Qawra/Dwejra Heritage Park

Approved Plan

MINISTRY FOR GOZO

MEPA

SAN LAWRENZ

NTM
nature trust (malta)

WWF

Life

2005
2010

Action Plan
November 2005

With the support of the Ministry of Rural Affairs and the Environment

ISBN 99932-83-17-7

Q a w r a / D w e j r a

Heritage Park

Action Plan

a project supported by

LIFE Third COUNTRIES

LIFE03 TCY/M/000047

January 2005 – January 2010

partners in the formulation of plan

Nature Trust (Malta)

MEPA

WWF Italia

29 November 2005

to be reviewed biennially

Qawra/Dwejra Heritage Park Steering Committee

Ministry for Gozo	MEPA	San Lawrenz Local Council	Nature Trust Malta

Table of Contents

Tables

Figures

MAPS

Plates

Executive summary

0.1 The Malta Environment and Planning Authority (MEPA) is responsible for the identification and protection of sites of scientific and cultural importance. The scope of MEPA's activities is to safeguard such sites according to established international practices and standards. In order to achieve its aims, MEPA undertakes responsibility for the preparation of management plans for such sites. The areas known as Qawra and Dwejra, on the western coast of the island of Gozo, have for several years been considered as prime candidates for designation as sites of scientific and cultural importance, and their protection was specifically promoted in the Structure Plan for the Maltese Islands. Their potential as areas protected for natural and cultural aims was first officially recognised in 1992, when the House of Representatives approved the above-mentioned Structure Plan.

0.2 MEPA has approved this Action Plan as the Qawra/Dwejra Heritage Park. This includes proposals for 23 management measures to be implemented in order for the site to achieve the desired levels of protection of natural and culture heritage, in compliance with the above-mentioned laws and plans. As specified in the Development Planning Act, this document was subject to a period for public consultation between the 12th of April 2005 and the 24th of May 2005. During this discussion period, a number of meetings with members of the public and different sectors were organised. MEPA also receive comments from the public regarding the Plan in general as well as specific aspects of it. These comments were reviewed and considered by MEPA before the Plan was submitted for final approval to the Minister for Rural Affairs and the Environment.

0.3 The preparation of this Plan, as well as part of its implementation, are being financed by the European Community through the LIFE Third COUNTRIES scheme. Efforts to obtain funding through this scheme were coordinated by Nature Trust (Malta) together with MEPA and the Italian branch of the international non-governmental organisation (NGO) World Wide Fund for Nature (WWF Italia). The preparation of the Action Plan was overseen by a Committee appointed by the Minister for Rural Affairs and the Environment. Members of the Committee were representatives of the following organisations:

- Ministry for Gozo;
- MEPA;
- San Lawrenz Local Council; and
- Nature Trust (Malta).

0.4 Upon approval of this Plan, a Management Board will be constituted and will be responsible for the implementation of this Plan and the management of the Park.

0.5 The selection of the Qawra/Dwejra site in Gozo was based on several factors which endow this site with a unique character, both in terrestrial and in marine areas. These include, for instance, a range of landscape types typical of the Maltese Islands, ranging from terraced fields and garigue to cliffs, valleys and caves. The site is furthermore characterised by various rare geological features

that give the site a unique and interesting quality. The Qawra/Dwejra areas are also of great importance for biodiversity despite their small size, as they provide a habitat for several species of flora and fauna. Several of these species are endemic to the Maltese Islands, that is, they are found only in these Islands and nowhere else in the world. Several of the species endemic to the Maltese Islands are present in this site. Additionally, the area is one of few in the Maltese Islands where visitors can still enjoy a sense of wilderness.

0.6 The site is also unique, however, because of man's influence upon this natural setting. Several archaeological and cultural features testify as to the long history of human land use in the area. Nowadays, the visitor to the site is immediately made aware of man's influence through various notable features, such as the terraced fields and hardstone quarries. The area today sustains several economic activities, including agriculture, fishing, quarrying, diving and several tourism-related enterprises such as boat trips. The area is frequented by approximately 750,000 visitors every year, both locals and tourists. There is also a small community of summer residents, who occupy boathouses in the Qawra area.

0.7 The biggest challenge for management is the reconciliation of human influence within the site with the conservation and preservation of resources and features of scientific, cultural and aesthetic interest. The aim of this Action Plan is therefore the creation of a Heritage Park in a manner based on the participation of all stakeholders. The aims of the Park are not merely conservation-related but also include the fulfilment of educational goals and the provision of opportunities for activities such as agriculture and specialized tourism. For these aims to be attained, the management measures proposed in the Action Plan will need to be realised. The twenty-three measures proposed in the Plan deal with:

Education

1. the construction and operation of an interpretation centre;
2. the use and management of the Qawra tower;

Integrated Conservation and Environmental Improvement

3. the conservation of rubble walls;
4. restoration of degraded sites;
5. the management of alien and invasive species of flora and fauna;
6. the taking and implementation of decisions regarding the preservation of the feature known as the Azure Window (it-Tieqa);
7. the improvement of St. Anne's chapel;
8. the management of the boathouses and surrounding areas in Qawra;
9. the taking and implementation of decisions regarding the future of quarrying in the area;

Transport

10. traffic management and the management of parking;
11. the use of appropriate material for surfacing of roads and car parks;

Marine

12. refuelling and lubrication of boats;

13. marine protected area;

Infrastructure

14. the management of water and sewage services;
15. the use of solar energy technologies;

Recreation

16. the management of tourism-related activities;
17. the potential of the site for walking trails;
18. the management of diving activities;
19. health and safety precautions;
20. the management of climbing, abseiling and cycling activities;

Management Initiatives

21. publicity regarding the Heritage Park;
22. visitor management; and
23. funding.

0.8 Different management zones will also be established within the Park, both on land and in the sea. Different levels of protection will be afforded to the different zones. Efforts will also be made to ensure recognition of the site's environmental and cultural resources in several ways, including, for example, through its designation as a World Heritage Site.

List of Abbreviations

Terms	Meaning
AAI	Area of Archaeological Importance
AEI	Area of Ecological Importance
Berne Convention	Convention on the Conservation of European Wildlife and Natural Habitats
Birds Directive	Council Directive 79/409/EEC of 2 April 1979 *on the conservation of wild birds*
CHA	Cultural Heritage Act, 2002
DPA	Development Planning Act, 1992
EC	European Community
EPA	Environment Protection Act, 2001
Habitats Directive	Council Directive 92/43/EEC of 21 May 1992 *on the conservation of natural habitats and of wild fauna and flora*
IBA	Important Bird Areas
MEPA	Malta Environment and Planning Authority
MPA	Marine Protected Area
MRA	Malta Resources Authority
MRAA	Malta Resources Authority Act, 2000
MRAE	Ministry for Rural Affairs and the Environment
NCS	Natural Colour System ®©
NGO	Non-governmental organisation
Nitrates Directive	Council Directive 91/676/EEC of 12 December 1991 *concerning the protection of waters against pollution caused by nitrates from agricultural sources*
RCA	Rural Conservation Area
SAC	Special Area of Conservation
SSI	Site of Scientific Importance
WHS	World Heritage Site
WWF	World Wide Fund for Nature

1 Background

1.1 General aim

1.1.1 This Action Plan aims:

- to provide a comprehensive summary of the key features of interest within the Site proposed in the public consultation draft of the Gozo and Comino Local Plan as the Qawra/Dwejra Heritage Park;
- to identify the ideal objectives of management and constraints likely to be faced;
- to specify the operational objectives which are to be attained within specified timeframes;
- to describe the approved management approach and structure; and
- to describe proposed management strategies designed to achieve the desired objectives.

1.2 Policy

Legal framework

1.2.1 In Malta, sites of natural or cultural importance together with specific environmental resources are protected through plans, policies, and regulations issued under the following Acts and as amended:

- Development Planning Act, 1992 (DPA)[1]
- Environment Protection Act, 2001 (EPA)[2]
- Malta Resources Authority Act, 2001 (MRAA)[3]
- Cultural Heritage Act, 2002 (CHA).[4]

1.2.2 Other laws which are meant to protect important resources include the

- Fertile Soil (Preservation) Act, 1973,[5] and
- Fisheries Conservation and Management Act, 2001.[6]

1.2.3 The DPA regulates the workings of the Maltese spatial planning system, which was set up in 1992 and which is currently in force. Among other things, it provides for the establishment and management of the Malta Environment and Planning Authority (MEPA), which is the public agency responsible for both spatial planning and environmental protection. MEPA is also the competent authority responsible, under the EPA, for the provision of advice to the Government of Malta with respect to the formulation of environmental regulations issued under the same Act, and for the implementation of such regulations.

notes and references

[1] ----Chapter 356 of the Laws of Malta.

[2] ----Chapter 435 of the Laws of Malta.

[3] ----Chapter 423 of the Laws of Malta.

[4] ----Chapter 445 of the Laws of Malta.

[5] ----Chapter 236 of the Laws of Malta.

[6] ----Chapter 425 of the Laws of Malta.

1.2.4 MEPA with respect to the protection of environmental resources is mainly focused on the conservation of biodiversity, the protection of the countryside, air quality, ecological and chemical water quality, noise abatement, pollution prevention and control, and waste management. The responsibilities for the (aquatic environments including the coastal waters and inland surface waters, both of which are within MEPA's remit) regulation of water resources and the use of energy, and mineral resources are delegated by the Government of Malta to the Malta Resources Authority (MRA) under the MRAA, although some such responsibilities are also shared with other agencies such as MEPA.

1.2.5 European Community (EC) environmental policy is transposed into Maltese Law mainly through Regulations issued under the above-mentioned EPA and MRAA.

1.2.6 The CHA promotes the close collaboration of the Superintendence for Cultural Heritage and MEPA in the safeguarding of sites, buildings, or landscapes which form part of Malta's cultural heritage. It also provides for the setting up and running of Heritage Malta, which is the national agency responsible for the management of national museums and heritage sites.

Spatial planning and conservation policy

1.2.7 In the field of spatial planning, MEPA is responsible for the drawing up of development plans as specified in the DPA. There are two main types of such plans, namely the Structure Plan and its Subsidiary Plans.

1.2.8 The Structure Plan is intended to provide a strategic policy framework for physical development, to enable the determination of applications for development consent and to provide a framework within which detailed Subsidiary Plans, such as Local Plans and Subject Plans can be formulated. The DPA also provides for the formulation of Planning Policies which provide more detailed guidance than Structure Plan policies.

1.2.9 The current Structure Plan was first issued in 1992 and is currently under review. The second of the three major goals of the plan makes the following commitment:

> To use land and buildings efficiently, and consequently to channel development activity into existing and committed urban areas, particularly through a rehabilitation and upgrading of the existing fabric and infrastructure thus constraining further inroads into undeveloped land and generally resulting in higher density development than at present.

1.2.10 This goal is supported by policies, which establish the principle that no urban development is to be permitted outside existing and committed built-up areas and provide guidelines concerning the conservation of cultural heritage, rural areas, and marine environments.

In line with recent and current trends in spatial planning practice, the current Structure Plan was formulated to promote inter-agency collaboration for the attainment of specific objectives. In other words, the implementation of the above-mentioned Structure Plan conservation policies has to be carried out in conjunction with Regulations issued under the above-mentioned EPA, MRAA, and CHA, and through the collaborative involvement of different Government departments and public agencies.

1.3 Site selection

1.3.1 This Action Plan covers the Site, namely Qawra/Dwejra on the island of Gozo, which is identified in the Structure Plan as having the potential to be designated as a National Park under Policy RCO 35. In addition, the Structure Plan states in Policies RCO 36 to RCO 38 that:

> Policy RCO 36
> Efforts will be made to declare the Qawra area including the Inland Sea and Dwejra Bay, in Gozo, a Natural World Heritage Site in terms of the Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972).
>
> Policy RCO 37
> A management authority for the Qawra National Park will be established. This management authority will formulate detailed management plans which take into consideration the type, location, size, traditional human use and activities, and the presence of features of natural, historical, archaeological, scientific, or aesthetic interest in the Qawra area including the Inland Sea and Dwejra Bay, so that the public may enjoy these features without their suffering any degradation or harm.
>
> Policy RCO 38
> Without prejudice to any other policy or regulation governing the Qawra area including the Inland Sea and il-Bajja tad-Dwejra, Conservation Areas, including Marine Conservation Areas, may be designated within the Qawra National Park, and policies relevant to such designated Conservation Areas are applicable in addition to any applicable to the National Park as a whole.

Plate 1
Key features of the proposed Qawra/Dwejra Heritage Park

Fungus rock (il-Ġebla tal-Ġeneral) in il-Bajja tad-Dwejra

Inland Sea (il-Qawra)

Azure Window (*it-Tieqa*)

1.3.2 As is shown in Section 2 (Site description), these policies refer to an area which is located in the western part of the island of Gozo, which is the northernmost component of the Maltese Islands. The exact location and extent of the area are indicated in detail in Section 2.1 on page 19. In the recently issued public consultation draft of the Gozo and Comino Local Plan (2002), the potential designation of the Site is referred to as a Heritage Park.[7] For this reason, in this Plan, the area is henceforth referred to as the **Site** or the **proposed Qawra/Dwejra Heritage Park**.

notes and references

[7] ----The proposals made in the Gozo and Comino Local Plan are discussed in Section 2.2.4 on page 26.

1.3.3 The area is well-known among the local population for the so-called Inland Sea (*il-Qawra*), *il-Ġebla tal-Ġeneral*, also known as Fungus Rock, which is an islet located in a bay (*il-Bajja tad-Dwejra*), and the so-called Azure Window (*it-Tieqa*)(see Plate 1 above).

1.3.4 There is however much more to the Qawra/Dwejra area than is indicated above. Although located close to the village of San Lawrenz and easily accessible, the Site still conveys a feeling of remoteness to visitors. Most of it is taken up by terraced fields, which have been cultivated for centuries. Indeed, its landscape has, to a substantial extent, been moulded by human influence. In addition, the Site harbours various features of natural and cultural significance (Plate 2).

1.3.5 The Site is also popular with both the local population and visitors to Gozo because it is the only part of the coast in western Gozo where access to the sea is relatively easy. Human influence is also evident in the Inland Sea area as it provides direct access to the sea for both swimmers and users of small sea-craft. The area immediately around the Inland Sea has long been used in connection with activities linked with such craft. Indeed, a substantial number of boathouses, which are used as summer houses, have been constructed around the Inland Sea.

1.3.6 Il-Bajja tad-Dwejra, also known as *il-Port*, that is the harbour, has also long been connected with maritime use, as it consists of a sheltered inlet protected from the elements by Fungus Rock.

1.3.7 The Site also supports a rich diversity of wildlife and habitats, and the landscape supports an impressive scenery, dominated by geomorphologic features such as valleys, archways, tunnels, caves, subsidence structures, depressions as well as the above-mentioned Fungus Rock. A number of natural habitats constitute EU important biotopes *(refer to Figure 8).* Similarly, a number of species of EU importance are also found on site *(refer to para. 2.10.1.1)*.

