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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE  
AND NATURAL HABITATS

**Bern Convention Group of Experts  
on European Islands Biological Diversity**

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**Groupe d'experts de la Convention de Berne  
sur la diversité biologique des îles d'Europe**

Galéria (Corsica, France), 9-11 June 2011

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Galéria (Corse, France), 9-11 juin 2011

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**European Islands Biological Diversity**

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**La Diversité biologique des Iles européennes**

**National reports and contributions /  
Rapports nationaux et Contributions**

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

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## 1. FRANCE / FRANCE

### 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 : près de 70 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 :

- 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 climatique.

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 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 deux réserves naturelles en montagne ; si le littoral constitue un espace particulièrement sensible et menacé 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 Public 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. Sardoia*, *Limonium strictissimum*, *Euphorbia peplis*, etc...)
- renforcer la réglementation et les contrôles sur l'introduction d'espèces exogènes à la Corse
- interdire l'introduction de Truites farios de souche atlantique dans les torrents d'altitude (>500 m)

poursuivre les partenariats entrepris entre le Conservatoire botanique national de Corse et les autorités des îles toscanes, sardes et Baléares et les étendre via les réseaux universitaires aux cortèges faunistiques

### SUMMARY

There is an important number of Island and Islets in Metropolitan France (almost 1300), principally situated in Brittany 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 :

- Natural Areas of Ecological, Faunistical and Floristical Interest (ZNIIEFF) census. 80 of the French islands are covered by this assesement ;
- Natura 2000 : 10% of the French sites are situated on islands ;
- Regional Naturel Parks: Corsica and Brittany
- National Parks : Port Cros
- Marine Parks (l'Iroise)
- Natural Reserves : 15 are situated on islands
- Biotop Prefectoral : almost 70 are situated on islands

We should mention the particular task of the Costline 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 Conservatoriesworkb 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. I 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. Sardoia*, *Limonium strictissimum*, *Euphorbia peplis*, etc...)
- to reinforce the regulation and controls on the introduction of exogenic species to Corsica .
- to prohibit the introduction of Trouts farios of Atlantic stock into the torrents of altitude (> 500 m) .
- to continue the partnerships undertaken between the national botanical Academy of Corsica and the authorities of the Tuscan, Sardinian islands and Balearic Islands and to extend them via the university networks to the faunistic species

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

## 2. IRELAND / IRLANDE

### PREPARED BY

### NATIONAL PARKS & WILDLIFE SERVICE, DEPARTMENT OF ARTS, HERITAGE AND LOCAL GOVERNMENT

#### General characteristics

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).

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.

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

Taxonomic Group	Approx. number of species	Checklist?	Regional Red list?
Fungi	c. 9,000	No	No
Lichens	1,134	Yes	No
Algae	c. 1,000 (freshwater) 579 (marine)	No	No Yes [2011]
Bryophytes	797	Yes	Yes [2011]
Vascular plants	2,328	Yes	No [1988]
Non-insect invertebrates	c. 8,000	No	No Non-marine molluscs [2009]
Insects	c. 11,422	Yes	No Bees [2006] Water beetles [2009] Butterflies [2010] Dragonflies [2011]
Fish	29 (freshwater) 563 (marine)	Yes Yes	Yes [2011] No
Amphibians	3	Yes	Yes [2011]
Reptiles	7	Yes	Yes [2011]
Birds	457	Yes	Yes [2009]
Mammals	34 (terrestrial) 26 (marine)	Yes Yes	Yes [2009] No

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 Arts, Heritage and the Gaeltacht) in the Republic of Ireland, and the Northern Ireland Environment Agency.

## Biodiversity & 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 char 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.

## Pressures and 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 Ireland's 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.

## Invasive species

Ireland is developing and implementing measures to tackle IAS in partnership with the Northern Ireland administration. Following a report which was published in 2004 both authorities agreed to work together and with others to tackle the invasive species problem. In response to the recommendations of this report the 'Invasive Species in Ireland' project started in May 2006 and ran until 2009. Both authorities decided to continue with the project and a new contract was signed for the project in 2010 for a further three years with the costs of shared equally between both administrations.

A risk assessment protocol has been developed and over 600 risk assessments have been carried out on established and potential invasive species to identify those species that pose the greatest threat to biodiversity on the island of Ireland. Exclusion strategies, contingency plans and management strategies are being prepared for these species. The highest risk to biodiversity in Ireland is from freshwater invasive species, in particular ornamental pond plants and fish.

An Invasive Species Ireland Management Toolkit has recently been published which is intended to provide information to anyone wanting to learn more about how to manage invasive species. The tool kit contains information on management quick guide, Risk Assessment for non-native species recorded in Ireland and species that have not yet arrived, Invasive Species Action Plans for prioritised

high impact invasive species and Best Practice Management of some widely establish invasive species.

Codes of Practice are also being developed in conjunction with relevant sectors. Following the publication of the Horticulture COP, COPs for the aquaculture sector, recreational water users and marina operators have been published.

