing a narrow and steeply sloping rocky shore. Nevertheless, small bays with coarse sediment accumulation are an infrequent, but characteristic, feature. The entire north coast compartment is the most extensive stretch of this seascape, although sea-cliffs do occur in the southwest of the Island.

■ **Granite rocky platform coast**

This is an eroding and accreting shore characterized by extensive rocky reefs criss-crossed with sediment-floored gullies (‘gutters’). The Violet Bank compartment and the extremes of St Ouen’s Bay are the largest areas of rocky platform.

■ **Beach coast**

Where deposition has been dominant and sediments have accumulated, coastal beaches occur. The shore profile and substrate composition vary greatly depending on geographical location. Whilst there are no estuaries in the Island, the majority of freshwater run-off from the land reaches the sea as seeps down the beaches.



The subtidal environment is relatively unknown. The seabed is predominantly tideswept sands and gravels. Shallow water sandbanks, such as the Castle Bank, and bedrock reefs are a lesser, but nonetheless significant, habitat. Large reef systems surround the Les Écréhous and Paternosters and extensive areas of shallow water with mixed sediment habitats stretch southeast from the Violet Bank. Of special interest is the submerged Plateau des Minquiers, an area of water shallower than 10m covering over 100 square kilometres (Culley et al, 1993).

The factors, which produce Jersey’s rich intertidal biodiversity, are similar to those producing the diversity of terrestrial habitats. That is the tidal range (the third largest in the world) and the biogeographic position, (at the convergence of the Boreal and Lusitanian marine regions). The vertical and horizontal variation in zonation, the varied substrates and the impact of lithography on geology provide myriad microhabitats and account for the number of different biotopes. Kindleysides (1995) identified 38 intertidal biotopes in Jersey compared with 87 in the entire UK.

Although the nineteenth century coastal engineering works had a major effect on coastal dynamics, studies indicate that the species composition of the marine zone have probably changed little. However a major threat to the coastal zone has developed in the last few years. The problem of disposing of the massive production of rubbish has been addressed by filling a large area in St Aubin's Bay, destroying the area with the highest species diversity of all Jersey's coastal compartments studied by Kindleysides in 1995. This underlines the need to take into account a wide range of factors if the biodiversity of Jersey is to be preserved.

Marine

It is in the oceans that some of the issues associated with sustainable use of biodiversity come into sharpest focus. Jersey can make a local contribution to the resolution of the problems associated with the exploitation of marine resources and the maintenance of biodiversity of the oceans. Issues to be resolved are:

- a) Maintaining and improving controls on man-made inputs into the sea.
- b) Managing the pressures on fish and other marine organisms, which can affect the food supply of other species.
- c) Addressing the impact of certain fishing practices on non-target species such as birds and dolphins.

This will hopefully be the subject of a Coastal Zone Management Policy by 2003.

OTHER HABITATS

Four other habitats, while not being of international importance, are valuable in a local context. These have been especially affected by human activity. Their preservation and enhancement needs to be addressed at an overall strategic level to prevent further damage to the cultural landscape and the species diversity of Jersey.

Wet Meadow

With the development of the ability of Islanders to alter their environment, significant changes were made to the valleys, which fall to the south of the Island. The construction of water mills and their associated leats from the twelfth century onwards meant that valley bottoms were drained as the construction of leats diverted streams. Today most of that work has fallen into disrepair and the valley bottoms are slowly returning to their original swampy condition. Changes in agricultural practice have diminished the importance of the wet meadows as a grazing resource, and coarse vegetation and developing willow and alder carr have shaded out their species richness. Sympathetic management, possibly by an agri-environmental grazing scheme, could restore the species diversity of these valley bottoms.





In the south east since the 1960s valuable areas of damp meadow have been lost to development of an industrial estate, and drainage works to minimise flooding have destroyed further areas which were once purple with the Jersey orchid. The remaining wet meadow areas in the Longueville area will be designated as an SSI in due course, and with appropriate management the assemblage of plants and animals, which have suffered recently, may recover its diversity.

Salt marshes have completely disappeared from the Island; even in Lester-Garland's time they had almost completely vanished, although remnant species still may persist in one area.

Woodland

On the steep valley sides in the interior of the Island woodland has developed where land is too sloping for agricultural use. Interestingly, there seems to be no historical evidence of organised exploitation of resources such as charcoal or coppice products from these wooded *côtills*. In the period from the thirteenth to the late sixteenth century historical records indicate an extreme scarcity of wood. The massive expansion of planting of cider apple orchards in the hundred years between the late sixteenth and seventeenth centuries changed the face of the Island. The delightful and idiosyncratic descriptions of Poingdestre (1682) and Falle (1694) record this change in agriculture and the landscape, which Falle described as a "prodigious obstruction to tillage".

From the mid nineteenth century onwards the potato gradually superseded the cider apple as the main Island crop. From the "continuous forest" described by Lyte (1808) and Plees (1817) at the start of the century, the Island became as we see it now, with woodland confined to the steep valley sides. These woods make an essential contribution to the landscape as well as providing habitat for many species, notably the red squirrel. Some of the oldest woods may be those found on the north-east coast.

Marsh and Freshwater

Grouville Marsh an area of Grouville, which before the second war was open wet meadow, has now made a transition to a developing willow carr. With the co-operation of the tenants and the National Trust for Jersey (NTJ), it is hoped that the progression can be arrested to preserve a plagio-climax of carr and reed bed. This is an extremely important refuge for migratory birds as well as an actual and potential habitat for other interesting species.

St. Ouen's Pond, also owned by the NTJ extends to some 4.5 ha and is totally surrounded by the reed bed. The pond and its surrounding semi-natural habitats comprise a varied sequence of communities from the coast; inland to the edge of the more intensively managed agricultural land. Although interrupted by the coastal road, and by some agricultural land where the native species have mostly been lost, the sequence is fairly intact. The salt marsh community merges into the adjacent dune grassland, with salt marsh plants occurring within it and some of the grassland plants venturing into the edge of the salt-affected zone.

Walls and Banques

Comparison of the field boundaries shown on the Richmond map of 1794 and those on modern maps show that many have survived although there is a threat to their continued survival from agricultural improvement, general neglect and road and housing development. The lichen-covered roadside walls and the internal field boundaries with their wild life communities are a valuable cultural and natural historical reservoir and every effort should be made to preserve them. Using charismatic species like the red squirrel as a flagship species to draw attention to the broader value of these features will help in this aim.

PEOPLE-MODIFIED HABITATS

Urban - Although at first glance urban areas may seem to be devoid of wildlife, on closer inspection it becomes clear development is by no means continuous. Urban areas in the Island contain remnants of natural habitat, which have survived development (e.g. Green Street Cemetery and South Hill). Parks and private gardens can also be important for wildlife. Wildlife can thrive in towns and suburbs given the right conditions and drawing attention to this can increase awareness and concern for conservation. Appropriate management of urban parks can improve conditions for wildlife and lower maintenance costs.

Farming - About 54% of the Island's land area is in farming use. Farmers therefore have a key role to play in the preservation and enhancement of biodiversity. The Island's landscape today has been mainly determined by farming activities, and the future wellbeing of wildlife depends to a great extent on agricultural policy. Changes in agricultural practice in the last 50 years, especially the intensification of production have reduced the value of much productive land to wildlife.

Some major issues are:

- a) Encroachment of agricultural activity onto semi-natural areas and the "edge effect" of farming activity (e.g. spray drift and fertilizer run off).
- b) Loss of important farmland features such as hedgerows and small wetlands.
- c) Deterioration of the value to wildlife of productive cropped and grazed land as the intensity of production has increased, involving such changes as crop and grassland monocultures and the switch from hay to silage.
- d) Damage to food chains and soil, water and other ecosystem components caused by pesticides and fertilizers.
- e) Potential effects on biodiversity of the introduction of genetically modified crops. In accordance with Article 14 (b) of the Convention, adequate impact assessment of such introductions will be undertaken (see below).
- f) Planting of exotic trees as hedging.

The environmentally linked benefits enjoyed by farmers in France and Great Britain should apply to Jersey as well.





Table 3.1.

Summarises the broad habitat type in Jersey

Column 1 lists the broad habitat types

Column 2 lists proposed key habitats for which costed action plans will be prepared

Column 3 lists habitats in Jersey listed for special attention under Annex 1 of the EC habitats directive

| BROAD HABITATS | KEY HABITATS | INTERNATIONAL OBLIGATION |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Mixed Woodland | Mixed woodland | |
| Boundary Features Rick Hedgerows | Ancient and/or species | |
| Arable | | |
| Improved Grassland | | |
| Unimproved neutral grassland | | |
| Acid grassland | | |
| Calcareous grassland | | |
| Wet meadows | Wet meadows | |
| Standing open water | | |
| Maritime heath (EC Habitats) | Maritime heath | Atlantic Erica-Ulex heaths |
| Maritime cliff and slope | Maritime cliff and slope | |
| Shingle above high tide mark | Coastal vegetated shingle structure | |
| Sand dune | Coastal sand dune (including fixed dunes with herbaceous vegetation, dune heath, dune scrub and strandline vegetation) | (EC Habitats) |
| Creeping willow mats | | (EC Habitats) |
| Other marine habitats: | Intertidal | (Ramsar) |
| Shallow water sandbanks covered by sea water at all times | (CORINE 11.25) | |
| Mudflats and sandflats not covered by sea water at low tide | (CORINE 14) | |
| Rocky reefs | | |

SPECIES

Introduction

All gardeners and farmers know that plants and animals exist in a number of varieties or forms. In Jersey, for example, the Jersey Royal potato and the Jersey cow are varieties, which have been bred and selected to enhance their desirable characteristics.

Just as no two humans are exactly alike, so wild plants and animals are all slightly different. In many cases these differences, caused by inherited genetic variation, are very slight and are not documented or investigated. Even obvious differences in a species, in size or colour do not necessarily merit documentation as separate subspecies (ssp.). Importantly, invisible differences in biochemistry or physiology may be important for the survival and evolution of a species faced with environmental change.

Within-species variation is important for survival because it allows populations of species to change their genetic make-up over time. If variation within a species is limited, the degree and rate of change will be slower, and a plant or animal will be less able to cope with environmental change or adapt to the changes in other species with which it shares a habitat. This is why so much importance is attached to maintaining genetic diversity. As well as being a part of the complexity of the natural world, it enables plants and animals to change as their surroundings change.