1.3.8 The marine environment consists of a mix of shallow lagoon-type habitats, seagrass meadows, impressive boulder fields, submarine caves, sea stacks, archways, sheer drop-offs, blowholes and shallow reefs.

1.3.9 Both the Inland Sea and *il-Port* are outstanding examples of large-scale circular subsidence structures and associated infill sediments with clear fossil beds. These formations were formed as underground caverns created through a karstic dissolution process, which could only have taken place on land.

1.3.10 Terrestrial influence is also evident, especially with the effects of erosion by stream flows, the presence of perennial freshwater pools, seepage from cliffs, a small waterfall at *il-Port* and the presence of dry-valley systems feeding the *Inland Sea,* with examples of phreatic tubes, depressions and undercutting.

1.3.11 The Site is also of importance for its palaeontology, with the presence at Qawra of Quaternary deposits containing partly re-worked blue clay and fossil remains that can throw light on the biogeography and terrestrial evolution of the Pelagian Block since the Plio-

cene period. The whole area of Qawra/Dwejra is rich in fossiliferous deposits, some of which date as far back as the Oligocene Epoch.

1.3.12 As regards biological processes, the locality contains an important rupestral community endemic to the Maltese Islands, demonstrating ongoing biological evolution. The area also supports a number of endemic species, such as the Maltese Stocks (*Matthiola incana* subsp. *melitensis* – Plate 2) and several of the 21 endemic higher plants of the Maltese Islands are represented here.

1.3.13 Fungus Rock is also home to the Maltese Wall Lizard known as *Podarcis filfolensis generalensis*. This sub-species (one of five sub-species of *P. filfolensis,* four of which are endemic to Malta) is endemic to this rock and shows microevolution in progress.

1.3.14 The islet is also the only locality in the Maltese Islands where the Malta Fungus (*Cynomorium coccineum*) is found. This parasitic flowering plant (which was thought to be a fungus with medicinal properties) was first described from this rock and was highly prized by the Knights of the Order of St. John who saw fit to guard the rock against intruders. It has also been found in other Mediterranean locations, but it is nowhere common except on Fungus Rock.

1.3.15 The Qawra/Dwejra area also supports other Maltese endemics such as the isopod *Spelaeoniscus vallettai*, a variant of the topshell *Trochoidea spratti* and the door snail *Muticaria macrostoma* forma *oscitans*. It is also an important bird breeding and nesting site. The cliffs are of particular importance as they support several rare species.

Plate 2
Other features of the proposed Qawra/Dwejra Heritage Park

Maltese Stocks – Ġiża ta' Malta
Matthiola incana melitensis

Qawra Tower

Blue Hole

1.3.16 Whilst the scenic value of the area has been generally enhanced through traditional activities, other activities also take place. In the latter part of the twentieth century access to the Inland Sea was considerably facilitated by the construction of a road, and quarrying activity in the area dramatically gathered pace. It is now the only site in Gozo where quarrying for Globigerina Limestone blocks is carried out.

1.3.17 The increase in motorcar ownership continued to facilitate access to the area resulting in a greater number of people being able to visit the area at any given time. The advent of

mass tourism from the late-1970s onwards compounded the issues as the area also became accessible to large numbers of tourists. Affluence in Maltese society also resulted in more and more people having access to marine craft and with this area being the only launching point on Gozo's western coast, pressures on the small body of water at the Inland Sea increased.

1.3.18 As stated above, the Qawra/Dwejra area is also very popular with tourists, receiving approximately 750,000 visitors a year, of which 40,000 visit the Site for diving purposes. The Blue Hole (Plate 2) is one of several attractions in the area. The challenge is to reconcile tourism and conservation, by catering for the tourist population whilst preserving the area's integrity. The area is therefore ideal for implementing a new planned ecotourism [8] approach.

The importance of the proposed Qawra/Dwejra Heritage Park as outlined in this section, combined with the pressures which are progressively building up in different areas within the Site, highlight the urgent need for the implementation of the above-mentioned Structure Plan Policies RCO 36, 37 and 38, and therefore the need for the formulation and realisation of this Action Plan.

notes and references

[8] ----The International Ecotourism Society defines ecotourism as '… *responsible travel to natural areas that conserves the environment and improves the well-being of local people'.*

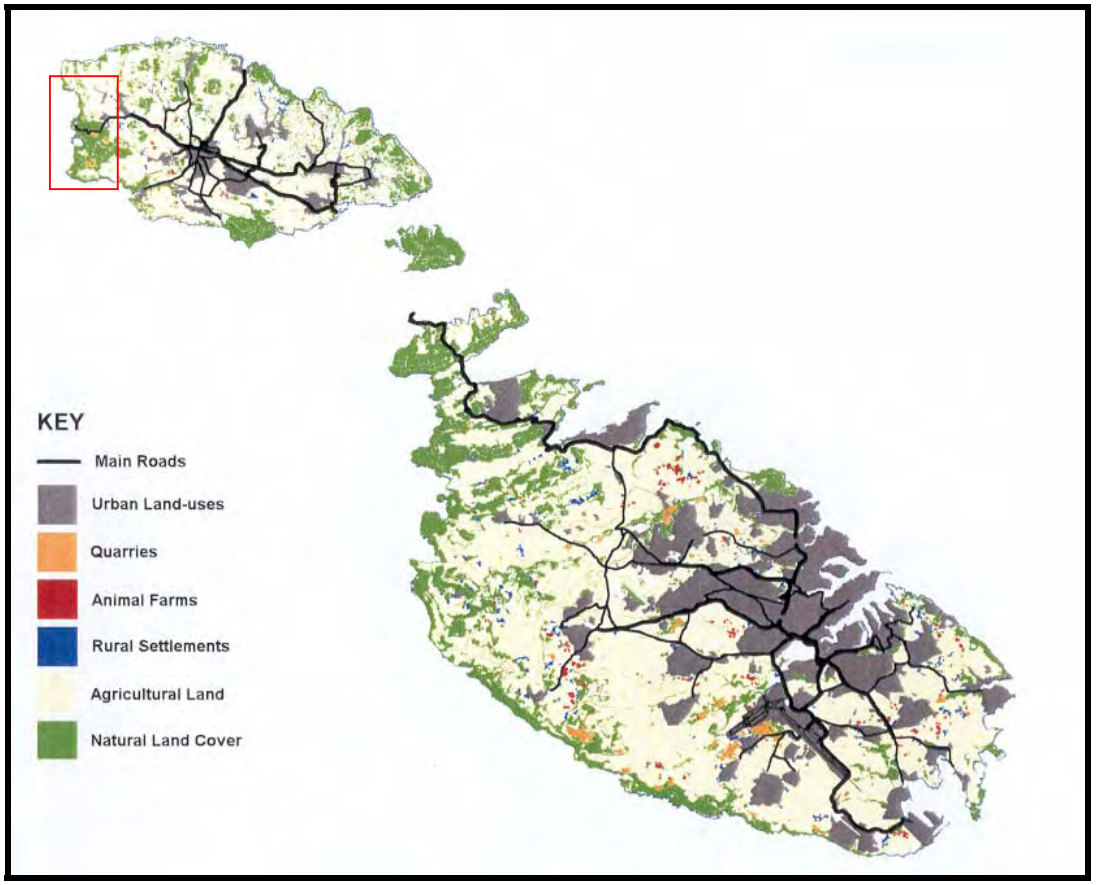
2 Site description

2.1 Location and Site boundaries

2.1.1 Location

2.1.1.1 The Qawra/ Dwejra area is situated on the western coast of the island of Gozo, as indicated in Figure 1. It is located at a longitude of 36º2'E and a latitude of 14º11'N. Mean altitude is of 56 metres, whilst the maximum altitude is 161 metres.

Figure 1
Location of the Qawra/Dwejra area



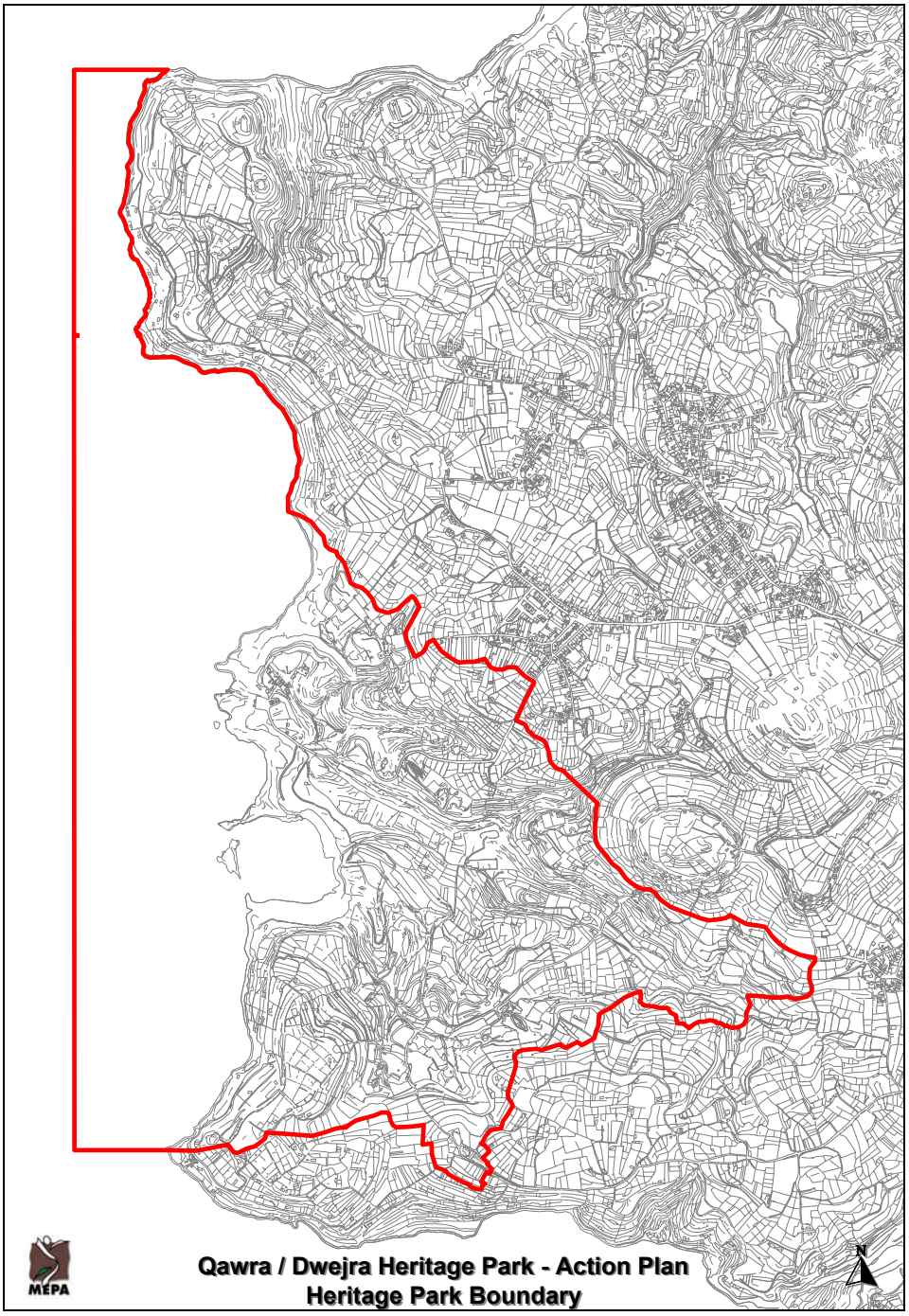
Source: Kasap, 2003

2.1.1.2 The site forms part of the San Lawrenz Local Council area. It combines a unique array of terrestrial and marine geology and geomorphology, a diverse range of habitats, a landscape of high aesthetic quality and a rich cultural heritage. Gozo and the islands of Malta and Comino constitute the Maltese archipelago, located in the middle of the Mediterranean Sea. Gozo has a surface area of approximately 67km2 and supports a resident population of 29,026 (Census of Population and Housing, 1995).

2.1.2 Site boundaries

2.1.2.1 The boundaries of the Site earmarked for the proposed Qawra/ Dwejra Heritage Park are indicated in Figure 2 below.

