8. Biodiversity

Key messages

- The status of 29 percent of Maltese habitats and 36 percent of Maltese species listed in the Habitats Directive is still unknown. In addition, 64 percent of habitats and 44 percent of species have an inadequate or bad conservation status. Stringent measures are required for these to attain favourable status, while further surveys are needed to assess those with unknown status.

- Invasive alien species represent a serious threat to Malta’s biodiversity. Action plans are required to eradicate such species and prevent further introductions.

- In order to identify actions to address the principal threats facing Maltese habitats and species of importance, further baseline studies and monitoring are necessary.

- 28 Maltese sites have been included in the EU Natura 2000 network under the Habitats Directive, which, apart from the one marine site, cover 13.1 percent of land area. These sites are considered 93 percent sufficient in affording protection to the Maltese terrestrial habitats and species of community interest. 13 additional, but often overlapping sites covering 5.2 percent of land area have also been included as Natura 2000 sites under the Birds Directive.

- Management of protected areas is being addressed by Government and by MEPA in partnership with non-governmental organisations. Structural funding has been allocated to accelerate this process.

8.1 Introduction and policy context

This Sub-report concerns the status of, and the threats to, living organisms and their habitats in the Maltese Islands. Living organisms include a large number of species including those from the plant, animal, fungi, and bacteria groups. The area where groups of species live at a specific point in time may be described as a habitat, and in Malta, there are a number of habitats of conservation value. These include cliffs, sand dunes, salt marshes, woodlands, garigue areas and coastal waters. Many species also live in agricultural land, both abandoned and utilised, and in urban areas. The variety of living organisms in Malta, and the ecological and environmental complexes that they inhabit, may be described as Malta’s biodiversity.¹

Biodiversity is not only of intrinsic value in its own right, but also of direct instrumental value to human society. It provides the clean air and water essential for life-support systems, the resources that feed directly into economic sectors such as fisheries and agriculture, and the environment in which recreational,

cultural, artistic and tourism-related activities can take place. Despite its small size, Malta holds an interesting array of habitats and species.

At an international level, biodiversity is protected by means of a number of multilateral environmental agreements, principal among which is the United Nations (UN) Convention on Biological Diversity, which addresses biodiversity in an extensive manner. Its target is the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources. Other agreements address certain habitats or species, such as the Bonn Convention, the aim of which is to conserve and manage terrestrial, marine and avian migratory species, and the Ramsar Convention, on the conservation and sustainable use of wetlands and their resources, the Barcelona Convention on the protection of the Mediterranean Sea, and the Bern Convention on the conservation of European wildlife and natural habitats. At a European Union (EU) level, the major policy instruments in relation to biodiversity include the 1979 Birds Directive (as amended) and 1992 Habitats Directive (as amended). An EU Biodiversity Strategy was adopted in 1998, aimed at furthering the objectives of the UN Convention on Biological Diversity. Under this strategy, in 2001, an initiative was adopted to halt the loss of European biodiversity by 2010. This 2001 initiative was followed by the EU Biodiversity Action Plan in 2006.

National legislation concerning nature protection is extensive, based upon a number of legal instruments, the principal among which is the 2001 Environment Protection Act. A sizeable amount of subsidiary legislation has been issued under this Act to transpose the provisions of international Conventions and European

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9 CEC 1998.
11 CEC 2006a.
12 Cap. 435.
Directives. The principle regulations in this respect are LN 311 of 2006\textsuperscript{13} and LN 79 of 2006\textsuperscript{14} (as amended) transposing the Habitats and Birds Directives respectively. Apart from affording protection to a number of habitats and species, these, along with other, regulations,\textsuperscript{15} have allowed for the designation and conservation of various habitats and species.

### 8.2 Threats to Biodiversity

Despite the introduction of substantial legal protection for important habitats and species during the last 15 years, the loss of Malta’s biodiversity continues. Indigenous biodiversity in the Maltese Islands is faced with similar threats as those faced by biodiversity throughout the EU,\textsuperscript{16} with one of the most significant threats in Malta being that of land development, followed by invasive alien species and over-exploitation. Climate change is also becoming a threat to Maltese biodiversity.

**Land Development**

With an area of 315 km\textsuperscript{2} and a population density of 1,298 residents per km\textsuperscript{2} in 2007,\textsuperscript{17} Malta’s land area is subject to strong pressures for building development. Land is Malta’s primary non-renewable resource, and is therefore used not only for building the necessary homes, commercial and social facilities needed for Malta’s economic and social development, but also for its investment value. As a result, construction occupies an important role in the economic development of the islands despite its relatively small contribution to GDP (3.79 percent in 2007).\textsuperscript{18}

These land-use dynamics have a significant impact on biodiversity in the Maltese Islands, as land development takes up the natural and agricultural land area needed for biodiversity to thrive. Although many generally-successful efforts have been made to define and directly protect the most important Maltese habitats where rare or threatened species live, the overall scale and pattern of development, and the related activity in terms of, for example, transport and mineral extraction, takes its toll on the health of Malta’s biodiversity. In this respect, species that once thrived in areas that remain undeveloped also suffer the effects of land development, due to changes in the environmental media such as

\textsuperscript{13} LN 311 of 2006 under the Environment Protection Act (Cap.435) and the Development Planning Act (Cap. 356) (Flora, Fauna and Natural Habitats Protection Regulations, 2006), as amended by LN 162 of 2009.

\textsuperscript{14} LN 79 of 2006 under the Environment Protection Act (Cap. 435) and the Code of Police Laws (Cap. 10) (Conservation of Wild Birds Regulations, 2006), amended by LN 39 of 2007.

\textsuperscript{15} These are listed at \url{http://www.mepa.org.mt}.

\textsuperscript{16} CEC 2006a.

\textsuperscript{17} NSO 2008a.

\textsuperscript{18} NSO 2008b.
air and water, and also since the overall land area in which they are found is further limited.

Between 1990 and 2006, approximately 2.7km$^2$ (0.85 percent)$^{19}$ of total land area, consisting of sclerophyllous vegetation,$^{20}$ agricultural land and non-irrigated arable land, was converted to discontinuous urban fabric, industrial or commercial units, mineral extraction sites and dumping sites. In recent years, as part of the local planning process, an exercise to rationalize the development zone boundary took place, which has resulted in an overall increase of 2.3 percent in the development zone.$^{21}$ Furthermore, although Malta’s planning system$^{22}$ provides a well-defined development boundary that serves to contain development$^{23}$ within specifically allocated areas, the lack of large sites within the development boundary that are in single ownership places pressure for large new developments such as schools and hospitals outside the development zone. Some uses, such as the waste treatment facilities that are being built to bring Malta in line with EU waste treatment standards, also require locations in the countryside due to their incompatibility with residential uses.$^{24}$

**Invasive Alien Species**

Invasive alien species are those species that are introduced outside their natural environment and that are capable of out-competing indigenous organisms. Such species are known to lead to a significant impact on the economy.$^{25}$ An invasive alien species that has caused much damage to Maltese Palm species is the Red Palm Weevil (*Rhynchophorus ferrugineus*; Maltese: Bumunqar Aħmar tal-Palm), which is discussed in Box 8.1 below. Malta’s draft National Strategy for Sustainable Development recommends that a strategy to control existent alien species and prevent further introductions should be drawn up.$^{26}$ **Alien species are therefore a serious threat to Malta’s biodiversity, requiring the formulation of action plans to eradicate them and to prevent further introductions.**

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$^{19}$ This value was obtained using CORINE Land Cover Change maps (refer to Sub-report 4 on Land). Although the minimum size of land parcels used in the CORINE land cover map was 25ha, however since this scale is not sensitive enough to monitor short-term land use change in the Maltese context, a scale of 5ha land parcels was used to produce the Land Cover Change maps, on which this calculation is based.