Geographical Variation

Populations of species have different characteristics over their distribution range. When this variation is well developed, it can be recognised by taxonomists (specialists in recognising and classifying organisms who give formal names to subspecies). For instance, the Jersey Bank Vole is recognised as a subspecies existing only in Jersey.

There are other examples of geographical variation of species in Jersey. In the same way that local buildings are distinctive and contribute to the special sense of place, biological evolution has resulted in the distinctive appearance of species in a unique local setting. Local wildlife is valued for the aesthetic pleasure and spiritual refreshment it provides. When everyone knows that local wildlife includes species that are unique to the Island, they have a reason for pride and another justification for calling for its preservation. This is important when it is realised that a population in one part of its range is not necessarily the same as a population elsewhere. Island populations have developed in isolation and should be preserved.



Effects of Introductions

This includes planting of seed and trees which have been grown outside the Island. As well as changing or destroying habitats by cutting and clearing, humans have always moved plants and animals around, either intentionally or by mistake. For example, Neolithic farmers introduced many of today's weeds of cultivation like cornflower and corncockle, both now sadly rare.

The vastly improved communications in the twentieth century mean that species can "hitch a ride" very easily. Whilst in many cases seeds carried in trouser turnups for example will not be able to persist in their new location, but some may gain a foothold. Furthermore, the fashion for wildlife gardening means that seeds brought at a garden centre may have been collected from plants from far away. These plants may be different in form, a product of geographical variation, and the erosion of native genetic strains by interbreeding with plants of a more vigorous genetic strain is a very real threat.



"Non-native" Species

As noted above, plants and animals have always been moved around by human activity. Many of our most familiar plants, though they did not originate here, are now totally naturalised. When the ice of the last glaciation began to retreat about 15-20,000 years ago there were very few plants and animals. Sub-fossil plant remains and the distinctive pollen grains found in peat indicate the history of the development and change of the flora and hence the animals that live off the plants since the Quaternary. Debates about which plants are native or non-native are ultimately sterile, but certain guidelines can be used (see below). Clearly some species are more easily identified as non-native than others. Birds, amphibians mammals and reptiles are represented in Jersey by relatively few, well documented species. It is therefore simple to determine what is native in these groups. Although the red squirrel, the rabbit and the hedgehog were introduced relatively recently (c.1885, 1200s,1850s respectively; Le Sueur 1976) they are now part of our native fauna.

A general presumption is adopted by this strategy against any new attempts to introduce, re-establish or artificially maintain populations of birds, amphibians, mammals and reptiles, which are not accepted as native by recognised Island authorities. Determination of the native status of plants and insects is more problematical. Nature is ever changing and it is pointless as well as potentially damaging to take an over-controlling position. Whenever practicable seed or plants grown from seed, or cuttings collected from species determined to be of local provenance, should be used for tree planting of other landscaping schemes.

When considering appropriate management of non-native or species naturalised in Jersey three categories can be identified:

- Naturalised or non-native species, which can be detrimental at times. The decision as to whether certain species should be eradicated locally is essentially a management decision to be taken in the light of such factors as whether the plant is likely to impoverish a habitat by becoming too dominant as in the case of Tree

Lupin (*Lupinus arboreus*.) It can change the soil chemistry of dune grassland and impoverish the flora by shading. Also Sycamore (*Acer pseudoplatanus*) which can at certain stages of woodland development diminish the diversity of the ground flora and lower canopy.

- Robust non-native sub-species. Other introductions of robust sub-species of native species such as Kidney vetch (*Anthyllis vulneraria ssp. polyphylla*) and ssp. (*carpatica*) (in Jersey ssp. *vulneraria var. langei* is native) or Oxeye daisy (*Leucanthemum vulgare x superbum*) should be discouraged. Publicity stressing the potential damage caused by well meaning attempts to plant “wildflower” seed mixes of dubious provenance would help to minimise this threat. The flora of the Island is well recorded, and continuous monitoring of changes in species composition is important for this reason as well as being essential for monitoring the status of local floral diversity.
- Very invasive non-native species. Non-native species, which are shown to threaten the survival of habitats or species, will be eradicated if possible. Examples of species in this category are Hottentot Fig (*Carpobrotis edulis*) which dominates sections of the south-west coastal cliffs to the detriment of the native habitat and species and Japanese Knotweed (*Reynoutria japonica*) a garden escape which can spread quickly and shade out other species

The proposed botanic gardens could play a valuable role by collecting and storing stocks of local provenance wildflower seed to provide for local landscaping schemes. The spreading of hay containing seed from local species-rich swards could also provide a source of seed.







Section 4

Conservation Issues

In Situ/Ex Situ Conservation

EIA Procedures in Jersey

Role of Environmental Adviser

International Relations

Contingency Planning

Targets for Key Species and Habitats

Loss of biodiversity and other issues



CAUSES OF LOSS OF BIODIVERSITY

Water - Biodiversity can be affected by over-use of water and by water pollution. In Jersey, over extraction has affected wetland habitats such as Le Ouaisné Common, (breeding sites for the agile frog), Grouville Marsh and St Ouen's Pond. Pollution of water from overuse of agrochemicals and from domestic sources is affecting amphibian populations throughout the Island. Inappropriate engineering work in watercourse management such as culverting of streams can also affect the wildlife by removing habitat and also by channelling surface water into the sea instead of allowing the water to accumulate and filter back into the local water table. The general lowering of water tables by over-extraction affects the diversity and composition of species, which depend on wet conditions.

Energy and Climate Change - Most systems for producing, transmitting and using energy have a direct or indirect impact on biodiversity. The production of carbon dioxide by the combustion of fossil fuels contributes to the greenhouse effect. If, as is predicted, climate change results from greenhouse gas emissions there will be significant implications for the Island's biodiversity in the long term (i.e by 2050).

Although climate change is seen as a relatively unimportant factor in the short term (i.e. 2002-2007), current predictions suggest that by 2050 the UK may be, on average, 2° C warmer, with up to 10% more rainfall. Despite more rainfall higher rates of evapotranspiration may increase soil moisture deficit and drought. The sea level may rise by 20 cm. There is however a high uncertainty rate in these predictions and among other possible outcomes is the effect of changes in the North Atlantic oceanic circulation, leading to reduction in the warming effect of the Gulf Stream.

Jersey's unique flora and fauna is a result of the Island's situation on the interface between the warm temperate (Lusitanian) and cold temperate (Boreal) biogeographical regions. Thus conditions for species associated with Mediterranean climates could improve, whilst species associated with temperate climates may decrease. The potential for colonisation by new species will be limited by the fact that Jersey is an island and by fragmentation of semi-natural habitats locally. Furthermore, the rate of climate change predicted exceeds the rate at which ecosystems are capable of change.

These predictions underline the importance of allowing wildlife as much flexibility as possible by preserving and enhancing the Island's biodiversity and by reversing the trend towards fragmentation .

Transport - Growth in road transport has a significant effect on biodiversity. As well as new road construction, overcutting of roadside vegetation and culverting of roadside streams significantly damage wildlife habitats. Management of roadside verges also has an impact on species viability. The fragmentation of habitats by roads, combined with overcutting of verges affects both the potential range of a species and its breeding success. Increase in the size of the airport and harbour also diminishes diversity by destroying habitat.

ARTICLE 9 OF THE CONVENTION ON BIOLOGICAL DIVERSITY SAYS: EX-SITU CONSERVATION

Each Contracting Party shall, as far as possible and as appropriate, and predominantly for the purpose of complementing in-situ measures:

- (a) Adopt measures for the ex-situ conservation of components of biological diversity, preferably in the country of origin of such components;
- (b) Establish and maintain facilities for ex-situ conservation of and research on plants, animals and microorganisms, preferably in the country of origin of genetic resources;
- (c) Adopt measures for the recovery and rehabilitation of threatened species and for their reintroduction into their natural habitats under appropriate conditions;
- (d) Regulate and manage collection of biological resources from natural habitats for ex-situ conservation purposes so as not to threaten ecosystems and in-situ populations of species, except where special temporary ex-situ measures are required under subparagraph (c) above; and
- (e) Co-operate in providing financial and other support for ex-situ conservation outlined in subparagraph (a) to (d) above and in the establishment and maintenance of ex-situ conservation facilities in developing countries.

Recreation and Tourism - The natural resources of the Island are of great value for recreation and tourism. Although perhaps not a major threat to biodiversity, pressure on valuable sites can lead to localised damage and disturbance of species. Noisy activities can also destroy the tranquillity of areas. Noisy, disruptive and damaging activities must be carefully managed.

Land Use Planning - Development has a direct impact on biodiversity when it damages or destroys wildlife habitats. Sustainable development requires the balancing of the requirements of human activity with the needs of the environment. It should be States' policy to make effective use of derelict or underused land in urban areas. Essential development work should take into account urban open space, which has value as wildlife habitat.

Some key issues are:

- a) How to ensure that development does not adversely affect environmental resources, so that where new development must take place, loss of biodiversity is avoided, reduced to a practical minimum or reversed.
- b) How to enhance biodiversity in existing open spaces and new developments.

CONSERVATION ISSUES

In-Situ/Ex-Situ Conservation - "Ex-situ conservation" means the conservation of components of biological diversity outside their natural habitats. "In-situ conservation" means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties. In accordance with Article 9 of the Convention on Biological Diversity, ex-situ measures shall be applied 'predominantly for the purpose of complementing in-situ measures'. Ex-situ conservation measures will not be used unless there is strong evidence that the species concerned is in serious decline and in-situ measures are unlikely to address the decline.

Alien Species - These may threaten ecosystems, habitats and species and then have to be controlled or eradicated in accordance with Article 8 (i) of the Convention on Biological Diversity, Article 11 of the Bern Convention, and Article III (4c) of the Bonn Convention. The deliberate release into the wild of imported species is prohibited under Article 15 of the Conservation of Wildlife (Jersey) Law 2000. The variety of terms used to describe species introduced deliberately or inadvertently by humanity such as 'exotics', 'introduced', 'alien', and 'feral' are often used interchangeably, leading to confusion. The conclusions of a conference in 1995 reported by Holmes and Stroud in *British Birds* which discussed this matter are adopted by this strategy and summarised as follows:

- The origins of species are described by using the terms 'alien', 'exotic', or non-native.