An extensive stakeholder engagement programme has been underway, one element of which is the All-Ireland Invasive Species Forum. This forum meets annually and has over 100 organisations involved including central and local Government, state agencies, industry, academia and the NGO sector. The fifth Annual Forum was held in Belfast in April, 2011. There are four technical working groups on marine, freshwater, terrestrial invasive species and education and awareness.

The National Invasive Species Database contains up to date records on the distribution of invasive species on the island of Ireland which can be viewed as interactive maps. This Database has been developed as a resource to assist recording, monitoring and surveillance programmes, and provides the infrastructure for development of an early warning system for invasive species.

CAISIE (Control of Aquatic Invasive Species and Restoration of Natural Communities in Ireland) is an EU Life+ funded programme which will contribute to the understanding and control of aquatic invasive species in Ireland. CAISIE commenced in September 2009. The project is due for completion in the first quarter of 2013.

Objectives of the project include the protection of the native biodiversity in Lough Corrib in County Galway by eradicating, controlling or containing *Lagarosiphon major* and preventing the further spread of high impact aquatic invasive species by implementing control measures in a key dispersal corridor (i.e. the canals and Barrow Navigation).

The first evidence of the Asian Clam (*Corbicula fluminea*) in Ireland was recorded in April 2010. This species is considered extremely invasive and its presence in Ireland is a matter of considerable concern. The presence of dense and sustainable populations of *Corbicula* was confirmed in the River Barrow. The highest density recorded in this section of river was in excess of 9,000 individuals per sq metre.

### **Farming for conservation in the Burren (BurrenLIFE)**

The Burren region (c.720km<sup>2</sup>) is a glaciated karst landscape located in the mid-west of Ireland. It boasts extensive areas of Natura 2000 priority habitats including limestone pavements, orchid rich grasslands and lakes known as turloughs. The Burren's limestone grasslands were always in demand by farmers whose unique pastoral activities – including the reverse transhumance tradition of winter grazing – have been proven to be central to the presence of such a rich biodiversity. However, a distortion of the 'balance' between farming and the Burren in recent decades has resulted in serious conservation concerns: agricultural intensification has impacted on water quality, while a reduction in farming on rough limestone grasslands has resulted in extensive scrub encroachment. Livelihoods in the farming and the tourism sector were also threatened as a result.

The BurrenLIFE Project 2005-2010 was a partnership involving government agencies and farmers associations. The objective of this 5 year project was to develop a new model for sustainable agriculture in the Burren in order to conserve the remarkable biodiversity and the habitats of the region designated under the Habitats Directive, while ensuring farming remains profitable. The principal threats to the area are scrub invasion, under and overgrazing.

The Project focused on practical solutions, e.g. scrub removal, improving access, water provision, rebuilding internal walls and developing new feeding systems. Twenty farms covering over 3,097ha were selected using individual farm plans drawn up by the project team. A number of agreed actions were undertaken and the impact of these actions was monitored.

A follow on programme called The Burren Farming for Conservation Programme (BFCP), will run from 2010-2013. The programme is aimed at mainstreaming the findings of the BurrenLIFE Project. Massively oversubscribed, the BFCP now works with 120 Burren farmers managing 12,887ha within Natura 2000.

A range of diverse but complimentary Project Actions has been developed, including:

- Implementing best-known land management practices on 2,000ha of the Burren, including new feeding systems, redeployment of existing livestock and targeted scrub removal.
- Increasing understanding of the relationship between land management practices and the natural heritage of the Burren.
- Developing new support mechanisms for the sustainable management of the Burren habitats through research and advisory services, marketing initiatives, co-operative structures and the revision of existing agri-environmental schemes.
- Enhancing awareness and skills relating to the heritage of the Burren and its management through a range of practical initiatives aimed at empowering local communities.
- Disseminating information relating to the agricultural management of areas of high nature and cultural conservation value in Europe through literature and the media.

Expected Results

- The maintenance or enhancement of the conservation status of the habitats of Burren farmland and of the wetland habitats associated with the Project sites, now termed 'LIFE farms'
- The development and support of a new model for 'Conservation Agriculture' in the Burren
- Greater awareness and understanding of the heritage of the Burren and how to manage it
- Better understanding of issues relating to the management of areas of high nature value like the Burren

### 3. ITALY / ITALIE

#### OVERVIEW ON BIOLOGICAL DIVERSITY IN THE ITALIAN ISLANDS – Updating to the 2010 National Report -

By Brundu G.<sup>(1)</sup> & Cappelluti F.<sup>(2)</sup>

<sup>(1)</sup>*(Corpo Forestale e di Vigilanza Ambientale) Sardinian Forest Service, Directorate-general, Via Biasi 7, 09131 Cagliari – Italy [www.sardegnaambiente.it/corpoforestale/].*

<sup>(2)</sup>*(Ministero dell’Ambiente e della Tutela del Territorio e del Mare) Ministry of the Environment, Land and Sea, Directorate-general for nature and sea protection, II Division – Biodiversity, Via Capitan Bavastro 174, 00154 Roma – Italy [www.minambiente.it]*

