COUNCIL OF EUROPE CONSEIL DE L'EUROPE

Strasbourg, 2 September 2010 **T-PVS (2010) 12**
[tpvs12e_2010]

CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Group of Experts on European Islands Biological Diversity

Svalbard (Norway), 26-27 July 2010)

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REPORT

Document
prepared by
the Directorate of Culture and Cultural and Natural Heritage

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The Group of Experts on European Island Biological Diversity met in Longyearbyen (Svalbard, Norway) from 26 to 27 July 2010, this being the 2nd meeting of the Group.

The Standing Committee is invited to:

1. Thank Norwegian conservation authorities and the Environment Office of the Governor of Svalbard for the excellent hospitality and most professional organisation of the meeting;
2. Take note of the report of the meeting, in particular on the progress towards preparing a European Charter on Island Biodiversity;
3. Take note in particular of the activities proposed by the Group while deciding on its programme of activities for 2011;
4. Etablish an advisory group in partnership with IUCN ISSG and EPPO to provide support and advice on eradication of IAS in islands.

1. Opening of the meeting

The Chair, Mr Øystein Størkersen, welcomed participants (list in appendix 2) and referred to the environmental regulations of the Svalbard archipelago and the efforts of the Norwegian Government and the Svalbard Governor to protect its pristine nature, including controls to avoid accidental introductions of invasive alien species (IAS).

Ms Guri Tveito, Head of the Environmental Protection Office of the Governor of Svalbard, presented the ecological characteristics and the history of these arctic islands. There is a special Environment Act for Svalbard so that not all Norwegian environment legislation applies automatically. Local police is charged to ensure respect of environmental law. The economy is based on tourism, mining and research. Local mining is strictly regulated and 65 % of the whole territory is covered by 21 nature reserves, and 7 national parks. A fee to visitors feeds an environmental protection fund. Impact of traffic vehicles is limited. The archipelago counts with many interesting species of flora, marine mammals, the polar bear, arctic fox and a special reindeer. Greatest environmental challenges are global warming and long-range pollution.

The secretariat informed the Group that, since the last meeting in Tenerife, priority had been given to the preparation of a Charter on European Island Biodiversity and to producing guidelines on island biodiversity and climate change.

2. Adoption of the Agenda

The Agenda was adopted as it figures in appendix 1 to the report.

3. Reports from States and international organisations

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Written reports were presented by Croatia, France, Ireland, Italy, Malta, Norway and Spain (Canary Islands).

3.1 Mediterranean

The delegate of **Malta**, Ms Lisa Schembri-Gambin, presented an overview of the biological diversity of the Maltese archipelago, its endemic species and environmental threats. Many species have an unfavourable conservation status so a powerful legislation is implemented, based on Bern Convention and EU directives obligations. Much of the conservation work is focused on threatened species and protected areas.

The delegate of **France** informed the Group of the high number of islands and islets in France (up to 1,300 islands in the Mediterranea and on the Atlantic front) the main being the island of Corsica which accounts for 90 % of all island territory in metropolitan France). The biodiversity of 80 of the islands is well studied and a number of protected areas ensure a good habitat protection (10 % of Natura 2000 sites are on islands and National and Regional Parks cover a good part of Corsica, Brittany islands, and Port Cros, with the addition of many natural reserves, marine parks, etc.). There is political will to increase protected areas from 0,5 % of the territory to 2 % by 2020 and to complete the system with ecological corridors ("*trame verte / bleue*"). Three fields of special concern are invasive alien species, impacts of climate change and impact of tourism.

3.2 Small Mediterranean Areas Initiative

The representative of the *Conservatoire des Espaces littoraux et des Rifvages lacustres* (France) presented an initiative of his organisation and other partners to promote biodiversity conservation in small islands through technical assistance and multilateral and bilateral institutional co-operation. Partners can change but the initiative is focused in "project coaching", transfer of technical expertise and capacity building on small islands (less than 3,000 ha). There are over 15,000 small islands in the Mediterranean, often with interesting biodiversity, high pressures, and poor management. A network of 200 experts has

been put together in 12 Mediterranean countries. 60 projects have been carried out, including scientific research, birds census management, awareness and eradication of IAS.

3.3 North Atlantic and the Baltic

The delegate of the **United Kingdom** presented on-going island biodiversity work in the United Kingdom. He presented the general geographic characteristics of United Kingdom islands (other than United Kingdom mainland) and of their great significance for threatened biodiversity, in particular marine and coastal birds, but also marine mammals. United Kingdom islands had also maintained traditional farming and associated floras and faunas, acting as interesting refuges for threatened species or interesting genetic varieties. Key issues were alien species (many threatening native biodiversity), so eradication in particular of rats was a key priority. Marine renewable energy (windfarms, wave and tide devices) were an important concern.

3.4 Macaronesia

The delegate of **Spain** presented the high biodiversity of the Canary islands and the main threats (tourism, social difficulties, trade farming, transport or alien species, water scarcity, strong human impact on the land including high urbanisation, traffic, poor management of solid and liquid waste, lack of goal planning and environment policies, land degradation). 40 % of the land is designated as protected areas, but policies may be turning against protection. Information on native biodiversity and invasive species is good, many action plans for species are implemented and IAS vigorously fought (but resources are often a problem).

3.5 Iceland, Norway and the Arctic

The delegate of **Norway** (Chair) informed the Group that much of the efforts of his country in conservation of island biodiversity are focused in the Svalbard Archipelago and the Jan Mayen islands in the Arctic Ocean and their special flora and fauna (marine mammals, a good polar bear population). Control of alien species is a priority for these territories, as well as limiting the effects of tourism and mining on their environment. Specific legislation is implemented. Knowledge and protection of their biodiversity is good. The spread of few introduced species (King crabs, sibling vole) is a matter of concern, as well as the effects of climate change on local flora and fauna and further spread of invasive species.

3.6 Unesco experiences

The delegate of **Unesco** presented the Madrid Action Plan for Biosphere Reserves and how it was being implemented in islands. There are 179 coastal and island biosphere reserves in 64 countries, 55 of all biosphere reserves are in islands or small islands (18 in Europe).

The mid-term evaluation of the Madrid Action Plan will be finalised in 2010. The focus of the Madrid Action Plan is to develop, though Biosphere Reserves, models for global, national and local sustainability. They are to serve as learning sites for policy professionals, decision makers, scientists, management practitioners and stakeholder communities to work together to make sustainable development relevant to local communities.

3.7 BirdLife

The delegate of BirdLife informed participants how NGO scientific and conservation work is relevant to biodiversity of European islands. He noted how biodiversity in islands (well studied by BirdLife) can contribute to detect global changes. Since 1980 BirdLife records birds in a wide network of areas (Important Bird Areas IBA). The identification of these sites helped protection through Natura 2000 and the Emerald network. BirdLife Spain was carrying out a “marine IBA in Spain”, identifying also non-breeding (coastal) concentration of birds, marine areas used by land-breeding colonies and migration bottlenecks This work could help further focus of the work of this group of experts on small islands.

4. European Charter on Island Biodiversity

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The Consultant, Mr Yves de Soye, presented the first draft of the Charter. He had chosen to include both principles as well as recommendation, so that the Group may decide the level of detail preferred for such a document.

The Secretariat recalled the original idea of the Charter, namely a relatively short document aimed at rising the profile of island for conservation of biodiversity and suggesting some broad principles aimed at inspiring action by governments and other stakeholders.

There was a broad discussion by governments and observers. Some delegations thought that the present draft contained too much detail and very precise recommendations to governments and preferred a leaner version focusing more of "statements of principle" and some broader guidance. Some delegates also wished a code that would be addressed to a broad audience, not only governments. There was also general agreement that the code should be relatively short so it may be used easily by politicians or interested governments, NGOs, conservation workers, etc.

It was agreed that a revised version of the Charter would be circulated to members of the Group of Experts well in advance to the next meeting, aiming to propose a new version for possible adoption by the standing Committee to the Bern Convention in November 2011.

5. Invasive Alien Species on Islands

5.1 Priorities for eradication on IAS on European Islands

Mr Giuseppe Brundu presented ideas for a prioritisation of species for islands based on work developed in the framework of the European and Mediterranean Plant Protection Organisation (EPPO) for selecting species for possible "Pest Risk Analysis". It is based on two criteria: range (including spread) and impact (on the natural environment, on crops or forestry). Priority should be given to species with small range and high impact. For islands, range could be defined in many ways (number of individuals, distance to other islands, practical difficulties of removal, etc.). Impact for islands could be defined through the effect of the species on endemic species or threatened habitats, the possible conservation benefits from intervention, etc.

The Group too note of the information presented and appreciated the value of the methodology to select species for eradication.

5.2 Supporting eradication by the creation of an advisory group on eradication on European islands

Mr Piero Genovesi, Chair of the ISSG of the IUCN, informed the Group on the success of a conference held in New-Zealand on eradication and on recent work and policy on IAS and eradication (CBD post-2010 targets, EEA work, EU initiatives). Some groups of species – like critically endangered birds – are threatened by IAS, which are also key factors in half of animal extinctions. Amphibians are particularly at risk. Eradication can be an effective response and is often successful (particularly on vertebrates and on islands). The database on eradication records many successful campaigns in many European islands. In the Mediterranean experiences to control rats in islands to promote sea birds are working very well, as well as eradication of a number of invasive plants. Eradication can be also very cost efficient if linked to early warning and rapid response.

He proposed that the technical work of the Group of Experts on European Islands could provide the basis for EU policy on the topic. He also proposed that the Bern Convention establishes a small advisory group that, working in co-operation with ISSG and EPPO, may provide support, advice, exchange of technical information on specific projects on eradication. The advisory group could work in close connection with Bern Convention Groups of Experts (on IAS, on European Island Biodiversity, on

Biodiversity and Climate Change, on different taxonomic groups) and be consulted for advice by governments, NGO and other partners of the Convention, ISSG and EPPO.

The Group decided this was a good idea to be proposed to the Standing Committee of the Convention.

5.3 News from the Pacific

a. The Pacific Invasive Initiative

Mr Mick Clout, from the University of Auckland, presented this multi-stakeholders initiative (largely funded by the Government of New Zealand) which aims to strengthen the capacity of Pacific island countries and territories to effectively manage invasive alien species. The initiative networks interested people across the region, carries out projects, gives assessment and guidance to governments and conservation professionals, provides as appropriate with technical support, develops specific tools and organises training courses. Mr Clout stressed the importance of sharing information and to focus well projects and action in areas where conservation gains may be greater. The experience is successful (in a region where IAS is the main cause of species extinctions) and could inspire action in other region. Government support has been key to continuity.

b. "helping island adapt" Initiative

Mr Stas Burgiel presented the results of a Workshop on regional action to combat invasive species. The workshop was aimed at the identification and strengthening of networks and structures that enable effective and sustainable invasive species management for islands. The workshop identified priorities for the CBD and other international fora, in particular regarding the post-2010 biodiversity targets to be adopted in Nagoya, where IAS as drivers of biodiversity loss should be recognised and included in the CBD Strategic Plan. At the workshop, there was recognition that IAS and climate change combined may strongly impact island biodiversity. There is a need to enhance political, financial and technical support for regional collaboration and initiatives addressing invasive alien species. Sharing of experiences and information is vital. In many areas or regions there is a co-ordination gap, which groups like the Bern Convention one could help improve. Much work on IAS is done in protected areas, but not elsewhere.

The Group welcomed the two presentations and discussed how to use those experience to further its work. There was recognition of the difficulties of networks conservationists working on islands and the need to share information. Perhaps the Bern Convention should catalyse the making of some "demonstration projects".

6. Climate Change Effects on Island Biodiversity

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Mr Yves de Soye presented a report made by Ms Cordula Epple, of UNEP-WCMC. The particular geographical and biological features of islands make these territories poor in species but very rich in endemism (while they comprise only 5 % of land they have 20 % of endemic plants). They are often conservation hotspots (especially "oceanic" type islands) and their flora and fauna is already threatened because of the small size of many islands and the intense human action. A third of globally threatened mammal, bird and amphibian species live in islands. Islands in Europe are very varied and most require a specific conservation approach. Island Biodiversity hotspots are specially in the South of the continent and the Macaronesian region Island biodiversity is very vulnerable to climate change because of low possibilities of dispersal, high rates of endemism and often very limited distribution areas for many species although little information on overall population trends is available at present. Climate change is held partly responsible for large-scale decline in sea birds in the North Sea and North Atlantic. Islands will also suffer how expansion of invasive alien species linked to climate change.

The Group of Experts took note that the Group of Experts on Biodiversity and Climate Change had proposed a draft recommendation island biodiversity and climate change for possible adoption by the standing Committee.

7. Priorities for action and proposals to the standing Committee to the Bern Convention

The Group discussed much on this topic, given the very varied number of actions that are needed on islands. It was important to find an appropriate "*niche*" for the work of the Group, adapted to its limited resources and to the priorities in conservation of island biodiversity.

The Secretariat explained that the role of the Group was largely to provide both new ideas and guidance to governments (and other partners) through the Bern Convention on priorities for legislation or action.

The Group agreed that, following CBD island biodiversity work, the Group should focus its work on areas that are not covered in other fields (protected areas, ecosystem services, energy, water, etc.) but, rather, on "ecosystem health" and biodiversity conservation. Some issues were selected as of particular relevance: endemics, island red lists, areas of special concentration of breeding birds or marine mammals or reptiles, biological interest of coastal waters around islands, islands role for migratory species, islands as refuges, islands containing rare habitat types or traditional biodiversity friendly agriculture having disappeared in the mainland.

Information needs to be collected in how those values / areas are affected by IAS, tourism, changes in land-use, climate change and other ecosystem change drivers.

Bern convention may provide guidance, co-ordination and advice on any of the above issues, for instance:

- Analysis of information gaps and resources needed for action;
- Endemics / red listing in islands;
- Island as areas of important for migratory species;
- Islands as refuge for species / habitats lost or threatened in the mainlands;
- Islands importance for marine vertebrates (particularly birds, marine turtle);
- Island suffering biodiversity loss;
- Island species and habitats threatened by climate change;
- Combating IAS in island (filling the information gap, proposing action and guidance, preparing demonstration projects).

The Group agreed to have a table summarising possible action. Mr Ian Bainbridge volunteered to co-ordinate its preparation. It is included in appendix 4 to this report.

8. Other business

The Group accepted with gratitude the proposal of France to host in Corsica the next meeting of the Group.

No other business was raised.

Appendix 1

Bern Convention Group of Experts on European Island Biological Diversity

2nd meeting

Longyearbyen, Svalbard, Norway, (26-27 July 2010)
9.30am – 6.00 pm

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AGENDA

INTRODUCTION – PRESENTATIONS

1. OPENING OF THE MEETING

Welcome and opening of the meeting by the Chair, Mr Øystein Størkersen , and the Svalbard local authorities, Ms Guri Tveito

Secretariat remarks and updates.