$^{20}$ Sclerophyllous vegetation is vegetation having hard leaves.

$^{21}$ See Sub-report 4 on Land.

$^{22}$ In accordance with Structure Plan Policy SET 11.

$^{23}$ With the exception of legitimate uses that require a rural location, such as agricultural buildings.

$^{24}$ See Sub-report 4 on Land.

$^{25}$ EEA 2005.

$^{26}$ NCSD 2006.
Box 8.1 Invasive alien species – The Red Palm Weevil

The Red Palm Weevil originates from tropical Asia, but has now spread to Africa and Europe. This pest has also reached the Maltese Islands and was first recorded in a Wardija garden in July 2007. Since then, a number of other outbreaks have been identified in various localities mainly in the central and northern regions of Malta. This invasive species has spread due to the transportation of infested young or adult date palm trees and offshoots from contaminated areas. There is evidence to suggest that infected palm trees have been exported from Egypt and European countries such as Spain and Italy. This species is of major concern because its attack is noticed only when it is too late to save the palm tree, and this results in the death of the tree.

Upon the first findings of this beetle a notification was published in the Government Gazette on 16th October 2007. A press release was subsequently issued on 24th October 2007 by the then Ministry of Rural Affairs and the Environment to warn the public of its presence. Movement of palm trees from Malta to Gozo was then banned as per a Government Notice of 9th November 2007. Other related press releases concerned the use of palm fronds during Palm Sunday and the use of palm fronds by fishermen. Guidelines were also issued and made available on the Plant Health Department’s website. Eventually, all palm owners were obliged to register their palm trees with the Plant Health Department, as per LN 42 of 2009. In addition, OPM Circular 31/2008 of 15 December 2008 indicated that every Ministry must ensure that every Department and entity that falls under that Ministry’s responsibility must inform the Plant Health Department, Ministry for Resources and Rural Affairs, about every palm present within their property.

The invasiveness of this species across Mediterranean countries has led to the adoption, by the European Commission, of Decision 2007/365 EC, applying strict quarantine measures between and inside the countries affected and threatened by the pest.

Source: Plant Health Department

Genetically Modified Organisms (GMOs) are varieties formed when the genetic material of certain species is modified to confer, in most cases, an economically advantageous trait. GMOs are the cause of major debate in view of their potential to negatively impact on biodiversity, since if placed in the wild, either purposely or accidentally, GMOs may hybridise with wild or cultivated relatives, or may become invasive. They may also have a toxic effect on organisms, including humans. For this reason, stringent approval procedures, including scientific risk assessment, are necessary before GMOs can be placed on the market. As a member of the EU, Malta is required to regulate the contained use of Genetically Modified Micro-

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27 Plant Health Department.
28 As per the Plant Quarantine Act (Cap. 433) (Part V Containment and Eradication of Plant Pests, Article 20 para [1]).
29 Government Gazette No. 18,146.
30 DOI 2009.
31 DOI 2008.
32 LN 42 of 2009 under the Plant Quarantine Act (Cap. 433) (Control of the Red Palm Weevil Regulations, 2009).
organisms (GMMs), the release of GMOs into the environment, and their placing on the market. In order to fulfill its obligations, MEPA has established a Biosafety Co-ordinating Committee (BCC), whose function is to review and assess applications sent by the European Commission for consultation with Member States, as well as applications that originate in Malta. Applications can be made for contained experimentation with GMMs within laboratories, for the experimental release of GMOs, their placing on the market and the use of viable GMO food and feed. Furthermore, the BCC is also requested to comment on draft documents, and to draft legislation and safeguard clauses. At a European level, Malta has insisted on the need to protect fragile ecosystems, in particular small, isolated islands, from possibly invasive GMOs.

Between 2004 and 2008, the BCC reviewed 42 applications originating within the EU for the placing on the market of GMOs (17 applications) and the entry of GM food and feed (25 applications). It also reviewed nine safeguard clauses submitted by six Member States. As the competent authority for such applications, MEPA received no applications for the experimental release of GMOs in Malta that have not yet been tested in other countries. The BCC reviewed and agreed upon a proposed draft legislation by the BCC secretariat to repeal previous legislation. It also reviewed and submitted comments on a document issued by the European Food Safety Authority entitled "Public Consultation on GM Plants for Non-food/feed Purposes". In addition, as per the obligations of the Cartagena Protocol on Biosafety, Malta has finalised the National Biosafety Framework for Malta and established the Maltese Biosafety Clearing House (an information exchange portal). The latter is an information-exchange mechanism that is part of the Clearing House Mechanism of the Convention on Biological Diversity, which aims at assisting Parties to the Convention to implement its provisions and to facilitate sharing of information on, and experience with, living modified organisms.

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35 Ratified by Malta on 5th January 2007.


Over-exploitation of wildlife

Wildlife is exploited for a number of reasons, ranging from food, to human enjoyment, scientific research or private collection for use as souvenirs or pets. When individuals are removed from a population, changes in abundance and size structure, skewed sex ratio (significant differences in the abundance of one sex and another), and a general reduction in genetic diversity of that population results. Excessive removal of one species also has an effect on other species depending on it for survival. As a consequence, the balance of natural systems is lost and recovery, if at all possible, is generally long-term.

Being located in the centre of the Mediterranean, Malta represents a principal migratory route for birds travelling between Europe and Africa. Migrating birds use the Islands as resting grounds to replenish fat stores for their onward journey and to avoid adverse weather conditions. In this context, the hunting and trapping tradition in the Maltese Islands, and more significantly its illegal practice, poses a threat to these species. Uncontrolled exploitation in Malta has led to the extinction of a number of species and the reduction in population of many others. Various species are being exploited in the Maltese Islands but information on such exploitation is lacking. A rough indication of the scale of exploitation of wild migratory birds can be given using the catches registered in the Carnet de Chasse declarations, which are mandatory for persons wishing to obtain a licence for hunting and trapping (Chart 8.1).

![Chart 8.1: Total number of birds declared hunted or trapped](chart8.1.png)

Source: MEPA

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40 Raine 2007.
41 Lanfranco 1999.
42 The Carnet de Chasse is a register in which the hunter/trapper keeps a record of what was captured during the year.
Between 2002 and 2006, an annual average of 188,126 birds were declared hunted or trapped in the Maltese Islands. The trend is increasing, largely due to a steep rise in declared catches in 2007, when the total declared catch increased by 80 percent over the previous year, from 153,094 to 247,755. This followed awareness-raising among hunters of the importance of accurate statistics. The bird species declared most hunted or trapped for this period was the Turtle Dove, with an average annual catch of almost 40,000 birds, followed by the Song Thrush at almost 35,000 birds, and the Quail and Linnet at over 22,000 and almost 18,000 respectively.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>12,546</td>
</tr>
<tr>
<td>2003</td>
<td>12,104</td>
</tr>
<tr>
<td>2004</td>
<td>12,307</td>
</tr>
<tr>
<td>2005</td>
<td>11,981</td>
</tr>
<tr>
<td>2006</td>
<td>12,044</td>
</tr>
<tr>
<td>2007</td>
<td>10,831</td>
</tr>
</tbody>
</table>

**Table 8.1: Number of returned Carnet de Chasse forms**

Returned Carnet de Chasse forms indicate an average of 12,000 active hunters/trappers per annum in this period, but the overall trend is for the number to decrease, by approximately 260 forms per year (Table 8.1). Between 2005 and 2007 approximately 1,646 individuals sat for and passed the Hunting and Trapping License Exams, which relate to new licence applications. Data on licences granted by the Police is also available (Table 8.2). While there was a decrease in the number of licences for hunting on sea and trapping of birds, there was an increase in licences on hunting on land.