#### Introduction

The present report updates the national report written for the Svalbard meeting (26-29 July 2010) and included in the general Report 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 2010-2011, which could be applied to biodiversity conservation on islands, even if only some 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 (2010-2011)

In 2010, declared by the United Nations “International Year of Biodiversity”, the Italian Ministry for Environment Land and Sea (MATTM) launched the **National Strategy for Biodiversity**<sup>1</sup> which was officially illustrated during the National Conference on Biodiversity, held in Rome on May 2010, on the occasion of the International Day for Biological Diversity. The Strategy was agreed by the State-Region Conference<sup>2</sup> on 7<sup>th</sup> October 2010. The strategy confirms Italy’s commitment to stop the loss of biodiversity and is a basic tool for integrating the key issues of biodiversity into national politics. The document stresses the need to strengthen and restore the resilience of ecosystems in order to ensure a steady flow of ecosystem services, that are essential for human well-being, the relationship between biodiversity and climate, focusing particularly on the role of ecosystems in mitigating and adapting to climate change, and the economic value of the benefits arising from biodiversity and ecosystem services and the costs of their loss.

It is divided into 15 working areas (1. Species, habitat and landscape; 2. Protected areas; 3. Genetic Resources; 4. Agriculture; 5. Forests; 6. Inland waters; 7. Marine environment; 8. Infrastructures and transport; 9. Urban areas; 9 Health; 11. Energy; 12 Tourism; 13. Research and innovation; 14 Education, information, communication and participation; 15. Italy and biodiversity in the world).

In the seventh working area, several priority targets are identified with the aim of protecting and promoting a sustainable use of 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), in particular by applying the principles of Integrated Coastal Zone Management, carrying out, for example, the Italy CAMP (Coastal Area Management Programme) Project or enforcing the marine protected areas system; from this point of view the implementation of the Strategy could have very good effects on conservation of island biodiversity, promoting at the same time sustainable development.

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

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<sup>1</sup> Available at: [http://www.minambiente.it/export/sites/default/archivio/allegati/biodiversita/Strategia\\_Nazionale\\_per\\_la\\_Biodiversita.pdf](http://www.minambiente.it/export/sites/default/archivio/allegati/biodiversita/Strategia_Nazionale_per_la_Biodiversita.pdf)

<sup>2</sup> Intesa del 07/10/2010 in sede di Conferenza permanente per i rapporti tra lo Stato, le Regioni e le Province autonome di Trento e Bolzano (Rep. 181/CSR).

commitments<sup>3</sup>. 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 agrobiodiversity is stored in Italian islands<sup>4</sup>, yet no precise reference is found on the PNBA (e.g., production *Capparis spinosa* on Eolian islands<sup>5</sup>, conservation of *Brassica macrocarpa* on Egadi islands<sup>6</sup>).

A joint conservation plan for the protection of biodiversity is also contained in the National Strategic Plan (PSN) and in several<sup>7</sup> **Rural Development Programs** (PSR), so that this could be applied at least to the main Italian islands of Sicily and Sardinia<sup>8</sup> and surrounding islets. Furthermore, the office for biodiversity of the State Forestry Department (*Corpo Forestale dello Stato*, CFS) acts to promote new 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.

Since 2008<sup>9</sup> 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/>)<sup>10</sup>, 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

<sup>3</sup> 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., Giacaneli 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](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 e valorizzazione dell'agrobiodiversità della Sardegna" Available at: <<http://www.consreg Sardegna.it/XIVLegislatura/Disegni%20e%20proposte%20di%20legge/propleg174.asp>>

<sup>4</sup> E.g., Laghetti G, Hammer K, Perrino P. 1996. Plant genetic resources in Pantelleria and Pelagie archipelago, Italy: collecting and conservation of local crop germplasm. FAO/IBPGR Plant Genetic Resources Newsletter, 108:17–25; Laghetti G, Hammer K, Olita G, Perrino P. 1998. Crop genetic resources from Ustica island (Italy): collecting and safeguarding. Plant Genetic Resources Newsletter 116:12–17; Laghetti G, Perrino P, Hammer K. 1999a. Collecting landraces and wild relatives in Neapolitan islands, Italy. Plant Genetic Resources Newsletter, 119:14–18; Laghetti G, Perrino P, Cifarelli S, Bullitta S, Hammer K. 1999b. Collecting crop genetic resources in Sardinia, Italy and its islands, 1998. Plant Genetic Resources Newsletter, 120:30–36; Laghetti G, Perrino P, Olita G, Hammer K. 2001. Multicrop collecting expeditions in Aeolian archipelago (Italy). Plant Genetic Resources Newsletter, 128:26–34; Laghetti G, Perrino P, Cifarelli S, Spahillari M, Hammer K. 2002. Collecting of landraces and wild relatives of cultivated plants in Ponziane islands and Tuscan archipelago, Italy. Plant Genetic Resources Newsletter, 131:28–34.

<sup>5</sup> Regione Sicilia, Assessorato Agricoltura e foreste, progetto "Caratterizzazione, miglioramento genetico-sanitario e difesa del Capperò 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.