Figure 2
Boundary of the proposed Qawra/Dwejra Heritage Park

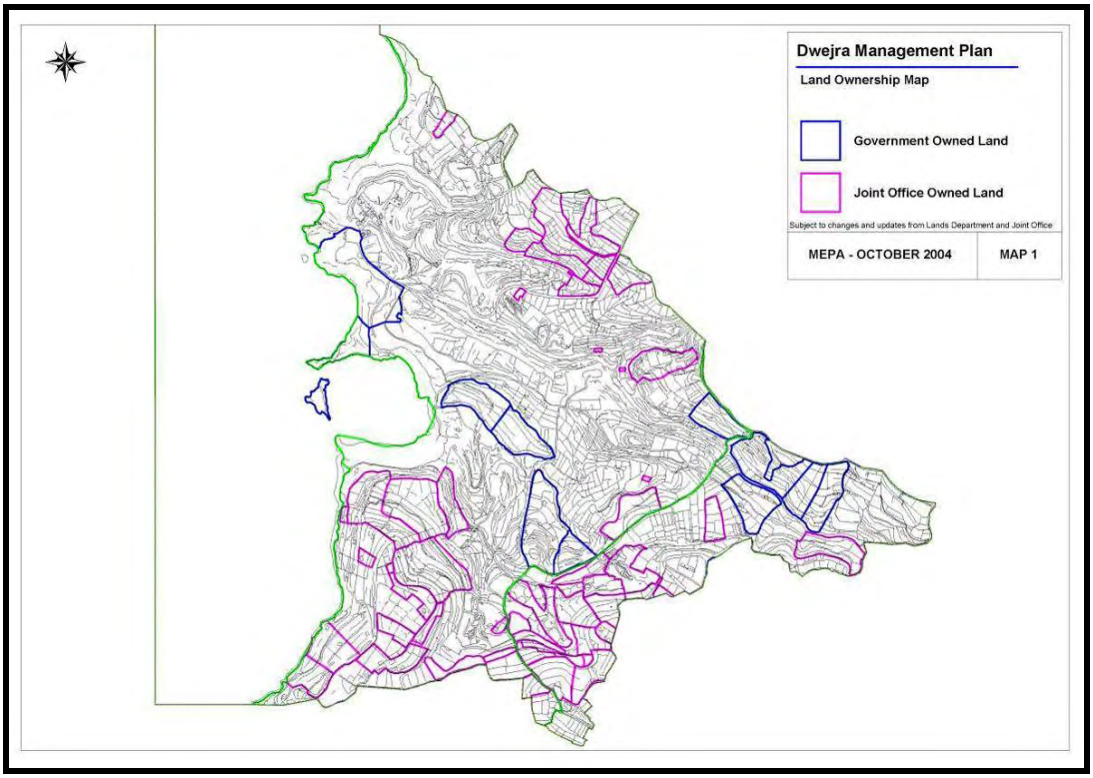


2.2 Legal status and rights

2.2.1 Ownership

2.2.1.1 Figure 3 identifies the properties which are owned by the Government of Malta and by private interests.

Figure 3
Land ownership within the proposed Qawra/Dwejra Heritage Park



Source: MEPA

2.2.2 Legal rights

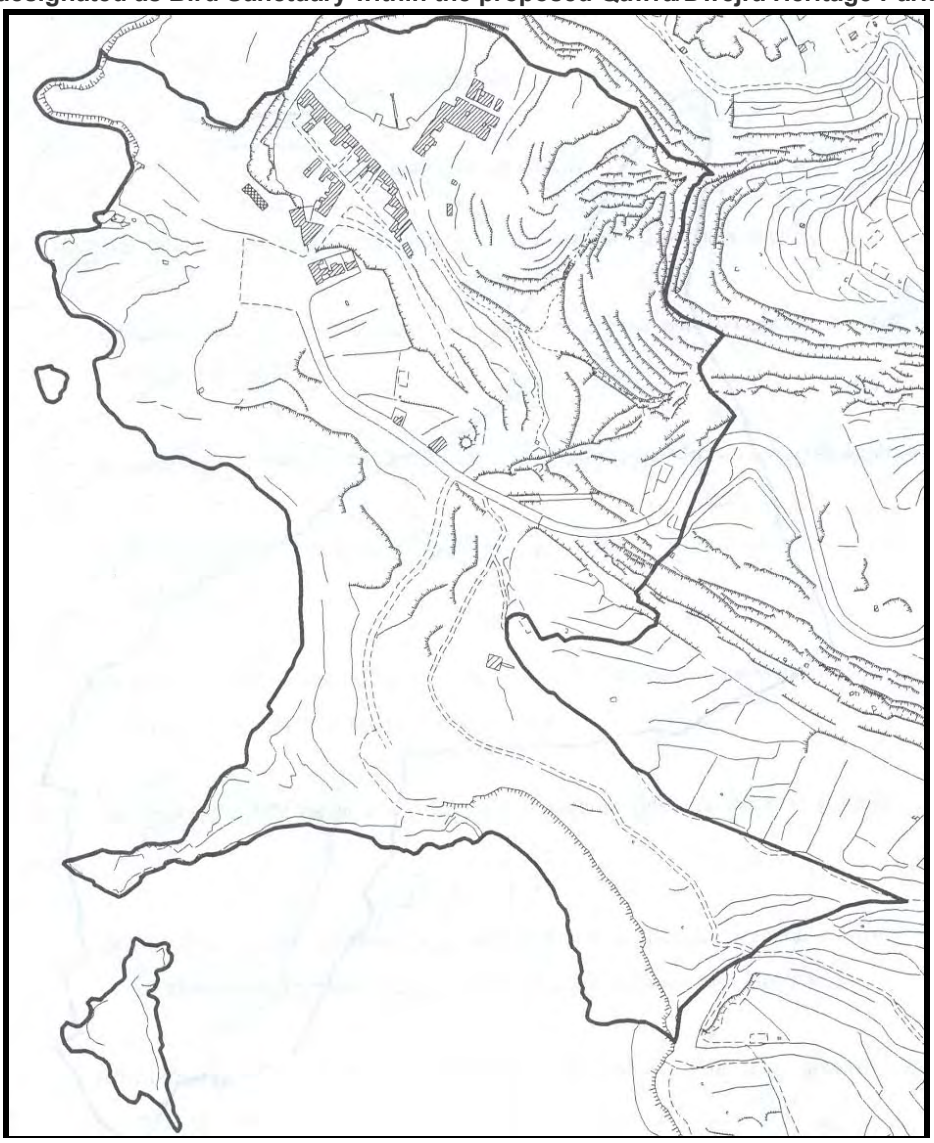
2.2.2.1 Property rights are enshrined in the Constitution of Malta under Articles 37 and 38, which establish the parameters of property rights. For example, such rights are limited with respect to situations involving soil and mineral resource conservation, agricultural development, water or antiquities or the public interest. Also, private property can be entered into by the authorities in particular cases such as those involving public health and safety and those relating to town and country planning.

2.2.3 Site status

2.2.3.1 As is indicated in Section 1.3.1 above, the Structure Plan for the Maltese Islands identifies the Site as having the potential for designation as a World Heritage Site (WHS). In addition to this, specific features in the Site have been assigned designations under the

RCO Policies of the Structure Plan for the Maltese Islands and Legal Notices issued under the EPA.

Figure 4
Area designated as Bird Sanctuary within the proposed Qawra/Dwejra Heritage Park



Source: MEPA

The following is a list of such designations:

- Fungus Rock was established as a Nature Reserve by the Fungus Rock (il-Ġebla tal-Ġeneral) Nature Reserve Regulations, 1992[9]. These Regulations prohibit access to

notes and references

[9] ----Legal Notice 22 of 1992.
This legal notice transposes the provisions of the following EC Directive into Maltese Law:

continued on next page

the islet and protect its flora and fauna. Part of the Site is also designated a Bird Sanctuary by virtue of the Birds and Wild Rabbit (Declaration of Protected Species and Nature Reserves) Regulations, 1993[10] (see Figure 4 above).

- The following Structure Plan policies are applicable to the Site:
  - Policies RCO 35 to 38 specifically consider the Qawra/Dwejra area and make proposals for its designation and management. Fungus Rock is also targeted by RCO 34 as a minor island of scientific importance.
  - Policy MCO 1 identifies Dwejra as a candidate Marine Conservation Area.
- The following three areas within the Site have been designated as Level 1 Areas of Ecological Importance (AEIs) and Sites of Scientific Importance (SSIs) as specified in the Structure Plan and in the Explanatory Memorandum of the Structure Plan:
  - il-Qattara;
  - l-Għadira ta' Sarraflu (under the DPA);[11]and
  - Fungus Rock. [12]

  The extent of scheduling around these sites is indicated in Figure 5, 6 and 7.
- A Tree Reserve was designated near il-Qattara by virtue of the Trees and Woodlands (Protection) Regulations, 2001.[13]
- The dry rubble walls bounding the terraced fields are protected through the Rubble Walls and Rural Structures (Conservation and Maintenance) Regulations, 1997.[14]
- A substantial part of the Site, including *il-Qattara*, and *L-Għadira ta' Sarraflu* are designated as Special Areas of Conservation (SAC) of International Importance INT 025 and National importance NAT 005 respectively by virtue of the Flora Fauna and Natural Habitats Regulations, 2003.[15] The extent of the SACs is indicated in Figures 6 & 8 respectively.

notes and references (continued from previous page)

Directive 92/43/EEC of 21 May 1992 *on the conservation of natural habitats and of wild fauna and flora* (Habitats Directive).

[10] ---Legal Notice 144 of 1993, as amended by Legal Notice 150 of 1993, Legal Notice 217 of 1997 and Legal Notice 106 of 1998.

This legal notice transposes the provisions of the following EC Directive into Maltese Law:

Directive 79/409/EEC of 2 April 1979 *on the conservation of wild birds*.

[11] ----Government Notice 288 of 1995.

[12] ---Government Notice 827 of 2002.

[13] ----Legal Notice 12 of 2001.

This legal notice transposes the provisions of the following EC Directive into Maltese Law:

Directive 92/43/EEC of 21 May 1992 *on the conservation of natural habitats and of wild fauna and flora* (Habitats Directive).

[14] ----Legal Notice 160 of 1997, as amended by Legal Notice 169 of 2004.

This legal notice transposes the provisions of the following Council Decision into Maltese Law:

Council Decision of 9 March 1998 on the conclusion, on behalf of the European Community, of the United Nations Convention to combat desertification in countries seriously affected by drought and/or desertification, particularly in Africa.

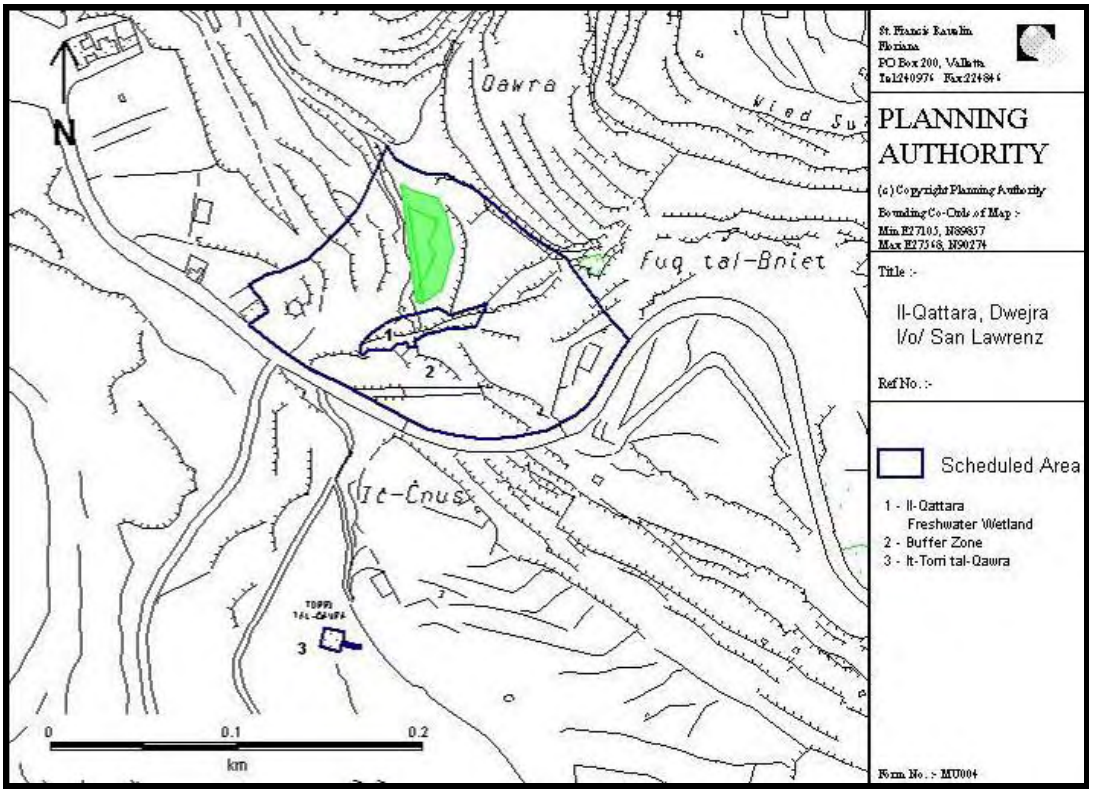
[15] ----Legal Notice 257 of 2003; refer also to MAP INT 025 in Government Notice 877 of 2003.

This legal notice transposes the provisions of the following EC Directive into Maltese Law:

Directive 92/43/EEC of 21 May 1992 *on the conservation of natural habitats and of wild fauna and flora* (Habitats Directive).

- *Il-Qattara* and *L-Għadira ta' Sarraflu* are being proposed as water bodies under the Water Policy Framework Regulations.[16]
- The Motor Vehicles (Offroading) Regulations, 1997 prohibit the use of the Site for offroading purposes.[17]
- The Qawra Tower (Plate 2), which forms part of the coastal defence system built by the Order of St John is also scheduled as a Level 1 Site under the Architecture category.[18] The tower was built in 1620.

Figure 5
Scheduled area at il-Qattara



Source: MEPA

2.2.3.2 Given that SACs are potentially Natura 2000 sites, the work carried out under the framework of this Action Plan should contribute towards the execution of the work which is required in order for MEPA (as the competent authority with respect to the Habitats Directive) to ensure that the proposed Qawra/Dwejra Heritage Park retains such a designation.

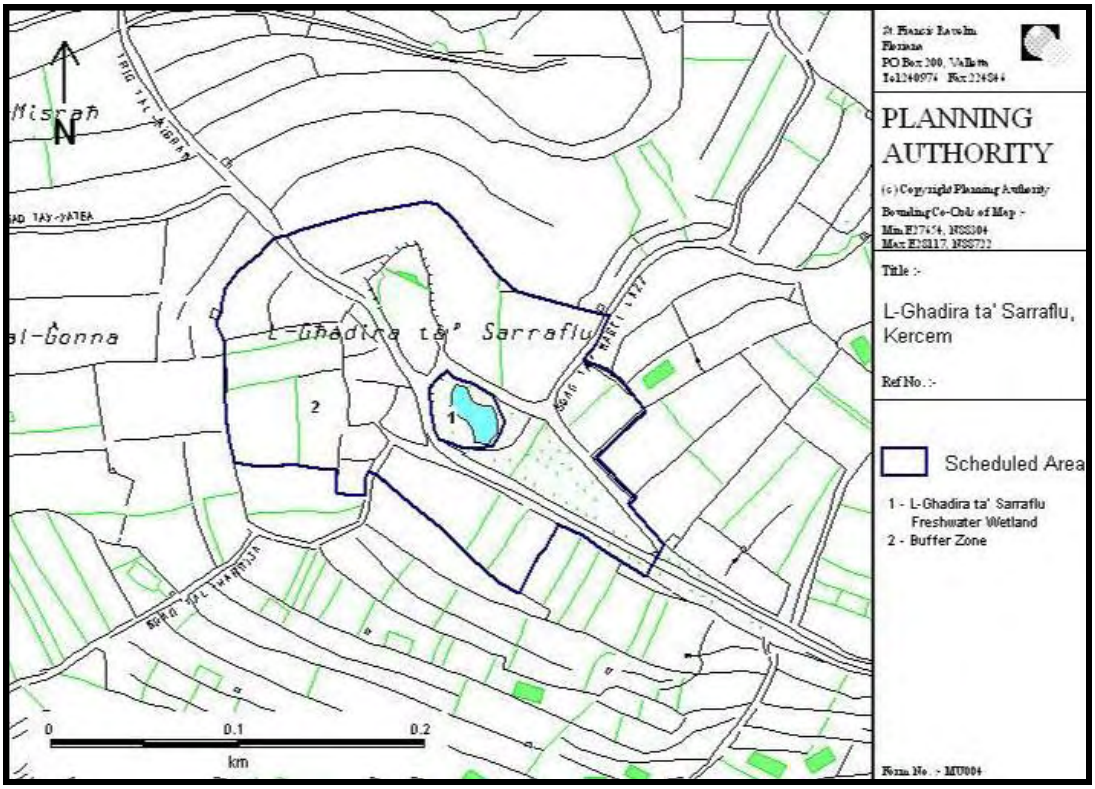
notes and references

[16] ----Legal Notice 194 of 2004.

[17] ----Legal Notice 196 of 1997.