ARTICLE 14. THE CONVENTION ON BIOLOGICAL DIVERSITY IMPACT ASSESSMENT AND MINIMIZING ADVERSE IMPACTS

1. Each Contracting Party, as far as possible and as appropriate, shall:

- (a) Introduce appropriate procedures requiring environmental impact assessment of its proposed projects that are likely to have significant adverse effects on biological diversity with a view to avoiding or minimizing such effects and, where appropriate, allow for public participation in such procedures;
- (b) Introduce appropriate arrangements to ensure that the environmental consequences of its programmes and policies that are likely to have significant adverse impacts on biological diversity are duly taken into account;
- (c) Promote, on the basis of reciprocity, notification, exchange of information and consultation on activities under their jurisdiction or control which are likely to significantly affect adversely the biological diversity of other States or areas beyond the limits of national jurisdiction, by encouraging the conclusion of bilateral, regional or multilateral arrangements, as appropriate;
- (d) In the case of imminent or grave danger or damage, originating under its jurisdiction or control, to biological diversity within the area under jurisdiction of other States or in areas beyond the limits of national jurisdiction, notify immediately the potentially affected States of such danger or damage, as well as initiate action to prevent or minimize such danger or damage; and
- (e) Promote national arrangements for emergency responses to activities or events, whether caused naturally or otherwise, which present a grave and imminent danger to biological diversity and encourage international cooperation to supplement such national efforts and, where appropriate and agreed by the States or regional economic integration organizations concerned, to establish joint contingency plans.

- The process by which establishment in the wild has occurred is described by using the terms ‘feral’, ‘introduced’ and ‘re-established’
- The outcome of the process, which results in wild self-sustaining populations, is more appropriately described by the all-encompassing term ‘naturalised’. The term ‘naturalised’ should be accompanied by a geographical reference.

A qualifier explaining the origin of a species produces four categories:

- **Naturalised Feral:** a domesticated species established in the wild. Keeping in captivity does not necessarily constitute domestication. The species must undergo some change in genotype, phenotype or behaviour in captivity.
- **Naturalised introduction:** established species, which would not occur without introduction by man.
- **Naturalised re-establishment:** a successful re-establishment of a species in areas of former occurrence. (The term re-introduction implies that the species was introduced in the first place. Re-established is thus favoured over re-introduction).
- **Naturalised establishment:** establishment of a species which occurs but does not breed naturally in a given area, e.g. a vagrant, passage migrant or winter visitor.

The broad definition of wild species in The Conservation of Wildlife (Jersey) Law 2000 is deliberate. The above explication is intended to provide guidelines in dealing with any eventualities which may arise when decisions are made on this difficult topic.

EIA PROCEDURES IN JERSEY

Under article 6 of the Island Planning (Jersey) Law 1964 (as amended) any development proposal that may threaten or cause damage to the environment (including biodiversity) is subject to a full EIA proposal to EC standards. Applying to all developments to the territorial limits of the Island, the process ensures that all possible measures are taken to ensure that any potential risks to the environment are prevented, reduced or mitigated. The process provides for public involvement.

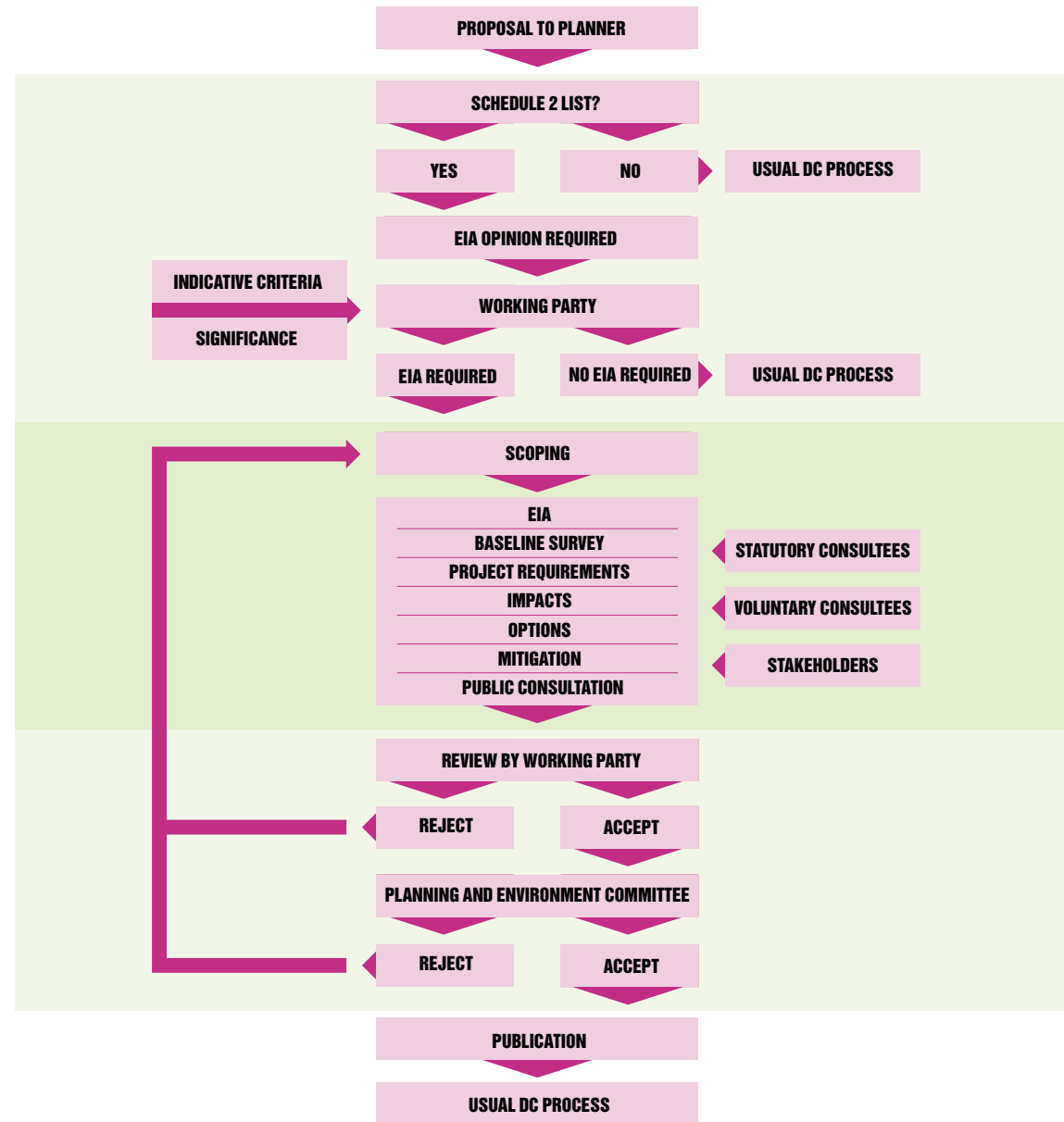
Role of Environmental Advisor

The Environmental Advisor is responsible for providing advice at strategic policy level to ensure that the impact of any policies, which might affect the biodiversity and environment of the Island, are taken into account.





Fig. 4.1.
The EIA Process



International relations

The International Relations and Policy Officer has the responsibility for promotion, notification, exchange of information and consultation on activities which are likely to significantly affect adversely the biological diversity of other states.

Contingency planning

Contingency plans to minimise the impact of accidents, such as oil spills, are co-ordinated by the Emergency Planning Officer and by the Emergencies Council.

OPPORTUNITIES FOR ENHANCING BIODIVERSITY

Water

- Encourage effective resource management.
- Control contamination.
- Encourage sympathetic management of watercourses to produce variety of bankside habitats

Transport

- Encourage alternative forms of transport such as walking and cycling and better public transport.
- Improve management of roadside banks and hedges

Farming

Develop agri-environment schemes which:

- Encourage farming and land management practices that enhance locally characteristic diversity of flora and fauna
Continue to improve crop management to minimise the use of fertilizers and pesticides.
- Encourage technological and other innovation to develop environmentally sympathetic farming methods.
- Encourage greater diversity on the farm, for instance by maintaining hedgerows.

Urban

- Create new urban wildspace in urban areas by appropriate management of urban parks, road verges and other open spaces.
- Encourage householders to enhance the biodiversity of their own gardens.

Coastal Zone

- Consideration of the adoption of soft engineering approaches to coastal defence including where appropriate setting back the line of defences.
- Development of a coastal zone management strategy including measures for protection of marine areas.
- Co-ordination of organisations responsible for various aspects of inshore waters, the shoreline and coastal fringe.

Marine

- Integrate environmental concerns into fisheries policies.
- Balance fishing effort against the natural ability of fish stocks to regenerate.



Section 5

Introduction

Habitats

Species

The Identification of Key Species

Limitations

Species Action Plans

Sample Action Plan

Habitat Statements

In-situ conservation

ARTICLE 8 OF THE BIODIVERSITY CONVENTION: IN-SITU CONSERVATION

Each contracting party shall, as far as possible and appropriate:

- a) establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity;
- b) develop, where necessary, guidelines for the selection, establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity;
- c) regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use;
- d) promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;
- e) promote environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering protection of these areas;
- f) rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, inter alia, through the development and implementation of plans or other management strategies;
- g) establish or maintain means to regulate, manage or control the risks associated with the use and release of living modified organisms resulting from biotechnology which are likely to have adverse environmental impacts that could affect the conservation and sustainable use of biological diversity, taking also into account the risks to human health;
- h) prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats and species;
- i) endeavour to provide the conditions needed for compatibility between present uses and the conservation of biological diversity and the sustainable use of its components;
- j) subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices;
- k) develop or maintain necessary legislation and/or other regulatory provisions for the protection of threatened species and populations;
- l) where a significant adverse effect on biological diversity has been determined pursuant to Article 7, regulate or manage the relevant processes and categories of activities: and
- m) co-operate in providing financial and other support for in-situ conservation outlined in subparagraphs (a) to (l) above, particularly to developing countries

INTRODUCTION

The accelerated pace of development and the intensification of farming in the Island since the beginning of the century have undoubtedly had a severe effect on the Island's wildlife. Construction of seawalls, both before and during the Occupation has destroyed coastal marshland habitats and their associated species. Many once common species are now apparently on the verge of extinction.

Targets for the preservation of our most threatened and declining species need to be developed if we are to conserve and enhance their populations and ranges. Species are dependent on the habitats they occupy, so targets for the quality and range of wildlife habitats and ecosystems in the Island should also be developed.

In line with UK strategy, both species and habitats are used as starting points. Habitat protection and management cover many species, and habitat action plans address this. Some species however require their own action plans either because they are found in a few small sites or because they are specially threatened by human activity. The targets reflect the judgement of local experts in the light of available knowledge. They usually represent the best estimate of an achievable but challenging target rather than optimum population or area.