<sup>6</sup> *Brassica macrocarpa* Guss., is an endemic species present on Egadi islands, and a primary source of the gene pool of *Brassica oleracea* L. It is an endangered 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).

<sup>7</sup> 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>>.

<sup>8</sup> E.g., see <[http://www.regione.sardegna.it/documenti/14\\_43\\_20071121202527.pdf](http://www.regione.sardegna.it/documenti/14_43_20071121202527.pdf)> and <<http://cbv.uniss.it/index.html>>.

<sup>9</sup> Cfr, DIPCO n. 23/2008, p. 131, Atto n. 164/2008.

<sup>10</sup> <[http://www.cooperazioneallosviluppo.esteri.it/pdgs/download/Global\\_Island\\_Strategy.pdf](http://www.cooperazioneallosviluppo.esteri.it/pdgs/download/Global_Island_Strategy.pdf)>

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 territorial cooperation, between the Maddalena Archipelago National Park and the Bocche di Bonifacio Natural Reserve<sup>11</sup>, which are the two main areas of the new marine park<sup>12</sup>.

The Pelagos Sanctuary<sup>13</sup>, 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<sup>14</sup>.

**Monk seal sightings** (*Monachus monachus*), witnessed by third party observers (divers, fishermen, tourists) have been recorded in various Italian locations during the course of the last decade and are subjected to a validation procedure carried out by ISPRA (Rome) which entails specific interviews of the sighters so as to assess the credibility of each sighting event. Such events have often been reported in the coastal waters of several Italian islands, a phenomenon which is likely to be influenced by the pristine environmental marine conditions (lower anthropic pressure with respect to many coastal mainland locations) which characterize many islands as well as the fact that several of the sighting locations lie closer to the nearby north African coasts where populations of the species are still hypothesized to exist. During the last few years, there have been distinct reports of monk seal sightings on the island of Marettimo. A preliminary monitoring activity of the coastal habitat was therefore recently initiated (spring 2011) on the island of Marettimo with the aim to identify the number of seals and their temporal pattern of use of specific haul-out areas on the island. The activity is carried out within the framework of a collaborative framework between the Marine Protected Area of the Egadi islands and ISPRA.

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<sup>11</sup> The *Office de l'Environnement de la Corse* (OEC), (Office for the Environment of Corsica), managing body of the Natural Reserve of the Straits of Bonifacio, as the project leader, and the Authority of the National Park of La Maddalena Archipelago, as the sole partner, presented in 2009 a new project for the second public notice of the European Territorial Cooperation Programme Italy-France "Maritime 2007-2013". The project, called "PMIBB" (Parc Marin International des Bouches de Bonifacio - International Marine Park of the Strait of Bonifacio), was admitted for funding after approval by the Steering Committee of the Programme. Consistent with the purpose of the program, which is to improve cooperation between the concerned border regions in terms of innovation and exploitation of natural and cultural resources, the proposals of the project, eligible for funding, aims to: (1) propose a model of joint management by the Community instrument of the EGTC (European Grouping of Territorial Cooperation). This under a structural, infrastructural, logistical, technical and economic point of view; (2) develop a management plan common to both partners, including: - the extension of the SPAMI (Specially Protected Areas of Mediterranean Importance) recognition, as obtained recently by the French partner, including the Archipelago of La Maddalena; (3) adopt an innovative model of energy management. The project, which lasts three years, has a budget of € 1,860,378.00 (equally shared between the French and the Italian side) and focuses on the "Axis 3: Natural and cultural resources - Specific Objective 3: Promote the use of renewable and alternative energy sources and the dissemination of the culture of energy conservation, giving priority to beneficiaries as partners who have proven experience in the field of energy". The future sustainability, including the financing of the European Grouping of Territorial Cooperation (EGTC), will be ensured by the involvement of professional resources dedicated to the presentation and subsequent management of projects under the European, national and regional context. [<http://www.pmibb.org>].

<sup>12</sup> Cfr < <http://www.cbd.int/iyb/doc/prints/iyb-report-2010-04-en.pdf>>

<sup>13</sup> Cfr also GIONHA project (Governance and Integrated Observation of marine Natural Habitat). Project partners: ARPAT (Tuscany region), Office de l'Environnement de la Corse, Liguria Region, Sardegna Region, and *Provincia di Livorno*. The project is funded by the European Territorial Cooperation Programme Italy-France "Maritime 2007-2013". Aim of the project is to raise public awareness on importance of the protection of marine habitats.

<sup>14</sup> Cfr < [http://www.repcet.com/docs/AF-07-008-PT\\_EN.pdf](http://www.repcet.com/docs/AF-07-008-PT_EN.pdf)>

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<sup>15</sup>. 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<sup>16</sup>. In the same species, the observed values on the PPI stations also match the predicted pattern of progressive decrease in body mass as estimated using Pennycuick's model<sup>17</sup>. 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<sup>18</sup>, 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

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<sup>15</sup> 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.

<sup>16</sup> Grattarola A., Spina F., Pilastro A. 1999. Spring migration of the Garder Warbler (*Sylvia borin*) across the Mediterranean. *J. Ornithol.*, 140: 419-430.