<table>
<thead>
<tr>
<th>Type of Licence</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunting on land</td>
<td>13,098</td>
<td>13,157</td>
<td>13,429</td>
</tr>
<tr>
<td>Hunting at sea</td>
<td>549</td>
<td>491</td>
<td>355</td>
</tr>
<tr>
<td>Trapping of birds</td>
<td>4,606</td>
<td>4,501</td>
<td>4,399</td>
</tr>
<tr>
<td>Trapping of wild rabbits</td>
<td>31</td>
<td>31</td>
<td>31</td>
</tr>
</tbody>
</table>

**Table 8.2: Police hunting and trapping licences**

**Climate Change**

The sustainable use and conservation of biodiversity will possibly also be undermined within the space of a few decades due to the effects of climate...
Indeed biodiversity loss is one of the expected impacts of climate change for the Maltese Islands. In its first communication to the United Nations Framework Convention on Climate Change\textsuperscript{44} Malta noted that the expected impacts of climate change will include, amongst others, the deterioration of potable water supplies and water quality, frequent extreme weather events, increased desertification and soil erosion, changes in sea water mass characteristics, and sea-level rise. Some of these impacts will directly, or indirectly, lead to the loss of biodiversity, in particular those species that are slow at adapting to such changes.

The effects of climate change are already being felt by European biodiversity. The European Environment Agency (EEA)\textsuperscript{45} notes that climate change is responsible for the observed northward latitude and upward altitude shift in the distribution ranges of certain species. Additionally, an increase in species richness has been observed in the past 30 years. However generalist species tolerating warm conditions have become more frequent. It is being predicted that climate change will become the principal threat faced by Europe’s biodiversity in the future. The EEA also notes that a 1°C warming in the Alps is predicted to result in a 40 percent loss of local endemic plants, while a 5°C warming would result in a 97 percent loss.\textsuperscript{46}

### 8.3 Status of biodiversity

Despite their small size, the Maltese Islands host a relatively significant number of species of flora and fauna, with a substantial amount being endemic.\textsuperscript{47} Natural habitats are of central importance for such species, since they provide the necessary environmental conditions for survival. As a result, the distribution and status of habitats dictates the status of the species within them. This section discusses the distribution of Maltese habitats, and provides an overview of the status of species or groups of species within them. Case examples are included in boxes 8.2 to 8.9.

As Malta is a small island state with a high population density, its terrestrial natural habitats are limited in extent and confined to specific areas. Forest remnants are only found in a few localities, and sand dunes have regressed through the years, with the species requiring such a habitat for their survival becoming more threatened. Cliffs are mainly found towards the North-Western and Southern parts of the islands and are particularly important for a number of endemic species, such as the Maltese Rock-Centaury (\textit{Palaeocyanus crassifolius}). Although certain

\textsuperscript{43} CEC 2006b.  
\textsuperscript{44} MRAE 2004.  
\textsuperscript{45} EEA 2007.  
\textsuperscript{46} EEA 2005.  
\textsuperscript{47} Found only in the Maltese Islands and nowhere else in the world.
activities (such as quarrying) can lead to impacts on cliff habitats, the status of such habitats is less threatened than other habitat types.

Some Maltese habitats and the species inhabiting them are important both nationally and at a European level. Charts 8.2 and 8.3 indicate the status of habitats and species listed in the Habitats Directive.\(^{48}\) The status of 29 percent of Maltese habitats and 36 percent of Maltese species listed in the Habitats Directive is still unknown, and a significant amount of these relate to the marine environment. In addition, 64 percent of habitats and 44 percent of species have a bad or inadequate conservation status. Stringent measures are required for these to attain favourable status, while further surveys are needed to assess the status of habitats and species with unknown status. Table 8.3 provides a qualitative review of the status of selected groups of species, mostly based on assessments carried out in the context of national reporting on the implementation of the Habitats Directive.\(^{49}\)

![Chart 8.2: Conservation status of habitats of European Community importance](image)

Source: MEPA/European Commission\(^{50}\)

The status categories used are: Favourable; Unfavourable – Inadequate; Unfavourable – Bad; and, Unknown. The plants, mammals, amphibians, reptiles, fish and invertebrates assessed are listed in the annexes of the Habitats Directive and have been assessed as per its requirements. However as explained in Table 8.3, not all these species are reflected in the assessment underlying Chart 8.2 and 8.3.


\(^{48}\) \(^{49}\) \(^{50}\)
Chart 8.3: Conservation status of species of European Community importance

Source: MEPA/European Commission

Plants: Out of 14 assessed terrestrial species, 13 have an unfavourable status. Of the latter, eight have an unfavourable - inadequate status and five have an unfavourable - bad status (one of these is possibly extinct prior to when EC Habitats Directive came into force in Malta, hence not considered in Chart 8.3). The status for the marine species could not be assigned in view of limited data (see Boxes 8.2, 8.3 and 8.4 for status of native trees, endemic plants in general, and the endemic Maltese Rock-Centaury respectively).

Fungi: A detailed assessment of fungal diversity has not yet been carried out, and is urgently required. On the basis of existing information, it appears that many species are confined to a few areas, particularly forest remnants and selected garigue sites; however, a good number of such habitats are protected. Increased human disturbance in key areas is likely to be the principal cause leading to possible decline.

Mammals: Nine terrestrial and 12 marine species found in the Maltese Islands were assessed. The hedgehog and two species of bats are at a favourable conservation status, with four other bat species being at an inadequate status. The status for another bat species and for the Sicilian shrew is as yet unknown. The status of marine mammals remains unknown. One bat species and four cetaceans are considered occasional and hence not considered in Chart 8.3.

Amphibians and Reptiles: Only one amphibian, the Painted Frog (*Discoglossus pictus*) is native to the Maltese Islands, with its status being inadequate and deteriorating. The eight species of Maltese terrestrial reptiles are all at a favourable conservation status, apart from one, this being the Selmunett Wall Lizard (*Podarcis filfolensis kieselbachi*), which is confined to St. Paul’s Islands. The status of the Loggerhead Turtle (*Caretta caretta*) – a marine reptile – in Maltese waters, is as yet unknown (see Boxes 8.5 and 8.6 for status of the Maltese Wall Lizard and Western Whip Snake respectively).

Fish: Only two fish species were assessed, the Mediterranean Killifish (*Aphanius fasciatus*) and the Allis Shad (*Alosa fallax*). Whilst the Mediterranean Killifish has an unfavourable/inadequate conservation status, the status of the Allis Shad is as yet unknown.

Invertebrates: Six terrestrial and six marine invertebrate species were assessed. The status of five of the terrestrial species is unfavourable, while it is unknown for another. The general status of marine species is unknown (see Boxes 8.7 and 8.8 for the status of Lepidoptera and the Noble Pen Shell respectively).