Section 1 described the key international obligation with which the Island wishes to comply and the local enabling legislation in place to achieve this. This section details the measures that Jersey is taking to comply with Article 8.

HABITATS

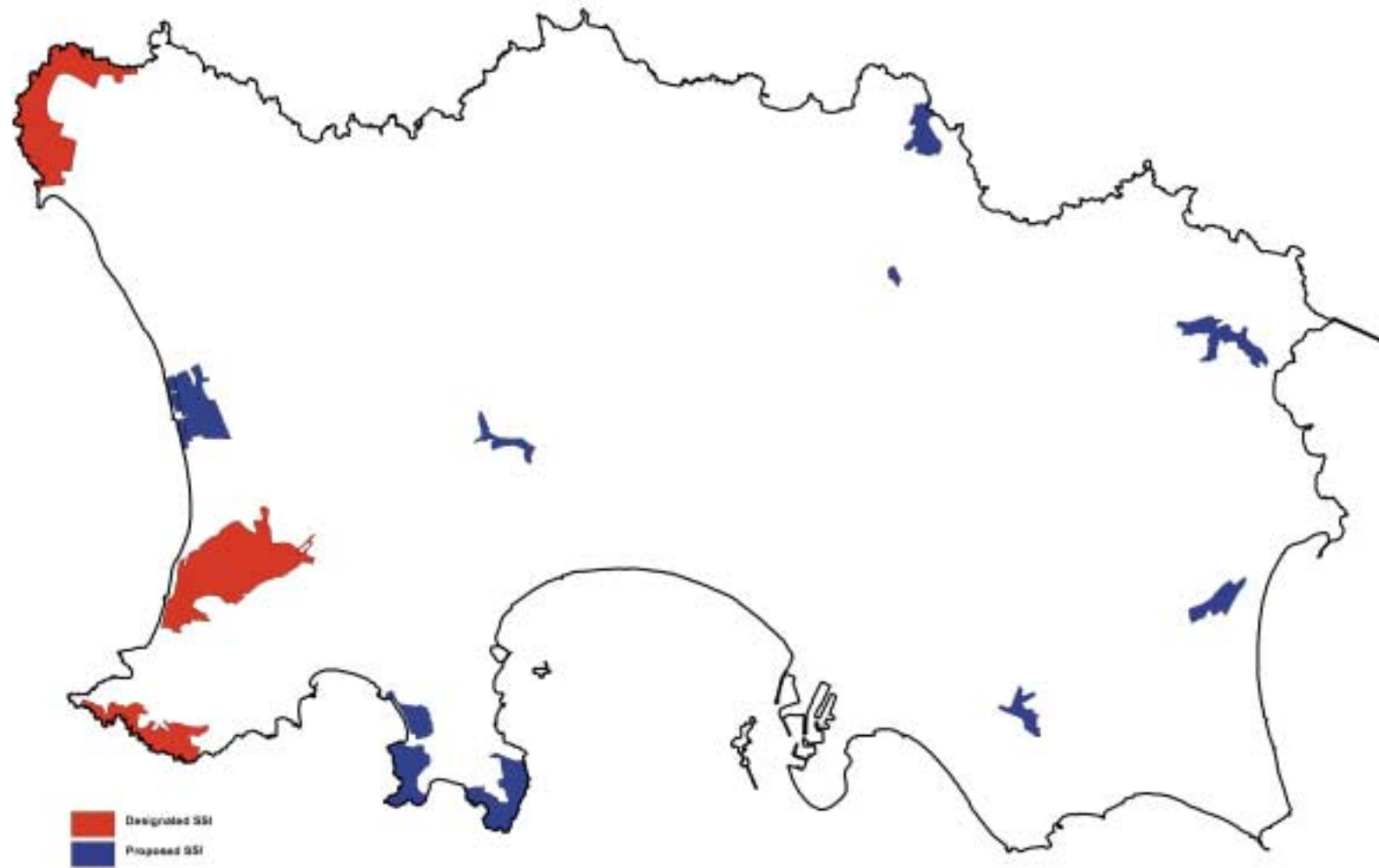
Designation of Specially Protected Areas

Guidelines for the designation of specially protected areas, SSIs arise from the requirements of Article 9 of the Island Planning (Jersey) Law 1964 (as amended):

- Designation of sites is carried out by order of the Planning and Environment Committee.
- A designation proposal which includes
 - the botanical, zoological and other interests of the area,
 - a justification for the boundary and
 - a list of all species to be protected by the designation to be prepared for all sites.
- An accurate survey of the boundaries of the sites is carried out.
- Notices of intention of designation are served and a 28-day period is required for consultation.
- The order is made by the Planning and Environment Committee



Fig. 5.1.
Map showing existing and proposed SSIs.





Designations other than SSIs

The designation of the south-east coast of Jersey as a Ramsar site will protect the internationally important wetland site (see map). An extensive consultation process ensured the continuation of traditional uses of the intertidal zone and involved the stakeholders in the determination and adoption of the best practices for the conservation and sustainable use of the biological diversity of the area.

Maintenance of Viable Populations and Protection of Ecosystems - the Red Squirrel

Over time, depletion in genetic variation will occur in small closed populations. The process of “genetic drift”, the loss of genetic variation can lead to increased susceptibility to disease and an inability to adapt to climatic variation.

The Jersey population of red squirrels (*Sciurus vulgaris*) is probably the result of several introductions from the south of England and from France (Le Sueur 1976) which occurred about 130 years ago. It is probable, given the small (c.400) present population that the original introductions numbered tens rather than hundreds. It is also probable that the introduced squirrel were taken from the same population, increasing the chances that they were related. Inbreeding, the mating of related individuals, can cause various defects including higher rates of birth defects, higher mortality, lower fecundity and reduced mating ability. Populations suffering from “inbreeding depression” may exhibit depressed population growth rate and a reduction in ability to adapt to changing environments; the latter is especially important in the light of the speed of modern environmental change. In an attempt to maximise the possibility of preserving the genetic diversity of Jersey’s squirrel population, the Red Squirrel Tree Planting Project has been initiated.

There are two main squirrel population centres in the Island, one in the south-west and one in the north-east. Studies have shown that animals in these centres have different genetic makeup. (Magris 1998). The project aims to create a corridor connecting these two centres, thus maximising the possibility of unrelated squirrels meeting and mating. It will also help to increase the squirrel population by increasing and connecting available habitat. Phase I was intended to consolidate connections between the St Brelade’s populations and the populations at Railway Walk, St Peter’s Valley and Waterworks Valley. The Project is collaboration between farmers and landowners in the area who will do the planting, ESU and PSD. Later phases will eventually provide connections across the Island.

Habitat Restoration

Habitat restoration carried out by the Environmental Services Unit in the recent past has shown that appropriate management or re-creation of habitats can lead to the recovery of species. Two such species are Brown Galingale (*Cyperus fuscus*) (see case study) and Jersey Forget-me-not (*Myosotis sicula*). This work

demonstrates that recovery plans, properly targeted, can be very effective in enhancing and conserving our native species.

The Effects of Biotechnology

In a recent resolution the States of Jersey agreed to take all possible care to designate and maintain the Island as free from the growing of genetically modified organisms. Research into genetic modification and on transgenic potatoes was also suspended.

HABITAT RESTORATION - A CASE STUDY

Le Ouaisné Pond and Brown Galingale (*Cyperus fuscus*)

C. fuscus disappeared from Jersey around 1832. It reappeared some 160 years later, in 1989, when Le Ouaisné Pond was dug out to prevent Common Reed, *Phragmites*, from taking over the area. The emergence of bare sand provided suitable conditions for seed in the seed bank to germinate, having been brought to the surface by digging. From this chance 'experiment' it is now known that *C. fuscus* seed probably has longevity of several decades. In this first year only one

plant was found and by 1990 the number had risen to 50 individuals. This was then followed by a few years of absence, then limited appearance, until in 1996 and 1997 when at least 3000 plants were observed in each year.

C. fuscus is located in Le Ouaisné Pond on the east side of Le Ouaisné Common, Jersey. The area has a lowered water table, which allows the pond and the dune slacks towards the middle of the common to dry out early in the year.



SPECIES

Identification and Preservation of Key Species

Species identified by application of the criteria discussed below are the subject of action plans being drawn up with the help of students on the University College London Conservation Course.

Action Plan Formats

Action Plans should be presented in a no-nonsense way so they can be interpreted easily by conservation practitioners - the people who ultimately will ensure the species survival in the Island. A number of formats for Action Plans have been proposed. A model Action Plan format is presented in Biodiversity: The UK Action Plan (1994). This format is very comprehensive in its nature but lacks the clarity and concise presentation required to ease the work of the conservation practitioner. The Biodiversity Steering Group proposed a more condensed Action Plan format in 1995. This basic format has now been modified through the practical experience of implementing Species Biodiversity Action Plans (BAPs). Recommendations from these experiences were summarised by Simonson in 1997 and it is from these recommendations that the Species Action Plan format currently in use with English Nature has been drawn.

Identification, Preservation and Enhancement of Key Habitats

A Phase I Habitat survey has been completed in September 1999 which provides a comprehensive list of habitats in the Island. Habitat action plans will be prepared for the following key habitats.

Key Habitats See fig. 3.1.

Mixed woodland

- Ancient and/or species rich hedgerows

- Wet meadows

- Maritime heath (north and south-west)

- Maritime cliff and slope

- Coastal sand dune (including fixed dunes with herbaceous vegetation, dune heath, dune scrub and strandline vegetation)

- Coastal vegetated shingle

- Intertidal habitats

- Shallow water sandbanks covered by seawater at all times

- Mudflats and sandflats not covered by seawater at low tide

- Rocky reefs



These plans will be linked to site management plans, which are being prepared as part of the ongoing work of

the countryside management team. The first site management plans to be prepared are those for designated SSIs. (Les Blanchés Banques, Les Landes and La Lande du Ouest).

THE IDENTIFICATION OF KEY SPECIES

The identification of criteria to select key species is the first step. Except where inapplicable to Jersey, the criteria identified follow those suggested by the UK Biodiversity Steering Group.