2. ADOPTION OF THE AGENDA

3. REPORTS BY STATES AND INTERNATIONAL ORGANISATIONS
[document T-PVS/Inf (2010)11] - News on on-going work

- **Mediterranean and Black Sea**
  Presentations by Croatia, France, Italy and Malta
- **Small Mediterranean Initiative (PIM)**
  Presentation by France (*Conservatoire du Littoral*)
- **North Atlantic and Baltic**
  Presentations by Ireland and the United Kingdom
- **Macaronesia**
  Presentation by Spain
- **Iceland, Norway and Arctic**
  Presentation by Norway

Unesco experiences
Presentation by Mr Miguel Clüsener-Godt

BirdLife experiences
Presentation by BirdLife Spain

4. EUROPEAN CHARTER ON ISLANDS
- *[document T-PVS/Inf (2010) 12]*

Presentation by consultant Mr Yves de Soye
Discussion

5. INVASIVE ALIEN SPECIES ON ISLANDS

- **5.1 Priorities for eradication on IAS on European Islands**
  Presentation by Mr Giuseppe Brundu

  5.2 Supporting eradication by the creation of an advisory group on eradication on European islands
  Presentation by Mr Piero Genovesi

- **5.3 News from the Pacific**

  a. The Pacific Invasive Initiative
  Presentation by Mr Mick Clout

  b. "Helping Islands adapt" initiative
  Presentation by Mr Stas Burgiel

6. CLIMATE CHANGE EFFECTS ON ISLAND BIODIVERSITY
[Document T-PVS/Inf (2010) 9]
Presentation by Mr Yves de Soye
Discussion

7. PRIORITIES FOR ACTION AND PROPOSALS TO THE STANDING COMMITTEE TO THE BERN CONVENTION:

8. OTHER BUSINESS

Appendix 2

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LISTE DES PARTICIPANTS

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Appendix 3

COMPILATION OF NATIONAL REPORTS ON ACTIVITIES RELATED TO BIOLOGICAL DIVERSITY ON EUROPEAN ISLANDS

CONTENTS / SOMMAIRE

1. CROATIA / CROATIE

WRITTEN CONTRIBUTION ON ISLAND BIODIVERSITY IN CROATIA FOR THE 2ND MEETING OF THE BERN CONVENTION GROUP OF EXPERTS ON EUROPEAN ISLAND BIOLOGICAL DIVERSITY, SVALBARD (NORWAY), 26-29 JULY 2010

Prepared by the State Institute for Nature Protection and the Ministry of Culture, Nature Protection Directorate, July 2010

General characteristics

Even though Croatia is not an island state, it has 1 185 islands which are geographically classified into 718 islands, 389 islets (peak above sea level) and 78 reefs (peak below sea level). They all together represent just 5.8% of the Croatian territory, but they make up about 70% of the total Croatian coastline. Only 47 islands are inhabited, while 100 islands are considered to be occasionally inhabited. The 30 largest Croatian islands cover as much as 92.2% of the total island area. The largest islands are Kirk and Cres (405.78 km^2).

Biodiversity and endemism

Plant species richness for all Croatian islands has been estimated to 1807 plant species on the basis of floristic study of 106 Croatian islands (Nikolić et al. 2008). On these islands there were 89 circum-Adriatic endemic and 35 narrow endemic plant taxa recorded. Some of the narrow endemics include taxa from genera *Asperula*, *Brassica*, *Centaurea*, *Limonium* etc. which are mostly confined to South-east Adriatic islets.

Regarding the vertebrate fauna, almost 200 species inhabit Croatian islands (Tvrtković (ed.) 1997). Of the mammalians especially interesting is the only island population of European mole (*Talpa* cf. *europaea*), which was found on the island of Cres and is considered to belong to a discrete taxon. It is classified as Endangered in Red Book of Mammals of Croatia (Tvrtković (ed.) 2006).

Croatian islands present important nesting place for many endangered bird species as Cory's Shearwater (*Calonectris diomedea*), Eleonora's Falcon (*Falco eleonorae*), Griffon Vulture (*Gyps fulvus*), Audouin's Gull (*Larus audouinii*) and Little Tern (*Sterna albifrons*).

Among reptiles, the most interesting are 13 endemic taxa of Dalmatian wall lizard (*Podarcis melliselensis*), each restricted to a single island.

Invertebrates as a whole are poorly researched in Croatia. Although data on some groups of invertebrates on particular islands exist, general surveys on all Croatian islands have not been conducted yet.

Threats and problems

Main threats and problems on Croatian islands include: littoralization (concentration of economic activities and population along the coast), lack of integrated coastal zone planning and management, illegal building, tourism and urban development (including infrastructure and recreational activities), depopulation (the most prominent process on some islands), land abandoning (abandoning of traditional extensive grazing and mowing), unsustainable fishing, poaching, inadequate use of speleological objects, untreated waste waters, fires etc. Invasive alien species (IAS) also present one of the major threats to islands' biodiversity. Silver-leaved nightshade (*Solanum elaeagnifolium* Cav.) on the island of Plavnik, eastern mosquitofish (*Gambusia holbrooki*) in ponds of several islands, small Indian mongoose (*Herpestes auropunctatus*) on some Dalmatian islands and wild boar (*Sus scrofa*), fallow deer (*Dama dama*) and mouflon (*Ovis aries musimon*) which have been introduced to some islands as game species represent just

some of the most prominent IAS problems on Croatian islands. Furthermore, two invasive algae of the genus *Caulerpa* have been found in the Croatian part of the Adriatic Sea: *Caulerpa taxifolia* and *Caulerpa racemosa*.

Protection of island biodiversity

Legislation

The Regulation on Protected Coastal Area Development and Conservation (Official Gazette 128/04) defines 'protected coastal area' consisting of all the islands and a 1 000m wide mainland and a 300m wide marine belt measured from the coastline, which stands for tidal wave line on the coast.

The Islands Act (Official Gazette Nos. 34/99, 149/99, 32/02, 33/06) prohibits the introduction and breeding of alien game species, which do not inhabit the island naturally.

The Nature Protection Act (Official Gazette Nos. 70/05 and 139/08) does not address island biodiversity as a separate subject, but regulates the protection of species and habitats, as well as the protection and use of natural assets.

In the Strategy and Action Plan for the Protection of Biological and Landscape Diversity of the Republic of Croatia (Official Gazette No. 143/08) the following action plans specifically address the island biodiversity issues:

- Protection of ecosystems and habitats - Establish and implement protection of habitats on islands hosting endemic taxa and/or on nesting sites, resting places during migration, sand beaches, ponds and springs.
- Elimination of invasive species - Scientifically determine the population count of introduced game on the islands, develop and implement elimination programmes.

The Ordinance on Proclamation of Wild Taxa as Protected and Strictly Protected (Official Gazette No. 99/09) and the Ordinance on the Sorts of Habitat Types, Habitat Map, Endangered and Rare Habitat Types as well as Safeguard Measures for Conservation of Habitat Types (Official Gazette No. 119/09) contain the lists of protected species and habitats.

The Regulation on Proclamation of the Ecological Network (Official Gazette No. 109/07) established the Croatian Ecological Network on the 47% of the land and 39% of the marine territory. Ecological Network covers 86,88% of the total island area in Croatia.

On the COP9 of the Convention on Biological Diversity in 2008, the Republic of Croatia committed to GLISPA Partnership that brings together island nations and nations with islands to ensure the conservation and sustainable livelihoods on islands.

Croatia is also dealing with the island biodiversity issues in the scope of the activities and incentives under the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) (Barcelona, 1976, 1995) and the appertaining Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (Barcelona, 1995).

Action plan for eradication of wild boar (*Sus scrofa*) on the islands of Krk and Cres has been prepared in the May 2010 under the coordination of Center for the sustainable development of north Adriatic islands. This document is non-legally binding.

Protected areas

There are three National parks on islands (IUCN category II; Brijuni, Kornati, Mljet) and two island Nature parks (IUCN category V; Telašćica and Lastovo Archipelago), which consist of land territory and the adjacent sea.

Process of the permanent protection of the Lošinj-Cres archipelago as a Regional park (IUCN category V) is ongoing, since this area has been identified as one of the critical habitats for bottlenose dolphins (*Tursiops truncatus*) in the eastern Adriatic.

Croatian Ecological Network

Croatian Ecological Network was proclaimed in 2007 in accordance with the Nature Protection Act, with defined areas of national and international importance. It includes Areas important for wild taxa (except birds) and habitats, which correspond to NATURA 2000 proposed Sites of Community Importance (pSCIs), and Areas internationally important for birds, which correspond to NATURA 2000 Special Protection Areas (SPAs).

Areas important for wild taxa (except birds) and habitats comprise in total 27.49% of the island territory in Croatia while areas internationally important for birds cover as much as 81.26% of the island territory in Croatia.

Ongoing and planned projects

Project Blue Corridor

As a part of a large-scale Conservation planning project initiated by World Wildlife Fund for Nature (WWF) 12 hot spot marine biodiversity areas for conservation in the Mediterranean region have been identified. One of 12 sites is in the Adriatic Sea, Dalmatian coast and represents a 'blue corridor' for biodiversity conservation, which specifically recognizes islands Svetac, Brusnik, Biševo, Vis, Lastovo, Mljet, Sušac and Jabuka pit. WWF and Sunce (non-government organization from Split, Croatia) are advocating implementation of the *'blue corridor'* project that would help establish an MPA network in the Adriatic Sea.

Project COAST

The main goal of the UNDP/GEF project Conservation and Sustainable Use of Biodiversity in the Dalmatian Coast through Greening Coastal Development (COAST) is to ensure that the development path of the Croatian Coast is environmentally friendly, with the conservation of landscape and biological diversity central to that development path. Project areas are four Dalmatian counties rich with biological and landscape diversity, including the following islands: Pag, Mljet, Vis, Biševo, Svetac, Jabuka, Brusnik and Palagruža, identified as of national, Mediterranean and global values. The project is to remove barriers to mainstreaming and implementing environmentally friendly practices of the key economic sectors in Dalmatia: tourism, fisheries, mariculture, agriculture and banking/finance.

The project results so far are: inventory of fauna, inventory and mapping of flora, habitat mapping, inventory of coastal fisheries resources and recommendations for sustainable coastal fisheries in Vis aquatorium, creation of the technical/expert basis as prerequisites for management of the Biševo and SE Vis marine areas as a part of the Croatian Ecological Network. In the year 2008 the book "The flora of Adriatic coast and islands" has been published, also in the frames of COAST project.

Identification and setting-up of the marine part of Natura 2000 network in Croatia - Marine NATURA 2000 Republic of Croatia

This project aims at the identification of the marine part of NATURA 2000 network with the main goal – detailed program of work for finalizing marine NATURA 2000. This programme of work is to be prepared through consultations with relevant stakeholders and scientific community and will also contribute to further development of the national biodiversity monitoring system through capacity building for the inventorying of marine biodiversity and monitoring and reporting according to provisions of Habitats Directive. The project should start in autumn 2010.

WWF Thousand islands - Contribution to the implementation of NATURA 2000 in Croatia

As a follow up project of PHARE 2005 (Implementation of NATURA 2000 in Croatia) - The consultation process launched by the PHARE project was very successful but incomplete in a sense that it

did not address the relevant sectors that take part in management and use of the sea (fisheries, maritime transportation, tourism, energy, etc.). The proposed project will assist the SINP in extending the NATURA 2000 consultation process to all public and private groups that have an interest in the management and use of marine resources and areas, in order to prepare the ground for the future effective management of the identified marine NATURA 2000 sites. The improvement of scientific knowledge on relevant marine biodiversity features provided by the IPA project should be coupled with a consultation process with all groups that have an interest and stake in the management of marine areas and resources (e.g. Ministry of Agriculture, fishery sector, etc.), both at national and county level.

Strategic Partnership for the Mediterranean Sea Large Marine Ecosystem - Pilot-project for Croatian marine protected areas (MedPan)

The aim of the project is to enlarge effectiveness of biodiversity conservation of valuable coastal and marine areas by crating coherent network of protected marine areas and development of management plans for selected marine parks: national parks Kornati, Mljet and Brijuni, as well as nature parks Telašćica and Lastovo archipelago.

Croatia Nature Protection Investment Project (NPIP)

Project aims to support preparations of Croatia for entering the European Union in the segment of nature protection. The main aim of the project is to support establishment and implementation of NATURA 2000 network. It is going to encompass investments in the ecological network, investments in local community to raise nature protection and revitalization of rural areas as well as institutional capacity building.

Improved marine protected area system in Republic of Croatia for better conservation of globally important biodiversity reservoirs and maintenance of carbon pools

The main project goal is to enable sustainable conservation of marine biodiversity through supporting capacity building of protected areas and regional/local public institutions located at targeted pilot sites (Brijuni area, Kornati and Telašćica area, nature park Lastovo Archipelago, Mljet area). This will enable them to effectively mitigate and monitor human impact and climate change risks, as well as raise awareness on the importance of Posidonia meadows among developing (economic) sectors and local community.

2. FRANCE / FRANCE

Contribution de la France

BIODIVERSITE DES ILES FRANCAISES METROPOLITAINES. BILAN ET PERSPECTIVES

Bernard RECORBET[1] et Jean Philipe SIBLET[2]

RESUME

La France métropolitaine compte un nombre très important d'îles et d'îlots (près de 1300) situés pour un part importante en Bretagne et en Méditerranée, la Corse représentant à elle seule plus de 90% des surfaces insulaires françaises de métropole.

La biodiversité de ces îles est particulièrement remarquable et est mise en évidence par de nombreux outils d'inventaires et de protections :

- l'inventaire de Zones Naturelles d'Intérêt Ecologique Faunistique et Floristique (ZNIEFF). 80% des îles françaises sont couvertes pour cet inventaire ;
- Natura 2000 : 10% des surfaces couvertes par ce dispositif sont des îles ;
- Les parcs naturels régionaux : la Corse et la Bretagnes sont concernées
- Les parcs nationaux : Port Cros
- Les parcs marins (l'Iroise)
- Les réserves naturelles : 15 concernent en tout ou partie des îles
- Les arrêtés préfectoraux de biotope : 67 concernent en tout ou partie des îles

Il faut souligner le rôle particulier joué par le Conservatoire des Espaces Littoraux et de Rivages Lacustres dont la vocation est d'acheter des terrains pour les soustraire aux aménagements et à la spéculation foncière. Cet organisme à acquis, depuis sa création en 1975, près de 21000 hectares sur des îles.

Le rôle des conservatoires botaniques nationaux est également très important et porte principalement sur des actions d'acquisition de la connaissance sur la flore, avec un point focal sur la flore remarquable, un travail de veille/sensibilisation sur les espèces exotiques envahissantes et enfin un travail de recensement et de cartographie des habitats.

D'autres outils tels que les réserves de biosphère du programme MAB, les zones humides « RAMSAR », le parc international des Bouches de Bonifacio en Corse, le sanctuaire PELAGOS pour les cétacés en Méditerranée…. viennent compléter le dispositif.

La biodiversité de ces îles est fragile et elle est menacée par différents facteurs dont deux font l'objet de développements particuliers :

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- les espèces exotiques envahissantes. Ce problème est particulièrement inquiétant en milieu insulaire et le rapport fait la synthèse des actions de contrôle, d'éradication et de suivis qui sont actuellement mise en œuvre sur les îles françaises ;
- les impacts du réchauffement climatiques.

Face à ces menaces le constat de la nécessité de renforcer la protection de la biodiversité insulaire est posé, en accord d'ailleurs avec les politiques issues du Grenelle de l'environnement : stratégies de création d'aires protégées, trame verte et bleue, atlas de la biodiversité communale ou plus anciennes tels que les plans nationaux d'action.

Pour les Bouches de Bonifacio, site écologique particulièrement riche, les ministres italien et français ont signé le en juin 2010 à Palau (Sardaigne) deux déclarations, l'une relative à la création du parc marin international des Bouches de Bonifacio et l'autre relative à une demande à l'ONU d'interdire le passage dans les Bouches de Bonifacio des navires transportant des marchandises dangereuses. Dans l'attente de cette interdiction, ils ont transmis à l' Organisation Maritime Internationale le 25 juin dernier une demande de désignation des Bouches de Bonifacio comme Zone Maritime particulièrement Vulnérable (ZMPV).

A l'avenir plusieurs piste d'études et d'actions sont à mettre en œuvre telles que :

- l'étude des conséquences du développement du tourisme
- l'approfondissement des connaissances sur les invertébrés
- l'étude des conséquences des changements climatiques sur les espèces endémiques
- les conséquences du développement des énergies renouvelables sur la biodiversité insulaire.

Et un certain nombre de mesures spécifiques à la Corse qui concentre de nombreux enjeux du fait de son taux d'endémisme élevé :

- créer au moins 2 réserves naturelles en montagne ; si le littoral constitue un espace particulièrement sensible et menacée par les activités touristiques, les zones de montagne insulaires soumises à une pression touristique croissante et jusque là épargnées sont à surveiller, en Corse en particulier.
- consolider le réseau des réserves sur le littoral, au Cap Corse et entre le golfe de Porto (aire du site du patrimoine mondial) et Calvi.
- -délimiter de toute urgence le Domaine Publique Maritime sur l'ensemble des plages et arrières plages, lieux d'enjeux de conservation très importants , afin de mettre en place une gestion réelle des formations végétales associées (*Anchusa crispa, Linaria flava, susp. Sardoa, Limonium strictissimum, Euphorbia peplis,etc…)*
- - renforcer la réglementation et les contrôles sur l'introduction d'espèces exogènes à la Corse.

SUMMARY

There is an important number of Island and Islets in Metropolitan France (almost 1300), principally situated in Brittanynée and Mediterranean Sea. Corsica count for more than 90% of this superficy of French metropolitan island.