Birds: There was a decrease in the Blue Rock Thrush (*Monticola solitarius*) population in the last 20 years and the Corn Bunting (*Miliaria calandra*) continues to decline. In 2007, Barn Swallows (*Hirundo rustica*), Spotted Flycatchers (*Muscicapa striata*) and Woodchat Shrike (*Lanius senator*) bred successfully at Buskett while the Spectacled Warbler (*Sylvia conspicillata*), the Collared Dove (*Streptopelia decaocto*) and the Little Ringed Plover (*Charadrius dubius*) populations increased. The status of migratory birds may be considered as threatened due to illegal hunting (see Box 8.9 for status of breeding and migratory birds).

Source: MEPA; Sultana and Raine 2008

**Table 8.3: Status of selected groups of species in the Maltese Islands**
True woodlands constitute approximately five percent of the Maltese Islands, with this value incorporating also non-native trees. To date, approximately 60 species of trees are known to be native to the Maltese Islands and they form a number of communities. Each community consists of typical species, with the prevailing species depending on the habitat conditions. As Chart 8.4 indicates, while 23 percent of these species are frequent, 66 percent are rare or threatened and 11 percent are extinct. These values arise from the fact that trees are faced by a number of threats such as natural and human-induced fires, vandalism, grazing, cutting and collection of trees, development (including construction of roads, parking areas and buildings), lack of awareness, national security, and the presence and introduction of alien species. By limiting their extent these impacts inhibit the proper development of woodlands. As an example, coastal maritime woodlands are extremely rare, due to, amongst others, the development of fishing villages and the use of land for agriculture, for the building of fortifications, for recreation, and for the construction of roads, tourist amenities and so on. The ecological importance of rare and threatened species calls for an increased effort to conserve native trees by enforcing current regulations and promoting the use of Maltese trees in afforestation, reforestation and ecological restoration projects.

![Chart 8.4: Status of native trees](Source: MEPA)
Box 8.3 Status of endemic flora

Endemic plants are species that are found only in the Maltese Islands, while sub-endemic species are ones that are found in the Maltese Islands and in one or two other restricted territories. These plants, in particular strict endemics, contribute to the identity of the Maltese Islands and its inhabitants. The status of 10 endemic and sub-endemic species is discussed here. Their status has been assessed in view of the fact that besides being of national importance, they are also listed in the annexes of the Habitats Directive, giving them European community importance. All the species assessed had an unfavourable status, with two of them being in a bad and deteriorating state. Although their habitat is also protected through the designation of protected areas, their condition indicates that a much greater effort is required to safeguard them. Implementation and enforcement of policies aimed at protecting this flora is necessary, together with research and monitoring, these being required in order to gain knowledge that can be utilised to prepare and utilise action plans for specific species or groups of species. Education and awareness-raising are also crucial for the proper conservation and management of these plants.

Photo: Linaria pseudolaxiflora: A sub-endemic plant that has a bad and deteriorating status (Source: MEPA)

Source: MEPA

Box 8.4 Status of the Maltese national plant of the Islands: Maltese Rock-Centaury

The Maltese Rock-Centaury (Palaeocyanus crassifolius; Maltese name: Widnet il-baħar) is a flowering plant that grows to a height of up to 50cm and produces a purple flower between the months of May and July. This species is endemic to the Maltese Islands and is Malta’s national plant.

These are: the Maltese Pyramidal Orchid (Anacamptis urvilleana); Maltese Cliff-Orache (Cremnophyton lanfrancoi); Maltese Waterwort (Elatine gussonei); Maltese Everlasting (Helichrysum melitense); Maltese Hyoseris (Hyoseris frutescens); Maltese Toadflax (Linaria pseudolaxiflora); Crescent Orchid / Moon Orchid (Ophrys lunulata); Maltese Spider Orchid (Ophrys melitensis); Sand Broomrape (Orobanche densiflora); Maltese Rock-centaury (Palaeocyanus crassifolius).
According to the Red Data Book for the Maltese Islands, this endemic species was rare in 1989. In 2005, the status of the population was re-assessed (as per the International Union for the Conservation of Nature [IUCN] criteria); it was assigned the threat status of critically endangered. Indeed, the range and distribution of this species is known to have declined between 1915 to 2007. Following an assessment of its conservation status in 2007, it was concluded that this is unfavourable. While the reasons for this decline are not certain, it is believed that a reduction in number of individuals was observed due to its habitat becoming very restricted, the population being extremely fragmented and the plant species having a very low natural recruitment level. In view of these reasons, it is being predicted that its status and the area and quality of its habitat will decline in the future. The severity of this predicted decline is exacerbated by the fact that juvenile plants are attacked by moth larvae, and the fact that the plant is sensitive to invasion by alien species. The Maltese Rock-Centaury has been afforded protection both on a national and regional scale. Its habitat has also been protected through the designation of protected areas both on a national and regional scale. The distribution of this species is restricted (Map 8.1), with the plant being confined mainly to cliff and boulder scree habitats; it is rarely also found along the cliff-top plateau.

Map 8.1: Distribution of the Maltese Rock-Centaury (*Palaeocyanus crassifolius*) across the Maltese Islands

Source: MEPA

Photo: The Maltese Rock-Centaury (*Palaeocyanus crassifolius*) (Source: MEPA)

Source: MEPA

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The Maltese Wall Lizard (*Podarcis filfolensis*; Maltese name: Gremxula ta’ Malta) is the only Wall Lizard that is found in the Maltese Islands. The males exhibit bright colours that are not found on the females and the young. The Wall Lizard feeds mostly on insects, fruits and vegetables. This species is endemic to the Pelagian and Maltese Islands, with the latter hosting four out of the five sub-species that exist. The most well-known sub-species (*Podarcis filfolensis maltensis*) is found on the islands of Malta, Gozo and Comino. Different sub-species are found on the islets of Filfla (*Podarcis filfolensis filfolensis*), Fungus Rock (*Podarcis filfolensis generalensis*) and St. Paul’s Islands (*Podarcis filfolensis kieselbach*), with the Filfla sub-species being the first to be described. There is an indication that the *Podarcis filfolensis* on the islet of Cominotto is yet a different sub-species, however, this is unconfirmed. In 2006 the Filfla sub-species was described as endangered in view of the very small population, while the status of the Fungus Rock sub-species was described as critically endangered due to the restricted geographical range. These states were assigned using IUCN criteria. A different assessment was carried out as per the obligations of the EC Habitats Directive in which case both sub-species were given a favourable status in view of the fact that despite the small populations and limited geographical ranges that they inhabit, the sub-species are expected to survive and prosper. The St. Paul’s Islands sub-species was assigned a critically endangered status in line with IUCN criteria, since the population is limited and found within a restricted geographical area. A bad conservation status was assigned under the EC Habitats Directive in view of the fact that this sub-species has been reducing in numbers throughout the years due to rat invasion, with the future prospects for the species being bad (see Box 8.13). All sub-species are protected through national and regional legislation, while the three islets on which the different sub-species mentioned above are found have also been protected through national legislation, as well as under the EC Habitats Directive.

Photo: The sub-species of the Maltese Wall Lizard found on Filfla - *Podarcis filfolensis filfolensis* (Source: A.E. Baldacchino)
**Box 8.6 Status of the Western Whip Snake**

The Western Whip Snake (*Hierophis viridiflavus* Maltese name: *Serp Iswed*) can grow up to 150 cm in length and is the largest snake in the Maltese Islands. It typically has a black appearance and while considered dangerous due to its biting, it is not poisonous. It feeds on lizards (and their eggs) and other reptiles, including smaller snakes. It also feeds on mice, frogs, young birds and large insects.