- World status - species listed by the IUCN or other sources as globally threatened
- Local decline rate
- Rapidly declining >50% decline in range / numbers in last 25 years
- Declining 25-50% decline in range / numbers in last 25 years
- UK status - species listed in the British red data book or Biodiversity Steering Group short, middle and long lists
- French status - species listed in the French red data book
- International Conventions- species listed in EU Birds Directive or Habitats Directives, the Bern, Bonn or CITES convention or under the Conservation of Wildlife (Jersey) Law 2000



This approach produces a long list of species. The short list, drawn from the long list applies two more criteria:

- Local threat
- Local rarity:
- Rare - currently occurs in 1-5 squares
- Scarce - currently occurs in 6-15 squares
- Common - currently occurs in 16 squares or more
- Local distinctiveness - includes potential flagship, keystone and typical species. This criterion is intended to add extra weight to species already identified under other criteria

From the short list, a list is drawn up containing species for which action plans will be prepared. The criteria applying to the action plan list are:

- substantial decline in recent years
- local rarity
- covered by relevant Conventions, Directives and legislation
- high popular appeal also meeting one of above criteria

An Example of the Process - Plants

This example is included since the only list completed so far is the list for vascular plants. Many of the comments apply to other species groups and indicate the problems in compiling lists in the light of the very limited information available.

A long list of rare plants in Jersey, prepared in consultation with the Botany Section of the Société Jersiaise was



the starting point for the compilation of a species shortlist. This contained species that were, in the authors' view, either rare (no strict definition given) or rapidly declining in Jersey. It was initially written as a guide for species to be included in the proposed Conservation of Wildlife (Jersey) Law 2000.

Where not already on the list, species, or subspecies, were added that were;

- a) Listed in Red Data Books for Britain and France (Perring & Farrell 1977),
- b) Listed in the Biodiversity Steering Group short, middle or long lists,
- c) Absent from the U.K.

Also added to the list were species found to have declined significantly by the Société Jersiaise, Botany Section's re-mapping scheme. Nine species considered by local botanists to have declined since the Island's flora was mapped over a ten year period in the 1960s have been remapped in the past four years. The current distribution of these species can thus be compared with distribution in the 1960s and the extent of any decline identified.

Species, or subspecies, that were known or probable introductions or garden escapes were removed from the list. The Biodiversity Convention placed a great emphasis on the conservation of states' native species (Wynne et al, 1995). The following categories are recognised:

- a) Only known from occasional records,
- b) Not known in Jersey in the last 25 years
- c) Only identifiable by an expert. (This includes groups such as *Callitriche spp.* where the aggregate is common but the status of individual species is unknown (Le Sueur, 1984)).

178 species thus form a list of species of conservation concern in Jersey. These are matched against the criteria and the shortlist of 15 priority species for conservation action is drawn from this. World status is taken as the most important category followed by species known to have rapidly declined in the last 25 years, in line with the system used in the UK. A combination of the other criteria is used to prioritise further. Rarity, on the whole, is seen to be less important than decline as many species, especially on a small island such as Jersey, have such specific requirements that they will only ever be found in a small number of sites and are thus less appropriate targets for conservation action.

LIMITATIONS

It must be stated most strongly that due to a lack of data (see below), beyond those species internationally threatened, the process of selecting species for priority action is highly subjective. The shortlist is not definitive and with improvements in knowledge different priorities are likely to be recognised.

Whilst the best available data are all that can be used to compile the shortlist, there are many shortcomings with this data, some of which are described below:



- a) The only documented information on the status of plant species in Jersey is Le Sueur (1984). While more recent records for a few, selected species appear in the annual report of the Botany Section of the Société Jersiaise (Annual Bulletin Société Jersiaise, 1985-1996), most data are now out of date.
- b) Data on species declines are few. Re-mapping has only been carried out for a small number of species.
- c) Further caution is necessary due to slight differences in the grid squares used (the 1990s maps use the now completed OS 1km grid squares instead of the 1.15km squares used by LeSueur, 1984).
- d) The causes of the decline of several species are not fully understood.
- e) The use of presence / absence in a number of squares to assess species' status takes no account of species that are declining or rare within each square.

A similar process has been adopted to compile lists of other species (see above). All plans and lists are based on the best available information and will need regular review. Populations of all long list species should be monitored where possible. Action Plans should be prepared for the remaining species on the short list by 2005 and work on refining the lists should be ongoing (See the section The Way Forward).

SPECIES ACTION PLANS

Species Action Plans are prepared under the following headings and sub-headings (a similar approach is used for habitats):

Current Status

Biological and ecological description of the species.

Information on habitat, historical and current range, numerical status and changes in abundance over the last 25 years.

Sites and habitat types species inhabits in Jersey.

Statutory importance of the species e.g. present on the long list of Biodiversity: The UK Steering Group Report - Volume 2 and any legal protection afforded to the species.

Current Factors Causing Loss or Decline

'Current' refers to factors that have occurred over the last 25 years. Factors include those that are preventing recovery as well as those that are still contributing to losses. Without scientific studies it is often impossible to say whether a particular factor has been a major cause in the decline of the species, and often the factors listed are those that the author believes could be the cause, but without evidence. Factors are listed in order of priority.





Current Action

Current conservation action and monitoring or research that is being undertaken on the species.

Action Plan Objectives and Targets

Lists the objectives of the Action Plan, not the actions by which these will be achieved.

Targets, of what to aim for, and by when, are included in this section and it is these by which the success of the Action Plan will be measured.

It is recommended that the targets be quantitative in terms of population numbers and range (Wynne et al. 1995), although this may not always be possible.

Dates set for targets to be carefully considered, not arbitrary.

A five-yearly basis is recommended for reporting on outcomes.

Targets should be SMART - Specific, Measurable, Achievable, Realistic, Timed.

Proposed Action with Lead Agencies

Actions should address the factors listed in section 4.

Organisations listed as being responsible for undertaking the recommended actions should be the statutory bodies and NGOs.

Actions are presented under the following headings:

Policy and Legislation

Site Safeguard and Management

Species Protection and Management

Advisory

Future Research and Monitoring

Communications and Publicity

Links with other Action Plans - actions for this species which will also benefit other species with Biodiversity Action Plans

It should be recognised that it is difficult to use these targets to place accountability on to conservation practitioners due to natural variations in population sizes in nature. It is better to assess their performance by asking if they implemented all the recommended actions.

SAMPLE ACTION PLAN

Species Action Plan for *Cyperus fuscus* - Brown Galingale

CURRENT STATUS

- *Cyperus fuscus* is found on bare, nutrient rich mud with a high pH that is seasonally exposed on the margins of ponds and ditches. It benefits from some soil disturbance and plants are able to withstand up to one week of inundation by water before death.
- *C. fuscus* is located in Le Ouaisné Pond on the East Side of Ouaisné Common, Jersey.
- Brown Galingale is currently known from one site in Jersey and from six sites, all in the south of England. Outside of the UK *C. fuscus* is widespread, where it ranges across Europe, adjacent parts of Africa and much of Asia.
- Brown Galingale is listed on the Long list of *Biodiversity: The UK Steering Group Report* (1995) as 'internationally threatened 1' (Unfavourable conservation status in Europe). It occurs in 1-5 ten-km squares in Great Britain. *C. fuscus* is 'rare' in Jersey.

CURRENT FACTORS CAUSING LOSS OR DECLINE

- Loss of sites.
- Habitat degradation.
- Loss of interconnectivity between pond and ditch sites may have limited the ability of *C. fuscus* to disperse.
- *C. fuscus* exists at a single site, Ouaisné, meaning there is a high risk of a chance event eliminating the species from the Island.
- Run off water from the road feeds directly into Ouaisné Pond. This provides two threats: long term accumulation of toxic chemicals in the pond and the possibility of a major pollution event taking place on the road destroying *C. fuscus*.
- Changes in the water level at Ouaisné could result in the habitat becoming unsuitable. Grazing of *C. fuscus* by rabbits.
- *C. fuscus* is at risk from grazing ducks.
- Overgrowth of newly germinated seedlings by other species such as *Mentha aquatica* and *Phragmites australis*.
- There may be a lack of sufficient disturbance at the site.
- Le Ouaisné has been afforded no statutory site protection.

CURRENT ACTION

- Seed from four English sites is held at the Millennium Seed Bank, Wakehurst Place and seed and plants from one other are held at Bristol Botanic Gardens.
- Monitoring of all sites takes place annually.
- PLANTLIFE collates monitoring data from all sites into an annual report.
- The extent of *Phragmites* is monitored annually. Reeds are cut back to a marked level when they start to encroach on the pond.

SAMPLE ACTION PLAN

Species Action Plan for *Cyperus fuscus* - Brown Galingale - continued

ACTION PLAN OBJECTIVES AND TARGETS

- Establish an *ex-situ* programme to maintain the genetic diversity of *C. fuscus* in Jersey, by 2000.
- Maintain and enhance the population at Ouaisné by 2001.
- Introduce a population to a suitable new site and manage this site for *C. fuscus* by 2003.
- Provide statutory or active site protection at Ouaisné by 2004.
- Commence research into the impacts of rabbit and duck grazing on the fruiting success of *C. fuscus* at Ouaisné by 2003.

PROPOSED ACTION WITH LEAD AGENCIES

Policy and Legislation

- No action proposed.

Site Safeguard and Management

- Submit Le Ouaisné Pond and Le Ouaisné Common for designation as a SSI, by 2004 (ESU).
- Manage water levels at Ouaisné, ensuring that they are maintained within the parameters necessary for the species long-term survival, by 2000 (CMT).
- Introduce mild annual summer disturbance by 2001 e.g. trampling or drive a vehicle across the site once, (CMT).
- Divert run off water from the road so it does not flow into the pond at Le Ouaisné by 2006, (ESU to negotiate with the relevant States Authority).
- Ensure public access to the pond is not increased, (CMT).

Species Protection and Management

- Bring seedlings, from Ouaisné, into cultivation by 2000, (ESU).
- Collect seeds from Ouaisné and send them to the Millennium Seed Bank at Wakehurst Place by 2000, (ESU).
- Introduce *C. fuscus* to a new site, by 2003 (ESU and CMT). Monitor the new population, (ESU).

Advisory

- No action proposed.

Future Research and Monitoring

- Continue to monitor the population at Ouaisné annually and monitor the new population when introduced (ESU and CMT).
- Commence research into the impacts of rabbit and duck grazing on the fruiting success of the population at Ouaisné, by 2003 (ESU). Contact English Nature for advice on the experimental procedure that should be followed.
- Monitor research being undertaken in Britain on other aspects that influence the ecology of *C. fuscus*, (ESU).