<sup>17</sup> 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.

<sup>18</sup> 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.

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<sup>19,20</sup>, as well as to better understand their orientation mechanisms<sup>21</sup>.

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<sup>22</sup> and an innovative “whole-island telemetry” approach<sup>23</sup> 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 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<sup>24</sup>.

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*<sup>25</sup> and *Phylloscopus*<sup>26,27,28</sup>. 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<sup>29</sup>. 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

<sup>19</sup> 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/atlane/1vol-1-32.pdf](http://www.isprambiente.it/site/_files/atlane/1vol-1-32.pdf)>.

<sup>20</sup> Spina F., Volponi S. 2009. Atlante della Migrazione degli Uccelli in Italia. Vol. 2: Passeriformi. ISPRA – MATTM, Roma, pp. 629.

<sup>21</sup> 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.

<sup>22</sup> 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](http://www.ardeola.org/pubs/57(1)/121-132)>.

<sup>23</sup> 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.

<sup>24</sup> (Tenan & Spina 2010) *cfr* above.

<sup>25</sup> 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.

<sup>26</sup> 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.

<sup>27</sup> Schwilch R., Mantovani R., Spina F., Jenni L. 2001- Nectar consumption of warblers after long-distance flights during spring migration. *Ibis*, 143: 24-32.

<sup>28</sup> 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.

<sup>29</sup> 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.

the earlier arrivals of migrants at northern latitudes across Europe are related to an earlier departure from latitudes south of the Sahara<sup>30,31</sup>. 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<sup>32</sup>.

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 *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<sup>33</sup>.

In decision IX/21<sup>34</sup>, the Conference of the Parties to the CBD requested the Subsidiary Body on Scientific, Technical and Technological Advice to undertake an in-depth review of the programme of work on island biodiversity at one of its meetings after the tenth meeting of the Conference of the Parties (Nagoya, Japan, October 2010), for final consideration by COP 11 in 2012. On the 15<sup>th</sup> February 2011 the Secretariat of the Convention on Biological Diversity (CBD) has invited island Parties and Parties with islands to provide information for the in-depth review of the implementation of the Programme of Work on island biodiversity. The review will be undertaken by the CBD's Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) at its 16th meeting, tentatively scheduled for May 2012. The review will measure progress in the implementation of the island biodiversity Programme of Work (annex to Decision VIII/1). It will focus on: the extent of implementation; status and trends of island biodiversity and drivers of change; constraints to implementation; activities and views of relevant organizations; and key responses and suggestions to maximize the contribution of the POW to the 2011-2020 Strategic Plan of the Convention and its goals and targets.

### **News and activities at national/regional/local level (2010-2011)**

National activities for the conservation of **Audouin's Gull** – largely insular in its breeding distribution - are ongoing and have led to the complete national census of the breeding population also in 2010 and 2011, 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.

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

<sup>30</sup> 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., Lehtikoinen A., Edvardsen E., Solvano R., Stenseth N.C. 2006. Rapid Advance of Spring Arrival Dates in Long-Distance Migratory Birds. *Science*, 312: 1959-1961.

<sup>31</sup> 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., Lehtikoinen 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.

<sup>32</sup> *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., Rubolini 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.

<sup>33</sup> *Cfr.* < [http://www.riservaventotene.it/index.php?option=com\\_content&view=article&id=90&Itemid=79](http://www.riservaventotene.it/index.php?option=com_content&view=article&id=90&Itemid=79)>.

<sup>34</sup> (see <http://www.cbd.int/doc/decisions/cop-09/cop-09-dec-21-en.pdf>)

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**<sup>35</sup>, we highlight the **project LIFE+ “Montecristo 2010”**<sup>36</sup>. The project aims 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 the **conservation of breeding *Procellariidae*** 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”<sup>37</sup> Sardinia, Italy], still being monitored in 2011, and analyses of data to evaluate/disseminate the results obtained with management and priorities for the future. Publications produced at this regard are listed further below<sup>38</sup>. The activities are carried out mainly by ISPRA- CRA 16, NEMO<sup>39</sup> s.a.s., ARP Lazio (<http://www.arplazio.it/>), PN *Arcipelago Toscano* (<http://www.islepark.it/>) and *Tavolara* MPA.

On Sardinia island control activities against *Myocastor coypus* are going on at local level<sup>40</sup>, but the species is still present<sup>41</sup>. Local removal of *Carpobrotus* sp. was part of the project *Providune*<sup>42</sup> (in the southern coast of Sardinia) and at “Stintino” sand dunes in the NW coast<sup>43</sup>. *Carpobrotus* sp.pl. (notably *Carpobrotus acinaciformis*, *C. edulis* and their hybrids<sup>44</sup>) 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<sup>45</sup> than competition for pollinators<sup>46,47</sup> and have been recorded associated with an approximately 30–50% decrease in the diversity of native vegetation, with detrimental effect on soil properties and biological soil crust<sup>48</sup>.