The island biodiversity is specially important and covered by numerous assessments and protection tools :

- Naturals Areas of Ecological, Faunistical and Floristical Interest (ZNIIEFF) census. 80 of the French islands are covered by this assessment ;
- Natura 2000 : 10% of the French sites are situated on islands ;
- Regional Naturel Parks: Corsica and Brittany
- National Park : Port Cros
- Marine Park (l'Iroise)
- Natural Reserves : 15 are situated on islands
- Biotop Prefectoral : 67 are situated on islands

We should mention the particular task of the Coastline Spaces Conservatory who buy in order to protect them from urbanisation plans. Since 1975, this institution have bought approximately 21000 hectares on islands.

The National Botanical Conservatories job is also very important. They manage botanical surveys with special interest on rare and threatened plants, monitoring on invasive species, and habitats mapping.

Other tools like Biosphere Reserves (MAB project), RAMSAR wetlands, International Park of Bonifacio Mouths in Corsica, PELAGOS cetacean sanctuary in Mediterranean sea…. Are involved on island biodiversity protection.

Island biodiversity is sensitive and threatened by several factors including two which are specially discussed :

- Invasive species. This is a specially frightening problem for island ecosystems. This report make a synthesis on regulation, eradication and monitoring actions actually conducted in French islands ;
- Climate change impacts.

Facing these threats, it seems necessary to reinforces island biodiversity protection. Some plans are already in action, following the "Grenelle of environnement" like : protected areas creation strategy, Green and Blue framework, communal biodiversity atlas, and some more ancient like species national action plans.

For the Mouths of Bonifacio, particularly rich ecological site, the ministers Italian and French signed in June 2010 in Palau (Sardinia) two declarations, the one relating one to the creation of the international marine park of the Mouths of Bonifacio and the other relative one to a request with UNO to prohibit the passage in the Mouths of Bonifacio the ships carrying dangerous goods. In waiting of this prohibition, they transmitted to the Maritime Organization International last on June 25 a request for designation of the Mouths of Bonifacio like Maritime Zone Particularly Vulnerable (MZPV)

Some studies and actions could be explored for the future :

- impacts of tourism on biodiversity ;
- studies on invertebrates ;

- Impact of climate change on endemics species
- Impact of « green energy » on island biodiversity

And specific measures in Corsica who concentrates many stakes because a rate of high endemism :

- to create at least 2 natural reserves in mountain; if the littoral constitutes a space particularly sensitive and threatened by the tourist activities, the insular mountainous areas subjected to an increasing tourist pressure and until saved there are to be supervised, in Corsica in particular.
- to consolidate the network of the reserves on the littoral, in the Corsica Cape and between the gulf of Porto (surface of the site of the world heritage) and Calvi. ·
- - to urgently delimit the Maritime Domain Public on the whole of the beaches and back beaches, places of very important stakes of conservation, in order to set up a real management of the associated vegetation formations (*Anchusa crispa, Linaria flava, susp. Sardoa, Limonium strictissimum, Euphorbia peplis*, etc…) ·
- to reinforce the regulation and controls on the introduction of exogenic species to Corsica ·

3. IRELAND / IRLANDE

ISLAND BIODIVERSITY IN IRELAND

Background

Ireland's biodiversity is a product of its glacial history, complex geology and oceanic climate coupled with a long history of human influence. Owing to geographic isolation, Ireland has a depauperate flora and fauna by European standards, with few endemics (table 1). However, the mild, wet climate and relatively unpolluted atmosphere mean that many of the habitats in Ireland are of international importance (e.g. machair, turloughs, raised bogs, limestone pavement) due to their scarcity and the unique species communities found on them (e.g. species characteristic of alpine and Mediterranean communities co-occurring in the Burren; species-rich Atlantic bryophyte communities in the south-west; hepatic mat communities in the uplands).

Table 1 – Species diversity for major groups, in Ireland.

Taxonomic Group	Approximate number of species	Number of legally protected species
Vascular plants	c. 900 native; c. 1,108 established aliens	68
Bryophytes	c. 584 mosses; 228 liverworts; 3 hornworts	19
Algae	700-1,000 freshwater; 579 marine	4
Lichens	c. 1,000	1
Lichenicolous fungi	150	
Fungi	>3,500	
Mammals	c.35 terrestrial; 2 seals; 24 cetaceans	26 terrestrial+ all seals & cetaceans
Birds	c.450 observed	All
Reptiles	2; 1 turtle, but 3 others occasionally observed	1 + all turtles
Amphibians	3	3
Freshwater fish	28	11
Invertebrates	c.18,107 documented	8

Ireland is an important staging post and destination for migratory birds of conservation importance (e.g. Greenland White-fronted Geese (*Anser albifrons flavirostris*), and holds significant populations of birds rare elsewhere in Europe as well as internationally important wetland bird communities.

Much of Ireland's biodiversity is in the marine environment, with important cetacean populations, cold water coral communities and many species at the northern or southern limit of their distributional range.

The 'All-Island' approach to biodiversity conservation is important in Ireland, as species and habitats do not observe political boundaries. Many projects are run as a co-operation between the National Parks and Wildlife Service (of the Department of the Environment, Heritage and Local Government) in the Republic of Ireland, and the Northern Ireland Environment Agency.

Endemism

Ireland would have been rendered almost sterile biologically during the last glacial maximum, and virtually all of the island's species have colonised since the ice retreated (c. 10,000BP). As a result Ireland has much lower rates of endemism than would be expected on an island. However, there is increasing genetic evidence that some species may have survived the last glaciation *in situ*, and it is in these species that we primarily see some endemism (e.g. Irish Hare (*Lepus timidus hibernicus*), Killarney Shad (*Alosa fallax killarnensis*), Arctic charr species complex (*Salvelinus alpinus* agg.)). Endemic plant species are also found in the speciose Hawkweed (*Hieracium*), Dandelion (*Taraxacum*), Bramble (*Rubus*) and Whitebeam (*Sorbus*) genera. An endemic variety of Bumblebee (*Bombus muscorum* var. *allenellus*) is found on the offshore Aran Islands. The sea anemone (*Edwardsia delapii*) is an example of a marine endemic.

An unusual feature of some Irish species is the breadth of niche occupied here, the depauperate biota meaning that competition with con-generic species is often limited or even absent. For example the white-

clawed crayfish (*Austropotamobius pallipes*), the only crayfish species in Ireland, occurs in both rivers and lakes here, but elsewhere in its range is limited to rivers. Similarly the common frog (*Rana temporaria*) is the only frog species in Ireland and occurs from sea-level to mountain tops. Elsewhere in its range, where this frog competes with several other frog species, this frog occupies a more confined niche.

State of Ireland's Biodiversity

A recent comprehensive assessment of the conservation status within Ireland for the species and habitats listed on the EU Habitats Directive [92/43/EEC] showed that the majority of the island's important habitats have an unfavourable conservation status, including raised and blanket bogs, dune systems, fens and mires, natural grasslands and woodlands (figure 1). Many protected species have a moderately satisfactory status but some, particularly those that occur in wetland and aquatic environments, are also reported to be of bad conservation status, such as the Atlantic salmon and freshwater pearl mussel (figure 2).

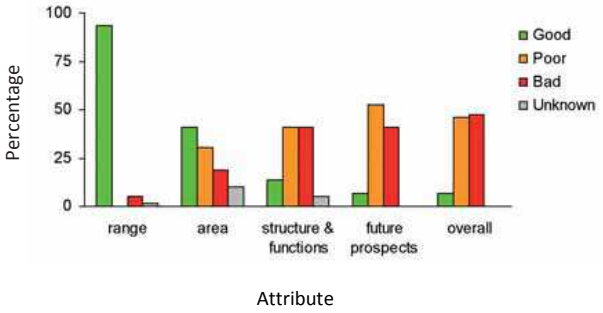

Figure 1 - Summary of conservation status for all Irish Habitats Directive habitats

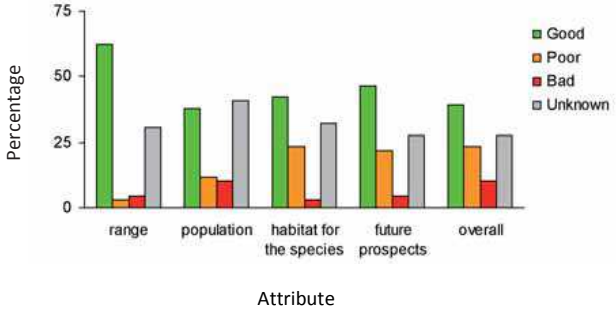

Figure 2 - Summary of conservation status for all Irish Habitats Directive species

These results can be taken as an indictor of the status of Ireland's biodiversity in general, as Habitats Directive listed habitats and species are found throughout Ireland, and cover most of Ireland's biodiversity hotspots. Indeed, the assessment is backed up by recent IUCN regional red list assessments for water beetles and non-marine molluscs, which also show that a relatively high percentage of wetland species are threatened.

The list of Birds of Conservation Concern for Ireland, which assesses species using a system similar to the IUCN, places 25 species on the red list (i.e. of most conservation concern), 85 on the amber list, with only 89 on the least concern green list. However, there is also evidence that many of the more common breeding birds in Ireland have fared quite well over the last ten years (figure 3).

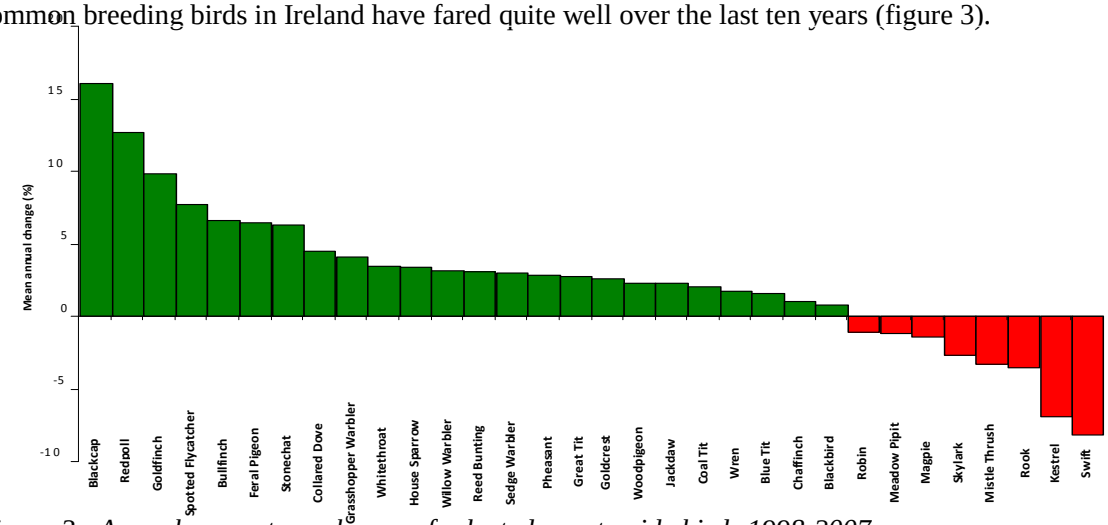

Figure 3 - Annual percentage change of selected countryside birds 1998-2007

Economic benefits of biodiversity

A recent study to identify the nature and scale of the benefits that Irish society derives from biodiversity presented an assessment of the benefits of selected ecosystem services in the principal social and economic sectors (Table 2). Based on a preliminary estimate, the value of Ireland's ecosystem services in terms of their productive output and human utility to be over €2.6 billion per annum. This estimate omits other significant services including waste assimilation provided by aquatic biodiversity and benefits to human health.

Policy costs are estimated to be €370m per year, but only a proportion of these are truly incurred on protecting biodiversity. For example, the National Parks and Wildlife Service spends around €35m per year directly on biodiversity protection.

Table 2 – Policy costs and likely benefit values of ecosystem services in Ireland, listed by sector.

Sector	Policy costs (per annum)	Value (per annum)	Comments
Agriculture	€180 mill.	€1,200 mill.	Potentially significantly greater benefits from more sustainable agriculture
Forestry	€15 mill.	€55 mill.	Non-market benefits increasingly being recognised
Marine	€30 mill.	€230 mill.	Potentially significantly greater benefits from more sustainable resource management.
Human welfare	€260 mill.	€920 mill.	Selected benefits only
Health	Negligible	Unknown	Probably tens of millions
Water quality	€65 mill.		Catchment management expenditure likely to increase
Roads (mitigation)	€40 mill.		

Threats

Ireland has experienced nearly a century of commercial afforestation, some 40 years of agricultural intensification and a decade of economic boom, which has put extreme pressure on its native biodiversity. The key threats to Irelands' biodiversity have been identified as:

- Direct damage, such as peat cutting, drainage and infilling; buildings and infrastructure; reclamation of wetlands such as bogs and fens; and removal of sand and gravel.
- Over-grazing and under-grazing of grasslands, peatlands, and coastal habitats.
- Pollution of both surface water and groundwater by nutrients or silt.
- Unsustainable exploitation of water, sand, peat, fish and other natural goods and services.
- Invasion by alien species of plants and animals.
- Recreational pressure in areas which were previously undisturbed.

Additional pressures on a number of species and habitats are likely to arise if Ireland undergoes climatic changes according to predictions.

Conservation measures

Biodiversity in Ireland is protected by national legislation (in particular the Wildlife Act, 1976, Wildlife (Amendment) Act, 2000, Flora (Protection) Order, 1999 and Whale Fisheries Act, 1937), EU directives (in particular the Birds Directive [79/409/EEC], Habitats Directive [92/43/EEC] and Water Framework Directive [2000/60/EC]) and numerous international agreements (e.g. CITES, CBD, RAMSAR, Bern Convention, Convention on Migratory Species, OSPAR).

Biodiversity areas are protected by several designations, primarily Special Areas of Conservation (423 sites), Special Protection Areas (147 sites) and Natural Heritage Areas (148 sites designated; 600 sites under consideration). State owned lands are designated as National Parks (6 sites) and Nature Reserves (78 sites).

Conservation management plans are in preparation for designated areas. In addition, agri-environmental schemes and native woodland schemes have been available for land managers to sign up to. An active programme of bog acquisition is underway, with the ultimate aim of reducing or eliminating turf-cutting, and expanding the programme of bog restoration.

Extensive species and habitat monitoring programmes are underway. In 2010 the primary focus is on grasslands, uplands, turloughs, juniper scrub, limestone pavement, sea cliffs, various rare bryophytes, various birds species, the otter (*Lutra lutra*), frog (*Rana temporaria*) and freshwater pearl mussel (*Margaritifera margaritifera*).

A key goal of Ireland's National Biodiversity Plan is to integrate biodiversity concerns into all sectoral activities, and to increase public awareness of the importance and economic value of biodiversity. Ireland's public awareness campaign 'Notice Nature' was the winner of the 2007 EU award for best practice in communicating environmental issues (http://www.noticenature.ie).

The lack of an organised framework for the management of biodiversity data in Ireland, has been a key bottleneck for conservation programmes. However, a National Biodiversity Data Centre is now in place (since 2007) and acts as a central repository for handling biodiversity, and other relevant, data from a large number of sources and stakeholders (e.g. Government departments and agencies; NGOs, private collectors). The centre is working to provide checklists for all species groups in Ireland, as well as compiling inventory data about their distributions and habitats through a state of the art online mapping system. This improved access to biodiversity data will ensure that future policies and decision makers, that impact on biodiversity, have access to the best available information. See http://www.biodiversityireland.ie for more information.

A red listing programme aims to assess the conservation status, using IUCN categories and criteria, for Irish species, particularly for those groups that are currently under-represented on the national legislation or EU Directives. In 2010 red lists will be compiled for bryophytes, dragonflies, butterflies, fish, amphibians and reptiles.

Reintroduction programmes are in place for several raptor species, such as the golden eagle (*Aquila chrysaetos*), red kite (*Milvus milvus*) and white-tailed sea eagle (*Haliaeetus albicilla*).

Invasive species

As is the case in any island state, the threat posed by alien invasive species is significant and the impacts are already in some cases almost irreversible (e.g. *Rhododendron ponticum* invasion of native forest; Zebra mussel (*Dreissena polymorpha*) in lakes and rivers). Most of the problematic invaders have arrived as escaped ornamentals, deliberate introductions for fisheries, or in ballast waters. Invasive species are a particular threat to aquatic habitats, especially rivers, lakes and canals.