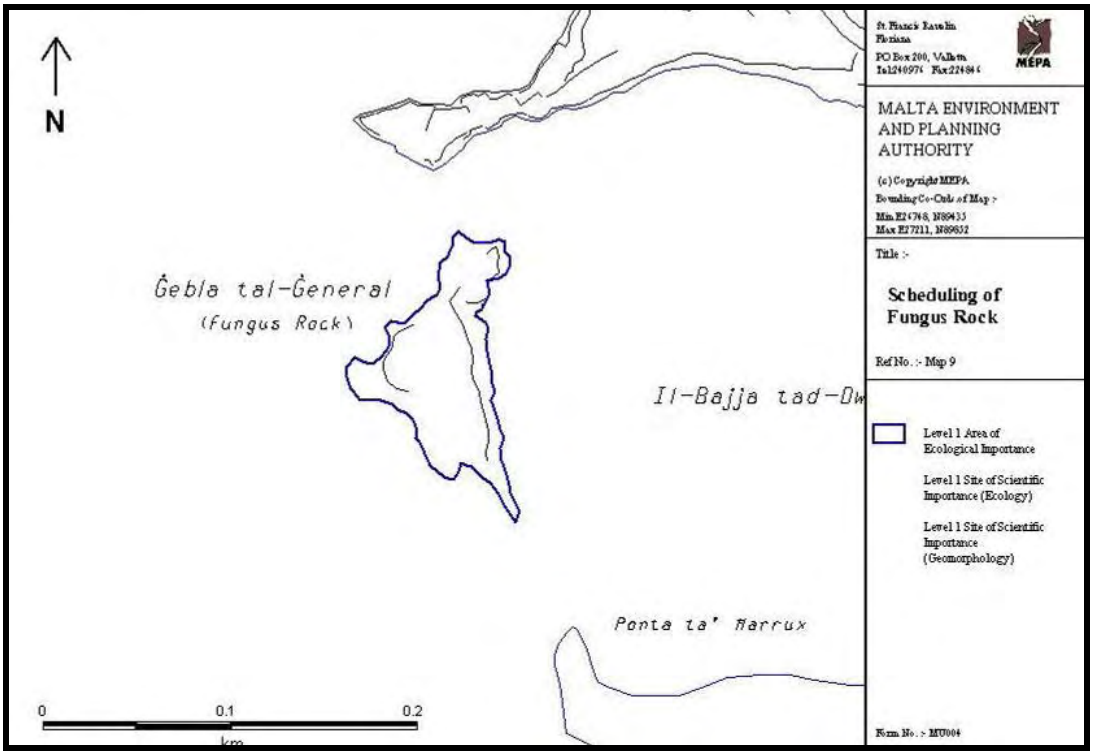
[18] ----Government Notice 729 of 1995.

Figure 6
Scheduled area at l-Għadira ta' Sarraflu



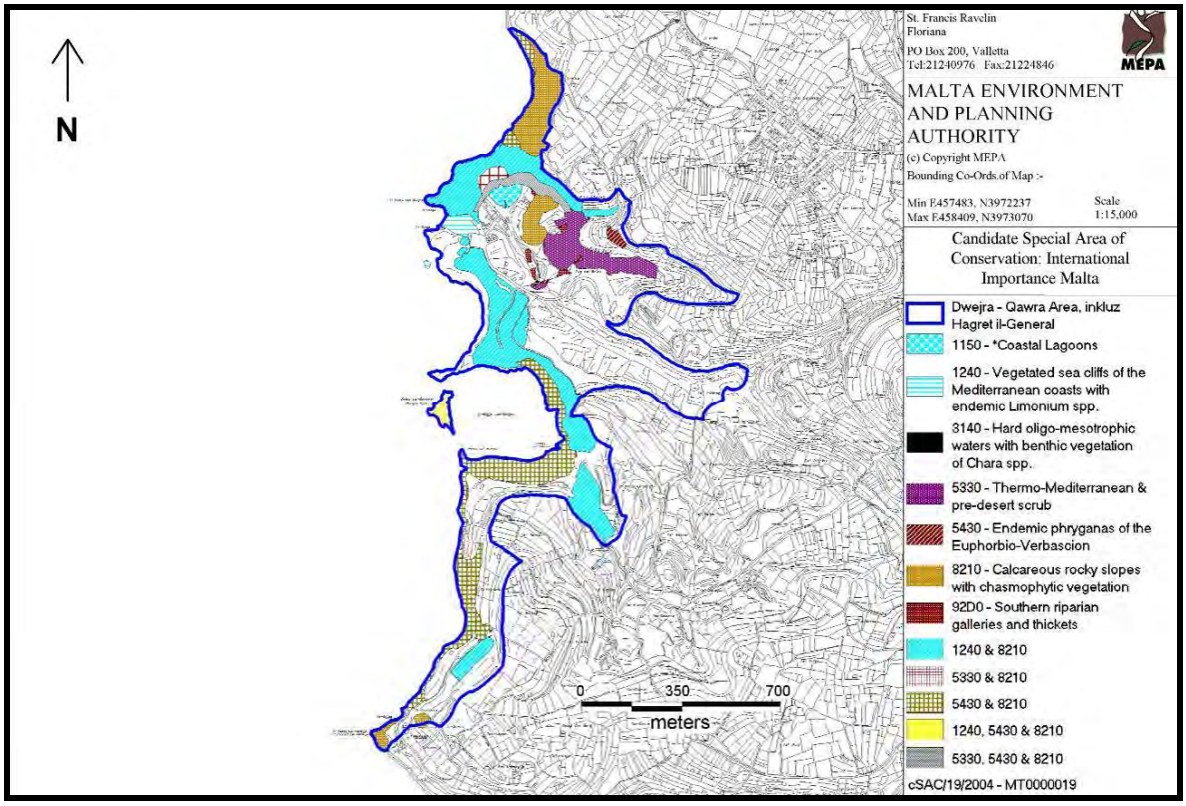
Source: MEPA

Figure 7
Scheduled area in Fungus Rock



Source: MEPA

Figure 8
Extent of Special Area of Conservation in the Qawra/Dwejra area



Source: MEPA

2.2.4 Other plans

Gozo and Comino Local Plan

2.2.4.1 As is noted in Section 1.1 above, the Structure Plan for the Maltese Islands provides the framework for the development of more detailed development plans. In 2002, MEPA issued the public consultation draft of the Gozo and Comino Local Plan which has the following to state with respect to the area:

> The western area of San Lawrenz is a geologically, ecologically and scenically very sensitive area and has been indicated by the Structure Plan as a candidate World Heritage Site. The area is also frequented by many tourists and is especially popular with divers. However, this very sensitive area is surrounded by a string of quarries which detract from the considerable scenic qualities of the area. The Qawra area (Inland Sea) is encircled by a conglomeration of boathouses. Some of these have been in existence for more than 40 years. However, the original group gradually extended outwards. By the late 1990's, the buildings had created a considerably larger impact in a very sensitive area. The matter is exacerbated by a large unorganised parking area littered with spalls. It is important that whilst enforcement action is taken against the structures built after 1992, the rest of the structures should be integrated within the very sensitive context through a management plan for the area. This management should not only reconcile traditional human activities with the considerable natural attributes of the site but should also create the necessary institutional structures to effectively and sustainably manage the areas, preferably with a revenue generating mechanism to maintain and upgrade this very sensitive site.

2.2.4.2 This plan is currently being reviewed in the light of the response of the public to the above-mentioned draft.

2.2.4.3 As is noted in Section 1.3.2 (on page 15), the designation Qawra/Dwejra Heritage Park is proposed in this plan, specifically in Policy GZ-Slwz-1, which suggests that the Site

> ... shall be designated as the Qawra/Dwejra Heritage Park and shall be afforded protection as an Area of Ecological Importance, a Site of Scientific Importance, an Area of Archaeological Importance and an Area of High Landscape Value. The area shall be managed according to the provisions of clauses 15.34 to 15.40 of the Explanatory Memorandum of the Structure Plan and according to criteria of the World Conservation Union (IUCN) and as a candidate World Heritage Site.
>
> To this effect, a management committee shall be set up under the coordination of MEPA, so as to oversee the formulation and implementation of a detailed Management Plan. The Management Plan for the area shall address issues such as responsibility for management, maintenance and upkeep, interpretation facilities, organisation of land-use activities and monitoring of changes and their impact. It shall also be entrusted to oversee the interpretation of the various areas through appropriate facilities on site, rationalized visitor management, restoration of damaged landscapes, promotion of well signed visitor routes, the removal of illegal structures built after the Planning Authority was set up as documented on aerial photography and other compatible interventions.

2.2.4.4 The following Local Plan policies are also concerned with the Site:

GZ-Slwz-2

MEPA shall favourably consider proposals to attenuate the negative environmental impacts at Qawra and Dwejra. Requests for development permission for such development shall include a detailed Management Plan as referred to in policy GZ-Slwz-1 above.

The erection of additional boathouses or other permanent structures shall be prohibited in this area. There shall also be a general presumption against the introduction of utility services in this area.

GZ·Slwz-3

Proposals to utilize it-Torri tal-Qawra as an Interpretation Centre for the Heritage Park shall be given favourable consideration provided that:

a) apart from restoration and upkeep, structural interventions on (and around) the tower shall be strictly limited;

b) pedestrian access to the tower shall be improved but the design and materials used should be very low key and should integrate with the surrounding natural terrain; and

c) the imaginative intervention should not be dependent on the use of water or electricity from the public utility network.

GZ-Slwz-4

The rehabilitation of disused quarries through infill and subsequent conversion to agriculture shall be encouraged in the San Lawrenz area. There shall be a general presumption against the lateral extension of quarries in this area, except for extensions directed away from the Qawra/Dwejra Heritage Park area (provided that the extensions do not infringe upon other protected areas and sites) and screened from long distance views into the site. All such extensions shall be subject to an Environmental Impact Assessment.

GZ-TRAN-10

MEPA will encourage the preparation of parking management schemes to upgrade and regularize car parking at the following sensitive areas, situated by the coast:

a) Qawra (Dwejra Bay and Inland Sea)

b) Xwieni Bay

c) Ramla Bay

d) San Blas Bay

e) Dahlet Qorrot

f) Hondoq ir-Rummien

g) Mgarr ix Xini.

These schemes should include measures to stop the encroachment of parking along the coast, strictly define where parking is permitted, and introduce landscaping to screen parking areas. The amount of parking provided should take account of the environmental capacity of the site and the standard of the approach road. The schemes should balance the requirement for parking against the need to safeguard and improve the environment of these sensitive areas. Access to legitimate boathouses and slipways also needs to be considered.

Structure Plan Review

2.2.4.5 As is noted above, the Structure Plan is currently under review. Part of the review process involved the issue of the Coastal Strategy Topic Paper. The policy direction provided for predominantly rural coastal areas aims to safeguard and promote the natural and cultural value of protected areas, to encourage the continuation of agricultural land uses, to restrain mineral extraction from extending towards the coastline and to limit recreational development to safeguard the predominant use of the area. It also proposes that new development should be related to the rehabilitation of abandoned agricultural land or spent quarries.

Rural Development Plan for Malta

2.2.4.6 Recently the Government of Malta, through the Ministry of Rural Affairs and the Environment (MRAE), issued the Rural Development Plan for Malta 2004-2006,[19] the main goal of which is

... to co-ordinate in an integrated manner the natural, human and financial resources of the agricultural and rural communities of Malta with a view to ensuring the sustainable growth of the rural economy and the improvement of the rural way of life in a fair and balanced manner.

2.2.4.7 Among other things, this plan promotes the 'agri-environment' through the encouragement of specific measures mainly reduction of the incidence of soil erosion, an increase in biodiversity, enhancement of local indigenous species and promotion of organic farming.

Legal standing of the Plan

2.2.4.8 When considering potential legal designations for a management plan for the Qawra/Dwejra area, three options were proposed:

a. Management Plan as implementation of Structure Plan policy;
b. Management Plan for Special Area of Conservation; and
c. Management Plan as an annex to the Local Plan or as a Subsidiary Plan.

A. Management plan as implementation of Structure Plan policy

2.2.4.9 As is noted in Section 1.3 above, Policy RCO 37 of the Structure Plan for the Maltese Islands makes a commitment with regards to the setting up of a management authority for the Qawra/Dwejra area, after this is designated a National Park. Among other things, this authority is empowered to formulate comprehensive environmental management plans for the park.

notes and references

[19] ----The Rural Development Plan for Malta 2004 – 2006 was prepared as required under Council Regulation (EC) No 1257/1999 of 17 May 1999 *on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF) and amending and repealing certain Regulations*.

B. Management Plan for Special Area of Conservation

2.2.4.10 As is noted in Section 2.2.3 above, part of the Site is a designated SAC. Regulation 8(3) of the Flora, Fauna and Natural Habitats Protection Regulations, 2003[20], states that a management plan must be issued for designated SACs:

> The Competent Authority shall issue a management plan for the said SACs which shall include planning, management, supervision and monitoring measures in line with the protection category or categories assigned to the SAC in question. Such measures may include for each protected areas as appropriate:
>
> a) a long-term ecological vision for the SAC and the related terrestrial, coastal and marine communities, and provisions for biodiversity protection, zoning, public awareness and education, management, performance, evaluation and any other activities required by the Competent Authority;
> b) the legal and institutional framework and protection measures applicable;
> c) the continuous monitoring of ecological processes, habitats, population dynamics, landscapes, as well as the impact of human activities;
> d) the active involvement of local communities and populations, as appropriate, in the management of the SAC, including assistance to local inhabitants who might be affected by the establishment of such area;
> e) the adoption of mechanisms for financing the promotion and management of the SAC, as well as the development of activities which ensure that management is compatible with the objectives of conservation of such area;
> f) the regulation of activities compatible with the objectives for which the SAC is established and the terms of the related permits; and
> g) the training of managers and qualified technical personnel, as well as the development of an appropriate infrastructure for its management.

C. Management Plan as an Annex to the Local Plan or as a subsidiary plan

2.2.4.11 Article 23 of the DPA states:

> Where the Authority considers that for the proper and effective management of development it is necessary to prepare more detailed proposals than can be appropriately embodied in the Structure Plan, the Authority may prepare such subsidiary plans, that is to say subject plans, local plans, action plans and development briefs, as appears to it to be necessary.

2.2.4.12 Subsequently, Article 26 of the same DPA states that in the case of

> ...an area where the Authority (i.e. MEPA) considers that it has to pay particular attention in order to better manage the rate of development or re-development or where special factors have to be taken into account which otherwise cannot be taken,

an Action Plan can be formulated in order to provide the necessary detailed guidelines for the management of the territory in question.

This Management Plan is therefore designated as an Action Plan for the Qawra/Dwejra area as per the provisions of the DPA specified above.

notes and references

[20] ----Legal Notice 257 of 2003.
This legal notice transposes the provisions of the following EC Directive into Maltese Law:
Council Directive 92/43/EEC of 21 May 1992 *on the conservation of natural habitats and of wild fauna and flora* (Habitats Directive).