The Western Whip Snake may be found in a range of habitats across the Islands, including dry locations along valley sides, *maquis*, open rocky ground, stone scree and rubble walls. It has also been recorded in urban settings such that its range is considered to be favourable and stable. The population status of this snake species is also considered to be favourable, with encouraging prospects for the future. Indeed, this is the most common snake species on the Maltese Islands.

Despite being common, the species is at times persecuted, and suffers from habitat loss. It is also of importance on a European level, it being protected through the EC Habitats Directive, where it is listed as a species of community interest, and through the Bern Convention. It is hence afforded legal protection under national legislation.

*Photo: The Western Whip Snake (*Hierophis viridiflavus*) (Source: MEPA)*

**Source: MEPA**

**Box 8.7 Status of Lepidoptera**

The Lepidoptera group is composed of butterflies and moths. In general, butterflies are colourful and fly by day, whereas moths are dull in colour and fly by night. While rare for moths, it is common for butterflies of different sexes to have different colouration. Various species of Lepidoptera are found across the Maltese Islands, a number of which are common, whereas others are scarce, or threatened. Hundreds of these species are known to be resident in the Maltese Islands, with a number of these being endemic. Migratory ones are also known to occur on the islands.

87 species that are considered to be endemic and/or possibly threatened were assessed and a threat category was assigned to them (based on IUCN threat categories). While five percent of these species are extinct, 58 percent, consisting of the critically endangered, endangered and vulnerable categories, are threatened (Chart 8.5). Furthermore, ten percent of species have a Near Threatened status, meaning that they are close to being threatened if the situation does not improve. No data is available for 23 percent of these selected species, of which might actually also qualify as threatened. Only three percent were labelled as Of Least Concern. This overall negative status arises for various reasons. A number of species are rare or very rare - hence their threatened status - while other species have become threatened through the collection of caterpillars or adults and the use of biocides specifically aimed at them. Habitat loss has also had an effect. The loss of habitat and food supply has affected both resident species and migratory ones, with the latter failing to establish themselves permanently. Other factors such as drought, resulting in a lack of food plants, have also had an impact on the status of these species.

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57 Data was obtained through a study commissioned by MEPA (Mifsud forthcoming).
Box 8.8 Status of the Noble Pen Shell

The Noble Pen Shell (*Pinna nobilis* Maltese name: In-Nakkra tal-Ħarira) is a large, brown, fan-shaped, bivalve shellfish, which is of importance in view of it being the largest mollusc endemic to the Mediterranean Sea. This mollusc typically lives in the coastal region, on the shoals that are either sandy or overgrown by sea grasses and can reach a length of 1.2 metres. It is afforded legal protection through both national and regional legislation. This species has been threatened for a number of years since it is negatively impacted by anchors and fishing gear, collection, marine pollution and the decline of seagrass meadows. A study was carried out on the ecology of the Noble Pen Shell within the Rdum Majjiesa/Ras ir-Raheb marine protected area. Details on the spatial distribution, size of shells and size distribution were obtained, together with an estimation of the population size within this area. The study showed that the population was evenly distributed throughout the seagrass meadows of the marine protected area, with some degree of aggregation. Two particular sites had a high number of individuals, including large and old specimens. The population as a whole mainly consisted of young specimens, however, with the stock of large specimens being small within the area studied. The study revealed that a stable stock of large specimens is required for the survival of the population and its adaptation to new conditions, hence monitoring of the adult specimens to evaluate their survival is crucial.

Photo: *Pinna nobilis* (source: Jose R. Garcia March)
Box 8.9 Status of Birds

To date, a total of 20 species of birds are known to breed regularly in the Maltese Islands while 22 others breed irregularly. Malta is a particularly important site for migratory birds flying through the European-African migratory pathway.

The most widespread breeding species in the Maltese Islands is the Spanish Sparrow *Passer hispaniolensis*, with the highest densities recorded in agricultural areas and at the periphery of towns and villages. The Tree Sparrow (*P. montanus*), while being sparsely scattered in Gozo, is largely concentrated on the Western part of Malta. Studies by Birdlife Malta suggest that the population of this species is slowly increasing; however further studies are required to confirm this.

The population of the Sardinian Warbler (*Sylvia melanocephala*) is constant, while its breeding range is widely distributed throughout the three main islands. The Spectacled Warbler (*S. conspicillata*), on the other hand, is mainly confined to the coastal zone and is more commonly found in Gozo. The Corn Bunting (*Miliaria calandra*) population is rather scarce with only a few pairs still breeding in Malta and Gozo. The Short-toed Lark (*Calandrella brachydactyla*), typically inhabiting open countryside is sparsely distributed in Western Malta, but still relatively widespread throughout Gozo. Cetti’s Warbler (*Cettia cetti*) and the Zitting Cisticola (*Cisticola juncidis*) are regular breeding birds. The Zitting Cisticola’s population fluctuates in number but is widespread in areas that provide optimum conditions for breeding. The Blue Rock Thrush (*Monticola solitarius*) population has decreased in the last 20 years and is currently confined to the coastal cliffs of the islands with very few pairs breeding at inland sites. The cliffs are also home to a relatively large population of Cory’s Shearwater (*Calonectris diomedea*) and Yelkouan Shearwater (*Puffinus yelkouan*). Spotted Flycatchers (*Muscicapa striata*), the Woodchat Shrike (*Lanius senator*) and Linnets (*Carduelis cannabina*) although rare, have been recorded breeding in a few wooded localities particularly in Buskett. At 5,000 to 8,000 pairs, Filfla supports the largest colony of European Storm-Petrel (*Hydrobates pelagicus melitensis*) in the Mediterranean. The islet is also home to the Yellow-legged Gull (*Larus michahellis*) whose population has increased to over 150 pairs in the last years. The Little Ringed Plover (*Charadrius dubius*), the Moorhen (*Gallinula chloropus*) and the Reed Warbler (*Acrocephalus scirpaceus*) are known to breed annually at Salina and Simar, while the Common Starling (*Sturnus vulgaris*) is known to breed commonly on Comino and the Collared Dove (*Streptopelia decaocto*) at Mellieha. Although rare, the Barn Swallow (*Hirundo rustica*) and the House Martin (*Delichon urbicum*) also breed in the Maltese Islands, while the Rock/Feral Dove (*Columba livia*) breeds in large numbers along the Southern cliffs, in towns, and on Comino.

A large number of migratory birds fly over Malta on their way to and from European breeding grounds. During bad weather and late afternoons these birds use the islands as a resting ground and colonise areas such as Buskett, Girgenti and Mizieb. Typical species that make use of the islands, particularly in autumn, include the Marsh Harrier (*Circus aeruginosus*), the Honey Buzzard (*Pernis apivorus*), the European Hobby (*Falco subbuteo*), the Lesser Kestrel (*Falco naumanni*) and the Night Heron (*Nycticorax nycticorax*). The status of these birds of prey as they fly over the Maltese Islands may be considered as threatened due to illegal hunting.