An All-Ireland invasive species project has been in place since 2004 (http://www.invasivespeciesireland.com). This project provides detailed information on the most unwanted species, as well as advice on how to deal with some of the established invaders. A web-based reporting tool provides an early warning system for dealing with new invaders as soon as they are identified (see http://invasives.biodiversityireland.ie/asian-clam/). This project has already shown some success stories, with the eradication of chub (*Leuciscus cephalus*) and the development of methods for eradicating curly waterweed (*Lagarosiphon major*).

Climate change

The presence of so many species at the extreme of their range in Ireland, means that the island is uniquely placed for monitoring the impacts of climate change. The effects of climate change are already evident, such as the rapid spread of the warmth-loving little egret (*Egretta garzetta*), breeding first in Cork but now common and spread as far north as Louth. However there are contradictions, with the snowy owl (*Bubo scandiacus*), a species at home on the tundra, nesting in Donegal, and the great skua (*Stercorarius skua*), which nests in the Shetlands and far north, nesting recently in Ireland. The migrant hawker dragonfly (*Aeshna mixta*), which was first recorded in Ireland 2000, has now spread north and west along the coast (figure 4). Other native species likely to benefit from include the lesser horseshoe bat (*Rhinolophus hipposideros*), Kerry slug (*Geomalacus maculosus*) and natterjack toad (*Bufo calamita*).

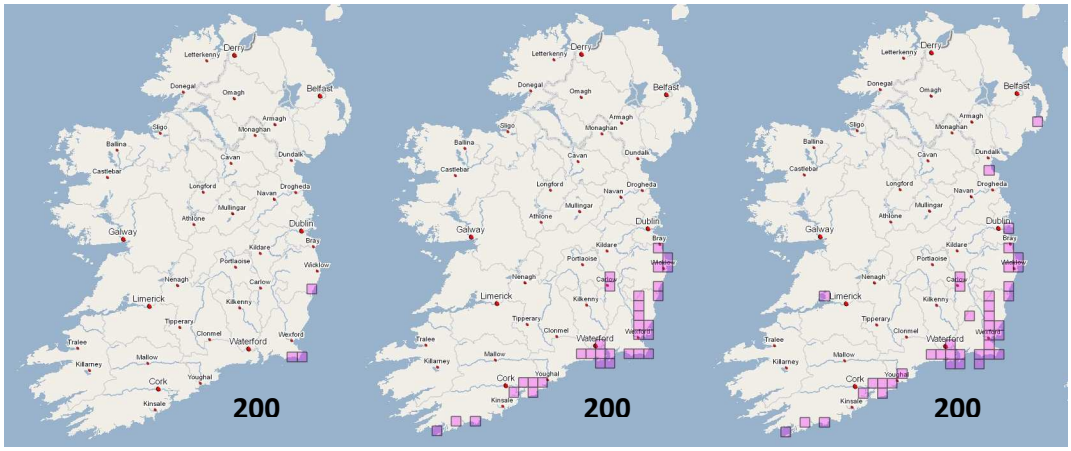

Figure 4 – Spread of the migrant hawker dragonfly across Ireland.

There are still no fully satisfactory models showing how climate change will impact on Irish biodiversity, given the complex range of habitats, geomorphology and the uncertainty over changes that will occur in the oceanic currents that drive the Irish climate. However, recent research has identified Irelands internationally important peatlands (active raised bog, blanket bog, fens) and turloughs as being at particular risk.

CASE STUDIES

Conservation management of the natterjack toad (*Bufo calamita*)

The natterjack toad, a Red Data Book and EU Habitats Annex IV species, is the only toad species in Ireland. It has a biogeographically interesting distribution, and is sometimes referred to as an example of a Lusitanian species (one that links the south-west of Ireland and the north of Spain). It has been declining steadily in Ireland from the early 20th century up to the present day, mainly due to loss of breeding ponds following land drainage. The natural range is confined to a small number of coastal sites on the Dingle and Iveragh peninsulas in Co. Kerry. Recent surveys put the population at c.12,000 adults. A study carried out between 2004-2006 indicated that the range is at risk of contracting further, with very poor and irregular breeding activity recorded at the most westerly part of the current range, despite the creation of two additional pools there in 2003.

In 2008, the NPWS launched a scheme to encourage farmers to conserve toads on their land. Farmers were invited to enter a 5 year agreement with the NPWS and in return receive annual payments related to the number of ponds they dig and for maintaining the ponds (e.g. through hand clearance of vegetation) and the surrounding sward (through grazing) in a suitable condition for natterjacks. €500 was paid for the first two ponds in each hectare, and there has been an encouraging take-up for the scheme. In

2008, the first year of the programme, 25 farmers joined and 49 new ponds were dug. Ten additional farmers joined in 2009, bringing the total number of new breeding sites to 69.

Roseate Tern Conservation (*Sterna dougallii*) (NBP Action 26]

The Roseate Tern, (*Sterna dougallii*), is the rarest breeding seabird in northern Europe and is listed in Annex I to the EU Birds Directive, in Appendix II to the Berne Convention on the Conservation of European Wildlife and Natural Habitats (1979) and in Appendix II to the Bonn Convention on the Conservation of Migratory Species of Wild Animals (1979).

In 1988, Rockabill Island, located off north County Dublin, was designated a Special Protection Area under the Birds Directive, and a Statutory Refuge for Fauna under the Wildlife Act, 1976. When the lighthouse keepers left the island in 1989, a conservation NGO and the State cooperated to secure the Island for the terns. BirdWatch Ireland now carries out wardening and scientific seabird monitoring of Rockabill with funding from NPWS.

The number of Roseate Tern nests has increased from 152 in 1989 to reach a peak of 1,052 nests in 2009. Rockabill is an internationally important breeding site, supporting ca 78% of the NE Atlantic breeding population. Other nesting sites are in Wexford in Ireland and in small scattered colonies in the UK and Brittany in France.

Similarly numbers of breeding Common Tern (*Sterna hirundo*) have also been increasing in recent years, peaking in 2007 with 1,411 nests. Arctic Terns (*Sterna paradisaea*) have also bred at Rockabill in low numbers since 1992. This breeding population had increased to 200+ pairs by 2004 and has remained relatively stable since. Other seabirds that are also included in the annual seabird monitoring programme at Rockabill are Kittiwake (*Rissa tridactyla*) and Black Guillemot (*Cepphus grille*).

4. ITALY / ITALIE

OVERVIEW ON BIOLOGICAL DIVERSITY IN THE ITALIAN ISLANDS – Updating to the 2009 National Report (T-PVS (2009) 13).

By Cappelluti F.[(1)], Brundu G.[(2)]

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INTRODUCTION

The present report constitute an updating of the national report produced for the Tenerife meeting (1-3 October 2009) and included in the general Report (T-PVS (2009) 13) prepared by the Directorate of Culture and Cultural and Natural Heritage. It lists newly started or in progress activities. Furthermore, it gives a piece of information on environmental policy measures, adopted and implemented by Italy during 2009-2010, which could be applied to biodiversity conservation on islands, even if only a few of them were specifically and explicitly addressed to biodiversity on islands. Nevertheless, a number of issues, data and trends remain worrying and need continuous and further efforts.

NEWS AND ACTIVITIES AT INTERNATIONAL/NATIONAL LEVEL (2009-2010)

In order to reduce the loss of biodiversity the Italian Ministry for Environment Land and Sea (MATTM) has launched the **National Strategy on Biodiversity** which was officially illustrated during the National Conference on Biodiversity held in Rome on 22nd May 2010, on the occasion of the International Day for Biological Diversity. The strategy confirms Italy's commitment to stop the loss of biodiversity and is an important tool for integrating the key issues of biodiversity into national politics. There is a clear commitment in the protection of the marine and costal habitats in the framework of main national and international commitments and legislation (e.g., Dir. no. 2008/56/CE, 2002/413/CE) and to apply a National Strategy for the Integrated Management of Coastal Zones (IMCZ)[3], and from this point of view this could be highly beneficially to conservation of island biodiversity. Nevertheless, there are only very few specific references to biodiversity on islands both in the national Strategy on Biodiversity (e.g., *cfr* "small-islands", draft version dated 18 June 2010, pag. 22) and in the preparatory work of the "Thematic tables[4]".

At the **G8 meeting in Sicily** (22-24 April 2009), environment ministers adopted the "**Carta di Siracusa[5]"** together with ministers from 11 other countries and representatives from international organizations. The document stresses the relationship between biodiversity and climate, focusing

[3] See also: Verso la Strategia Nazionale per la Biodiversità, esiti del tavolo tecnico "Turismo e biodiversità: opportunità e impatti sulla biodiversità" AAVV (2010) *<http://www.minambiente.it/opencms/opencms/home_it/menu.html?m=Progetto__Verso_la_Strategia_Nazionale_p.html&mp=/menu/menu_attivita/&lang=it>*. The

[4] E.g., 320 Important Plant Areas (IPAs) have been individuated and mapped in Italy and many of them are on islands.

[5] Available at: *<http://www.g8ambiente.it/public/images/20090424/doceng/09_04_24_Carta%20di%20Siracusa%20on%20Biodiversity.pdf>*

particularly on the role of ecosystems in mitigating and adapting to climate change. Strengthening and restoring the resilience of ecosystems, as well as ensuring a steady flow of ecosystem services, were also recognized as essential for human well-being and for achieving the Millennium Development Goals. Ministers gave special emphasis to the definition of a common path towards post-2010 targets for biodiversity. No explicit reference is found in the "Carta di Siracusa" to island ecosystems, but points 19 and 20, respectively, stress the need for conservation and sustainable development of marine and coastal zones, in particular by applying the principles of integrated coastal zone management and (20) for developing and strengthening actions to prevent and to control invasive alien species, also taking into consideration the high costs of coping with existing invasions and their strong impact on biodiversity and ecosystem services (early warning and rapid response are cited among the priority actions to be implemented).

The Ministry of Agriculture and Forestry Politics (MIPAF) has elaborated the **National Plan on Agricultural Biodiversity** (PNBA) whose main objective is to supply guidelines for the conservation and valorization of genetic and biological resources in agriculture according to national and international commitments[6]. To this end, a Permanent Committee for genetic resources has been established and is coordinated by the Ministry of Agriculture and Forestry Politics. A significant portion of agrobiodiveristy is stored in Italian islands, yet no precise reference is found on the PNBA (e.g., production *Capparis spinosa* on Eolian islands[7], conservation of *Brassica macrocarpa* on Egadi islands[8]).

A joint conservation plan for the protection of biodiversity is also contained in the National Strategic Plan (PSN) and in several[9] **Rural Development Programs** (PSR), so that this could be applied at least to the main Italian islands of Sicily and Sardinia[10] and surrounding islets. Furthermore, the office for biodiversity of the State Forestry Department (*Corpo Forestale dello Stato*, CFS) acts to promote new

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[6] E.g., On 3 November 2001, the International Treaty on Plant Genetic Resources for Food and Agriculture (Treaty) was adopted by the FAO Conference at its 31st session in Rome, by Resolution 3/2001 (http://www.planttreaty.org/). The Treaty is a new, legally binding instrument which seeks to ensure the conservation and sustainable management of plant genetic resources for food and agriculture, as well as the fair and equitable sharing of the benefits arising from their use (art. 1.1). At the crossroads of agriculture, commerce and the environment, the Treaty also aims to promote synergy in these areas (preamble). (http://www.fao.org/DOCREP/005/Y3872E/y3872e06.htm). The Treaty was ratified by Italy with the law no. 101, dated 6 April 2004, n. 101. The Law gives peculiar responsibilities to the regions, and consequently to the islands of Sicily and Sardinia, for conservation of autochthonous germplasm. See also ISPRA Manual, "Piotto B., Giacanelli V., Ercole S. (eds.), 2010. La conservazione ex situ della biodiversità delle specie vegetali spontanee e coltivate in Italia. Stato dell'arte, criticità e azioni da compiere". Manuali e linee guida ISPRA 54/2010. Available at < *http://www.isprambiente.it/site/_contentfiles/00004300/4305_MLG_54_2010.pdf* >. *Cfr* also the draft proposal of the Sardinian regional law, PL n. 174 dated 16 June 2010, titled "Tutela, conservazione e valorizzazione dell'agrobiodiversità della Sardegna" Available at: *<http://www.consregsardegna.it/XIVLegislatura/Disegni%20e%20proposte%20di%20legge/propleg174.asp>*

[7] Regione Sicilia, Assessorato Agricoltura e foreste, progetto "Caratterizzazione, miglioramento genetico-sanitario e difesa del Cappero delle isole minori della Sicilia". See also, e.g., Laghetti G.; Perrino P.; Hammer K. 1999. Collecting landraces and wild relatives in the Neapolitan islands, Italy. Plant Genetic Resources Newsletter (IPGRI/FAO), 119; Laghetti G.; Hammer K.; Olita G.; Perrino P. 1998. Crop genetic resources from Ustica island (Italy): collecting and safeguarding. Plant Genetic Resources Newsletter (IPGRI/FAO), 116: 12-17. See also: K. Hammer and G. Laghetti, 2006. Small Agricultural Islands and Plant Genetic Resources. *Le piccole isole rurali italiane*. Istituto di Genetica Vegetale (IGV), Consiglio Nazionale delle Ricerche (CNR), Bari, Italy, 244 pp.

[8] *Brassica macrocarpa* Guss., is an endemic species present on Egadi islands, and a primary source of the gene pool of *Brassica oleracea* L. It i san andangered species, under monitoring to define *in situ* conservation strategies in the framework of the project EUGENRES 057 "AEGRO", cfr < *http://www.cbd.int/iyb/doc/celebrations/iyb-Italy-ISPRA-article-it.pdf*> (pag. 11).

[9] E,g, Sardinia Island PRS at <*http://www.regione.sardegna.it/speciali/programmasvilupporurale/*>; Sicily islands at <*http://www.regione.sicilia.it/Agricolturaeforeste/Assessorato/index.htm*>.

[10] E.g., see < *http://www.regione.sardegna.it/documenti/14_43_20071121202527.pdf*> and < *http://cbv.uniss.it/index.html*>.

methodologies for a durable use of natural resources especially in natural reserves and in the biosphere reserves, that in some cases are island territories. Within this office a national network of germplasm and renaturalization has been created with the objective of safeguarding native plant species.

Noteworthy, the international workshop "**Island and Coastal biosphere reserve in the Mediterranean: Model for sustainable development**[11]" was organized in Syracuse during 10-12 November 2009 by the UNESCO Venice office and the MAB Secretariat in collaboration with the Italian Ministry for Environment Land and Sea Protection, the Consortium Plemmirio[12], Marine Protected Area in Syracuse (Sicily) and Italian National Commission for UNESCO.

Since 2008[13] the Italian ministry of Foreign Affairs has funded, through UNEP - Directorate General for Development Cooperation (DGCS), the **GID** initiative (**Global Island Database** - http://gid.unep-wcmc.org/)[14], with strong links to the Global Islands Network (GIN), as well as IUCN's Species Survival Commission's (SSC) Invasive Species Specialist Group (ISSG) and the Pacific Ecosystems at Risk (PIER) project. The GID reflects five of the themes important for islands, as identified by the Island Biodiversity Programme of Work (IBPoW) of the Convention on Biological Diversity (CBD), namely biodiversity, climate change, invasive species, pollution and sustainability.

More recently, the Italian Minister of the Environment, has announced financial support for the **Global Invasive Species Database** (**GISD**), the freely accessible online database of the ISSG. The GISD is acknowledged as the most authoritative and comprehensive database on alien species at the global scale. Following the appointment of Piero Genovesi as the new ISSG chair, GISD will be hosted at the Environmental Protection and Research Institute (ISPRA) in Rome, Italy. The Italian Ministry of Environment is committed to provide financial contributions to enhance the improvement of the GISD and, in particular, to integrate it with other information services, thus increasing support to decision makers. The commitment of the Italian Minister is a first implementation of the actions listed in the Syracuse Charter on Biodiversity, agreed at the last G8 Environment Ministers meeting, which calls for developing and strengthening actions to prevent and control the spread of invasive alien species, and support to global information systems. From this point of view this is an important step toward the mitigation of the menace of IAS against island ecosystems.