<sup>35</sup> Cfr also special session on “Management of allochthonous species” held at Fabriano (Ancona, Italy) on the 5-7 May 2010, during the “VII Congresso Italiano di Teriologia” < <http://gis.dipbsf.unisubria.it/congressi/index.php/atit/atit2010> >

<sup>36</sup> 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/LIT/IDPagina/1973> >.

<sup>37</sup> AMP Tavolara – Punta Coda Cavallo web site: < <http://www.amptavolara.it/> >

<sup>38</sup> Capizzi D., Baccetti N., Sposimo P. 2008. Rats et puffins sur les îles italiennes: stratégies de gestion et priorités. In : CEEP, Actes des ateliers de travail du programme LIFE Nature 2003-2007 Conservation des populations d'oiseaux marins des îles de Marseille, Commission européenne : 59-61; Baccetti N., Capizzi D., Corbi F., Massa B., Nissardi S., Spano G., Sposimo P. 2009. Breeding shearwaters on Italian islands: population size, island selection and co-existence with their main alien predator, the black rat. Riv. Ital. Orn., 78: 83-100; Ruffino L., Bourgeois K., Vidal E., Duhem C., Paracuellos M., Escribano Canova F., Sposimo P., Baccetti N., Pascal M., Oro D. 2009. Invasive rats and seabirds: a global review after 2,000 years of an unwanted coexistence on Mediterranean islands. Biological Invasions, 11: 1631–1651; Capizzi D, Baccetti N, Sposimo P. 2010. Prioritizing rat eradication on islands by cost and effectiveness to protect nesting seabirds. Biological Conservation, 143: 1716–1727.

<sup>39</sup> Web page at: < <http://www.nemoambiente.com/> >.

<sup>40</sup> 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](http://www.provincia.mediocampidano.it/resources/cms/documents/20091015_DEL_GP_0137.pdf) >.

<sup>41</sup> E.g., see < <http://www.sardegnaambiente.it/index.php?xsl=612&s=103934&v=2&c=4577&idsito=19> >.

<sup>42</sup> 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/> >.

<sup>43</sup> Description of the project at: < [http://www.apat.gov.it/site/files/Pubblicazioni/Rapporto\\_100\\_2009\\_cap\\_1\\_11.pdf](http://www.apat.gov.it/site/files/Pubblicazioni/Rapporto_100_2009_cap_1_11.pdf) > pp. 305-306.

<sup>44</sup> Suehs C.M., Affre L., Médail F. 2004. Invasion dynamics of two alien *Carpobrotus* taxa on a Mediterranean island. II. Reproductive strategies. Heredity, 92: 550–556.

<sup>45</sup> Vilà M., Tessier M., Suehs C.M., Brundu G., Manca L., Galanidis A., Lambdon P., Manca M., Médail F., Moragues E., Traveset A., Troumbis A.Y., Hulme P.E. 2006. Local and regional assessment of the impacts of plant invaders on vegetation structure and soil properties of Mediterranean islands. Journal of Biogeography, 33: 853-861.

<sup>46</sup> Bartolomeus I., Bosch J., Vilà M. 2008. High invasive pollen transfer, yet low deposition on native stigmas in a *Carpobrotus*-invaded community. Annals of Botany 102: 417–424.

<sup>47</sup> Moragues E., Traveset A. 2005. Effect of *Carpobrotus* spp. on the pollination success of native plant species of the Balearic Islands. Biological Conservation, 122: 611–619.

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During 2010 the floating plant “**water hyacinth**” [*Eichhornia crassipes* (Mart.) Solms], a worldwide invasive species native to South America and of ornamental introduction, jammed more than 8 km of a river in the Central-West Sardinia, with tons of floating plant matter. The direct costs for the removal intervention were around Euro 175,000.00. The *Corpo Forestale e di Vigilanza Ambientale* of Sardinia will be involved in the monitoring and early warning to prevent and promptly tackle new outbreaks. Nevertheless, there are still gaps in the legislation framework for managing invasive aliens in island territories, and contradictory elements (e.g., how to treat plant residuals after removal with concern to EU and national waste legislation? How to manage this type of water invasions inside a “Natura 2000” site?).

During 2010 a new Mediterranean plant species, i.e. *Crocus ilvensis* sp. nov. (sect. *Crocus*, Iridaceae), endemic to Elba Island (Tuscan Archipelago, Italy) was described by Peruzzi & Carta<sup>49</sup>. The known distribution range of *C. ilvensis* is completely included within the Tuscan Archipelago National Park and within the site of community importance (SIC) IT5150012. Its extent of occurrence (EOO) is 30.2 km<sup>2</sup>, while its area of occupancy (AOO) is 16 km<sup>2</sup>. Major threats are changes in native species dynamics and predation by wild *Sus scrofa*. In Italy, 15 *Crocus* species occur, 4 of them being endemic: *Crocus etruscus* Parl. (continental Tuscany), *C. imperati* Ten., *C. suaveolens* Bertol. (central–southern Italy) and *C. siculus* Tineo (Sicily).