2.3 Management infrastructure

2.3.1 Organisations/Agencies

Steering committee

2.3.1.1 The work on this Action Plan was monitored by a Qawra/Dwejra Heritage Park Steering Committee, which was appointed by the Minister for Rural Affairs and the Environment. This committee is made up as shown in Table 1 below:

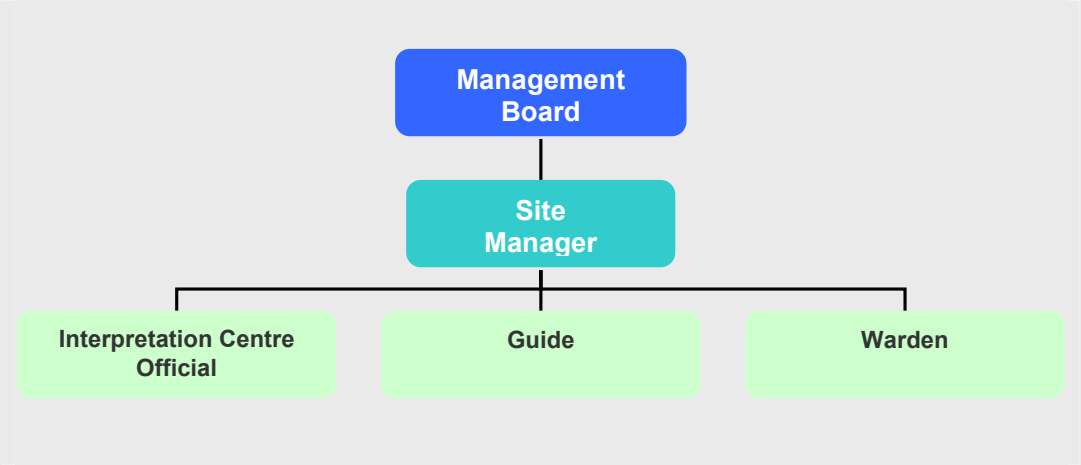
Table 1
The Qawra/Dwejra World Heritage Site Steering Committee

Name	Position in steering committee	Represented organisation	Position in organisation
Joe Tabone	Chair	MEPA	Board Member
Louis F Cassar	Vice-chair	MEPA	Board Member
Hon Giovanna Debono	Member	Ministry for Gozo	Minister
Anthony Zammit	Member	Ministry for Gozo	Official
Noel Formosa	Member	San Lawrenz Local Council	Mayor
Chris Attard	Member	MEPA	Senior Planning Officer
Vincent Attard	Life Dwejra Project Coordinator	Nature Trust (Malta)	President

Dr. Godwin Debono also served as the Steering Committee's first Chairman till May 2005.

2.3.1.2 After the approval of the Action Plan, it is envisaged that the members of the Steering Committee will constitute the members of the Qawra/Dwejra Heritage Park Management Board. This board shall be the equivalent of the Management Authority specified in Policy RCO 37 of the Structure Plan for the Maltese Islands. The Board shall be responsible for a management team structured as follows:

Figure 9
Qawra/Dwejra Heritage Park Management Team



2.3.1.3 The Management Board shall appoint a Site Manager and enter into an agreement for the implementation of this Action Plan. The Management Board shall appoint a Site Manager for the implementation of this project.

2.3.1.4 This organisational structure should be considered as provisional and may be altered following evaluations of management effectiveness and reviews of the Action Plan. Should funds permit, the staff complement will be gradually increased.

2.3.1.5 Given that only limited staff can be employed because of financial constraints, the management team will also seek assistance from other authorities, public agencies, and NGOs wherever possible. These include the Civil Protection Department, the Malta Maritime Authority, the Administrative Law Enforcement division of the Malta Police Force, the Armed Forces of Malta and the possibility of deploying Government employees.

Partners

2.3.1.6 The preparation of this Action Plan has been the responsibility of the following partners:

- Nature Trust (Malta);
- MEPA; and
- World Wide Fund for Nature (Italia).

Nature Trust

Background

2.3.1.7 Nature Trust (Malta) is a voluntary environmental NGO, committed to the conservation of nature by promoting environmental awareness, managing areas of natural and scientific importance and lobbying for effective environmental legislation. Nature Trust also manages two reserves in Malta, namely

- Wied Għollieqa which has been designated as a SAC of National Importance under the Flora, Fauna and Natural Habitats Regulations, 2003, and
- the saltmarsh at il-Ballut ta' Marsaxlokk which has been designated as a SAC of National Importance under the Flora, Fauna and Natural Habitats Regulations, 2003.

2.3.1.8 Nature Trust (Malta) also manages an area of sand dunes in White Tower Bay.

2.3.1.9 The above-mentioned sites are located in different parts of the island of Malta, and substantial progress has been registered since Nature Trust (Malta) assumed its current environmental management role.

2.3.1.10 The following is this NGO's mission statement for the Qawra/Dwejra site, in which it is stated that the vision for the area is:

> ...one which aims to conserve the status quo for some of the habitats on Site whilst intervening in areas which require restoration or which need to be protected from possible threats. However conservation is not the sole aim as Nature Trust also recognizes the vital importance of including the community in the project at all stages whilst considering means which will enhance the Site as experienced by visitors. The combination of these two factors coupled with enforcement and ongoing education will lead to an opportunity for ecotourism and sustainable activities which in the long run will result in a positive net benefit to both the Site and its users.

Responsibilities

2.3.1.11 This organisation shall be co-ordinating the implementation of this Plan with the cooperation of the previously mentioned parties.

Malta Environment and Planning Authority

Background

2.3.1.12 As is noted in Section 1.1 above, MEPA is the regulatory authority responsible for both spatial planning and environmental protection. Among other things the mission statement of this agency states:

> Our aim is to pass onto our children a better country than we inherited. It is for this very reason that we compare our environment to a treasure, something we place our energies in, to protect, care for and improve. The environment encompasses all – nature, cultural and architectural heritage, towns and villages, the countryside, the seas and air. We believe that together we should carefully plan so that our heritage, this gem which we treasure, will not fade away.
>
> The Malta Environment & Planning Authority is committed to ensure that land use and the protection of the environment meet the needs of today's society and future communities. We are working to ensure a quality of life that will be in harmony with our natural, cultural and built environment. In so doing we are seeking to implement sustainable development that safeguards the environment.

Responsibilities

2.3.1.13 MEPA is responsible for the formulation of this Action Plan in collaboration with Nature Trust and the parties represented in the Steering Committee, other NGOs, and the public. With respect to the Qawra/Dwejra area, MEPA has issued a vision which is formalised as a policy statement in the public consultation draft of the Gozo and Comino Local Plan. As is noted earlier, this plan is currently being reviewed in response to the views of the public and shall be approved in the near future. Under this policy, this Action Plan shall have statutory status when formally approved by MEPA.

World Wide Fund for Nature (Italia)

Background

2.3.1.14 As is well-known the World Wide Fund for Nature (WWF) was set-up in the 1960s in order to promote the conservation of the natural environment and ecological processes worldwide. In other words, WWF is concerned with the protection of fauna and flora, the landscape, water, soils, air and other natural resources, with particular emphasis on the maintenance of essential ecological processes and life support systems, and on the preservation of genetic, species and ecosystem diversity, and on ensuring that the utilisation of wild plant and animal species and natural ecosystems is sustainable. The Mission Statement of this organisation states:

> WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:
>
> – conserving the world's biological diversity
> – ensuring that the use of renewable natural resources is sustainable
> – promoting the reduction of pollution and wasteful consumption.

Responsibilities

2.3.1.15 WWF (Italia) shall be providing support based on its wide experience in the field of protected area management. WWF will also include this project as part of the Mediterranean high eco regions. Support will specifically include:

- Mentoring, education and training initiatives;
- Advise on the reports, conservation objectives and works;
- Advise on the financial sustainability of the project;
- Assist the beneficiary in the capacity building of project staff;
- Guide the beneficiary on Natura 2000 site management, requirements and training on management; and
- Regular visits to aid in the project.

2.3.2 Facilities

2.3.2.1 It is envisaged that residents and visitors to the proposed Qawra/Dwejra Heritage Park shall be provided with the following facilities:

- Coach and private-car parking
- Interpretation centre
- Souvenir shop
- Public toilets
- Showers
- Catering facilities including bar/restaurant
- First aid room

2.3.3 Services

2.3.3.1 The following services will be introduced:

- Management of day to day activities:
  - Cleaning
  - Surveillance
- Education
- Guiding and provision of interpretation facilities

2.3.4 Health and safety

2.3.4.1 The Management Board plans to embark on a collaborative initiative together with the Department of Civil Protection in order to formulate a plan through which:

- its wardens shall be trained in order to offer first aid to visitors, and
- suitable facilities are provided in strategic locations in the Heritage Park.

2.3.5 Financial planning

2.3.5.1 A detailed financial sustainability report is being prepared in parallel with this Action Plan and will be submitted to the LIFE project officials of the DG Environment at the European Commission, in the coming months.

2.4 Climate

2.4.1 National climate

2.4.1.1 Malta's climate is typically Mediterranean, with mild, rainy winters and hot, dry summers. Rainfall averages 530 mm per annum. Further data on the climate is listed in Table 2 below.

Table 2
Summary of climatic characteristics of the Maltese Islands

Month	Hours of bright sunshine	Rainfall mm	Temperature				Sea	
			Max		Min			
			ºC	ºF	ºC	ºF	ºC	ºF
January	5.02	95.50	15.5	59.0	9.6	49.3	15.3	59.5
February	6.28	62.90	15.7	60.3	9.4	48.9	14.9	58.8
March	7.14	42.40	17.0	62.6	10.3	50.5	15.1	59.2
April	8.28	26.60	19.3	66.7	11.9	53.4	15.8	60.4
May	9.53	9.70	23.8	74.8	15.0	59.0	17.6	63.7
June	10.92	0.80	28.1	82.6	18.8	65.8	21.1	70.0
July	11.71	0.40	31.1	88.0	21.1	70.0	24.0	75.2
August	10.82	5.30	31.5	88.7	22.1	71.8	25.7	78.3
September	8.51	49.90	28.4	83.1	20.4	68.7	25.0	77.0
October	6.99	82.10	24.6	76.3	18.1	64.6	23.1	73.6
November	5.89	93.70	20.3	68.5	14.5	58.1	20.4	68.7
December	5.05	98.40	17.0	62.6	11.1	52.0	17.2	63.0
Annual Avg	**8.00**	**567.70***	**22.7**	**72.9**	**15.2**	**59.4**	**19.6**	**67.3**

Period of observations is 1st January 1971 to 31st December 2000
* denotes average annual rainfall
(Source: Data collected and supplied by the Meteorological Office, Malta International Airport plc)

2.4.1.2 Given the small size of the Maltese Islands, it is unlikely that significant regional variations occur. There is also a dearth of data specific to the island of Gozo and to the Dwejra region. However, it is worth noting that the Qawra/Dwejra area is very exposed to prevailing north-westerly and westerly winds.

2.5 Geology and Landforms

2.5.1 Bedrock

2.5.1.1 The Maltese Islands are predominantly composed of marine sedimentary rocks of Oligo-Miocene age with otherwise sporadic occurrences of Quaternary deposits in some areas. Five rock formations are recognised:

- Lower Coralline Limestone (the oldest layer)
- Globigerina Limestone
- Blue Clay
- Greensand
- Upper Coralline Limestone (the youngest layer).

Plate 3
Scutella subrotunda

2.5.1.2 The first three formations, together with some Quaternary deposits, are found within the Site (Figure 10).

Lower Coralline Limestone

2.5.1.3 The largely inaccessible and impressive coastal cliffs from Ras il-Wardija to Kap San Dimitri, of a maximum thickness of 130m, show a fine exposure of this rock type and its four members, i.e.:

- Wied Magħlaq Member (parallel beds of whitish limestones with a maximum thickness of 2 metres)
- Attard Member (massive beds of about 30 metres thickness)
- Xlendi Member (20 metre thick unit made up of cross-stratified beds)
- il-Mara member (outcrops of 1.5 metre thickness).

Globigerina Limestone

2.5.1.4 Globigerina is the most widely exposed formation within the Site and is here represented by three Members:

- Lower Globigerina Limestone, which includes the rich *Scutella* fossil bed and fossilised burrows of *Thalassinoides*, as well as the layer which is quarried for commercial use
- Middle Globigerina Limestone
- Upper Globigerina Limestone.

Blue Clay Formation

2.5.1.5 Exposures of this formation are limited to a small area inside the Qawra structure, an area just east of the Dwejra structure and the Għajn Abdul area.

Quaternary Deposits

2.5.1.6 At Dwejra, Quaternary Deposits are found on the Blue Clay layer in the Qawra depression and have yielded evidence of calcified roots and gastropods which are still extant today.

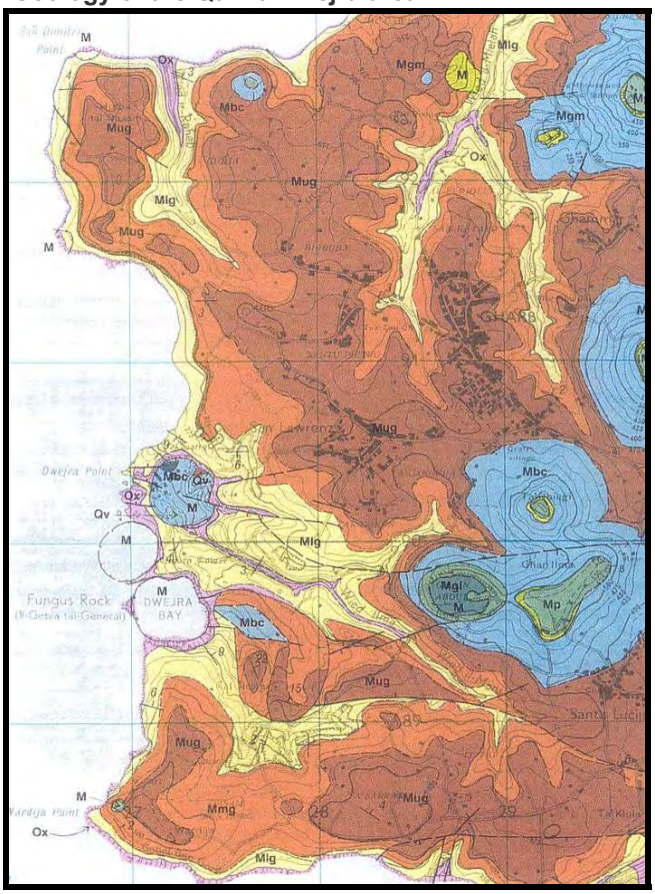
2.5.2 Drift deposits

2.5.2.1 Wave action through the opening that connects the Inland Sea with the open sea has created a roughly circular shingle beach made up of pebbles and cobbles derived from the surrounding Lower Coralline Limestone and Globigerina Limestone formations.

2.5.3 Land forms

2.5.3.1 The geomorphology of the Maltese Islands is largely determined by tectonism, drainage, doline features, drowned valleys and drowned doline structures. In spite of its small size, the Dwejra area holds an array of most of these features, resulting in magnificent scenery made up of subsidence structures, dry river valleys known as “widien”, an inland sea, sheer cliffs, islets, submarine caves and an arch.