Source: Sultana and Raine 2008

8.4 Nature Protection

Pressures exerted on biodiversity have given rise to the need for national and international conservation measures, often arising through legal requirements. This section provides an overview of the actions being taken in order to safeguard biodiversity in the Maltese Islands. The designation of protected areas in view of habitat protection, apart from species protection, is an important conservation tool
since the majority of species are becoming extinct due to habitat destruction.\textsuperscript{58}

One new Special Area of Conservation (SAC) was designated in 2008 in line with the Habitats Directive, such that at the time of publication, Malta had a total of 43 SACs of international or national importance, of which 41 are terrestrial and two are marine (Map 8.2). The terrestrial sites covered 13.3 percent of land area, while the marine sites, one between Rdum Majjiesa and Ras ir-Raheb, Malta and the other in the limits of Dwejra, Gozo, covered 11km\textsuperscript{2} of territorial waters. By end 2008, Malta’s Special Protected Areas (SPAs), designated in line with the Birds Directive, reached 13, covering 16.34 km\textsuperscript{2} or 5.18 percent of land area. Malta also has three Nature Reserves affording protection to islets and 29 affording protection to trees, together with 26 Bird Sanctuaries.\textsuperscript{59} Furthermore in 2007 all beaches and swimming areas in close proximity to urban areas or major roads, including 11 specifically named beaches were afforded legal protection from hunting.\textsuperscript{60} In addition, as of December 2008 Malta had 73 Areas of Ecological Importance and/or Sites of Scientific Importance, scheduled under the Development Planning Act (1992), wherein specific policies guide the type of development that can take place. In total, therefore, the Maltese Islands had 20.5 percent of its land area under one form or another of legal designation as of end 2008.

\textsuperscript{58} Haslett 2004.  
This figure includes the Addolorata Cemetery and San Anton gardens. Such protection is also afforded to within 50 metres of any other cemetery in Malta and Gozo, as well as to all public gardens. For more information refer to LN 79 of 2006 under the Environment Protection Act (Cap. 435) (Conservation of Wild Birds Regulations [Declaration of Open Season for Hunting and Taking of Wild Birds], 2006), amended by LN 39 of 2007.

\textsuperscript{59} LN 39 of 2007 under the Environment Protection Act (Cap. 345), Code of Police Laws (Cap.10) (Conservation of Wild Birds Regulations (Amendment) Regulations, 2007).
While legal designation is important, efficient protection of habitats and species also requires the active management of protected sites. **Management of protected areas**, which is carried out through the implementation of a management plan drawn up specifically for a particular area, **is being addressed by Government and by MEPA in partnership with non-governmental organisations**, and in most cases an agreement is signed between the competent authority (MEPA), other government agencies and departments, and the occupiers of the land forming part of the protected area. As of December 2007 four areas were being managed by non-governmental organisations via the implementation of a management plan and subject to a management agreement. These included Għadira Nature Reserve, Simar Nature Reserve, Ghajn Tuffieha and Qawra/Dwejra Heritage Park. Other areas for which a management plan was being implemented but were not as yet covered by a management agreement include Xrobb l-Għaġin Nature Park, Wied Ghollieqa and Ramla l-Ħamra. Thus as of December 2007 seven protected areas were being managed subject to a management plan. Six of these areas are part of, or entire, SACs such that 3.5 percent of SACs were being managed subject to a management plan. Management plans for four other areas all of which are, or form part of, an SAC, were being developed and **structural funding has been allocated to accelerate this process**. These areas include il-Ballut ta’ Marsaxlokk, Pembroke, Ramla tat-Torri *per se* and all the rest of the...
Rдум tal-Madonna area. Management for three islets, two of which are an SAC, and the other forms part of an SAC, is afforded through specific legislation which restricts access to these sites.\(^{61}\) As of end 2008 management plans for the Pembroke Natura 2000 site and Ir-Ramla tat-Torri (part of a Natura 2000 site) had been submitted to MEPA for review, and the plan for the Rдум Majjiesa/Ras ir-Raheb area was in progress. In parallel, various activities by a number of agencies contribute to the administrative, statutory or contractual management of some 22 sites.\(^{62}\) Boxes 8.10, 8.11 and 8.12 present overviews of management activities at is-Simar Nature Reserve, Għajra Nature Reserve and Ghajn Tuffieha respectively.

**Box 8.10 Management of is-Simar Nature Reserve**

In the early 1990s is-Simar, a largely-neglected marshland used for recreation and dumping purposes, was converted into a nature reserve composed of a number of habitats that included reedbeds, an olive grove, pools and canals. Native trees such as the Tamarisk and the Maltese national tree, the Sandarac Gum Tree, were also present. The site hosts important species of fauna such as a wide variety of bird species, common and rare, snakes, skinks, chameleons and the rare and protected Killifish (*Aphanius fasciatus*).\(^{63}\) The site is a fully protected bird sanctuary, a Ramsar site and part of a Special Protected Area under the Natura 2000 network.

Simar Nature Reserve is currently managed by Birdlife Malta (BLM), which maintains the site in accordance with its agreed management plan. The management plan aims to strike a balance between the reedbed, open water, length of reed fringes, accessible shorelines and non-intervention areas. Its management regime includes the taking of monthly readings of salinity, rainfall and water level, together with the control of excessive growth of plants and the elimination of alien species. By 2006, the number of invasive *Aster squamatus* saltmarsh species had been greatly reduced, allowing saltmarsh vegetation to flourish, while in the same year, more alien *Acacia* (*Acacia*) saplings were removed from the islands found within the saltmarsh. The process of removing *Acacia* (*Acacia*) trees began in 2004. During this year work began on a visitor’s centre in the Reserve, and this was officially opened in October 2005. Every year BLM issues a report that includes activities undertaken for that year, together with lists of species of flora and fauna found within the Reserve and the status of each. Records of bird sightings for the year are also published, together with information on various floral and faunal species of interest. A total of 116 species of birds were recorded in and around the reserve in the period January – December 2006, with some interesting sightings being those of the Squacco Heron (*Ardeola ralloides*), spotted in April and June 2006, the Glossy Ibis (*Plegadis falcinellus*) spotted in April 2006 and the Great Snipe (*Gallinago media*) spotted in May of the same year. In 2006, a pair of Little Grebes (*Tachybaptus ruficollis*) successfully bred and raised their chicks within the reserve for the first time.

Source: BLM 2004a, 2005a

**Box 8.11 Management of Għadira Nature Reserve**

Formerly used as a saltpan, and later becoming a seasonal pool, Għadira was declared a bird sanctuary in 1978 after BLM presented Government with data indicating the ornithological value of the area. Għadira nature reserve currently consists of a wetland and saltmarsh habitat housing a number of rare and endemic species of flora and fauna, some of which are endangered and protected. BLM is the entity responsible for this site, whose management consists in monthly bird logging activities, taking monthly readings of salinity, rainfall and water level, controlling excessive growth of plants, and controlling and

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\(^{61}\) These include Filfla, il-Gżejjer ta’ San Pawl and Mgret il-Ġeneral.


eliminating alien species. The reserve is also used as a constant-effort ringing site to monitor bird migration and local bird populations. A total of 153 different bird species were observed in Ghadira in 2006.

In October 2004 a soil survey of the site was carried out in order to describe and characterize the soils of the area, and a soil map was drawn up. In 2005 a Kingfisher (Alcedo atthis) nesting site was constructed in the hope of attracting Kingfishers (Alcedo atthis), which spend approximately eight months in the nature reserve, to breed, while in 2006 an artificial bank was constructed to attract Sand Martins (Riparia riparia) to breed.