On the 12th April 2010, Italy and France signed an agreement to set in motion the procedure for the creation of a new protected area: the ***Bocche di Bonifacio*** **Transnational Marine Park**. Ministers for the Environment Stefania Prestigiacomo and Jean Louis Borloo also pledged to set up a European group for

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[11] The main outcome of the 3rd World Congress on Biosphere Reserves was the Madrid Action Plan (2008-2013) which among many topics, focuses on Islands and Coastal Zones. In addition, special emphasis was given to the integrated biodiversity conservation of natural resources and sustainable development, as well as to the creation of specific thematic networks, such as those that target island and coastal zones. Building on experiences developed in insular and coastal BRs of the Mediterranean, the Seminar "Island & Coastal Biosphere Reserves in the Mediterranean. Models for Sustainable Development" intended to explore topics of common interest that could then be further investigated in the framework of a new coordinated experimental program related to insular and coastal BRs in the region, allowing for the development of management guidelines and models to be extended to the most of Mediterranean insular, coastal and marine areas. *Cfr* < *http://www.unesco.org/en/venice/single-view/news/island_coastal_biosphere_reserves_in_the_mediterranean_models_for_sustainable_development/back/22834/cHash/431515b015/* >.

[12] The Protected Marine Area of Plemmirio, established in 2001, has taken the lead to initiate an inter-institutional dialogue among stakeholders for applying to become the first Coastal Biosphere Reserve in Italian island of Sicily, in full compliance with the Eruo MAB recommendations for Biosphere Reserves. In particular, Plemmirio aims at reviewing the old fashioned ideas of marine-versus land based BRs, considering the expansion of its territorial dimension to cover whole land-sea interface, taking into account of the need for an integrated coastal zone management and the fulfillment of the development functions underpinned by its outstanding natural and cultural assets. Moreover, Plemmirio is the single marine protected area in Italy where activities and infrastructures, have been designed with particular focus on children and disable people <*http://www.plemmirio.it/*>.

[13] *Cfr*, DIPCO n. 23/2008, p. 131, Atto n. 164/2008.

[14] < *http://www.cooperazioneallosviluppo.esteri.it/pdgcs/download/Global_Island_Strategy.pdf*>

territorial cooperation, between the Maddelena Archipelago National Park and the Bocche di Bonifacio Natural Reserve, which are the two main areas of the new marine park[15].

The Pelagos Sanctuary, founded on 21 February 2002, is now on the list of SPAMIs (Specially Protected Areas of Mediterranean Importance), as part of a protocol relating to the Barcelona Convention. This status gives Pelagos official recognition from Mediterranean countries as being part of a network whose aim is the efficient conservation of Mediterranean heritage. In November 2009 in Monaco, Pelagos' 4th Conference of the Parties (the decision-making body) voted for a resolution on maritime traffic, which involved the States promoting the Pelagos Sanctuary's recognition as a Particularly Sensitive Sea Area (PSSA) to the IMO, and contributing to the REPCET project (see above). This commitment was also made by ACCOBAMS during the last Scientific Committee meeting held in Casablanca in January 2010[16].

The **Small Islands Project** (PPI, *Progetto Piccole Isole*) was launched in 1988 by the Italian Ringing Centre at ISPRA (formerly *Istituto Nazionale per la Fauna Selvatica*). The project represents the largest ornithological monitoring effort ever realized within the Mediterranean, thanks also to the support offered by the General Directorate of Nature Protection of the Italian Ministry of the Environment. The main aims of the project are to investigate spring migration across the Mediterranean through a network of ringing stations operating together on the basis of standardized field protocols. A second aim is to obtain sound scientific evidence of the conservation value of Mediterranean islands and coastal habitats for staging migrants during a particularly delicate phase of their annual cycle. This knowledge is needed in order to develop reliable policies for the conservation of migratory birds within the Mediterranean, with special concern to avian biodiversity on islands.

The network of Mediterranean islands and coastal sites where staging birds are monitored represents an important component of the migratory system of many species, linked to largely variable habitats, both on the breeding and wintering areas. The seasonality of passage, for instance, is a species-specific feature; the different species show a strong consistency in their migration timing in spring, and the inter-annual, within-species variability in the mean date of passage is significantly lower than the variation recorded among species[17]. The general seasonal pattern of passage of trans-Saharan migrants across the Mediterranean has been found to be influenced by factors acting on the wintering and breeding quarters. The importance of Africa is confirmed by the earlier spring movements within the Mediterranean of species wintering in more northern quarters; equally, species overcoming a complete wing moult on the wintering grounds show delayed northward movements. As for the influence of the breeding quarters, we found that early migration is related to cavity nesting, a strategy which implies direct competition for limited nesting opportunities, hence a selective advantage for an early arrival on the breeding grounds. The monitoring activities have also allowed to clarify different aspects of the relationships between climate and weather conditions and the inter- and intra-specific features of the calendar of return migration (see below).

The collection of biometrical data on all PPI stations allows also to infer on different populations of a same specie crossing different areas of the Mediterranean. A network of ringing stations also provides data on the daily distribution of catches at different stages of barrier crossing. In this case, by considering a general S-N pattern of movements across the Central Mediterranean, has been possible to confirm a progressive movement of fronts of migration, with a delayed arrival on islands at higher latitudes, as in the Garden Warbler[18]. In the same species, the observed values on the PPI stations also match the predicted

[15] *Cfr < http://www.cbd.int/iyb/doc/prints/iyb-report-2010-04-en.pdf>*
[16] Cfr < *http://www.repcet.com/docs/AF-07-008-PT_EN.pdf>*
[17] Rubolini D., Spina F., Saino N. 2005. Correlates of timing of spring migration in birds: a comparative study of trans-Saharan migrants. Biol. Journal Linnean Society, 85(2): 199-210.
[18] Grattarola A., Spina F., Pilastro A. 1999. Spring migration of the Garder Warbler (*Sylvia borin*) across the Mediterranean. J. Ornithol., 140: 419-430.

pattern of progressive decrease in body mass as estimated using Pennycuick's model[19]. This suggests that in fact birds are able to cross the extended barrier represented by the Sahara and Mediterranean in spring without significantly refueling en route; however they also need to find available habitats and resources on key staging areas like those represented by Mediterranean islands. The network of Mediterranean islands is of crucial importance for birds regardless of physical conditions and including migrants still with very large energy reserves.

The most important variable in explaining the observed inter-specific differences in average physical conditions on Mediterranean islands, as found in a large sample of trans-Saharan migrants[20], is the northernmost latitude of the preferred wintering habitat for each species in Africa. Hence, the crossing of the Sahara and the Mediterranean in spring is constrained by the distribution of preferred habitats south of the Sahara *i.e.* the overall width of the ecological barrier that the different species will cross without significantly refueling is not necessarily the same for all species, as not all species are reaching their departure physical conditions in the same geographical area in Africa. This stresses again how important Mediterranean islands are for the conservation of large numbers of birds and species which are challenged with the crossing of a barrier which becomes increasingly wide due to the ongoing desertification of the Sahel and the progressive reduction of equatorial forests in Africa.

Recoveries of ringed birds, together with specific field orientation experiments have allowed to identify areas of origin and destination of birds crossing the Mediterranean in spring[21,22], as well as to better understand their orientation mechanisms[23].

The intense monitoring activities carried out within PPI have also allowed to investigate the ecological role of island habitats for staging migrants. The conservation value of a staging area is significantly determined also by the overall number of migrants making use of the site. It is particularly difficult to soundly estimate such numbers, especially when the population sampled through any census method (e.g. ringing in this case), is represented by a large fraction of transients (*i.e.* birds which quickly move through the study area, or island in this case). It is therefore important to find analytical tools allowing to estimate the stopover duration of single individuals. For this purpose, both the existing CMR (capture/mark/recapture) models and novel technologies have been used at the most intensively studied site within the PPI network, which is represented by the small island of *Ventotene* (Italy). The former, traditional models[24] and an innovative "whole-island telemetry" approach[25] have confirmed an extremely fast turnover rate of staging migrants, offering new insights on the possibility to come to new analytical tools finally allowing to better describe the real conservation values of the network of most important stopover sites represented by Mediterranean islands.

The fact that each ringed birds is also described in terms of physical condition at first capture, as well as when it is possibly later retrapped, allows to understand the factors governing the decision by birds to

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[19] Pennycuick C. J. 1975. Mechanics of flight. In Avian Biology, vol. 5, chapter 1 (ed. D. S. Farner and J. R. King), pp. 1–75. New York: Academic Press; Pennycuick, C. J. 1999. Measuring Birds' Wings for Flight Performance Calculations. Second edition. Bristol: Boundary Layer Publications.

[20] Pilastro A., Spina F. 1997. Ecological and morphological correlates of residual fat reserves in passerine migrants at their spring arrival in southern Europe. Journal of Avian Biology, 28: 309-318.

[21] Spina F., Volponi S. 2008. Atlante della Migrazione degli Uccelli in Italia. Vol. 1: non-Passeriformi. ISPRA – MATTM, Roma, pp. 800. Available at < *http://www.isprambiente.it/site/_files/atlante/1vol-1-32.pdf*>.

[22] Spina F., Volponi S. 2009. Atlante della Migrazione degli Uccelli in Italia. Vol. 2: Passeriformi. ISPRA – MATTM, Roma, pp. 629.

[23]Gaggini V., Baldaccini E., Spina F., Giunchi D. 2010. Orientation of the pied flycatcher *Ficedula hypoleuca*: cue-conflict experiments during spring migration. Behav. Ecol. Sociobiol., 64: 1333–1342.

[24] Tenan S., Spina F. 2010. Timing and condition-related effects on recapture probability, mass change and stopover length of spring migrating songbirds on a small Mediterranean island. Ardeola, 57: 121-132. < *http://www.ardeola.org/pubs/57(1)/121-132*>.

[25] Goymann W., Spina F., Ferri A., Fusani L. 2010. Body fat influences departure from stopover sites in migratory birds: evidence from whole-island telemetry. Biol. Lett., 6: 478-481.

stage or not; this is an important aspect again when wishing to properly define and measure the conservation value of staging sites. Data on physical conditions at arrival on an island and at departure are allow interesting applied analyses[26].

A key aspect to understand the value of islands for the conservation of the biodiversity of migratory birds is represented by the use of habitats by staging birds during their stopover. An interesting and original approach from this respect has been followed in analyzing the strong relationship between some of the Mediterranean plant species blooming in spring and the nectar uptake by migrants belonging primarily to the genus *Sylvia*[27] and *Phylloscopus*[28,29,30]. Large numbers of birds survive their spring migration thanks to their plasticity in taking advantage of nectar offered by plant species such as *Brassica* sp. or *Ferula* sp., again confirming the importance of Mediterranean plant communities for these birds and the positive outcome birds obtain while staging on the islands. The network of PPI sites has also allowed to better understand the ecological determinants, frequency and geographical distribution of this nectar feeding behavior[31]. This is an important component of the scientific knowledge the PPI provides for large-scale coordinated conservation policies. This is particularly true within the larger context of the environmental effects of global change; data collected through the PPI have shown for the first time how the earlier arrivals of migrants at northern latitudes across Europe are related to an earlier departure from latitudes south of the Sahara[32,33]. A strong influence of climate in Africa in influencing the seasonal passage of migrants across the Mediterranean has also been recently shown for the first time thanks to monitoring data collected through PPI[34].

Last but not least, monitoring ringing activities represents unique opportunity for environmental education and public awareness on the importance of Mediterranean and Italian island for the conservation of European birds. From this respect one particularly interesting case is represented by the island of

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[26] (Tenan & Spina 2010) *cfr* above.

[27] Brambilla M., Vitulano S., Spina F., Baccetti N., Gargallo G., Fabbri E., Guidali F., Randi E. 2008. A molecular phylogeny of the *Sylvia cantillans* complex: Cryptic species within the Mediterranean basin. Mol. Phylogenet. Evol., 48: 461-472.

[28] Jenni L., Jenni-Eiermann S., Spina F., Schwabl H. 2000. Regulation of protein breakdown and adrenocortical response to stress in birds during migratory flights. Am. J. Physiol. Regulatory Integrative Comp. Physiol., 278: R1182-R1189 – *Cfr* also: Jenni L., Mueller S., Spina F., Kvist A., Lindstroem Å. 2006. Effect of endurance flight on haematocrit in migrating birds. Journal of Ornithology, 147: 531-542.

[29] Schwilch R., Mantovani R., Spina F., Jenni L. 2001- Nectar consumption of warblers after long-distance flights during spring migration. Ibis, 143: 24-32.

[30] Schwilch R., Grattarola A., Spina F., Jenni L. 2002. Protein loss during long-distance migratory flight in passerine birds: adaptation and constraint. The Journal of Experimental Biology: 205 687–695.

[31] Cecere J., Matricardi C., Frank B., Imperio S., Spina F., Gargallo G., Barboutis C., Boitani L. 2010. Nectar exploitation by songbirds at Mediterranean stopover sites. Ardeola, 57: 143-157.

[32] Jonzén N., Lindén A., Ergon T., Knudsen E., Vik J.O., Rubolini D., Piacentini D., Brinch C., Spina F., Karlsson L., Stervander M., Andersson A., Waldenström J., Lehikoinen A., Edvardsen E., Solvano R., Stenseth N.C. 2006. Rapid Advance of Spring Arrival Dates in Long-Distance Migratory Birds. Science, 312: 1959-1961.

[33] Jonzén N., Lindén A., Ergon T., Knudsen E., Vik J.O., Rubolini D., Piacentini D., Brinch C., Spina F., Karlsson L., Stervander M., Andersson A., Waldenström J., Lehikoinen A., Edvardsen E., Solvano R., Stenseth N.C. 2007. Response to Comment on "Rapid Advance of Spring Arrival Dates in Long-Distance Migratory Birds". Science, 315: 598.

[34] *Cfr*, e.g.: Rubolini D., Spina F., Saino N. 2004. Protandry and sexual dimorphism in trans-Saharan migratory birds. Behavioral Ecology, 15(4): 592–601; Rubolini D., Spina F., Saino N. 2005. Correlates of timing of spring migration in birds: a comparative study of trans-Saharan migrants. Biol. Journal Linnean Society, 85(2): 199-210; Saino N, Rubolini D., Jonzén N., Ergon T., Montemaggiori A., Stenseth N., Spina F., 2007. Temperature and rainfall anomalies in Africa predict timing of spring migration in trans-Saharan migratory birds. Clim. Res., 35: 123-134; Saino N., Ruolini D., von Hardenberg J., Ambrosiani R., Provenzale A., Romano M., Spina F. 2009. Spring migration decisions in relation to weather are predicted by wing morphology among trans-Mediterranean migratory birds. Functional Ecology, 24: 658-669; Saino N., Rubolini D., Serra L., Caprioli M., Morganti M., Ambrosini R., Spina F. 2010. Sex-related variation in migration phenology in relation to sexual dimorphism: a test of competing hypotheses for the evolution of protandry. J. Evolutionary Biology, doi:10.1111/j.1420-9101.2010.02068.x.

Ventotene, which has been listed as SPA based on data collected through the PPI and, for the same reason, has later been protected through a Nature Reserve. On that site, intense education campaigns involve large numbers of students and tourists, and the first **Migration Museum and Bird Observatory** in Italy has been created, attracting large numbers of visitors and representing now an important component for the local tourism economy[35].

NEWS AND ACTIVITIES AT NATIONAL/REGIONAL/LOCAL LEVEL (2009-2010)

National activities for the conservation of **Audouin's Gull** are ongoing and have lead to the complete national census of the breeding population, assessment of breeding success, marking of juveniles and control of marked breeders: actions carried out annually by ISPRA-CRA 16, with collaboration of MPAs and local authorities, as well as of a network of local experts. A Workshop was organized on 12 December 2009 at *Cilento* National Park[36], and consequent conservation measures[37] at regional level (*Campania* region, Italy).

In April 2010, the Ministry of the Environment established four new **Marine Protected Areas** in Italy, increasing the number of Marine Protected Areas in Italy to thirty. At present, Italy has 27 Marine Protected Areas and 11 of them concern islands or archipelagos, as to say that in almost all the remarkable Italian island systems there is today a kind of protection under national legislation.