Figure 10
Geology of the Qawra/Dwejra area



Notes regarding Figure 10
Brown and yellow indicate areas of exposed Globigerina Limestone.
Blue indicates areas of Blue Clay.
Pink indicates areas of Lower Coralline Limestone.
Green indicates areas of Upper Coralline Limestone.
Source: Geological Map of Malta

Solution Subsidence Structures

2.5.3.2 At least four solution subsidence structures are found in the Dwejra area (Plate 4). The formation mechanisms are still debated. It is likely that these were formed by cavern collapse in submarine areas during the Miocene. The Qawra structure is the best example of all such structures on the Maltese Islands. It is bound by vertical walls and the base is partly submerged under a shallow inland sea connected to the open sea by a conduit. The inland sea is unique to the Maltese Islands. Other structures include the North Dwejra

Structure, the Dwejra Structure and the tal-Ħarrax Structure. It is also probable that other solution subsidence structures, or remnants of these, occur in the area.

Plate 4
Solution subsidence structures (marked d) in the Dwejra area
The mesa structure of Għajn Abdul (marked m) is also underpinned by cavern collapse

Source: Pedley, Clarke and Galea, 2002

Widien (Valleys)

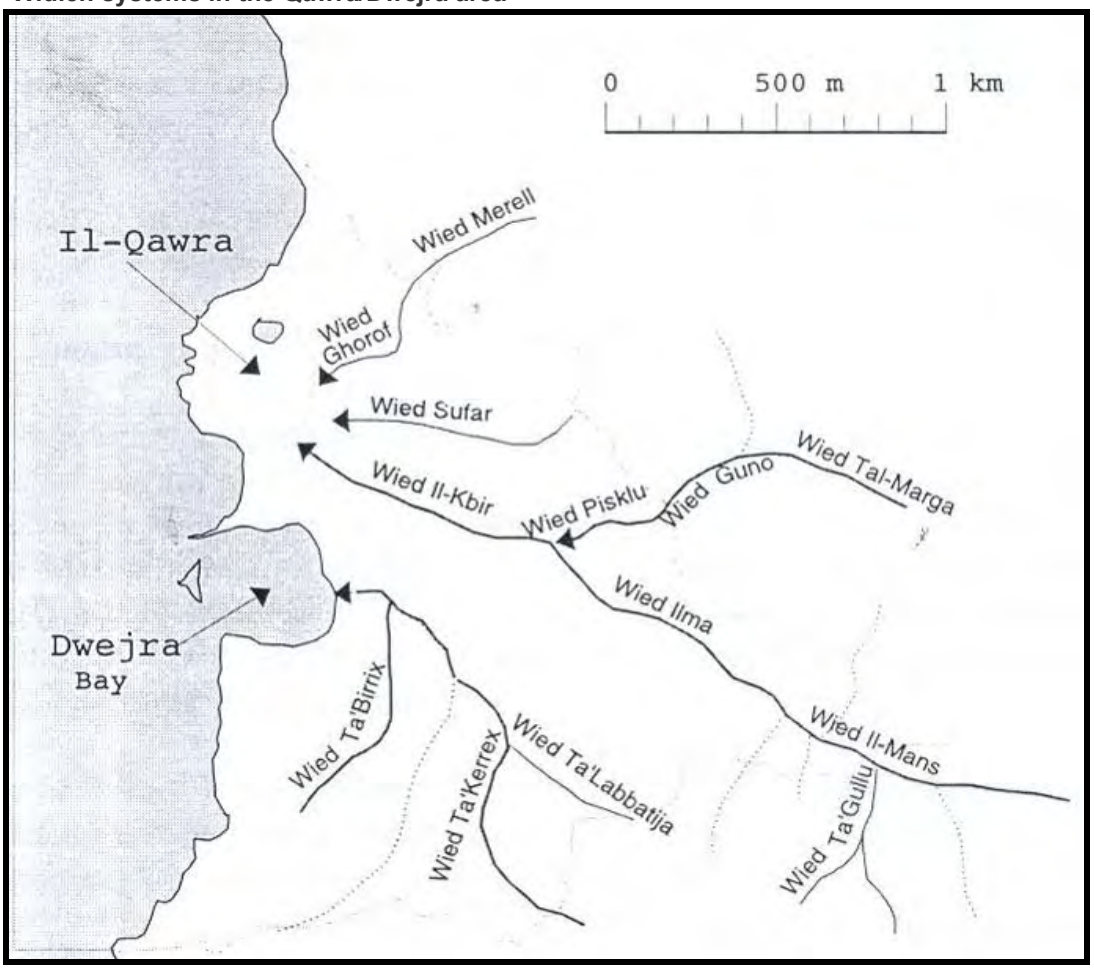
2.5.3.3 The watercourses at Dwejra are made up of six systems (Figure 11) the formation of which appears to be heavily linked to the subsidence structures and associated tectonic features of the area. These systems are as follows:

- Wied il-Mans, Wied Ilma and Wied il-Kbir constitute the main system of the area together with a tributary from Wied Ta' Gullu. It discharges into il-Qawra and displays some remarkable karstic features along the downstream path where the watercourse path has been cut through the Lower Coralline Limestone, forming beautiful gorges;
- Wied Pisklu is the main tributary to the above system and is mainly cut in the Globigerina Limestone;
- Wied Sufar discharges into the Qawra structure forming a narrow gorge downstream as it cuts through the Lower Coralline Limestone;

Plate 5
Wied Ghorof

- Wied Merell and Wied Għorof discharge into the Inland Sea via a hanging valley cut in the Lower Coralline Limestone;
- Wied ta' Birrix and Wied Ta' Kerrex lie within the second largest watershed in the area. A small tributary, Wied ta' Labbatija, discharges into Wied ta' Kerrex. The system discharges into il-Bajja tad-Dwejra via a hanging valley lying several tens of metres above sea-level; and
- The watercourse discharging from *Il-Qattara* down course to the Inland Sea.

Figure 11
Widien systems in the Qawra/Dwejra area



Source: Malta University Services, 1996

Coastal cliffs and erosion features

2.5.3.4 The sheer cliffs, characteristic of this coastline, are mostly linked to the subsidence structures described above. Evidence of this is their semi-circular nature and sub-aerial features which have survived the collapse. Erosion processes in the area result in a dynamic landscape which currently boasts a number of spectacular features, such as the

Fungus Rock Islet and a natural archway known as *it-Tieqa* (Azure Window). In addition, several crevices and caves, tunnels, arches and stacks are also present.

Plate 6
Coastal Cliffs – From *it-Turretta* to *il-Ponta tal-Hawt*

Marine Features

2.5.3.5 The area supports an impressive variety of underwater geomorphological features, including rocky platforms, drop-offs, shoals, boulder fields, arches, caves and tunnels, which are described in further detail below. A brief description of the main geomorphological features recorded from the present survey follows. Where mentioned, reference to different types of mobile substrata (boulders, cobbles, pebbles, sand etc.) is based on the Wentworth scale as used in Holme & McIntyre (1984) and in Pirotta & Schembri (1997). For a more detailed description the reader is referred to Borg, Micallef, Pirotta and Schembri (1997).

- **Drop-offs** [21] were the most abundant geomorphologic feature in the study area, except inside il-Bajja tal-Qawra and il-Bajja tad-Dwejra. The height of these drop-offs varies, but most have a very steep inclination. Furthermore, both 'continuous' (drop-offs that extend from the surface to the seabed without any major topographical variations down the cliff face) and 'non-continuous' (drop-offs that are characterised by ledges and platforms running across the vertical face) drop-offs are present, but the latter are predominant.
- **Bedrock platforms and shoals:** A wide bedrock platform is present between the shore lying below the Qawra tower and il-Baqra. Patches of sand are present in many places on this rocky platform. The marine area off iż-Żerqa supports a shoal that extends seawards for around 80m and has shallow (1-2 m) waters above it in various places.
- **Boulder fields:** Extensive boulder fields are present at the base of drop-offs throughout the study area. Boulders fields are found below the cliffs lying between il-Kap and iż-Żerqa and those lying between Fungus Rock and il-Ponta tal-Wardija. A dense boulder

notes and references

[21] ----Submarine rock faces equivalent to escarpments on land.

field is also present in the area surrounding it-Tieqa. In places, small patches of sand are interspersed amongst the boulders.

- **Arches:** One submerged arch and two emergent arches are present in the study area. The submerged arch is located just below the so-called 'Blue Hole' (present on the shoreward side of iż-Żerqa), of which it forms a part, and leads to a submerged cave lying below il-Hofra tal-Birwin. One of the two emergent arches is located below the cliffs in the ta' Slima area and forms part of the promontory which extends out from the cliff. The roof of this emergent arch lies high up within the cliff itself. The other emergent arch is it-Tieqa, and also has its roof high up within a cliff.
- **Caves:** Five large submerged caves and six large emergent caves are present in the study area. Several other minor caves and clefts are also present in the study area.
- **Tunnels:** Two tunnels are present in the study area; a long (circa 100m) emergent tunnel that connects the inland sea to the open sea, and a smaller tunnel (circa 6m long) that is fully submerged and located below iż-Żerqa .

As described above, the site includes many features of geological and geomorphological interest, both terrestrial and marine, which together combine to give the area its magnificent scenery. Key concerns of management are therefore to ensure that:

- such unique features are not damaged by anthropogenic activities;

- the area's unique array of landforms is utilised for educational purposes; and

- activities which diminish the landscape value of the area are managed.

2.6 Soils/Substrates

2.6.1 The Maltese Islands are characterised by a relatively young, undeveloped soil horizon, with soils characteristically rich in Calcium Carbonate and relatively poor in organic content. Three classes are recognised (Lang 1960):

- Terra Rossa – formed mainly from Coralline Limestone and represented at Dwejra by the Xagħra series (organic content = 3% or more);
- Xerorendzina – formed mainly from Globigerina Limestone and represented at Dwejra by the San Biagio series (organic content = 2%);
- Carbonate Raw Soils – formed mainly from Blue Clay and represented at Dwejra by the Nadur (organic content = 1%), Fiddien (organic content = low) and the San Lawrenz series.

2.6.2 In many areas of the Maltese Islands, soil complexes are also found. At Dwejra, one soil complex represented by l-Inglin soil is found (Malta University Services, 1996).

Soil is a valuable resource throughout the Maltese Islands. Management will therefore be concerned with reducing soil erosion, particularly through the maintenance of traditional rubble walls.

2.7 Hydrology/Hydrogeology

2.7.1 Marine, brackish and freshwater influences

2.7.1.1 The Site falls within the confines of two principal water catchments, which shed surface water into two networks of watercourses before discharging at il-Qawra and il-Bajja tad-Dwejra respectively. Two other smaller catchments discharge directly into il-Qawra (Figure 11). The deeply incised gorges were formed during pluvials, past periods of wetter climate, and watercourses now run dry except after heavy downpours. Sediment transport is relatively high, as indicated by heavy silting behind the dams constructed at Wied il-Kbir.

2.7.1.2 The influence of the dams has not been studied in detail; however, their presence is indicated in aerial photos dating back to 1957. This suggests that the dams may shield the boathouses bordering the Inland Sea from high volumes of run-off during stormy weather.

2.7.1.3 Two features of note in the area are the freshwater pools at il-Qattara and l-Ghadira ta' Sarraflu (Plate 7), both of which provide a habitat that is rare locally.

Plate 7

L-Ghadira ta' Sarraflu – Freshwater pool

The range of hydrological influences in the Qawra/Dwejra area results in a range of habitat types which endow the area with its rich biodiversity, including many elements that are rare. Management is therefore concerned with protecting such ecosystems.

2.7.2 Groundwater

2.7.2.1 Rainfall in the Maltese Islands averages 530 mm annually. Approximately 87% of this falls in winter. Of this rainfall, approximately 70% is lost to the atmosphere as evaporation/ transpiration, 6% is lost as run-off to the sea whilst 24% percolates into the ground. The hydrogeology and soils of the Dwejra area allow for infiltration and underground storage of rainwater in the Mean Sea Level Aquifer (where freshwater floats above the denser saline water at sea level). This aquifer has been heavily abused throughout the Maltese Islands because of over-extraction, resulting in a falling water table and saltwater intrusion into the aquifer. Evidence of an underground rock cut gallery is found at il-Qattara, the site of a locally quite unique natural permanent freshwater pool.

A key objective is to protect groundwater resources from pollution and over-extraction. Management will therefore encourage agricultural practices which reduce pollution of groundwater and will explore the possibility of preserving water supplies by using treated water from sewage treatment if possible.

2.8 Ecosystems (habitats) vegetation and ecological processes

2.8.1 Terrestrial ecology

2.8.1.1 Dwejra harbours a number of important habitat types which are in a relatively good state of conservation, mainly due to their isolation. Such habitat types include many typical of the Maltese Islands such as karstic terrain with steppe and garrigue, gently sloping rocky coast, vertical cliffs and various types of *widien*, as well as other more unusual habitats like freshwater wetland, saline marshland, freshwater pools and shingle beaches. Such localities are valuable, firstly as examples of rare habitat types and secondly, because they support a specialised biota. The Dwejra area supports high rates of endemism, with a substantial percentage of the endemic species and habitats found in the Maltese Islands actually occurring within the Dwejra area.

2.8.1.2 The main vegetation communities identified on Site are described below (MAP 1).

- Maltese rdum communities dominated by *Darniella melitensis*, *Daucus rupestris*, *Daucus gingidium*, *Limonium melitensis*, *Helichrysum melitense*, *Hyoseris frutescens*, *Chiliadenus bocconei* and *Cremnophyton lanfrancoi*;
- Maltese rdum communities based on *Darniella melitensis*, *Anthemis urvilleana*, *Capparis orientalis* and *Matthiola incana* subsp. *melitensis*;
- Treespurge formation based on *Euphorbia dendroides*;
- Labiate garrigue/Ermes mosaic;
- *Hypericum* phrygana;
- Ermes based on *Urginea pancration*, *Carlina involucrata*;
- Mediterranean subnitrophilous grass communities dominated by *Stipa capensis*;
- Reed beds colonised by *Arundo donax*;
- Watercourses;

N

Key

- Heritage Park Boundary
- Agricultural land cover (presently cultivated, fallow, ploughed)
- Mosaic of Maltese Rdum Communities
- Opuntia ficus-indica stands
- Archaeophytes (Ficus carica, Ceratonia siliqua, Olea europea)
- Abandoned agricultural land
- Arundo donax stands (Riparian cane formations)
- Long-abandoned fields/terraces or degraded parcels of land
- Watercourse (valleybed)
- Labiate garrigue/Ermes mosaic
- Ermes based on Urginea pancration, Carlina involucrata
- Mediterranean Subnitrophilous grass communities dominated by Stipa capensis
- Mediterranean Subnitrophilous grass communities dominated by Stipa capensis
- Ta' Sarraflu waterhole (Standing freshwater body)
- Tree Spurge Formation (Euphorbia dendroides)
- Quarry precincts (quarried area, spoil and ancillary facilities)
- Bare exposed rock/sparse vegetation
- Quarry precincts (quarried area, spoil and ancillary facilities)
- Rubble mound
- Ermes/Aerohaline mosaic (Carlina, Urginea, Inula)
- Thermo-Mediterranean heath garrigue/Hypericum phyrgana/Composite garrigue
- Hyblaeo-Maltese sea-cliff communities
- Agave americana plantation
- Planted Atriplex halimus bushes
- Maltese Rdum Community dominated by Helichrysum melitense
- Maltese Rdum Community dominated by Darniella melitensis/Helichrysum melitense
- Stack (Fungus Rock) with mosaic of Maltese Rdum Communities/Aerohaline elements
- Vitex agnus-castus stand (Chaste tree thickets)
- Athrocnemum

MAP 1

MEPA

Qawra / Dwejra Heritage Park - Action Plan
Terrestrial Ecological Resources

Compiled by Ecoserv Ltd. for Nature Trust (Malta) - Dwejra EU Life Project

- Hyblaeo-Maltese sea-cliff communities based on *Crithmo-Limonietalia* aerohaline assemblages of the cliffs and rocky shores with endemic sea-lavenders;
- *Athrocnemum* assemblages;
- Mosaic of Maltese rdum communities, Ermes, aerohaline and Mediterranean subnitrophilous grass communities;
- Aerohaline assemblages of the cliffs and rocky shores with endemic sea-lavenders;
- Ermes based on *Urginea pancration*, *Carlina involucrata*;
- Southern riparian galleries and thickets based on *Vitex agnus-castus*;
- Standing freshwater bodies;
- Ermes/aerohaline mosaic;
- Recently abandoned agricultural land;
- Long abandoned agricultural land undergoing secondary succession;
- Mosaic of aerohaline elements and rdum communities;
- *Eucalyptus* woodlots.