As in the case of is-Simar, every year BLM issues a report on Ghadira nature reserve, which includes activities undertaken for that year, together with lists of species of flora and fauna found in the Reserve, the status of each, and information on some of the species of interest. The monthly logs of birds sighted are also published and both common and rare sightings that occur during the year are reported. Some interesting sightings in 2006 where that of the Jack Snipe (Lymnocryptes minimus) spotted once in March, the Dotterel (Eudromias morinellus), spotted once in September, and the Sanderling (Calidris alba) and European Nightjar (Caprimulgus europaeus), both spotted in May.

Source: BLM 2004b; 2005b

Box 8.12 Management of Ghajn Tuffieha

Gaia Foundation is a non-profit non-governmental organisation that in August 1996 entered into an agreement with the then Planning Authority and the Ministry responsible for the environment for the management of the more recently (2004) designated Natura 2000 site at Ghajn Tuffieha. Management of the area, which has a surface area of 0.8 km², started in December 1996. The site is defined by the southern flank of ir-Ramla tal-Mixquqa (Golden Bay) in the north and in the south by il-Bajja tal-Ġnejna. The site also encroaches inland to the east on localities known as ix-Xagħra tat-Torri and tal-Lippija in the south, a headland between ir-Ramla tal-Mixquqa and ir-Ramla ta’ Ghajn Tuffieha in the north and il-Hotba il-Bajda, it-Tafal and Ghajn Tuffieha in the centre.

Gaia Foundation is responsible for the implementation of the Ghajn Tuffieha Management Plan, and this aims to ensure the sustainable development of this coastal area. Management of the site includes: the enforcement of regulations, such as those preventing off-roading, camping and littering; habitat restoration, with respect to the planting of native vegetation and phasing out of alien species; and, awareness-raising initiatives. In 2006 Gaia Foundation prepared maps of existing habitats and planted Esparto Grass (Lygeum spartum) in order to stabilize the clay slopes and rehabilitate some wild footpaths. During this period stones were placed along planted areas to clearly mark the footpaths for ramblers and to avoid them stepping on the seedlings. Various patrols were carried out, in particular during two film productions that took place, and new information boards highlighting the site regulations and the littering and off-roading laws were installed. Several educational workshops were organized at the centre and on site for both local and foreign schools, to help students appreciate the area, and to encourage them to be eco-friendly citizens.

Organic farming is encouraged on the cultivated regions of the managed site. This directly assists with the conservation of the flora and fauna since the threat from artificial fertilisers and plant protection products is eliminated. Moreover, an agro-environmental project is being initiated to encourage farmers to plant olive, almond and pomegranate trees. This has
a direct effect on the landscape since its historical appearance is restored. The aim of planting olive and almond trees rather than other fruit trees is that the fruit from these trees has a longer shelf-life and are amenable to be turned into agro-industrial products such as olive oil and olive paste. These trees are also hardier and more likely to withstand the impacts of climate change.

Photo: Għajn Tuffieħa area managed by Gaia Foundation (Source: http://www.projectgaia.org/msd.htm, accessed on 19th January 2010)

Source: Gaia Foundation 2006

Some of Malta’s habitats and species are also protected on a European scale. Indeed, a number of areas have been designated as part of the EU Natura 2000 network, which is a network of sites across the EU, designated under the Habitats64 and Birds65 Directives, which merit special conservation measures since they support habitats and species of community interest.66 The Natura 2000 network is one of the tools used by the EC to reach its target of halting the loss of biodiversity by 2010 and beyond.67 Sites designated under the Habitats Directive correspond to Malta’s SACs of international importance, while those designated in line with the obligations of the Birds Directive correspond to its SPAs.

Map 8.3: Sites designated as part of the EU Natura 2000 network

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64 92/43/EEC.
65 79/409/EEC.
67 CEC 2006b.
As of end 2008 Malta had designated 27 terrestrial sites covering 41km² or 13.06 percent of land area and one marine site,\textsuperscript{68} having an area of 8.5km², as sites under the Habitats Directive to form part of the Natura 2000 network (Map 8.3). Malta had also designated its 13 SPAs covering 5.18 percent of land area,\textsuperscript{69} which are automatically Natura 2000 sites. In some cases, the area of SAC and SPA Natura 2000 sites overlap. As of June 2008, the 27 terrestrial sites designated under the Habitats Directive were considered 93 percent sufficient in affording protection to the Maltese terrestrial habitats and species of Community interest (Chart 8.6). MEPA is currently aiming to collect more data in order to increase the number of marine protected areas in Malta.

\begin{center}
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\% Sufficiency \\
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\textbf{Chart 8.6: Sufficiency of EU countries with respect to proportion of proposed terrestrial Natura 2000 sites under the Habitats Directive (as of June 2008)}

Besides designating and managing sites, various other conservation efforts are currently being considered, either in the form of concrete actions, or on an ongoing basis such as the regulation of activities that directly or indirectly affect biodiversity, via the tools of permitting and licensing. Indeed, fishing and hunting activities are regulated by licences,\textsuperscript{70} while the taking, handling, possession, transport and trading of protected species are regulated through permits.\textsuperscript{71}

With respect to concrete actions, eradication programmes have been initiated in connection with different species. The eradication of rats and the Prickly Pear from

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\textsuperscript{68} The proposed sites were included in a Commission Decision in March 2008.

\textsuperscript{69} Candidate Natura 2000 sites proposed as per the obligations of the Habitats Directive are evaluated by the European Commission prior to inclusion in the network while SPAs are automatically included upon submission.

\textsuperscript{70} The legal provision for fishing is the Fishing Conservation and Management Act (Cap.425) and for hunting, it is the Conservation of Wild Birds Regulations (LN 79 of 2006, as amended by LN 39 of 2007) under the Environment Protection Act (Cap. 435) and the Code of Police Laws (Cap. 10).

\textsuperscript{71} Through LN 311 of 2006.
St. Paul’s Islands, as discussed in Box 8.13, is one example. Eradication of invasive plants from sensitive habitats listed in Annex I of the Habitats Directive, such as sand dunes, have also been carried out. Indeed, the Hottentot Fig (*Carpobrotus edulis*) was eradicated from a number of sand dunes, and the Giant Reed (*Arundo donax*) has been controlled at Ramla, Gozo. Moreover, certain important species have been re-introduced in their appropriate habitat, such as the Sea Daffodil (*Pancratium maritimum*), which has been re-introduced in certain degraded beaches in Mellieha. The Thorny Burnet (*Sarcopoterium spinosum*), a threatened plant species that exists as a small population in only one locality in Malta, has been propagated to enhance its population. Besides protecting various sites important for bats, iron bat grilles have been placed in the opening of caves known to serve as roosting areas (such as those at Ghar Hasan), in order to mitigate disturbance arising from human access.

Organic farming can be considered as an important measure to protect against the deterioration of habitats, and it was promoted through an agri-environment measure under the Rural Development Plan for Malta (2004 – 2006). As noted in Sub-report four on Land, as of end 2008 there were 14 certified producers of organic products in the Maltese Islands, covering 21.78 hectares (ha), (15.58ha fully converted and 6.20ha under conversion), and representing 0.19 percent of total agricultural land. The restoration of rubble walls, a measure that featured in the same Rural Development Plan, has also contributed to the conservation of habitats and species, since rubble walls serve to reduce soil erosion in agricultural fields by wind and water. Rubble walls themselves also provide an important habitat for a variety of flora and fauna of national and EU interest.