Regarding the implementation of Natura 2000 in marine areas Italy has designated 287 Sites of Community Importance (SCIs) with a marine part, and 55 marine Special Protection Areas (SPAs) Other identifications and designations of new marine SCIs are carried out at a regional level to improve the conservation status of marine habitats and species close to the coast and the islands.

Concerning ongoing projects on **eradication of invasive alien species (IAS) from islands**[38], we highlight the **project LIFE+ "Montecristo 2010**[39]**"** plans to achieve the eradication of alien plants (e.g. *Ailanthus altissima*, *Carpobrotus sp.*, *Acacia sp.*) and alien rats (e.g. *Rattus rattus*) from the islands of *Montecristo* and *Pianosa* (Tuscany, Italy) and **conservation of breeding *Procellaridae*** as a prosecution of two previous LIFE projects with similar purposes. It is noteworthy that *Montecristo* island would be the largest island in the world where rat eradication will take place.

Main achievements in 2009-2010 were also rat and mouse eradications on small islands in the *Tavolara* archipelago [protected marine area (AMP) of "Tavolara-Punta Coda Cavallo[40]" Sardinia, Italy], and analyses of data to evaluate/disseminate the results obtained with management and priorities for the

[35] *Cfr* < *http://www.riservaventotene.it/index.php?option=com_content&view=article&id=90&Itemid=79*>.
[36] Workshop "La gestione e la conservazione del Gabbiano corso (*Larus audouinii*) nelle Aree Protette". Web page at: < http://www.cilentoediano.it/gab.html> and at: < http://www.infs-acquatici.it/>. Proceedings are in preparation. *Cfr* also: Serra G., L. Melega, Baccetti N. 2001. Piano d'azione nazionale per il Gabbiano corso (*Larus audouinii*). Quad. Cons. Natura, Min. Ambiente. Ist. Naz. Fauna Selvatica, n. 6.
[37] *Cfr* < *http://programmazioneunitaria.regione.campania.it/doc/pdf/regionali/DD/DD-0064-080310-AGC05-misure-salvaguardia-gabbiano-corso.pdf*>.
[38] *Cfr* also special session on "Managment of allocthonous species" held at Fabriano (Ancona, Italy) on the 5-7 May 2010, during the "*VII Congresso Italiano di Teriologia*" < *http://gis.dipbsf.uninsubria.it/congressi/index.php/atit/atit2010*>
[39] See also: DECRETO 26 marzo 2010 - Cofinanziamento nazionale del progetto LIFE + «Montecristo 2010: eradicazione di componenti florofaunistiche aliene invasive e tutela di specie e habitat nell"Arcipelago Toscano», di cui al regolamento CE n. 614/2007, ai sensi della legge n. 183/1987. (Decreto n. 4/2010). (10A06826). < *http://www3.corpoforestale.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/1973*>.
[40] AMP Tavolara – Punta Coda Cavallo web site: < *http://www.amptavolara.it/*>

future. Publications produced at this regard are listed further below[41]. The activities are carried out mainly by ISPRA- CRA 16, NEMO[42] s.a.s., ARP Lazio (http://www.arplazio.it/), PN *Arcipelago Toscano* (http://www.islepark.it/) and *Tavolara* MPA. On the 4-5 December 2009, the AMP Tavolara, in collaboration with ISPRA, organized a technical workshop titled "Ratti & Isole[43]".

On 22nd of May 2009 the Sardinian-Corsican conferences on "**Biological invasions in the Sardinian-Corsican island system**" was organized in Sassari by the University of Sassari[44] and the Botanical Conservatory of Corsica (*Conservatoire Botanique National de Corse* - http://cbnc.oec.fr/) with the support of the Italian Botanical Society.

On Sardinia island control activities against *Myocastor coypus* are going on at local level[45], but the species is still present[46]. Local removal of *Carpobrotus* sp. was part of the project Providune[47] (in the southern coast of Sardinia) and at "Stintino" sand dunes in the NW coast[48]. *Carpobrotus* sp.pl. (notably *Carpobrotus acinaciformis*, *C. edulis* and their hybrids[49]) and other species of the *Aizoaceae* family, introduced from South Africa into almost all Mediterranean regions, are a serious threat for coastal and sand dunes ecosystems in Mediterranean islands. *Carpobrotus* sp.pl. grow very fast as a mat-forming plant. Competition for space and soil resources may be of greater importance to the local persistence of native plants[50] than competition for pollinators[51,52] and have been recorded associated with an

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[42] Web page at: < *http://www.nemoambiente.com/*>.

[43] "Ratti & isole: un'emergenza per la conservazione degli uccelli marini e una risposta gestionale concreta", at: <*http://www.amptavolara.it:80/index.php?option=com_content&task=view&id=152&Itemid=88*>

[44] Dipartimento di Botanica ed Ecologia vegetale, Università degli Studi di Sassari - Centro per la Conservazione e Valorizzazione della Biodiversità dell'Università di Sassari.

[45] E.g., Deliberazione della Giunta Provinciale di Oristano, n. 137 del 15/10/2009 "Accordo di programma tra la Provincia del Medio Campidano e le compagnie Barracellari in materia di tutela dell'Ambiente e della Fauna selvatica", < *http://www.provincia.mediocampidano.it/resources/cms/documents/20091015_DEL_GP_0137.pdf*>.

[46] E.g., see < *http://www.sardegnaambiente.it/index.php?xsl=612&s=103934&v=2&c=4577&idsito=19*>.

[47] Visit project home, PROVIDUNE (LIFE07NAT/IT/000519), "*Conservazione e ripristino di habitat dunali nei siti delle Province di Cagliari, Matera, Caserta*" web page at: < *http://www.providune.it/*>.

[48] Description of the project at: <*http://www.apat.gov.it/site/_files/Pubblicazioni/Rapporto_100_2009_cap_1_11.pdf*> pp. 305-306.

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approximately 30–50% decrease in the diversity of native vegetation, with detrimental effect on soil properties and biological soil crust[53].

The Department of Botany, the Faculty of Sciences and the Course of Doctorate in Plant Resources of the University of Palermo, with the scientific support of OPTIMA (the Organization for the Phyto-Taxonomic Investigation of the Mediterranean Area) and the International Foundation pro Herbario Mediterraneo, organized, with the financial support of the *Provincia di Trapani* the first **School on Plant Biodiversity of Mediterranean and Insular systems**. It will take place on 03-14 September 2010, at the "Palazzo Sales" in Erice (TP) Sicily.

During 2010 a new Mediterranean species of antlion, *Myrmeleon mariaemathildae* n. sp., was described on material from Sardinia (Italy) and Tunisia. The new species is associated with coastal dune environments colonized almost exclusively by grassy vegetation in which the larvae often build their pits close to *Ammophila* plants[54].

The **Italian island biodiversity picture remains mixed**, with positive developments for some species and habitats, and some problems for other.

ACKNOWLEDGEMENTS

Nicola Baccetti (ISPRA, Institute for Environmental Protection and Research), Piero Genovesi (Chair IUCN SSC Invasive Species Specialist Group – ISPRA), Fernando Spina (ISPRA - Italian Ringing Centre and Small Islands Project co-ordinator),) are gratefully acknowledged for the useful comments and contributions in the preparation of the present report.

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5. MALTA / MALTE

MALTA'S SHORT WRITTEN CONTRIBUTION ON ISLAND BIODIVERSITY
(2nd Meeting of the Expert Group on European Island Biodiversity, Norway, July 2010)

The present contribution provides an update on the developments and the state of play on the conservation of biodiversity in Malta.

Malta's State of the Environment Report (SOER) 2008

Building on the previous efforts and achievements found in past editions of the State of the Environment Reports for Malta (1998, 2002 and 2005), the Environment Protection Directorate within the Malta Environment and Planning Authority (MEPA) has launched this year the 2008 SOER. The latter report highlights the situation in a number of environmental areas including biodiversity, air, waters, climate change, and policy responses to environmental issues. The current report aims to communicate key environmental issues and trends to policymakers and civil society in a clear and concise way. Its seeks, to increase awareness and understanding of key environmental trends, to provide a sound evidence base for policy and decision-making, and to facilitate the measurement of environmental performance and progress towards sustainability. Moreover, the 2008 SOER takes a broader approach when analysing environment sectors and indeed explores more closely how environmental issues impact our daily lives in terms of health and the economy.

Results published in the 2008 SOER show that Malta has managed to achieve positive results in a number of key areas. For example, the Report looks at the progress made in the designation of terrestrial protected areas. As at 2008, Malta had designated 27 terrestrial Special Areas of Conservation (SACs) covering 41km² (13.06% of land area), one marine SAC of 8.5km², and 13 Special Protection Areas (SPAs; often overlapping with SACs) occupying 16.34km² or 5.18% of land area, all forming part of the EU Natura 2000 Network. Indeed, Malta has reached 93% sufficiency with respect to the proportion of habitats and species for which an adequate number of terrestrial Natura 2000 sites have been proposed under the Habitats Directive. It is noteworthy that such Natura 2000 sites also cover land area that falls within the Emerald Network.

On the other hand, the Report also highlights a number of issues that need further attention. It delves into a number of key environmental challenges in areas such as further protection of Malta's biodiversity, waste management, water management, the control of traffic emissions, as well as the ongoing pressures on land and the marine environment. Looking at the conservation status of protected species and habitats, the Report draws attention to the findings of the assessments carried out by Malta in line with requirements of Article 17 of the Habitats Directive. The status of 29% of Maltese habitats and 36% of Maltese species listed in this Directive is still unknown, of which a significant amount relates to the marine environment. In addition, 64% of habitats and 44% of species have a bad or inadequate conservation status. When considering the species in question (Figure 1, chart 2; see also Habitat and Species Checklist

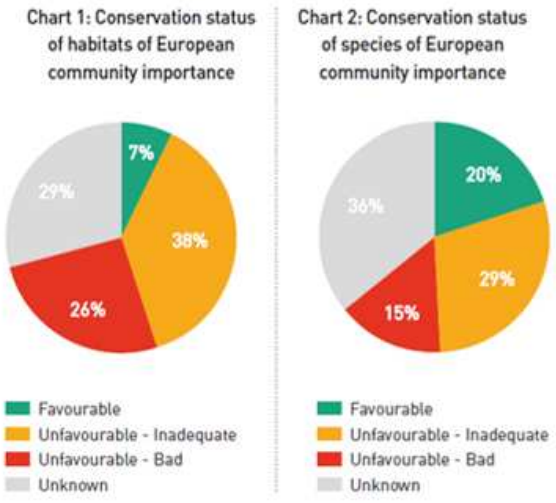

Figure 1 - Conservation Status of Species and Habitats of European Community Importance

- Malta), some of these are also covered by the Bern Convention. The 2008 SOER states 'Stringent measures are required for these to attain favorable status, while further surveys are needed to assess those with unknown status'.

In the context of climate change, the Report states that climate change adaptation needs to be addressed through the development of a wide-ranging adaptation plan that addresses actions across sectors as diverse as land-use, health and tourism, as well as impacts across a range of social groups. Moreover, it emphasises the requirement to mainstream climate change measures across all policy sectors, whilst striving for enhanced climate change adaptation through increased resilience.

The Report concludes by *inter alia* stating that while Malta has already made significant progress in upgrading its environmental policy capacity, its institutional capacity still needs to improve in terms of human resources and funding, as well as public and private sector investments to upgrade operations and infrastructure.

The International Year for Biodiversity (IYB)

Malta has joined other countries in celebrating the International Year for Biodiversity. Celebrations at a national level were officially launched on 18 May 2010. Prior to this day, activities aimed at raising awareness on biodiversity primarily included biodiversity-related articles written by the Malta Environment and Planning Authority, amongst which those published under the section entitled "One World" in a local newspaper. The aim of these articles is to provide the general public with information related to biodiversity, such as on the various habitats and species present locally, invasive alien species and marine protected areas. The "One World" articles published to date are listed in Table 1.

Article Series	Title of Article	Date when issued in local newspaper
Threatened Protected Plants	Maltese Rock Centaury	06/03/2010
	Maltese Everlasting	09/03/2010
	Maltese Cliff-Orache	11/03/2010
	Endemic Flora	13/03/2010
	Orchids in Malta	16/03/2010
	Trees in Malta	18/03/2010
Marine Protected Areas	Habitats and Species under Threat	20/03/2010
	What are the benefits of marine protected areas?	23/03/2010
	What can I do for marine protected areas?	25/03/2010
Threatened Protected Animals	Painted Frog	30/03/2010
	The Maltese Wall Lizard	01/04/2010
	The Maltese Freshwater Crab	03/04/2010
	Status of Selected Vertebrates	06/04/2010
	Bats in Malta	08/04/2010
	Some Species of Butterflies and Moths are scarce	10/04/2010
Invasive Alien Species	What are they and why are they a concern?	13/04/2010
	The Kaffir or Hottentot Fig	15/04/2010
	Prevention is better than cure	17/04/2010
Habitats of the Maltese Islands	Introduction	20/04/2010
	Terrestrial Habitats – An Overview	22/04/2010
	Terrestrial Habitats - Steppe	24/04/2010
	Terrestrial Habitats - Garrigue	27/04/2010
	Terrestrial Habitats - Maquis	29/04/2010
	Habitats - Woodland	01/05/2010
	Coastal Habitats – Saline Marshlands	04/05/2010
	Coastal Habitats – Rainwater Rockpools	06/05/2010
	Coastal Habitats – Sand Dunes	08/05/2010

	Freshwater Habitats - Watercourses	11/05/2010
	Rupestral Habitats – Caves and Cliffs	13/05/2010
Other	Biodiversity Day Today	22/05/2010

Table 1 – Articles published under "One World" as part of IYB celebrations

Malta will be holding a number of events to celebrate IYB, which are expected to include the publication of posters, and of action plans, a biodiversity photo exhibition/competition, setting up billboards at specific protected areas, open lectures, awareness-raising to NGOs and journalists, and clean-up activities. Selected legislation and policy documents related to biodiversity are also expected to be issued in the coming months. Some of these activities might actually be addressed beyond 2010.

Other Issues

Work has continued on the development of Malta's 'National Biodiversity Strategy and Action Plan' (NBSAP). Management of protected areas has also continued. *Ad hoc* discussions and management issues at a number of sites have also been carried out. In this respect, an application for a project proposal to develop a framework for the management of terrestrial Natura 2000 sites in the Maltese Islands has been submitted for funding under the European Agricultural Fund for Rural Development (EAFRD). As a concluding note, in conjunction with the increased efforts towards broader communication and awareness-raising, the MEPA website (www.mepa.org.mt) was completely revamped with a drive to improve public access to information (sections related to biodiversity are being updated from time-to-time).

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6. NORWAY / NORVEGE

Tasks for Group of Expert on Island Biodiversity:

- To identify conservation problems in European islands
- To identify inventory of threatened endemics
- To identify species and habitats at risk from climate change
- To identify and network regional experts
- To contribute to the CBD agenda with conservation solutions for European islands

1. Are there any specific conservation activities focused on island biodiversity in your state?

For Norway it is mainly the Arctic and Antarctic islands that display biodiversity of special conservation concern. In Europe this is mainly the Svalbard archipelago (65.000 km2, and 90.700 km2 sea) and Jan Mayen Islands (377 km2). Both areas are situated in the Arctic region with extreme climatic conditions and being very isolated from other land masses, but very influenced by sea ice and the Atlantic Sea current that especially makes the Western coast of Spitsbergen (the largest island in the Svalbard archipelago) exceptionally "warm" in relation to its far North latitude. The special climatic conditions have in its own way reduced the impact from alien species, as well as the impact from humans. However, centuries of expeditions and exploitation has reduced the populations of many species. In particular this applies to the large baleen whales and the walrus. While the largest predator in the world, the polar bear, has recovered after its protection and establishment of a circumpolar agreement on conservation of polar bear (1973). The population in Svalbard is a part of the Barents Sea population that also includes the Franz Josef Land and Novaya Zemlya, and is estimated to be about 3000 animals.

Traditionally the prevention of imports of new species (including new diseases and parasites) has been the focus of the authorities. Strict regulation applies for the import of any live fauna, and a ban on pet animals (except dogs) has been introduced. Concerning flora the prevention of introduction of new species was not focused until recently, when a new legislation was introduced in 1999 to prevent introduction and requiring a risk assessment by the nature conservation authorities. Prior to this it was commonplace to repair landscape damage (eg from roadbuilding or mining) using alien seeds (mainly from the Norwegian mainland, Russia and Arctic Canada).