2.8.1.3 Additionally, stands of *Opuntia ficus-indica* and *Agave americana*, both alien species, also exist. There are also a number of mounds of construction debris in the area, which have been colonised by different macrophytic assemblages depending on the pool of proximal colonisers and on the age and stability of the mound.

2.8.1.4 It is also worth noting that the two freshwater ponds in the Dwejra area, i.e. il-Qattara and l-Ghadira ta' Sarraflu, are both scheduled as Level 1 Areas of Ecological Importance/Sites of Scientific Importance (Section 2.2.3).

2.8.2 Marine ecology

2.8.2.1 The major benthic assemblages (MAP 2) in the area are as follows:

- Biocoenosis of infralittoral algae;
- Ecomorphoses of *Posidonia oceanica* meadows consisting of:
  - Ecomorphosis of continuous *Posidonia oceanica* meadows on sand with enclaves of bare sand, and
  - Ecomorphosis of reticulate *Posidonia oceanica* meadows on sand with enclaves of bare sand;
- Biocoenosis of coarse sands and fine gravels mixed by waves;
- Biocoenosis of well-sorted fine sands;
- Biocoenosis of coarse sands and muddy heterogeneous sediment; and
- Biocoenosis of infralittoral stones and pebbles.

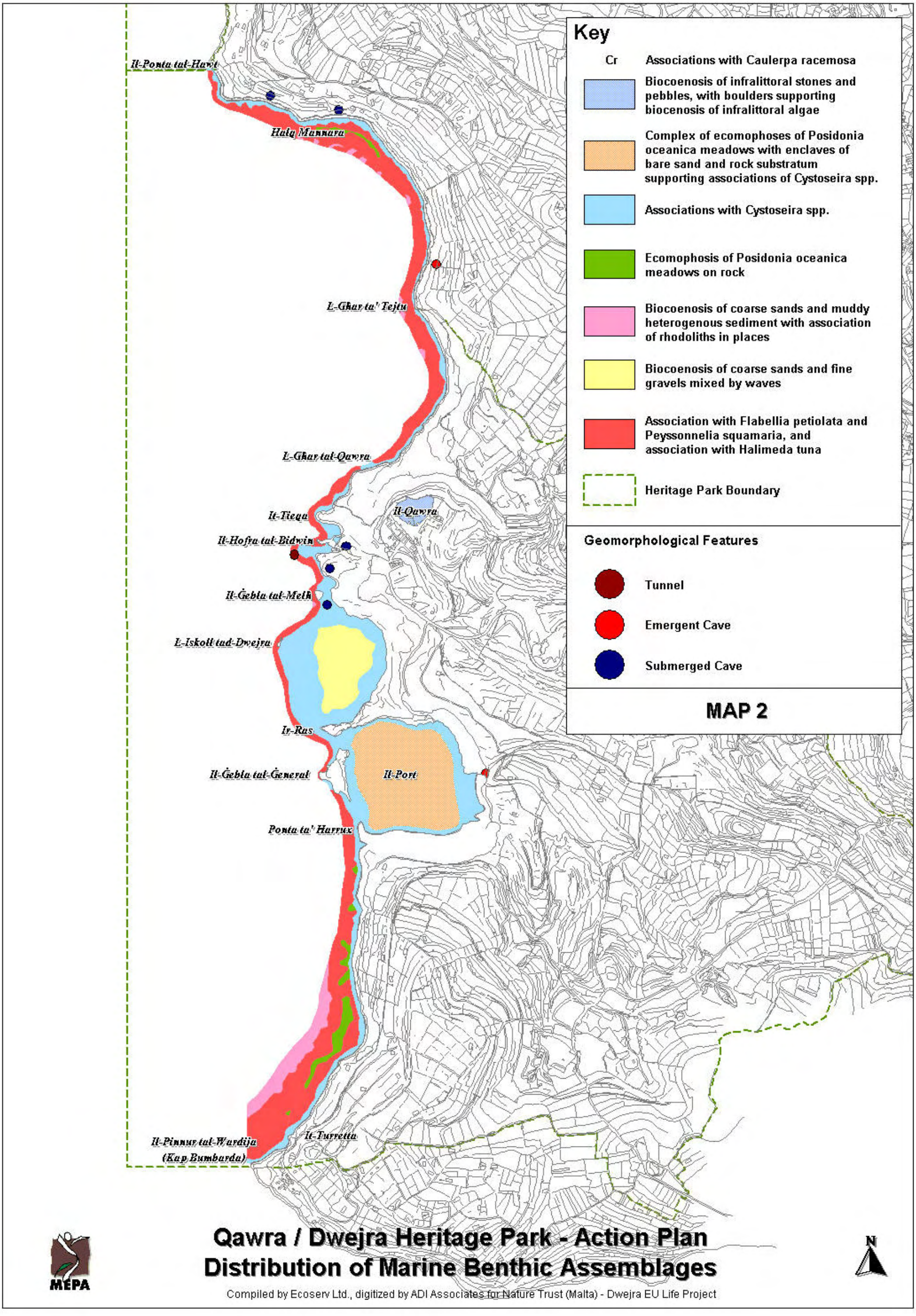
2.8.2.2 The Site includes several marine habitat types also declared as 'Natural Habitat Types whose conservation requires the designation of Special Areas of Conservation' by virtue of the Flora, Fauna and Natural Habitats Protection Regulations, 2003[22], the legislation which transposes the Habitats Directive locally. Such habitat types include sandbanks

notes and references

[22] ----Legal Notice 257 of 2003.

This legal notice transposes the provisions of the following EC Directive into Maltese Law:

Council Directive 92/43/EEC of 21 May 1992 *on the conservation of natural habitats and of wild fauna and flora* (Habitats Directive).


Il-Ponta tal-Hawt
Ħaġ Mannara
L-Għar ta' Tejtu
L-Għar tal-Qawra
It-Tieqa
Il-Qawra
Il-Ħofra tal-Bidwin
Il-Ġebla tal-Melħ
L-Iskoll tad-Dwejra
Ir-Ras
Il-Ġebla tal-Ġeneral
Il-Port
Ponta ta' Ħarrux
Il-Pinnur tal-Wardija
(Kap Bumbarda)
It-Turretta
Key
Cr
Associations with Caulerpa racemosa
Biocoenosis of infralittoral stones and pebbles, with boulders supporting biocenosis of infralittoral algae
Complex of ecomophoses of Posidonia oceanica meadows with enclaves of bare sand and rock substratum supporting associations of Cystoseira spp.
Associations with Cystoseira spp.
Ecomophosis of Posidonia oceanica meadows on rock
Biocoenosis of coarse sands and muddy heterogenous sediment with association of rhodoliths in places
Biocoenosis of coarse sands and fine gravels mixed by waves
Association with Flabellia petiolata and Peyssonnelia squamaria, and association with Halimeda tuna
Heritage Park Boundary
Geomorphological Features
Tunnel
Emergent Cave
Submerged Cave
MAP 2
MEPA
Qawra / Dwejra Heritage Park - Action Plan
Distribution of Marine Benthic Assemblages
Compiled by Ecoserv Ltd., digitized by ADI Associates for Nature Trust (Malta) - Dwejra EU Life Project
N

which are slightly covered by sea water all the time, *Posidonia* beds, reefs and submerged/partially submerged caves. The ecological, hydrormorphological and physio-chemical elements of the marine environment are also regulated by the Water Policy Framework Regulations *(L.N. 194 of 2004)*.

The Qawra/Dwejra site hosts a range of habitat types including both those that are typical and those that are rare. The high rates of endemism are also testimony to the ongoing evolutionary processes within the site. Protection of such ecosystems, habitats and ecological processes will be a priority of management. Management will also undertake to make good use of the area's natural heritage through education.

2.9 Flora

2.9.1.1 A substantial number of endemic species occur within the area, as well as rare species and species with a restricted distribution in the Maltese Islands or in the Mediterranean. These include the following:

Plant Species	*Status*	*Occurrence*	*Distribution*	*EU Importance*
Helichrysum melitense	Endemic	Very rare	Restricted (Maltese Islands)	Annex II, IV (Habitats Directive)
Zannichellia melitensis	Endemic	Rare	Restricted (Maltese Islands)	
Matthiola incana subsp. *melitensis*	Endemic	Rare		
Cremnophyton lanfrancoi	Endemic	Rare	Restricted (Maltese Islands)	Annex II, IV (Habitats Directive)
Cynomorium coccineum	Endemic		Restricted (Mediterranean and Maltese Islands)	
Chiliadenus bocconei	Endemic			
Anthemis urvilleana	Endemic			
Darniella melitensis	Endemic			
Hyoseris frutescens	Endemic			Annex II, IV (Habitats Directive)
Limonium melitensis	Endemic			
Senecio leucanthemifolius		Rare	Restricted (Mediterranean and Maltese Islands)	
Vitex agnus-castus		Rare	Restricted (Maltese Islands)	
Daucus rupestris			Restricted (Mediterranean and Maltese Islands)	
Hypericum aegyptiacum			Restricted (Mediterranean)	
Urginea pancration			Restricted (Mediterranean)	

2.9.1.2 Detailed species lists are derived from the background studies carried out by MEPA and Nature Trust. It is recommended that further studies of lower plants in the area be carried out.

2.9.1.3 Some of the endemic plants found in the area are palaeoendemics, relicts from the pre-glacial Mediterranean flora, and have no close relatives anywhere else in the world. These include *Cremnophyton lanfrancoi*, *Darniella melitensis*, *Chiliadenus bocconei* and *Hyoseris frutescens*. The genus *Cremnophyton* is also monotypic and therefore the genus is also endemic to the Maltese Islands.

Plate 8
Maltese Everlasting – Sempreviva ta' Għawdex – *Helichrysum melitense*

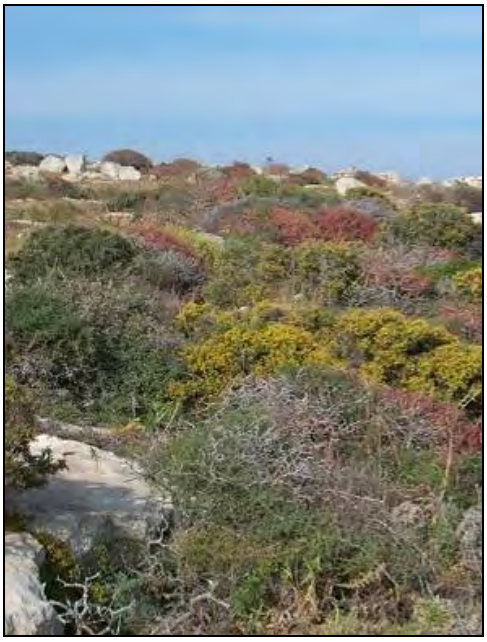
Photo by Nature Trust

2.9.1.4 A number of floral species within the Site are protected by virtue of the Flora, Fauna and Natural Habitats Regulations, 2003.[23] Other species are listed in Schedule II (Animal and plant species of interest whose conservation requires the designation of Special Areas of Conservation) of the same Regulations. Some floral species found within the area are also listed in Appendix I of the Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention) as Strictly Protected Flora Species. In addition, a

notes and references

[23] ----Legal Notice 257 of 2003.
This legal notice transposes the provisions of the following EC Directive into Maltese Law:
Council Directive 92/43/EEC of 21 May 1992 *on the conservation of natural habitats and of wild fauna and flora* (Habitats Directive).

number of tree species are protected by virtue of the Trees and Woodlands (Protection) Regulations, 2001.[24]



Relatively pristine garrigue *(Xagħri)*

Widnet il-Baħar

High garrigue characterised by Tree Spurge *(Tengħud tas-siġra)*

Pyramidal Orchid

Plate 9 - Types of flora found within the

Maltese Islands and within the Dwejra/Qawra Heritage Park

Photos courtesy of Mr. Louis F. Cassar

notes and references

[24] ----Legal Notice 12 of 2001.

This legal notice transposes the provisions of the following EC Directive into Maltese Law:

Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive).

2.10 Fauna

2.10.1 Invertebrates

2.10.1.1 A number of important species of beetles are found around *Il-Qattara*, including species confined to this locality, like the critically endangered beetles *Augyles maritimus* and *Aulacochthebius exaratus*. Other important species found around this freshwater habitat are threatened due to the rarity of their habitat, and consequently have a very restricted distribution in the Maltese Islands. These include the beetles *Octhebius celatus*, *Octhebius dilatatus*, *Potamonectes cerisyi* and *Siagona europea*, the amphipod *Orchestria gammarellus*, the freshwater spire-snail *Mercuria melitensis* and the dwarf pond-snail *Lymnaea truncatula*.

2.10.1.2 Apart from the fauna of *Il-Qattara*, several other endemic invertebrates are found in the Dwejra area. These include the endemic snails *Muticaria macrostoma* and *Trochoidea spratti*, the endemic pseudo-scorpion *Chthonius maltensis* and various endemic beetles including *Allophylax picipes melitensis*, *Heliopathes avarus dwejrensis*, *Laemostenus picicornis melitensis*, *Pimelia rugulosa melitana*, *Stenosis melitana*, *Stenostoma melitense* and *Tentyria laevigata leachi*. The endemic woodlouse *Armadillidium schmalfussi* is also found here, as is the very rare *Spelaeoniscus vallettai*, for which Dwejra is the type locality[25].

2.10.1.3 Marine invertebrates associated with the *Posidonia oceanica* meadows include numerous species of molluscs, polychaetes, crustaceans and echinoderms that seek refuge in the leaf canopy and root-rhizome layers and are hence less conspicuous. Additionally, several species of sponges, corals, sea urchins, sea stars, crabs and anemones occur in the area. Of particular note is the existence of small populations of *Pinna nobilis*, *Centrostephanus longispinus* and *Scyllarides latus*.