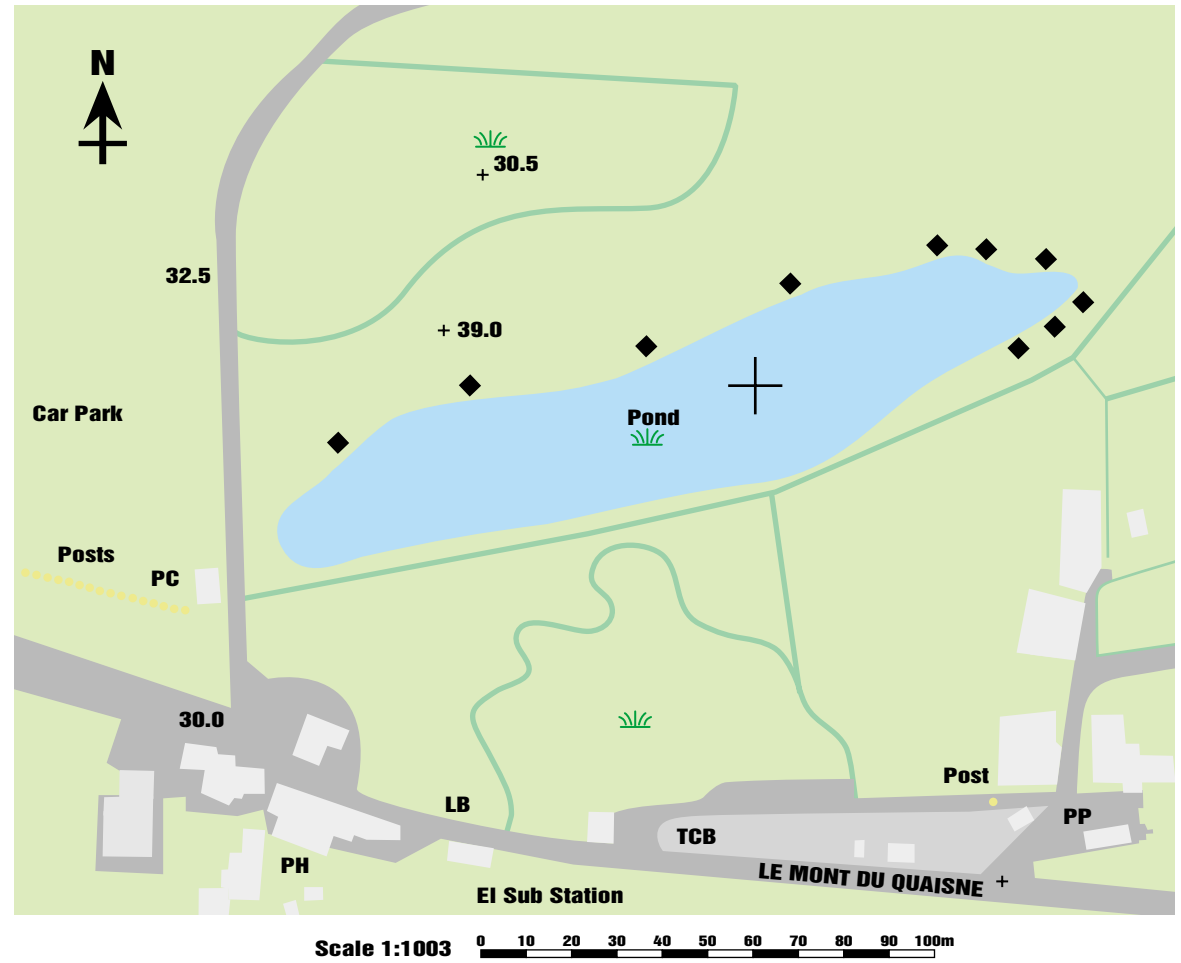
Communications and Publicity

- Send the monitoring data collected on *C. fuscus* at Ouaisné to PLANTLIFE annually (ESU).

Links with other Action Plans

- *C. fuscus* occupies bare mud habitats as do the BAP species *Elatine hexandra* and *Baldellia ranunculoides*. Management at Ouaisné for *C. fuscus* would benefit these species should they also appear.

Fig. 5.2.
Location Map of *Cyperus fuscus*



HABITAT STATEMENTS

A brief habitat statement has been prepared on the broad habitat types to inform policy and action. The habitat types to have been defined so as to be easily understood, unambiguous, and recognisable by a broad range of people.

The Identification of Key Habitats

The following criteria have been adopted to select key habitats. Costed Action Plans will be prepared for those habitats which satisfy one or more of the following criteria:

- Habitat for which Jersey has international obligations. e.g. listed in the EC Habitats Directive
- Habitats which are rare or important in the British Isles
- Habitats that are at risk in Jersey because of their rarity or vulnerability or high rate of decline in the last 20 years.
- Habitats that are important in Jersey because they provide a refuge for key species.

Habitat Action Plans - Format

Habitat action plans will be prepared under the following format:

Current Status

A physical description of the habitat including NVC or CORINE classification where appropriate.

A brief description of the biological importance of the habitat including notable species present and any links with species action plans

Current factors affecting the habitat

'Current' refers to factors that have occurred over the last 25 years. Factors considered to affect the habitat are listed in order of importance.





Current action

Legal Status - The current legal status of the habitat.

Management, research and guidance - Any management agreements, incentive grants, research or advice relating to the habitat.

Action plan objectives and proposed targets

Lists the objectives and targets of the plan, not the means of achievement.

The success of the action plan is measured against the targets.

Where possible quantitative targets will be set in terms of areas of habitat.

Reporting on outcomes will be on a five-yearly interval.

Proposed action

The methods by which the targets set in section 5.

Agencies responsible for targets are listed.

Actions are listed under the following headings:

Policy and Legislation

Site safeguard and management

Advisory

International

Future research and monitoring

Communication and Policy

Costings

Costs include any agri-environmental grants and average resource costs over 5 years. Cost estimates are based on previous experience and are based on costs of specific actions within the plans. Costings are general and could change if the assumptions made in the costing process prove to be under- or over-estimates





Section 6

Introduction

Data Requirements

The Jersey Environmental Database

Monitoring Climate Change

Habitat Classification

Information and data

ARTICLE 7 OF THE CONVENTION ON BIOLOGICAL DIVERSITY: IDENTIFICATION AND MONITORING

“Each Contracting Party shall, as far as possible and as appropriate, in particular for the purposes of Articles 8 to 10:

- a) Identify components of biological diversity important for its conservation and sustainable use having regard to the indicative list of categories set down in Annex I;
- b) Monitor, through sampling and other techniques, the components of biological diversity identified pursuant to subparagraph (a) above, paying particular attention to those requiring urgent conservation measures and those which offer the greatest potential for sustainable use;
- c) Identify processes and categories of activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity, and monitor their effects through sampling and other techniques; and
- d) Maintain and organize, by any mechanism data, derived from identification and monitoring activities pursuant to subparagraph (a), (b) and (c) above.

INTRODUCTION

It is to Jersey’s credit that much information and data on biodiversity has been collected in the past. The Société Jersiaise has an impressive amount of information, collected over the years in line with its stated objective of “the study of the history, the ancient language, the geology, the natural history and the antiquities of the Island”. Since the formation of a States’ conservation section in IDC in 1979, surveys have been carried out on most of the important habitats of the Island. Plant lists and habitat maps have been compiled. Unfortunately much of the work is not in an easily accessible form which would assist decision making on habitat management, species protection and land-use.

The collection, organisation and storage of biological data and information need to be improved. The opportunity to do this is provided by the need to comply with Article 7 of the Convention and the requirement to monitor progress on the implementation of Directives and Conventions. It is anticipated that once the mapping system has been adopted and the new Recorder 2000 is on line, it will be possible to make progress in this area. Consideration will be given to the issues of access to information and the intellectual property rights. It is important that data relating for instance to the location of especially rare plants or breeding birds is not immediately available to everyone. Existing links with data collectors in the Island will be strengthened.

The requirement under the Biodiversity Convention to identify important components of biodiversity for data collection and monitoring provides a framework into which requirements from a number of EC directives and other conventions fit. Table 6.1 shows the requirement to collect data and information relevant to biodiversity under various EC directives and the Convention itself. Table 6.2 shows the current status of surveillance and monitoring for the main groups of species in Jersey.

DATA REQUIREMENTS

The concept of biodiversity and the need to create an Island Strategy within the framework of the international Convention has drawn attention to the amount of work that has been done to date on this topic. In addition to work addressing the requirements of Article 7 of the Convention and the European dimension mentioned earlier, other important work has been completed during the preparation of the draft of the Island’s Conservation of Wildlife law. It deals with its schedules of protected species, the EU Birds and Habitats Directives and the international conventions, such as Bern, Bonn and Ramsar. The principles outlined in 2.4 above and the formulation and implementation of the Island Plan also require a fuller knowledge of species and habitats throughout the Island

The achievement of the broad aims, specific objectives and precise targets in States’ policy-making across the board depends to a large extent on data and information. The management of change requires knowledge of the existing position and what is changing. This gives understanding of the factors causing change, and identification and evaluation of the action needed to deal with them. Structured monitoring is a requirement of,

for example, the UK action plan. Basic requirements are:

- a) Establishment of a baseline;
- b) Regular and systematic monitoring to detect change or progress towards specific targets; and study of the reasons for change, especially undesirable change in order to inform action.

There is also a need for broader surveillance programmes which will allow the identification of important new trends such as declines in farmland birds, which in the UK have declined by as much as 50% in the last decade. The study of such trends would lead to action through operational programmes.

The quality of the decision taken is greatly influenced by the quality of the information, its relevance and the ease of access to it. As noted above, Jersey has a quantity of data on species and habitats, but it needs organisation to improve its accessibility. The first priority is the accessibility and co-ordination of existing data. Information support is needed for several areas including:

- planning applications;
- EIA decision making;

Due to lack of resources, it has not been possible to validate table 6.2 fully. However, the table does indicate that there are groups of species that are not covered by the required level of surveillance and monitoring. It will be necessary to give attention to the high costs of formal monitoring systems and the length of time before results can be fed into action. There is a need to prioritise on a more formal basis than at present, and to recognise that the lists of species are far from complete.

THE JERSEY ENVIRONMENTAL DATABASE

Following a request in the 1995 Strategic Policy Report, Alison Barnes (1996) made recommendations on :

- the generation of habitat and species data;
- monitoring habitat change;
- technology, including use of Recorder software system;
- standardisation/verification procedures;
- legal protocol;
- use of volunteers;



- staff requirements and finance, and
- inputting marine and non-biological data (such as geological) on the database and aiming at accreditation by the UK National Biodiversity network.