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

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## 4. MALTA / MALTE

### MALTA'S SHORT WRITTEN CONTRIBUTION ON ISLAND BIODIVERSITY

(3<sup>rd</sup> Meeting of the Expert Group on European Island Biodiversity, Corsica, June 2011)

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

#### National Activities undertaken under the Biodiversity Information Campaign

##### Educational Tours

Malta has continued its national activities with regards to raising awareness on biodiversity and safeguarding Malta's natural heritage as part of the National Biodiversity Information Campaign, which was launched on 18 May 2010.

A number of monthly tours have been organised by the Malta Environment and Planning Authority (MEPA) between October 2010 and April 2011. The aim of these tours was to assist local and foreign participants appreciate and understand the particular flora and fauna and natural habitats found in various areas of ecological importance scattered around the Maltese Islands. During these tours, participants were shown various habitats and species present in Malta, some of which are endemic. Table 1 below provides a short overview of the organised tours:

October 2010	An education tour was held at Ta' Rapa, a Natura 2000 site, having one of the important old holm oak remnants of the Maltese Islands. On this visit, participants were shown bay laurel matorral, buckthorn and lentisk maquis communities, relict riparian woodlands with elms and poplars as well as small pine woodlands.
November 2010	This education tour was held at in-Nigret/Gebel San Pietru, an area in the central of the Islands, where participants were shown watercourse vegetation, maquis formations, phrygana and steppic communities. The area which is rich with cultural and natural heritage including important species which the visitors were able to may appreciate.
December 2010	During this tour participants visited the cliffs at Il-Hnejja/Wied il-Hoxt which holds important garigue communities and a number of unique and endemic species. In addition, they were shown interesting maquis and reed communities, as well as one of the oldest stands of Sandarac Gum trees at the locality known as Il-Maqluba.
January 2011	This tour was held at Wied il-Mizieb, in the North of Malta and falls within a Natura 2000 site. Participants were shown one of the islands largest population of Sandarac Gum tree (Malta's National tree), as well as endemic phrygana communities with the Maltese Spurge and the Maltese Shrubby kidney Vetch.
February 2011	This tour visited the valley system of Wied Has-Saptan, which includes some unique Mediterranean scrub and rock-pool communities. Of interest here are the pear formations which are one of the oldest found on the Maltese Islands.
March 2011	In this tour participants were taken to the sister island of Gozo at Il-Qortin tal-Magun. This Natura 2000 site has one of the richest garigue and scrub communities of the Islands, having many different and rare threatened and/or endemic species and habitats.
April 2011	The final education tour in this series was to Ta' Lippija in the North of the Islands. This site has a unique variety of Mediterranean grassland species and here the public were able to appreciate the clay slope habitats and their typical species.

**Table 1 – Educational Tours organised by MEPA**

## **Published Information**

Additionally, awareness raising on biodiversity included the publishing of biodiversity-related articles written by the Malta Environment and Planning Authority (MEPA), 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. Such articles are still being published to date.

In the running up of the 9<sup>th</sup> meeting of the Group of Experts on Invasive Alien Species, held in Malta (18-20 May 2011) MEPA produced a poster depicting examples of invasive alien species (IAS) in the Maltese islands, whilst providing general information on IAS. Moreover MEPA published a booklet which focuses on the Code of Conduct on Horticulture and Invasive Alien Plants which was adopted by EPPO and the Council of Europe. This booklet is an abridged version of the Code, and providing additional national information.

Moreover MEPA has drafted “Guidelines on managing non-native plant invaders and restoring native plant communities in terrestrial settings in the Maltese Islands”. These guidelines aim to assist in the planning and implementation of management programmes aimed at counteracting the spread of plant invaders found in important natural areas and rural areas where the removal of alien plants is desired as it would benefit neighbouring natural and semi-natural habitats and to serve of assistance when designing and implementing native species recovery programmes, aimed at reinstating native plant communities to a favourable conservation status in compliance with the relevant legislation in force at the time. Preliminary consultation has been undertaken with potential users of the guidelines – namely site managers – in order to further refine the document. Wider public consultation is envisaged later this year.

## **Other activities**

On the 19<sup>th</sup> September 2010, the Malta Tourism Authority organised a Tourism and Biodiversity Fair. A number of non-government organisations participated, each displaying its own projects and promotional material related to the conservation of the environment. Additionally children could also take part in a biodiversity life-sized board game, similar to snakes-and-ladders, and quiz.

A diverse number of activities and initiatives have been organised by local NGO’s to mark the International Year of Biodiversity. These include a number of organised walks to Majjistral Nature and History Park. The Park to the north of the mainland encompasses clay slopes, water courses and boulder screes featuring a number of important and rare vegetation. Additionally a number of public guided walks to Ta’ Ċenċ, Gozo - an area which forms part of the EU Natura 2000 network of protected areas. These walks were introduced by a small presentation on the fauna and flora found there. The cliffs at Ta’ Ċenċ support a rich and unique floral assemblage characteristic of rupestral localities, including a number of endemics. The area is also of exceptionally importance for birds, as it supports a large population of sea-birds, such as the Cory’s Shearwater.

In conjunction with the celebrations of the European Bat Night in 2010, MEPA organised the ‘Malta Bat Night’ which provided the participants with an illustrated talk, an exhibition and a bat detecting night walk.