Generally the main focus for both areas regarding conservation of native fauna and flora has been to introduce legislation and to collect data on biodiversity to uncover emerging risks. The nature protection regime is very good, with a total of 65% of the terrestrial part of the Svalbard archipelago protected and 85% of the territorial waters off Svalbard out to 12 nautical miles, and the entire Jan Mayen Islands is protected. While the control of imports of goods and personnel- traffic still poses a huge risk for accidental import and spread of alien species. As on the mainland it is debated to change tactics in relation to accidental imports, to better prevent this. The nature conservation authorities of Norway has the main responsibility for conservation areas and activities related to threatened species in the two areas, see www.dirnat.no The local management authority is the Governor of Svalbard. General information on local regulations etc can be found at www.sysselmannen.no

The initiative on Conservation of Arctic Flora and Fauna (CAFF) under the Arctic Council aim to conserve arctic biodiversity and promote sustainable practices. Monitoring and networking of experts is important and a number of initiatives have been undertaken to this end. This include the following three expert groups: CAFF Flora Expert Group (CFG), Circumpolar Protected Area Network (CPAN) and Seabird Expert Group (Birds.), see http://caff.arcticportal.org/ The Arctic Climate and Impact Assessment (ACIA) report (2005), see http://acia.cicero.uio.no/ This report concluded with a need for more capacity to monitor and understand changes in the Arctic. The program Circumpolar Biodiversity Monitoring Program (CBMP), se http://cbmp.arcticportal.org is one response to this. The CBMP seek to

establish an international network of researchers, community experts and managers to detect, understand and report on Arctic biodiversity trends.

2. State of knowledge of threatened endemic island flora and fauna

The knowledge is quite good, and inventories has been published on the status of all species of fauna and flora, including red lists (the most recent in 2006, see www.artsdatabanken.no) . Due to the last ice age-period ca. 10.000 years ago probably most of the immigration and/or spread of species is quite recent on these islands. Nunataks at North-west Spitsbergen may have given space for some species to overwinter the ice-age period, but endemisms on species level are not found. However, on subspecies level some endemics do occur. Among the fauna the Arctic char Salvelinus alpinus is recognized with distinct genetic populations (ca. 100 watercourses), the Svalbard ptarmigan Lagopus mutus hyperborea is much larger than its cousin on the mainland and the Svalbard reindeer Rangifer tarandus platyrhynchus is a small version of the reindeer in other parts of the world. All of these species are recognized as distinct and confined to the Svalbard archipelago.

Threatened species, in particular flora has been given a high degree of protection through both specifically designed nature protection areas and through improved monitoring of their status. This is also linked to the increased efforts on red listing analysis of all species, including marine species.

The Norwegian Polar Institute has the main responsibility to conduct environmental monitoring in the two areas, including the atmosphere, and both terrestrial and marine habitats, see more on http://mosj.npolar.no

3. Available information on island IAS and their effect on endemic species

Among the most famed accidental introductions to Svalbard is the sibling vole Microtus rossiaemeridionalis, which took place sometime between 1919 and 1960 in the Russian settlement Grumant City. This alien species in Svalbard today mainly survive in close association with bird cliff areas localized between Longyearbyen and Grumant due to the availability of lush vegetation and shelter in scree beneath bird cliffs, but some animals are frequently observed among the Longyearbyen settlement too. This species is a vector for the parasite Echinococcus multiocularis which is a serious problem for humans. There seem to be no solution to eradicate this parasite. It is not known if this parasite causes problems for other mammals or fauna in Svalbard.

Both the grouse and the reindeer are subject to regular monitoring, upon which an annual bag quota is set.

The spread of king crab Paralithodes camschaticus and snow crab Chionoecetes opilio (both introduced from the Bering Strait-area) and their effects on the marine ecosystem is debated. The king crab was released in the Murmanskfjord in the 1960ies and is now numerous along the Barents sea coasts and the snow crab was first discovered in the Barents Sea in 1996 and is quickly spreading. Information regarding the king crab from the mainland demonstrates its capability of impacting negatively the benthos and other bottom dwelling species. Little information is available yet on the effects of these two species in Arctic waters. None of these two invasive alien species have spread to Svalbard yet.

4. Expected effects of climate change

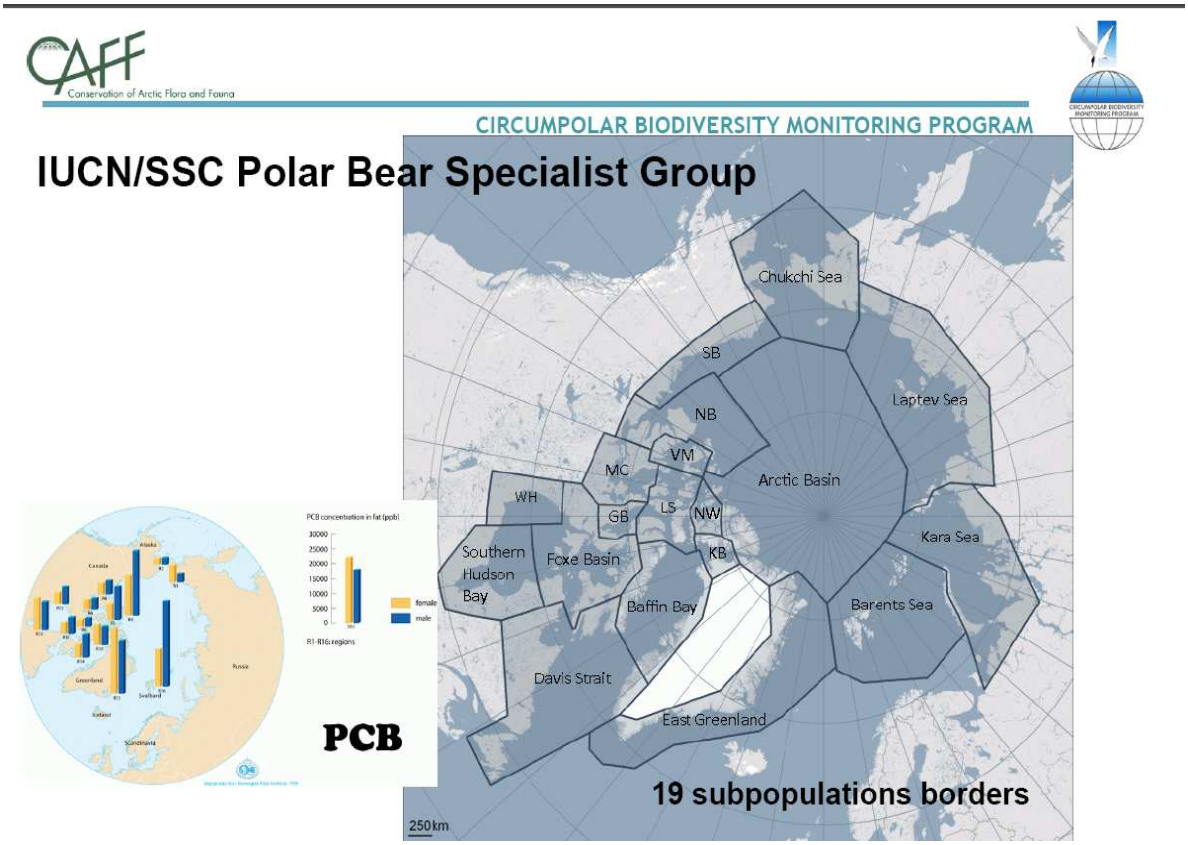
Monitoring shows that both precipitation and temperatures are now steadily increasing in the Arctic. This has a direct impact on the occurrence of sea ice coverage and changes of glaciers, see more on http://svalbard.miljostatus.no

Marine changes

Increase in temperatures, both at sea and of the air temperature has been registered in the high latitude areas. Research programmes has uncovered significant changes in the climate in these areas, se ACIA (http://acia.cicero.uio.no/). It is expected that dramatic changes in the

composition of marine fauna (eg plankton, squid and fish) will have a major impact on fish stock distribution and eg seabirds. Less sea ice also impacts marine species like seals and polar bear. In recent years more polar bear individuals have been observed landlocked in summertime, obviously due to less sea-ice, causing starvation and bad condition of the bears. Annual monitoring of seabird breeding on the islands is a part of a wider monitoring programme, covering the North Atlantic http://caff.arcticportal.org/expert-groups/seabird-group-cbird , see national monitoring programme www.seapop.no. The CAFF programme on seabirds aim to harmonise conservation, management and research and identify emerging needs. Changes in seawater temperatures is creating significant change in breeding success of seabirds in the southern part of the North-Atlantic.

The polar bear the population in the Barents Sea (including Svalbard, Franz Josef Land and Novaya Zemlya) was in 2005 estimated to be ca. 3000 individuals. More information on polar bears from the Norwegian Polar Institute (http://npweb.npolar.no/tema/Arter/isbjorn) the IUCN polar bear specialist group has a coordinating role for the Polar Bear Agreement (1973), see http://pbsg.npolar.no/en/index.html WWF International Arctic Programme are also engaged in polar bear research, see http://wwf.panda.org/what_we_do/where_we_work/arctic/area/species/polarbear/polar_bear/



Polar bear populations and PCB levels, Norwegian Polar Institute.

Observation of birds

Birds are quick to react to climatic changes and a steady flow of new bird species have been registered to Svalbard. The wider public has been encouraged to report on birds in the area and show a great interest in doing so. The nature conservation authorities has sponsored the establishment of a network of field biology interested people and a club house, see www.loff.biz. More on birds can be found on

www.svalbardbirds.com. A new field guide on Svalbard birds has recently been published and an English version will follow.

Flora changes

For terrestrial ecosystems it is at the moment more difficult to detect changes. However, it is expected that longer growing periods will make new areas available for the spread of existing species as well as new alien species. To monitor this situation a new research programme was initiated and the first report of this programme was published in 2010 (NINA report 579: http://www.nina.no/archive/nina/PppBasePdf/rapport/2010/579.pdf). The programme has established ten monitoring areas, where all vegetation will be mapped at regular intervals.

7. SPAIN (Canary Islands) / ESPAGNE (Iles Canaries)

CANARY ISLANDS (SPAIN)

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The Canary Islands are an archipelago located in the Eastern Atlantic off the NW coast of Africa that includes seven major islands and several islets. They have a total area of 7.446,95 km^2 and a population of 1.672.689 inhabitats.

The Canaries have the status of an autonomous region within the Spanish state, with its own government and parliament. The Island Councils (the local government of each island) are responsible for managing the protected natural areas and conserving biodiversity.

Together with the Azores and Madeira (Portugal), French Guyana, Guadeloupe, Martinique and Reunion (France) the Canaries form part of the Outermost Regions of the European Union.

Biodiversity of the Canary Islands

According to the Canary Islands Biodiversity Data Bank, so far a total of 3965 species are known in the marine environment, of which only 164 are endemic. On land, there are 11.628 native species (7956 non-endemic and 3642 endemic) and 1348 alien, making up 90% native and 10% alien. The table shows the proportions of each group.

Terrestrial species			
	Native species		Exotic species (%)
	Endemic (%)	Non-endemic (%)	
Vascular flora	14	11	46
Fungi	3	14	4
Bryophytes	0	4	0
Lichens	1	12	0
Vertebrates	2	1	3
Arthropods	55	55	40
Molluscs	5	2	2
Other invertebrates	0	1	5

http://www.gobiernodecanarias.org/cmayot/medioambiente/medionatural/biodiversidad/especies/bancodatos/index.html

The Canary Islands Catalogue of Protected Species

Once there is expert information that recommends it, the recently enacted Law 4/2010 of 4 June will include species, subspecies or populations where biodiversity is threatened or are of special interest for the ecosystems, classified into: endangered species (in danger of extinction or vulnerable), priority species for Canary ecosystems, and those requiring special protection. It currently includes 419 species.

http://www.gobiernodecanarias.org/cmayot/medioambiente/medionatural/biodiversidad/especies/catalogodeespeciesamenazadas/index.html

Plans for recovery of threatened species

Currently there are 19 recovery plans affecting 25 species: four vertebrates (two birds and two reptiles), and the rest are for flowering plants.

PHANEROGAMS	*Lotus kunkelii*
Atractylis preauxiana	*Lotus maculatus*
Bencomia sphaerocarpa	*Lotus pyranthus*
Caralluma burchardii	*Onopordon nogalesii*
Cheirolophus duranii	*Salvia herbanica*
Crambe sventenii	*Silene sabinosae*
Echium acanthocarpum	*Solanum vespertilio doramae*
Helianthemum bramwelliorum	*Stemmacantha cynaroides*
Helianthemum juliae	REPTILES
Helianthemum tenerifae	*Gallotia bravoana*
Helianthemum gonzalezferreri	*Gallotia simonyi*
Kunkeliella canariensis	BIRDS
Lotus berthelotii	*Fringilla teydea polatzeki*
Lotus eremiticus	*Neophron percnopterus majorensis*

http://www.gobiernodecanarias.org/cmayot/medioambiente/medionatural/biodiversidad/especies/catalogodeespeciesamenazadas/planes_especies_amenzadas.html

Protected areas

The Canary Network of Protected Natural Areas consists of 146 zones, which together constitute about 40% of the area of the archipelago. Currently, most of them have approved management plans. The Spanish state recently transferred to the Canary Islands Government the responsibility for managing the four National Parks.

http://www.gobiernodecanarias.org/cmayot/ordenacion/index.html

The Natura 2000 Network

Natura 2000 in the Canary Islands consists of a total of 208 sites (165 Special Areas Conservation (SACs) and 31 Special Protection Areas for birds (SPAs) which represent between 42% and 58% of the area of each island. Most of the areas on land are covered by the Canary Network of Protected Natural Areas.

Of the 168 natural habitats listed in Annex I of the Habitats Directive, about 24 are present in the Canary Islands. Two are marine: seagrass meadows (*Cymodocea nodosa)* and coastal lagoons, while the remaining 22 are terrestrial.

73 taxa are registered in the Habitat Directive for the Canaries. Of these, two are mosses, 4 are ferns, 60 higher plants, 4 reptiles and two mammals. However, the invertebrates are not represented, despite being the largest group and among those with highest endemicity. On the other hand, about 44 birds found in our islands are included in the Birds Directive.

http://www.gobiernodecanarias.org/cmayot/medioambiente/medionatural/rn2000/index.html

Biosphere reserves

There are five biosphere reserves in the Canary Islands: La Palma, Gran Canaria, El Hierro, Fuerteventura and Lanzarote.

http://www.mma.es/secciones/el_ministerio/organismos/oapn/oapn_mab_redreservas.htm

Climate change

In the Canaries, an Agency for Sustainable Development and Climate Change operates to promote policies and measures which contribute to more sustainable forms of development and address global warming. It also coordinates policies in the sector that may affect these objectives and works to favor both public and private initiatives with these ends. It also provides administrative and economic support to the Canary Forum for Sustainable Development and the Sustainable Development Observatory.

The *"Canary Island Strategy to Combat Climate Change"* is an operational tool acting as a framework for addressing the challenges facing the Canary Islands as a result of climate change; so as to be consistent with their greater wealth and vulnerability, and their responsibility and border situation.

http://www.gobiernodecanarias.org/agenciasostenible/index.aspx

Control of invasive alien species

At least 150 exotic species are believed to be invasive. The Island Councils and the Government of the Canaries are involved in numerous actions to control invasive plants in protected natural areas.

Recently the California King's snake (*Lamporpeltis getula*) has become established in Gran Canaria, the result of an illegal release. It is subject to major control efforts by various public administrations.

A database of introduced species has been built up and over the next four years, a major program will take place to map and assess the impact of exotic species.

http://www.gobiernodecanarias.org/cmayot/medioambiente/medionatural/biodiversidad/especies/bancodatos/bd_introducidas.html

8. UNITED KINGDOM / ROYAUME-UNI

ISLAND BIODIVERSITY WORK IN THE UK.