**Box 8.13: Control of Alien Species at St. Paul’s Islands**

St. Paul’s Islands are two small islands found to the North-East of Malta. The islands are uninhabited and the only structures they contain are a statue of St. Paul and a dilapidated building on the larger island. The islands are known to be rich in floral and faunal
communities, and are unique in being home to the sub-species of the Maltese Wall Lizard and the St. Paul’s Islands Wall Lizard (*Podarcis filiflensis kieselbachi*), endemic to these islets.

This site is afforded legal protection as a Specially Protected Area,\(^{72}\) nature reserve,\(^{73}\) bird sanctuary,\(^{74}\) Area of Ecological Importance and Site of Scientific Importance,\(^{75}\) and Special Area of Conservation of international importance. In 2004 the site was proposed by Malta to be included in the EC Natura 2000 Network under the EC Habitats Directive; it was accepted as a Natura 2000 Site in 2008.

Despite the legal protection afforded, the native communities of the islets are under threat due to the presence of alien species, namely the Norwegian Rat (*Rattus norvegicus*) and floral species such as the Prickly Pear (*Opuntia ficus-indica*). The presence of these alien species has led to an overall deteriorating conservation status of the site, leading to, amongst others, a drastic decrease in the population of the St. Paul’s Islands Wall Lizard (see Box 8.5). In view of this, an ecological restoration project was carried out, focusing on the eradication of rats and other alien species, captive breeding of the St. Paul’s Islands Wall Lizard, and control of human access and activities.

In order to eradicate the rats, standard methods were employed, using baits that were well out of reach of non-target species such as birds and reptiles. Floral alien species were removed manually. Regular monitoring and treatment was carried out as required to ensure that these alien invasive species did not re-establish themselves. Observations of the site following these procedures indicated that the natural floral and faunal communities of the islets had started to regenerate. Unfortunately, captive breeding of the St. Paul’s Islands Wall Lizard was unsuccessful and individuals in captivity were released back to the wild once the alien species were eradicated. Monitoring of the population is currently being carried out. The third key issue was addressed by raising awareness via the use of the media and talking to the general public showing interest in the site. A very positive response was received from the public who sometimes helped to identify breaches in regulations, especially in the summer months, leading to more effective enforcement. As at end 2008, information panels were planned to be placed on site to raise awareness and to provide guidelines for appropriate behaviour while on site.

Photo: St. Paul’s Islands (Source: MEPA)

In addition, a series of studies commissioned to provide insight into ways to strengthen conservation, have been completed. These studies have resulted in datasheets providing biological and ecological information on individual species. The information is currently being incorporated into a database, which will become a National Database on Biodiversity, for eventual publication and public access. Other studies have also been commissioned, aimed at increasing the knowledge base on alien species in the Maltese Islands through the development of lists of alien flora and fauna, with the objective of prioritising conservation/eradication efforts.

Although not a direct conservation measure, awareness-raising can significantly contribute to the protection of species and habitats. This has been carried out via:

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\(^{72}\) Designated in 1986 through the Specially Protected Areas Protocol under the Barcelona Convention.

\(^{73}\) LN 25 of 1993 under the Environment Protection Act (Cap.348) (Selmunett Islands [St. Paul’s Islands]) Nature Reserve Regulations, 1993).

\(^{74}\) LN 79 of 2006.

\(^{75}\) GN 827 of 2002 under the Development Planning Act (Cap. 356) (Development Planning Act, 1992 (Section 46) Scheduling of Property).
the publication of popular material, including posters on selected sites; production of an enhanced website on nature protection; commentaries during television and radio programmes; and, various seminars, amongst them seminars related to the Habitats Directive and Natura 2000, also including marine issues. Finally, conservation measures also take the form of investigations of any reports of illegal activities directly affecting protected habitats and species.

Of importance on a national scale is the drafting of the National Biodiversity Strategy and Action Plan, with the overall goal of the Strategy being to conserve, sustainably use and manage biodiversity, as well as integrate biodiversity into cross-sectoral policies and programmes. Conservation actions are also carried out by various non-governmental organisations such as BLM, which, together with two other conservation NGOs and four government authorities, are currently carrying out a project on the conservation of the Yelkouan Shearwater (Puffinus yelkouan).

This project is the largest conservation initiative of its kind in Malta, and is considered of importance since as noted earlier Malta hosts approximately 10 percent of the world’s population of Yelkouan Shearwaters. The project aims to reverse the decline of this bird population at Rdum tal-Madonna, L-Ahrax tal-Mellieha, where the largest Maltese colony of Yelkouans resides, to act as a demonstration model for Natura 2000 site management in Malta and to show a public-private partnership ‘best practice’ model in action.  

As part of Malta’s EU obligations, Government is required to put in place a breeding bird monitoring scheme to chart population changes for the country’s Farmland Bird Index (FB Index). The FB Index is one of the indicators used by the European Commission to assess the overall health of the rural environment. Of the 33 species identified for the FB Index, Malta has 10 present as breeding species (either sporadically or regularly), including species such as the Corn Bunting and the Short-toed Lark. In 2008, BirdLife Malta (in collaboration with the British Trust for Ornithology) was contracted by the Ministry for Resources and Rural Affairs to monitor and evaluate requirements related to Farmland Birds (FB), specifically to create the FB Index for Malta. 

The study represents an important first step in monitoring FB, by designing and implementing the initial methodology and carrying out the first-year study to amass sufficient data to create a baseline value. In particular the study identified that of the 10 ‘official’ farmland birds breeding in

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77 BLM 2008.
78 In this study, 71 1km-grid squares were surveyed using standard transect methodologies. All grid squares were visited twice during the breeding season, once between March 15th and April 15th and once between 15th May and 15th June. 30 ornithologists took part in the surveys, which amounted to a total of a total of 276,000m transects being surveyed over the season.
Malta, several of these were at unnaturally low numbers due to factors not necessarily related to the rural environment. These issues have been addressed by adding several other locally-breeding farmland bird species to the Maltese FB Index, to adapt the Index to Maltese realities. This index is critical for understanding long-term population changes of rural bird species, through long-term annual monitoring, thereby providing an important indicator of the overall health of Malta’s rural environment – a cornerstone of the Maltese ecosystem and landscape. Despite these initiatives, further baseline studies and monitoring are necessary in order to identify actions to address the principal threats facing Maltese habitats and species of importance.

8.5 Conclusion

This Sub-report has reviewed the threats to, and status of, living organisms and their habitats in the Maltese Islands, highlighting key concerns. It has also discussed actions taken to protect important habitats and species. The report highlights that the status of 29 percent of habitats and 36 percent of species listed in the Habitats Directive is still unknown. It also indicates that the 64 percent of habitats and 44 percent of species have an inadequate or bad conservation status. The Sub-report recommends that stringent measures be taken in order for these to attain favourable status. It is also noted that invasive alien species represent a serious threat to Malta’s biodiversity, and the Sub-report recommends that action plans are drawn up regarding the eradication of such species and prevention of further introductions.

In terms of actions taken to protect nature in the Maltese Islands, the Sub-report indicates that management of protected areas is being addressed, in partnership with non-governmental organisations. Structural funding has been allocated to accelerate this process. In addition, 28 Maltese sites (27 terrestrial and one marine) have been included in the EU Natura 2000 network under the Habitats Directive, covering (apart from the marine site) 13.1 percent of land area. A total of 13 additional, but often overlapping sites covering 5.2 percent of land area have also been included as Natura 2000 sites under the Birds Directive. However the Sub-report also notes that in order to identify the appropriate actions needed to address the principal threats facing Maltese habitats and species of importance, further baseline studies and monitoring are necessary.
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