The recommendations were adopted and funding was acquired and it is still important to appoint a full-time project officer. And a Phase I habitat survey was completed but lack of staff has seriously hindered the implementation of the recommendations.

Fieldwork for Le Sueur's *Flora of Jersey* began in the 1960s and is somewhat out of date. Furthermore the spatial references in the flora use a grid using latitude and longitude. Each square is a rectangle half a minute of latitude by one minute of longitude, giving an area of about 1.15 square kilometres. Modern recording methods use a kilometre square based on the UTM grid. If resources were available it might be possible to scan the entries in the flora for individual species and convert their location to a UTM grid, although inaccuracies would be introduced. This data could then be compared with modern records to give comparative data on the status of species.

Surveyors from the Société Jersiaise are using subjective methods to identify species that are decreasing in range. It is partly this data that is used to compile threatened species lists. This study is combined with data generated by workers employed by the ESU and before that the Conservation Department of the IDC. This data spans a period of nearly 20 years.

A Phase I habitat survey has been completed using a combination of remote sensing (analysis of satellite and aerial photography supported by ground truthing) and fieldwork. Phase II surveys of sites identified in Phase I as being of importance will define vegetation more precisely and will include surveys of animals and communities. Phase II information is used to justify the designation of SSIs and Ramsar sites and enough data has so far been generated to enable the designation or proposed designation of 12 terrestrial SSIs and one Ramsar site. Marine sites are less well covered, but a substantial amount of detailed information has been gathered on the south-east intertidal zone.



MONITORING

Baseline data on Jersey's habitats is now largely complete. It is recognised that the baseline data may not be representative, since all systems are subject to stochastic or cyclical change. A period of surveillance will be vital to ensure that the baseline is representative. Key components (components intrinsic to and vital to the ecological integrity of an ecosystem) of individual habitats will be identified as part of the development of a monitoring programme. The monitoring programme will also define specific methods, frequency of sampling and criteria for review and changes. A programme of resurveying will be initiated in 2005 to monitor gross habitat changes in size and quality. An interval between surveys of three years would be ideal. The resource commitments for such a programme would be considerable. Fig. 6.1. shows a schematic representation of the ideal monitoring strategy:



Fig. 4.
Schematic representation of ideal monitoring strategy (in Barnes 1996)

HABITAT CLASSIFICATION

Up to now the UK's National Vegetation Classification has been used in parallel with the European CORINE system. Biogeographically Jersey is part of Europe. This fact, combined with the small area and high diversity of Jersey's habitats, has made the use of NVC in the Island difficult. NVC is a vegetation classification. It relies on rigorous sampling by skilled field workers to generate data, which while producing consistent data, is fairly time consuming. The use of Domin values can be problematical and may not be consistent between surveyors. CORINE is a hierarchical habitat classification, which is based on European phytosociology. It is a 'quick and dirty' method, which can be used by non-specialists. CORINE is the system used to define habitats under the Europa 2000 scheme, and is thus more useful when setting the Island's habitats in a European context. The problem of comparing classification systems reflects the artificial nature of trying to divide a continuum of vegetation into distinct categories, especially in a small island where distinct communities can be crowded together. Data collection in the Island will be on a level, which will generally allow classification under the NVC. Since the collection of data is the most time consuming it is intended to run both systems in tandem where possible.

A computer mapping system is proposed that is user-friendly and will be accessible to naturalists, the Société Jersiaise and ESU staff.

Standardisation /Verification procedures - At present no real verification procedure exists. This issue will be addressed when the Biodiversity Review Panel is set up

Legal Protocol - Data entry will comply with The Data Protection (Jersey) Law, 1987.

Use of Volunteers - The proposed Biodiversity Review Panel will also investigate the possibility of using volunteers to input data. The natural history sections of the Société Jersiaise are actively investigating this but progress is slow.

Staff Requirements - It is hard to see how progress can be made on this project without the appointment of a full time project officer. It may be possible to employ temporary staff to input historical data, but without specialist supervision it is inevitable that serious errors will occur. Piecemeal development of the project will lead to more problems than it will solve.

Marine Data - Fairly comprehensive data has been gathered for the south-east coast during the preparation of the Ramsar designation for the area. Data are available for most of the rest of the shoreline, but, like terrestrial data, it needs to be collated, analysed and updated. Recorder 2000 will be used to help to produce a full dataset.

Non Biological Data - In order to provide centralised information, consideration will be given to including geological and other data in a linked system.

Table 6.1.
Requirements to collect data and information under various EC Directives and International Conventions

| REQUIREMENT FOR DATA AND INFORMATION | EC BIRDS DIRECTIVE | EC HABITATS DIRECTIVE | RAMSAR CONVENTION | BONN CONVENTION | BERN CONVENTION | BIODIVERSITY CONVENTION |
|-----------------------------------------------------------------------------------------|---------------------------|------------------------------|--------------------------|------------------------|------------------------|--------------------------------|
| REQUIREMENT TO GATHER INFORMATION ON | Wild Birds | Habitats and species | Wetlands and species | Migratory species | Threatened habitats | All components of biodiversity |
| MAINTAIN AND ORGANISE DATA | Yes | Yes | Yes | Yes | Yes | Yes |
| REQUIREMENT TO MONITOR | Bird population levels | Habitats and species | Wetlands and species | Migratory species | Threatened habitats | All components of biodiversity |
| COLLECT INFORMATION ON DESIGNATED SITES FOR CONSERVATION OF BIOLOGICAL DIVERSITY | SSIs | SSIs | SSIs | | | |
| DATA ON SUSTAINABLE USE OF BIODIVERSITY | Yes | Yes | Yes | Yes | Yes | Yes |
| DATA TO QUALIFY THREATS TO BIODIVERSITY | Yes | Yes | Yes | Yes | Yes | Yes |

Table 6.2.
Current Status of 'long list' Species Groups in Jersey

| GROUP | NUMBER OF SPECIES CURRENTLY ON LIST | NUMBER OF SPECIES WITH ACTION PLANS | NUMBER OF SPECIES OUTSIDE SSIs | NUMBER OF SPECIES MAINLY WITHIN SSIs | NUMBER OF SPECIES FOUND ISLANDWIDE | NUMBER OF SPECIES LACKING ADEQUATE STATUS ASSESSMENT | NUMBER OF SPECIES WITH SOME FORM OF ASSESSMENT PROGRAMME IN PLACE | NUMBER OF SPECIES WHICH ACTION PLANS EXIST OR ARE BEING CONSIDERED |
|-----------------------|--------------------------------------------|--------------------------------------------|---------------------------------------|---------------------------------------------|-------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Aldae | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Fungi | 2 | 0 | 2 | unknown | unknown | unknown | 0 | 0 |
| Lichens | 360 | 0 | unknown | unknown | | unknown | 0 | 0 |
| Liverworts | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Mosses | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Stoneworts | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Vascular plants | 304 | 18 | | | | | 8 | 25 |
| Ants | 1 | 1 | unknown | unknown | unknown | unknown | 1 | 1 |
| Bees | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Beetles | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Butterflies | 30 | 0 | | | | | 0 | 0 |
| Caddis Flies | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Crickets/Grasshoppers | 4 | 4 | 4 | 4 | | | | 0 0 |
| Dragonflies | 3 | 3 | | | | | 0 | 0 |
| Two-winged flies | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Matfly | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Millipedes | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Molluscs | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Moths | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Other invertebrates | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Spiders | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Stoneflies | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| True Bugs | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Wasps | 0 | 0 | unknown | unknown | unknown | unknown | 0 | 0 |
| Amphibians | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 0 |
| Birds | 3 | 3 | 2 | | | 2 | 3 | 3 |
| Fish | | | | | | | | |
| Mammals | 3 | 1 | 2 | 0 | | | | |
| Reptiles | 2 | 0 | 0 | 0 | | | 2 | |



Section 7

Introduction

Development of a Co-ordinated Education and Awareness Strategy

Key Sectors in Jersey

Public awareness and involvement

ARTICLE 13 OF THE CONVENTION ON BIOLOGICAL DIVERSITY- PUBLIC EDUCATION AND AWARENESS:

The Contracting Parties shall:

- Promote and encourage understanding of the importance of, and the measures required for, the conservation of biological diversity, as well as its propagation through media, and the inclusion of these topics in educational programmes; and
- Cooperate, as appropriate, with other States and international organizations in developing educational and public awareness programmes, with respect to conservation and sustainable use of biological diversity.

INTRODUCTION

Measures directly concerned with nature conservation are only a part of promoting and encouraging understanding of the importance of biodiversity. Measures must also be adopted to address the complex socio-economic factors that influence the way that people interact with their environment and to promote and encourage the ways that everyone can help in the conservation of biological diversity.

Although these broader issues are more appropriately addressed in the broader context of sustainability, the thread of personal responsibility for and involvement in the conservation of biodiversity is central to the educational aims of the strategy. The implementation of the action plans relies to a large extent on public understanding and support.

Perceptions of Biodiversity

A recent report commissioned to assist the development of Agenda 21 in Jersey held a series of focus groups. They note that while the groups evinced a strong aesthetic appreciation of the Island's landscape and natural beauty, "there was little awareness of the ecological importance of any of the habitats on Jersey, nor was (there) much concern about nature conservation expressed by the groups. Maintaining and enhancing biodiversity, a fundamental element of sustainable development strategies was not salient for group members - *which suggests that there is significant educational work to be done to raise this issue among the general public.*" (Italics added).

Research commissioned by the UK Biodiversity Steering Group showed that public understanding of biodiversity in the UK falls into three main categories; species, the natural environment and sustainability. The most common understanding of biodiversity is the "diversity of life", and the idea that species are vital to the maintenance of the earth's ecology. Biodiversity is also seen to mean the natural environment in a broader sense, including natural habitats. In both cases implicit in the word biodiversity is the need to take action to preserve the widest possible range of species and habitats. Biodiversity is also understood by some to have a deeper and more fundamental meaning linked to the impact of human activities on a global scale. In this sense, biodiversity is regarded as a crucial part of sustainability and is closely linked with Agenda 21. Although people in Jersey may not have such a developed awareness of biodiversity as they do in the UK, it nonetheless seems likely, given the similarities between the peoples that similar perceptions of biodiversity are held in Jersey.