Prepared for the second meeting of the
Group of Experts on European Islands Biological Diversity; Svalbard 26-29 July 2010
By Ian Bainbridge (Scottish Natural Heritage) and Dave Wootton (Defra)

1 BIODIVERSITY ON THE UK'S ISLANDS

The mainland of the United Kingdom is an island itself, although current UK biodiversity legislation and policy does not have a specific focus on islands; more it reflects the six main work programmes of the CBD. The UK also includes a large number of smaller islands (over 700 vegetated islands and around 70 populated islands), and there are four main archipelagos (Shetland, Orkney, the Outer and Inner Hebrides) and a number of other island groups across the UK, although the great majority of the islands are within Scotland. There are a large number of initiatives that work on the islands of the UK. Most of these are carried out by the devolved administrations.

A significant number of the UK's 257 Special Protection Areas (SPAs) are located on offshore islands[55], however listings are currently by site and country – the 'island' classification is not included.

1.1. Internationally-important populations

A review of UK SPAs[56] highlights that the UK is of major international importance for several groups of birds. These include a number of groups that are especially reliant on the UK's islands: breeding seabirds, breeding and wintering waders and passage and wintering wildfowl.

UK is one of the richest areas in the world for seabirds. Just under 8 million seabirds of 25 species breed in Britain and Ireland, including 90% of the world's Manx shearwaters (*Puffinus puffinus),* 68% of Gannets (*Morus bassanus)* and 60% of Great Skuas (*Stercorarius skua*), as well as almost all of Europe's Leach's petrels (*Oceanodorma leucorhoa*). The UK SPA network holds over 4,946,000 breeding seabirds, and protection has recently been extended into inshore waters around the breeding colonies in many cases. 31 of the UK SPAs are on offshore islands. These protect some 3,788,000 breeding seabirds- a substantial proportion of all the seabirds breeding in the north-east Atlantic and North Sea areas.

The Scottish islands hold some of the densest populations of breeding waders in Europe. 30% of the biogeographic population of southern dunlin (*Calidris alpina schinzii)* breeds on the machairs and peatlands of the Outer Hebrides. There are important breeding populations of nine other species, including ringed plover (*Charadrius hiaticula*) redshank (*Tringa totanus*) and Snipe (*Gallinago gallinago*) on the grasslands and Golden plover (*Pluvialis apricaria*) and Greensghank (*Tringa nebularia*) on the peatlands. Internationally important wintering populations of Curlew (*Numenius arquata*), Sanderling (*Calidris alba),* Turnstone (*Arenaria interpres*) and Purple sandpiper (*Calidris maritima*) occur on the islands rocky and sandy shores. The habitat protection provided for these birds is a major contribution to their international conservation.

[55] http://www.jncc.gov.uk/page-2598
[56] http://www.jncc.gov.uk/page-1415

The UK's islands hold around 200,000 grey seals (*Halichoerus grypus*); 85% of Europe's and 45% of the world population (of which 90% are in Scotland). There are also 46,000 harbour seals (*Phoca vitulina*); representing 30% of Europe's population (of which 85% breed in Scotland).

1.2 Grassland systems and species

Grassland systems and the species associated with them are also an important element of island biodiversity in the UK. Much island grassland is managed traditionally with little modern agricultural intensification, and hence it has a high wildlife value. Machair; a shell-enriched dune grassland, found extensively in western Scotland, is a classic UK habitat holding a wide range of threatened flora and fauna. Most of the UK's corncrake (*Crex crex*) population occurs on the Scottish islands, in the machair grassland. Breeding numbers have risen from 480 in 1993 to almost 1300 in 2008; due to direct intervention activities influencing island farming (crofting) management. It is likely that corncrakes will continue to be largely restricted to Scottish islands, but their recovery is a success story.

Machair also supports endangered insects such as the great yellow bumble bee (*Bombus distinguendus);* which is now restricted to the western and northern islands and the north Scottish coast. The slender Scotch burnet moth (*Zygaena loti scotica*) is found only on Mull on grazed coastal turf, though the nominate subspecies of this moth is found across mainland Europe.

Another widespread European bird species, the chough (*Pyrrhocorax pyrrhocorax*), is largely restricted to island grasslands in the UK, and requires special habitat management for its conservation.

1.3 Endemism

There is relatively little UK island endemism, but *Primula scotica* is a coastal heath and grassland species restricted to northern Scotland and Orkney; the Shetland mouse ear (*Cerastium nigrescens*) is endemic to north Shetland, and the Lundy cabbage (*Coincya wrightii*) is endemic to Lundy Island off south-west England, and also hosts an endemic flea beetle. Maintenance of grassland through appropriate grazing levels (and in the case of the Lundy cabbage, control of rhododendron (*R.. ponticum*)) are vital for these species.

2 MANAGEMENT ISSUES THAT AFFECT BIODIVERSITY IN THE UK 'S ISLANDS

There are a number of important management issues affecting island biodiversity in the UK.

2.1 Farming management

The Scottish islands hold important populations of both breeding and wintering geese. For much of the twentieth century, breeding greylag geese (*Anser anser*) were confined to the Outer Hebrides, and the population declined to around 50 breeding pairs. A range of protection measures led to their recovery and there are now around 40,000 birds spread across the western and northern Scottish islands. These are seen as causing conflict with farming management and may have effects on traditional farming which is beneficial to a range of other species.

In winter, the Scottish islands host large populations of Greenland white-fronted geese (*Anser albifrons flavirostris*) and Greenland barnacle geese (*Branta leucopsis*); around half of the world population of each species occur here. Almost all the Icelandic greylag goose population winters in Scotland; 80% (80,000) now winter on Orkney, having vacated the central Scotland mainland in the last decade. These also cause management conflict with farming interests, and several local goose management schemes have been in place on Scottish islands for the last ten years. There is currently a major review of these schemes by the Scottish Government. It is also recognised, however, that these goose populations also provide major tourism income from both birdwatching and shooting.

On a number of the UK's islands, there is overgrazing from deer and sheep, severely impacting habitat. As a consequence of difficulties in managing sheep on remote islands, a lack of grazing is also an issue on some islands. There are examples of how a lack of grazing has given rise to vegetation that is

unsuitable habitat for threatened species: eg for Barnacle geese (*B. leucopsis*) which depend on short-cropped turf.

White-tailed sea eagles (*Haliaeetus albicilla*) have been reintroduced to Scotland over last 35 years (with grateful thanks to Norway for providing the birds). There are now around 40 breeding pairs, mostly on Scottish islands. These are providing major tourism income to the islands of Mull and Skye. There is however, some perceived conflict with sheep farming, which continues to require efforts to resolve, though two recent scientific studies suggest there is little predation of lambs.

2.2 Marine renewables

The next substantial issue is likely to be the development of marine renewables around the UK coasts. Major developments of offshore wind, tidal and wave power devices are proposed. The latter two are likely to be largely around the Scottish islands where the largest natural wave and tidal resources occur. It will be vital to assess what effects these developments may have on the marine environment and to develop strategies and methods to minimise these effects.

2.3 Genetic conservation

Islands have an important role to play in genetic conservation; several Scottish islands hold endemic subspecies of mice (eg *Apodemus sylvaticus hirtensis* on St Kilda) and birds (eg *Troglodytes troglodytes zetlandicus* on Shetland). Some islands act as genetic refugia for widespread species. Several Scottish islands hold genetically-pure populations of red deer (*Cervus elaphus).* On the mainland, hybridisation with Sika deer (*C. nippon*) is widespread, and legislation is forthcoming to protect the island deer populations' genetic integrity. There has been a major study of red deer population genetics and demography on Rum for thirty years.

Machair management on the Scottish islands is partly-dependent on traditional local races of cereals, such as bere barley (*Hordeum vulgare*) and black oats (*Avena strigosa*); this represents important genetic conservation of farmed crop species.

In England, the Isle of Wight and in Wales, Anglesey act as refugia for populations of red squirrels (*Sciurus vulgaris*) threatened elsewhere by the spread of grey squirrels (*Sciurus carolinensis*) and the pox virus they carry.

2.4 Invasive non-native species

Invasive non-native species are a critical issue for the UK's island biodiversity, as is the case across much of the world. On the Outer Hebrides, hedgehogs (*Erinaceus europaeus*), which are native to mainland UK, were introduced in the 1970s by misguided individuals wishing to control slugs (*Arion* spp) in gardens. These are now having major effects on the internationally-important breeding wader populations, by their predation of wader eggs. A major removal programme is under way, and hedgehogs have now been almost cleared from North Uist. The American mink (*Mustela vison*) also causes serious problems to ground-nesting terns, gulls and waders, and a major removal programme[57] is under way on Harris and Lewis.

The most widespread non-natives issue is that of rats on islands with important seabird populations. These are mostly brown rats (*Rattus norvegicus*) but there were also black rats (*Rattus rattus*) on Lundy Island in south west England. Predation of seabird eggs and chicks has been a widespread problem. Over the last 50 years, twelve islands around the UK have had rat eradication programmes. There have been some excellent results in terms of seabird responses: Manx shearwaters (*P. puffinus*) numbers have trebled on Ramsey and Lundy in the 5-10 years since rat eradication.

The rat eradication projects have become increasingly large and ambitious. The project on Canna (off west Scotland) has been the largest to date. Canna is a 1300 ha, farmed and populated island, owned

[57] http://www.snh.org.uk/pdfs/scottish/wisles/minknov05.pdf

by the National Trust for Scotland. A grid of thousands of poison bait tubes was set in 2005-06. The project needed to remove and maintain a population of Canna fieldmice (*Apodemus sylvaticus*), which were held and bred by the Zoological Society of Scotland for over twelve months, and reintroduced after the poisoning process was complete. The project was apparently effective but NTS continues a monitoring programme, of both the rat absence and seabird population responses.

Scottish Natural Heritage is also trialling rat control on Rum; an 11,000 ha island, which holds 61000 pairs, 25% of the world's Manx shearwaters (*P. puffinus*). These nest on mountain-top slopes. This project will consider whether all-island control is necessary in this case.

Quarantine vigilance is also needed in regards of rat invasions. A recent case of a shipwrecked Scottish fishing vessel on St Kilda brought the threat of rat introduction to the most important seabird islands in the UK. This resulted in a programme of rat monitoring work, both after the wreck and during the ship-breaking operations. A similar protocol is needed for all rat-free seabird islands.

3 BIODIVERSITY IN THE UK CROWN DEPENDENCIES

The UK also has three Crown Dependencies; Jersey, Guernsey (and their archipelago of smaller islands) and the Isle of Man. These have many biogeographical similarities with mainland UK. The Channel islands are notable for holding a range of species whose range does not extend to mainland Britain; and insular forms of some species, such as the Guernsey form of the common vole *Microtus arvalis*) which also occurs on Orkney, its sole area in the UK. The Isle of Man holds important populations of breeding birds (e.g. seabirds, chough and hen harrier (*Circus cyaneus*); similar to some Scottish islands, and they hold a range of marine and terrestrial habitats which are significant in a UK and regional context.

4 CONCLUSIONS

A number of island biodiversity issues are very similar across islands, regardless of species, habitats, or geographical location. One of the key lessons learnt from experiences on inhabited UK islands is that the local people (local ownership and local involvement) are pivotal to the success of any conservation initiative. It is also important that conservation initiatives are appropriately scaled to the size of the populations of the islands to ensure long term sustainability and continuity.

Information-sharing across islands is important. For example, access to good quality scientific data about eradication or control of non-native invasive species on small islands (including costs, benefits, probability of success and how to maximise this) will help make the case for island-specific proposed actions.

Appendix 4

TABLE SUMMARISING POSSIBLE ACTION

Island Biodiversity Action Matrix- draft 1								
KEY ISSUES	**KEY THREATS**							
	Invasive Alien Species: one of the greatest threats to biodiversity IAS can have severe effects on small islands and species with small populations	**Tourism:** is extremely important to many island economies; but can hugely swell island populations and bring many pressures on biodiversity	**Development:** often associated with tourism, built development can affect key habitats severely on islands	**Land use change:** agricultural intensification of traditionally-managed areas, and the abandonment of remote islands can have major effects on island habitats and species	**Water use change:** increasing water demand and water treatment needs can have major effects on island water tables with resulting effects on species and habitats	**Renewable energy:** may be a solution to islands' energy demands, but many forms of renewable energy generation may have serious effects on island habitats and species	**Climate change:** environmental change linked to climate change may have major effects on islands, storm surges, sea-level rise and changes in precipitation and temperature will all affect island habitats and species	**Resource exploitation:** over-exploitation of island resources, such as inshore fisheries, salt production, may affect marine species and coastal and inshore habitats
Endemism: many of Europe's endemic species are centred on islands. These are specially protected and of high conservation value. Most extinctions in the last fifty years have been of island endemic species. Many islands also hold endemic subspecies or genetically distinct island forms, which are important for the conservation of genetic diversity.	Identify and analyse needs for endemic species conservation; eg plants on Mediterranean islands; Macaronesian reptiles, by removal of IAS. Compile list of island endemics and IAS threats, identify and promote actions with greatest positive effects on island endemics	Conflict between tourism and habitat conservation for key endemic species. Identify key sites for inclusion in protected sites networks.[2]	Loss of habitats and key sites for endemics due to built development	Change of farming practice affecting key sites for endemic species			Effects of climate change on endemic species with small distributions. Consider needs / benefits / risks of orphan species translocations	Effects on endemic marine species?
Colonies and Aggregations of breeding and wintering species: Islands hold internationally-important, vital populations of colonial breeding species of seabirds, wading birds, seals and turtles. Some islands also hold large proportions of the world's wintering populations of some species of wildfowl.	Identify risks to colonial species from IAS. Analyse needs for mammal eradication on seabird islands; identify actions to improve species and island prospects; develop expertise sharing across European partners.	Minimise effects of tourism on turtle, seal beaches. Investigate whether increased tourism on uninhabited islands is having effects on colonial species.		Changes in farming practice affecting habitats vital for breeding waders and wintering wildfowl.		Disruption to colonial species by renewable energy developments. Provide best practice guidance advice on windfarm locations.		
Coast(lines): Islands typically (and expectedly) host large proportions of the coastline and of coastal habitats, especially dune systems, coastal wetlands and cliffs.		Huge pressures from tourism on some coastal habitats.	Loss of coastal habitats to built development; tourist buildings, ports, desalination plants, etc.	Intensification of wetlands eg for rice production		Effects of renewable energy developments and power grid infrastructures on coastal habitats	Effects of higher sea levels causing coastal squeeze on saltmarsh habitats, effects of storm surges on soft shores	Loss of coastal wetlands to salt, rice, other agricultural production
Migration points: Some islands act as key migration points, or bottlenecks, for migrating birds, mammals, and possibly invertebrates. These can be vital for these species for part of their annual cycle.	Analyse effects of IAS on migrating wildlife	Pressure on habitat "oases" in migration bottlenecks which are major tourist destinations	Loss of "oases" to built development in urban bottlenecks	Loss of semi-natural habitats to intensive agriculture	Loss of water sources and oases for migrating species	High risk from windfarm developments at migration bottlenecks for large bird species: raptors, ciconids, eetc; Provide best practice guidance advice on windfarm locations.		

Species refugia: Some islands act as refugia for species threatened or extinct on continental Europe or "mainland" islands.	Analyse the need for improved biosecurity to prevent loss of refuge species to IAS. Identify most important refuge islands across Europe; compile best practice guidance for island biosecurity.	Assess risks of zoonoses, IAS being brought by tourists. Consider documentation to minimise biosecurity risks from tourism.	Assess Risks of zoonoses, IAS arrivals with building materials, development transport, etc.	Assess risks of zoonoses, IAS arrivals from imported farming materials, feedstuffs, etc.	Assess risks of changes in water use to refuge species	Assess risks of zoonoses, IAS arrivals with building materials, development transport, etc.	Assess risks to refuge species of changes in climate envelope on islands.	
Special habitats and management: Some islands retain traditional low-intensity management, especially of agricultural habitats, when compared to mainland agriculture. This results in the retention of high-nature value habitats which are rare or absent elsewhere.	Loss of key habitats to IAS – eg dune systems invaded by non-native plants.	Pressure on key habitats through heavy levels of tourist use.	Loss of key habitats to built development.	Loss of low-intensity farm management systems to intensification, simplification or abandonment. Identify key low intensity farmland areas and ensure EU is aware of their biodiversity value.	Loss of wetlands through increased ground water extraction causing lowered water tables; increased use of irrigation.		Changes in farming potential caused by climate change / global warming affecting habitats and land use.	