## **Protected Areas**

A project “Natura 2000 management planning for Malta and Gozo” proposed by MEPA, has been approved for co-financing by the European Agricultural Fund for Rural Development (EAFRD) under Measure 323 of the Rural Development Programme for Malta, 2007 – 2013. This project aims to establish management plans and legal provisions for all terrestrial Natura 2000 sites in the Maltese Islands and to increase awareness of Natura 2000 amongst the general public and stakeholders. This will pave the way for subsequent investment in the management of Natura 2000 sites in the Maltese Islands.

Lately, the Trees and Woodlands (Protection) Regulations, 2011, have been published under the Environment and Development Planning Act 2010. These regulations form part of a ‘better regulation’ process, and repeal the Trees and Woodlands Protection Regulations, 2001 (Legal Notice 12 of 2001),

with the aim of simplifying the process for issuing of permits related to protected trees, while at the same time increasing the protection afforded to certain species of trees and shrubs and areas important for endangered and rare trees.

## 5. UNITED KINGDOM / ROYAUME-UNI

### ISLAND BIODIVERSITY WORK IN THE UK – AN UPDATE.

*Prepared for the third meeting of the  
Group of Experts on European Islands Biological Diversity  
Galeria, Corsica 9 - 11 June 2011*

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<sup>50</sup>, however listings are currently by site and country – the 'island' classification is not included.

##### 1.1. Internationally-important populations

A review of UK SPAs<sup>51</sup> 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 (*Oceanodroma 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 Greenshank (*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.

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).

<sup>50</sup> <http://www.jncc.gov.uk/page-2598>

<sup>51</sup> <http://www.jncc.gov.uk/page-1415>

## 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 (*Pyrhocorax 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; framing 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. The 2010 Scottish Government Goose Management Review concluded that recent goose management policy and in particular the system of Local Goose Management Schemes, had been successful in improving the fortunes of most goose species and reducing the conflicts with agriculture. The exception to this is the populations of Greenland White-fronted goose, whose populations are still declining. The Review also concluded that there was a lack of equity in how agricultural managers who were all facing pressure from expanding goose populations were treated. This is particularly notable in Orkney & Caithness where populations of grey geese are expanding rapidly and goose schemes are largely unavailable. The Review also noted the high costs which were unlikely to be sustainable with public sector cuts.

The Government has now committed to developing revised Schemes with a reduced budget, which can focus on enhanced protection for species of conservation concern (Greenland White-fronts), and supports a greater emphasis on adaptive management, where data and management controls allow effective monitoring of hunting effort. There was a general steer that local costs could be reduced with minimum impact on conservation targets by reducing the goose scaring and modifying

monitoring efforts, within agreed limits. A decision has been made to enter into Interim Goose Management Schemes for the year 2011/12, which will require Local Schemes to reduce costs, following the general approach set out by the Scottish Government. Work will begin on tailoring the Schemes more significantly to address the revised policy direction during summer and autumn 2011. 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 52 breeding territories, mostly on Scottish islands. These are providing major tourism income to the islands of Mull and Skye. In the west 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. A third reintroduction on the east coast of Scotland is progressing well and is into its fifth year; the birds are using east coast seabird islands amongst other areas.

## 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 were introduced in the 1970s by misguided individuals wishing to control slugs (*Arion* spp) in gardens, are 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<sup>52</sup>. The American mink (*Mustela vison*) also causes serious problems to ground-nesting terns, gulls and waders, and a major removal programme<sup>53</sup> is under way on Harris and Lewis.

<sup>52</sup> <http://www.snh.gov.uk/land-and-sea/managing-wildlife/uist-wader-project/>

<sup>53</sup> <http://www.snh.gov.uk/land-and-sea/managing-wildlife/hebridean-mink-project/>

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 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 brown 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 is considering whether all-island control is necessary and is being implemented by The Food and Environment Research Agency (FERA). It aims to investigate the impact of predation by introduced rats on breeding success of Manx Shearwaters on the island of Rum. Breeding success of Manx Shearwaters was compared in areas where rats were removed by the use of rodenticides and in untreated control areas. Results from this trial will help to determine what future action will be taken to safeguard the future of the breeding Manx Shearwater population on Rum.

Rat activity was monitored at key stages to evaluate the success of the rat control strategy used in the treated area, detect any subsequent reinvasion or population recovery, and monitor rodent activity levels at the control sites. Two main methods were used to monitor rat activity (tracking plates and chew sticks). The data indicate that the density of rats at the treatment site may have been reduced by the rodenticide treatment in May, but showed signs of partial recovery or reinvasion by late August. The density of rats was lower than expected at the study sites, and may be an indication of inter-year variation. The second phase of the rat control trial will begin in June 2011 when last year's treatment area will become a control area and one of last year's control areas will become the treatment area.

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.

New Scottish legislation, introduced in 2010, increases the protection of islands from introductions of non-native species, or species whose natural range within Scotland does not include island areas. It is now illegal, for example, to introduce mammals to islands where they are not native.

### **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.