DEVELOPMENT OF A CO-ORDINATED EDUCATION AND AWARENESS STRATEGY

Formal Education and Training

The formal education sector must continue to play a major part in promoting the understanding and importance of biodiversity. With minor exceptions in certain subject areas, the Jersey Curriculum mirrors the



National Curriculum for England and the major revisions made to this document in 2000 were also reflected in the local version.

Amongst those changes was a new statement of values, aims and purposes which underpins the Jersey Curriculum. This states under the heading of '*The Environment*':

"We value the environment, both natural and shaped by humanity, as the basis of life and a source of wonder and inspiration. On the basis of these values, we should:

- *accept our responsibility to maintain a sustainable environment for future generations*
- *understand the place of human beings within nature*
- *understand our responsibilities for other species*
- *ensure that development can be justified*
- *preserve balance and diversity in nature wherever possible*
- *preserve areas of beauty and interest for future generations*
- *repair, wherever possible, habitats damaged by human development and other means."*

The Science and Geography programmes of study throughout Key Stages 1-3 aim to provide knowledge, skills and understanding to school children on a number of topics which have a direct relationship with the concept of biodiversity. Headings within these subject areas include *life processes and living things* and *knowledge and understanding of environmental change and sustainable development*.

Further to these subject specific connections, the Personal Social and Health Education (PSHE) Curriculum aims to provide pupils with the knowledge skills and understanding to become informed, active and responsible citizens, attributes which will clearly assist in the Islandwide objective of promoting the importance of biodiversity and sustainable development.

Nationally, a range of initiatives are underway to promote good practice in environmental education and ensure that a range of high quality resources on the subject are available to school teachers. Organisations such as the Council for Environmental Education and the Royal Society for the Protection of Birds provide expert advice and produce a range of guidance and resources for teaching about the importance of biodiversity in schools.

It is vital that the States of Jersey Departments responsible for education and environmental protection, work in partnership to ensure that Jersey keeps pace with developments at the national level and that progress continues to be made in this subject within the local formal education sector.

Public Awareness and Involvement

It is essential that the contact between people and nature is re-established. People of all ages must be encouraged to develop their direct knowledge and experience of biodiversity on an everyday basis. Relevant

initiatives being pursued by ESU include:

- a) A programme of walks and talks
- b) The production of information leaflets and videos
- c) The setting up of a computerised photographic archive; digital images are held on a database
- d) Various environmental events have been held since 1996 and these will continue to be an important way of bringing people together to learn about and discuss issues surrounding biodiversity.

Public consultation is enshrined in the decision making process. All initiatives involving biodiversity such as the St Ouen's Bay planning framework, and the consultation for Environmental Impact Assessment include wide public consultation as an essential component. Small consultation groups such as the Agile Frog Recovery Group and the protected species advisory group also fulfil an important role.



KEY SECTORS IN JERSEY

UK research has shown that levels of understanding and interest in biodiversity vary considerably between different sections of society. It is important to gear messages and proposals for involvement and action in accordance with the particular interests of each sector. A list of key sectors in Jersey is shown below.

- States Departments
- The churches and faiths
- Youth and community groups
- Tourism
- Business and commerce
- The farming industry
- The fishing industry
- The finance industry
- The professions
 - Architecture and landscape design
 - Engineering
 - Planning
 - Medical
 - Legal
- NGOs (Société Jersiaise, National Trust for Jersey, JWPT)
- Other land managers
- The media
- All forms of education



Champions of Biodiversity - The relevance of biodiversity for various sectors depends on how closely each sector is linked with the natural environment. The perception that biodiversity has no relevance for a particular sector could be overcome by the provision of leadership and inspiration from within individual sectors. Respected figures from within sectors should be encouraged to become *Champions of Biodiversity*. They would supplement key messages from this strategy with explanations of why biodiversity is important to their particular sector.

Partnerships - In the context of biodiversity partnerships are valuable and viable. Historically the department has made management agreements and provided advice for landowners and organisations. Recently an initiative to form a forum of farmers, growers, landowners and conservation groups is proving fruitful. It is intended that this will be an independent group, which will act as a conduit to involve a wide range of stakeholders who were previously difficult to reach.

Sponsorship - Limited departmental funds are available for funding small projects. The Société Jersiaise and the Jersey Tree Advisory Council are two groups who have benefited from this. The recent environmental festivals and weekend events attracted sponsorship from several Island businesses and it is hoped that this will expand through the Champions of Biodiversity scheme.

Barriers and Constraints - The following issues are perceived as preventing effective action to preserve biodiversity:

- a) the relevance of biodiversity is misunderstood. Unless biodiversity is promoted as a primary issue in its own right, and as a critical part of sustainability, all environmental actions will continue to be essentially palliative.
- b) the costs on the environment of everyday decisions are not apparent. To make progress in preserving biodiversity, the issues must be clearly defined to provide a basis for individual lifestyle and commercial decisions.
- c) consideration of biodiversity by organisations is often perceived as a costly extra burden. The financial benefits of an environmentally conscious approach are not always sufficiently emphasised.
- d) the lack of a consistent strategy for all States' departments towards the environment and the preservation of biodiversity leads to a public perception that the States does not follow the advice it is giving the public. The Agenda 21 focus groups were well aware that the Island faces problems but felt that their contribution as individuals was negated, as in the issue of waste separation, or that their willingness to contribute was ignored, as in the case of transport.
- e) information supplied may only reach those who are already concerned with environmental issues. The accessibility and usability of information must be carefully evaluated to ensure that relevant, practical, consistent and clear information is reaching individual key sectors.

- f) media treatment of environmental issues tends to focus on contentious issues. A higher profile should be given to biodiversity issues in all sections of the media.

Public Awareness

Biodiversity is ultimately lost or conserved at a local level and a considerable proportion of resources will continue to be devoted to providing information on biodiversity issues, and involving the population in the enhancement and conservation of the diversity of species in the Island. Key sectors in the Island will be approached to raise awareness and gain practical help. The gains to be made by involvement in the preservation of biodiversity will be emphasised.

International Linkages

The value of linkages both with the other Channel Islands and internationally should not be underestimated. Links with the authorities of other Channel Islands and the Isle of Man will be strengthened and the possibility of some involvement in EC projects such as Eurosite and Arc Manche will be investigated.







Section 8

References

Acknowledgements

The way forward

The task, which we have in front of us, we must tackle as partners, in the knowledge that we are leaving something worthwhile for those that come after us. In order to safeguard the extremely rich and visually attractive biodiversity of Jersey we must undertake a variety of protective measures and activities.

■ Designation of Sites of Special Interest.

Three have been declared already, the staff of ESU believe that six will be ready for designation by 2003 and nine by 2005. These are examples of what conservationists call site safeguard and will protect wildlife on the main wildlife sites of Jersey. We have an added responsibility to safeguard such areas because they belong to the world as well as to the people of Jersey.

■ Species Action Plans

Some species are more mobile or range more widely than over a limited range of sites but may nevertheless be rare or threatened. For these, Species Action Plans need to be prepared and implemented. They indicate how the sites and populations should be managed and who should be responsible. Again several of these have already been prepared and 20 will be completed by 2003 and 25 by 2005.

■ Sites of Importance for Nature Conservation (SINCs)

A new recommendation for Jersey is the need to identify small semi-natural areas that are important to wildlife. These areas may not necessarily justify SSI status but will nevertheless be key sites for the conservation of nature. It is not proposed that they will have any statutory protection but will be the focus of targeted survey work by ecologists and be under the attentive eye of the Island's planners. Such recognition of small semi-natural areas of lesser importance than SSIs is part of the planning process in many English counties and has proved to be particularly beneficial. They should be known as Sites of Importance for Nature Conservation or more briefly as SINCs. The process does not require any legislative change and will not threaten the rights of any landowner. Indeed conservationists look to landowners for their support and co operation.

■ Other Strategies

Although this strategy is fairly comprehensive there are still subjects which require further thought and development. It is therefore expected that in the next few years more detailed and focused strategies will be developed for grazing, water availability and quality for wildlife, public awareness of conservation (see below) and a Coastal Zone Management Strategy.

- It is also important that Jersey complies with all EU conservation and environmental directives and continues to administer CITES in an effective manner.

■ Research and Monitoring

There will continue to be topics which require research and monitoring. For example, more needs to be known about the population dynamics of Jersey orchid, the impact and rate of spread of Hottentot fig and the control of bracken. These topics are candidates for research and there are many more. Monitoring



needs to be conducted of groups such as bats, squirrels, agile frog, dartford warbler, heathland, wet meadows and sand dunes. There are established procedures for monitoring species and habitats and these are described elsewhere, for example in Goldsmith (1991).

■ Information Management

A GIS-based data storage and mapping system is needed for native species in Jersey. At present CADCORP is available to planners and the ESU but it needs to be expanded and to be made more user-friendly. It could be tested for suitability and development during 2003 and, if successful, expanded to a wide range of taxonomic groups. This would probably be better than reverting to previous attempts to use RECORDER or BIOBASE systems. Ideally recording groups in the Société Jersiaise would contribute to and be able to access the system.

■ Biodiversity Review Panel

A Biodiversity Review Panel should be established consisting of initially the three main NGOs (Société Jersiaise, National Trust for Jersey, Jersey Wildlife Preservation Trust) and the ESU. Other groups or individuals could be added in future, if desired. The Panel should prioritise work and resolve any disagreements arising from conflicting Action Plans or policies. It would need to meet four to six times each year with decisions being minuted and made available to interested parties.

The Strategy will require periodic reviews especially because nature is dynamic and human activities are constantly in flux. For example how will the landscape change if dairy herds decrease, and what will the ecological consequences be? The Review Panel will help to co-ordinate, direct, explain and justify conservation activities.

Interpretation Review

Surveys of wildlife awareness amongst the people of Jersey indicated a generally low level of perception and this needs to be addressed. Wildlife increases the quality of life for residents and attracts tourists, especially naturalists, to the Island. Partnerships between the Société Jersiaise, National Trust for Jersey, Departments of Tourism, and of Agriculture, need to be developed. Though recent progress has been made a strategy for better interpretation facilities and wider public awareness of wildlife and nature should be prepared by 2003.

Jersey retains a rich and varied flora and fauna but their future survival depends upon the enforcement of existing legislation together with greater voluntary action, public support and cooperation between individuals and agencies. Progress has been made in the last few years and with goodwill and the continued work of existing staff Jersey could become a model for other island territories.



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