2.10.2 Fish

2.10.2.1 Demersal species recorded in the area include the cephalopods *Sepia officinalis* and *Octopus vulgaris*, together with many fish species, of which the most abundant are combers (*Serranus scriba* and *Serranus cabrilla*), ornate wrasse (*Thalassoma pavo*), rainbow wrasse (*Coris julis*), wrasses (*Crenilabrus* spp. and *Labrus* sp.), damselfish (*Chromis chromis*), red mullet (*Mullus surmuletus* and *Gobius* spp.), black scorpionfish (*Scorpaena porcus*), and parrotfish (*Sparisoma cretense*). Other less abundant demersal fish species include red scorpion fish (*Scorpaena scrofa*), grouper (*Epinephelus guaza*), cardinalfish (*Apogon imberbis*), swallowtail seaperch (*Anthias anthias*), brown meagre (*Sciaena umbra*), eagle ray (Myliobatis aquila), moray eel (*Muraena Helena*), conger eel (*Conger conger*), and forkbeard (*Phycis phycis*).

notes and references

[25] ---The type locality of a species refers to the location from which the type specimen originated. The type specimen is the first plant of its kind collected for science, submitted for classification purposes, and stored in a herbarium.

Plate 10
Existing promotional material in Malta showing marine species

2.10.2.2 Pelagic fish fauna mainly comprises shoals of saupe (*Sarpa salpa),* bogue (*Boops boops*), picarel (*Spicara smaris*), amberjack (*Seriola dumerilii*), barracuda (*Sphyraena sphyraena*) and saddled bream (*Oblada melanura*).

2.10.2.3 It is also worth noting that anecdotal evidence suggests the presence of *Hippocampus* sp. near the so-called 'coral cave' (P. & S. Miller, SCUBA SCENES Ltd. and X. Hancock, personal communication, November 2004). However, it has not yet been determined whether the area serves as a breeding Site for *Hippocampus* sp. and further studies are recommended.

2.10.3 Amphibians and reptiles

2.10.3.1 An important reptile in the area is the General's Rock Lizard (*Podarcis filfolensis generalensis*), endemic to Fungus Rock in the Dwejra area. Other species known to occur in the area include the Maltese Wall Lizard (*Podarcis filfolensis maltensis, Plate 11 Below*), the Moorish Gecko (*Tarentola mauritanica*), the Turkish Gecko (*Hemidactylus turcicus*) and the Western Whip Snake (*Coluber viridiflavus, Plate 12 Below*).

2.10.3.2 The only amphibian of the Maltese Islands, the Painted Frog *Discoglossus pictus pictus* is found mainly in the areas where freshwater is present.

Plate 11

Maltese Wall Lizard

2.10.3.3 All local reptiles are protected by virtue of the Reptiles (Protection) Regulations, 1992[26]. *Podarcis filfolensis generalensis* and *Podarcis filfolensis maltensis* are also listed in Schedules II and V of the Flora, Fauna and Natural Habitats Protection Regulations, 2003[27]. Schedule II lists 'Animal

2.10.3.4 and plant species of interest whose conservation requires the designation of special areas of conservation', whilst Schedule V lists 'Protected Fauna'.

2.10.3.5 *Discoglossus pictus pictus* is protected by virtue of the Flora and Fauna Protection Regulations 1993, as amended, being listed in Schedule II (Protected Fauna). It is also listed in Schedule V (Protected Fauna) of the Flora, Fauna and Natural Habitats Protection Regulations, 2003.

notes and references

[26] ----Legal Notice 76 of 1992.

[27] ----Legal Notice 257 of 2003.

This legal notice transposes the provisions of the following EC Directive into Maltese Law:

Directive 92/43/EEC of 21 May 1992*on the conservation of natural habitats and of wild fauna and flora* (Habitats Directive).

2.10.3.6 Some species of reptile found in the Site are also listed in Appendix II (Strictly Protected Fauna Species) and Appendix III (Protected Fauna Species) of the Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention). The amphibian *Discoglossus pictus* is also listed in Appendix II.

Plate 12

Western Whip Snake

Photo: Kevin J. Sciberras.

2.10.4 Birds

2.10.4.1 With respect to birdlife, the Dwejra area is important for two main reasons:

- It provides a diverse array of habitats for both resident birds and migrants;
- In view of the area's geographic location on the coast, it offers the possibility for migrant species to funnel inland through the low-lying Wied Ilma/Wied il-Mans valley system.

2.10.4.2 Breeding birds occurring in the area, as well as those species which may breed in the area in view of the suitable habitats present, include Cory's Shearwater (*Calonectris diomedea*), Kestrel (*Falco tinnunculus*), Peregrine (*Falco peregrinus*), Quail (*Coturnix coturnix*), Moorhen (*Gallinula chloropus*), Yellow-legged Gull (*Larus cachinnans*), Rock Dove (*Columba livia*), Barn Owl (*Tyto alba*), Short-toed lark (*Calandrella brachydactyla*), Blue Rock Thrush (*Monticola solitarius*), Fan-tailed warbler (*Cisticola juncidis*), Spectacled Warbler (*Sylvia conspicillata*), Sardinian Warbler (*Sylvia melanocephala*), Spanish Sparrow (*Passer hispaniolensis*) and Corn Bunting (*Miliaria calandra*).

2.10.4.3 All of the above-mentioned species are protected by virtue of the Protection of Birds and Wild Rabbit Regulations, 1993 as amended[28] (although hunting and trapping of *Coturnix coturnix* and hunting of *Gallinula chloropus* are permitted, subject to conditions). A number of the above-mentioned birds are also listed in Annex 1 of the Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (Birds Directive).

Plate 13 – Scops Owl and Cory's Shearwater

Photo: John J. Borg

2.10.5 Mammals

Chiropterofauna

2.10.5.1 *Myotis blythi punicus*, *Pipistrellus pipistrellus*, *Pipistrellus pygmaeus*, *Pipistrellus kuhli* and *Plecotus austriacus* are known from the area (Borg, Fiore, Violani and Zava, 1990).

2.10.5.2 All bat species recorded in the Maltese Islands are declared protected by virtue of the Flora, Fauna and Natural Habitats Protection Regulations, 2003.

Plate 14 – Myotis Punicus

Photo: John J. Borg

notes and references

[28] ----Legal Notice 146 of 1993 as amended by Legal Notice 45 of 1996, Legal Notice 23 of 1997, Legal Notice 216 of 1997, Legal Notice 75 of 1998, Legal Notice 107 of 2000, Legal Notice 333 of 2001, Legal Notice 1 of 2002, Legal Notice 41 of 2003, Legal Notice 56 of 2003, Legal Notice 158 of 2003 and Legal Notice 222 of 2003.

Cetacea

2.10.5.3 According to local sightings in 2004, species of *Delphinidae* were noted in the area, particularly *Tursiops truncatos*. In the 1980s, a number of dolphins were trapped in the Inland Sea area after a storm. All locally-occurring species of cetacea are protected by virtue of the Marine Mammals Protection Regulations, 2003 [29] and some species are also listed in Appendix II (Strictly Protected Fauna Species) of the Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention).

Insectivora

2.10.5.4 The endemic Sicilian Shrew *Crocidura sicula calypso* is known from rubble walls in the area.

2.10.5.5 *Crocidura sicula* is listed in Schedule V (Protected Fauna) of the Flora, Fauna and Natural Habitats Protection Regulations, 2003. It is also listed in Appendix III (Protected Fauna Species) of the Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention).

The Qawra/Dwejra site is home to a wide range of species including many endemics and/or species with a restricted distribution. Several species are also protected by means of various national and international legal instruments. A priority of management will therefore be protection of these species from harmful anthropogenic impacts.

2.11 Human use within the Site

As with practically all of the Maltese Islands, the Site has a long history of human use and interventions – some of which have given rise to important characteristics and landscape features of the Site whilst others have resulted in the degradation of the Site.

2.11.1 Nature conservation

2.11.1.1 At present there is no formal management of the Site or any parts thereof. However, some components of the area are protected by means of several legal instruments, as described above.

2.11.1.2 Given the scientific importance of the area, nature conservation will be a key goal of management. Whilst the aim of this Action Plan is not to prohibit access and all anthropogenic activities on Site, management of anthropogenic influences is necessary so as not to compromise the integrity of natural features on Site. For this reason the aim of management will be to attempt to reconcile nature conservation with human activities in as sustainable a way as possible. The creation of a Marine Protected Area could be a significant development in this regard, catering for the needs of divers whilst protecting species from over-exploitation and thus providing, in the long-term, an area allowing stocks to replenish.

notes and references

[29] ----Legal Notice 203 of 2003.

2.11.2 Agriculture

2.11.2.1 Farming has shaped much of the landscape of the Maltese Islands, with terraced fields and rubble walls forming an intrinsic part of local heritage. Agriculture has, however, been on the decrease in recent years and is now largely a part-time enterprise for many farmers. The full-time gainfully occupied persons in agriculture represent only 1.1% of the total gainfully occupied population. Land is being abandoned in several places with the result that rubble walls are falling into disrepair and soil is being lost. In some cases lack of human intervention in abandoned fields has allowed natural regeneration through secondary succession. In other areas, abandoned land is used for bird trapping or has been overrun by opportunistic species.

Plate 15

Terraced Fields at *Ta' Ghajn Abdul*

2.11.2.2 Data on agricultural land within the Site itself will be available once the responsible authorities complete their respective studies. Agricultural land constitutes approximately 70% of the total land area. However, agricultural land within the confines of the three main local councils bordering the Site is as shown in Table 3 below:

Table 3
Agricultural land within the confines of the three local councils bordering the proposed Qawra/Dwejra Heritage Park

District	Total land declared by farmer ha	Total agricultural land area ha	of which		Garrigue land ha
			Irrigated Land /ha	Dry Land Land /ha	
Għarb	127.914	119.951	1.461	118.490	7.963
San Lawrenz	89.809	80.504	7.081	73.423	9.305
Kerċem	249.377	230.522	14.350	216.172	18.855

Source: Rural Development Department, 2004

2.11.2.3 The area of cultivated land in summer is much less than that in winter due to the lack of water and excessive heat. Agriculture within the Dwejra area also suffers from several additional constraints including:

- lack of adequate soil depth and high alkalinity which inhibit successful growing of deep-rooted plants and fruit trees;
- limited access to fields prohibiting use of modern machinery; and
- exposure to winds and sea spray which many agricultural products do not withstand.

2.11.2.4 A number of agricultural practices currently conflict with conservation objectives[30] of the area. Such conflicts include, for instance, damage to species in freshwater habitats because of high concentrations of pesticides that leach from fields. Other practices, such as the torching of fallow agricultural land and wasteland, are highly detrimental to birdlife.

2.11.3 Recreation

2.11.3.1 The Dwejra area is heavily utilised for numerous recreational pursuits by Maltese, Gozitans and tourists. Such activities include trekking, sports climbing,[31] coasteering,[32] abseiling, leisure fishing, boating, swimming and SCUBA diving. Picnics and barbecues are also commonly held within the Site. Illegal recreational activities such as offroading are also carried out within the area. The area is also used for seasonal recreational activities such as hunting and trapping, camping and annual fairs.

2.11.3.2 The area also attracts approximately 750,000 tourists a year, of which approximately 40,000 visit the Site for diving.

notes and references

30 ----Conservation objectives are defined in section 4.3 of this document.

31 ----Sports climbing is an activity where one climbs a vertical cliff face with the assistance of safety equipment.

32 ----Coasteering is a new up-and-coming sport where one navigates around the coastline combining the following skills: swimming and climbing amongst other sport practices.

2.11.3.3 Parts of the Site are subject to heavier recreational pressures than others. The Inland Sea, for instance, is frequented by several families owning boathouses in the area, which are often used as summer residences (Plate 16). Similarly, parts of the marine environment such as the Blue Hole are heavily frequented by divers; Marine caves may also be negatively impacted by air bubbles left by divers. Recreational pressures are also unevenly distributed over time, with higher numbers of visitors to the area in the summer months, which is also the peak tourist season.

Plate 16
Aerial view of boathouses bordering the Inland Sea

2.11.3.4 To date, there has been practically no management of such activities in the area. There has been no systematic study of the impact of such activities on features within the area; however, it is safe to say that these vary according to:

- the nature of the activity;
- the intensity of the activity; and
- responsible/irresponsible behaviour by those carrying out the activity.

2.11.3.5 A number of the activities mentioned above could be compatible with the conservation objectives of the area, provided they are well-managed and carried out responsibly. For other activities, such as hunting and trapping, it is likely that a detailed assessment of impacts needs to be carried out. Other activities such as offroading are highly detrimental to the area and illegal, and should be eliminated altogether.

2.11.4 Hunting, trapping, and fishing

2.11.4.1 Bird hunting and trapping are popular pursuits throughout the Maltese Islands, with a long historical tradition. Unfortunately, rampant abuses and low enforcement capabilities, coupled with degradation of natural habitats and disturbance, have resulted in significant adverse impacts on local bird populations. These are of particular concern given that Malta lies on a main migration route for narrow-front mi-

Plate 17
Trapper's hide in the Dwejra area

grants[33] such as raptors and also serves as a stop-over for other broad-front migrants, mostly breeding in Eastern Europe (S. Gatt, personal communication, March 2004).

2.11.4.2 Several bird species occurring within the area, even if protected, have been subject to persecution. Cory's Shearwater (*Calonectris diomedea*), for instance, is killed not only for pleasure shooting but also for use as bait in fishing. Other species which were known to breed regularly in the area in the past, such as the Kestrel (*Falco tinnunculus*), now breed only occasionally. Although the decline in bird numbers cannot be solely attributed to hunting and trapping, the control of such activities must be a paramount consideration in the management of the Site. Similarly, the control of other activities damaging to birdlife such as the burning of fallow agricultural fields, is necessary.

2.11.4.3 Several trapping hides are noticeable within the proposed Qawra/Dwejra Heritage Park. Apart from impacts of trapping on birdlife and of trapping hides on landscape (Plate 17) trappers also frequently use herbicides to clear vegetation from trapping sites. Some trappers also burn trapping sites in order to clear vegetation.

2.11.4.4 The Dwejra area was in the past a notoriously rich area for fishing. The Inland Sea was traditionally exploited by fishermen who took advantage of the shelter it offered for storing and launching their boats. Several boathouses bordering the Inland Sea were in fact built for this purpose. Nowadays, fishing has declined, both in line with a general trend and perhaps also because many fishermen note that fish stocks in the area have declined considerably. A number of boathouses are no longer used for fishing purposes.

2.11.5 Extraction

Quarrying

2.11.5.1 Mineral extraction within the area consists almost entirely of Globigerina Limestone quarries operating in a surface extractive manner (Plate 18). In Gozo, all major soft stone quarries are located within the Dwejra area. The quarries are therefore important in terms of economic return and employment. Direct employment within the Dwejra quarries provides a steady income for approximately 10 families. There are, however, considerable negative impacts to be considered. Quarrying has resulted in the eradication of important habitats and has caused irreversible damage to the landscape.

Plate 18
Quarries in the Dwejra area

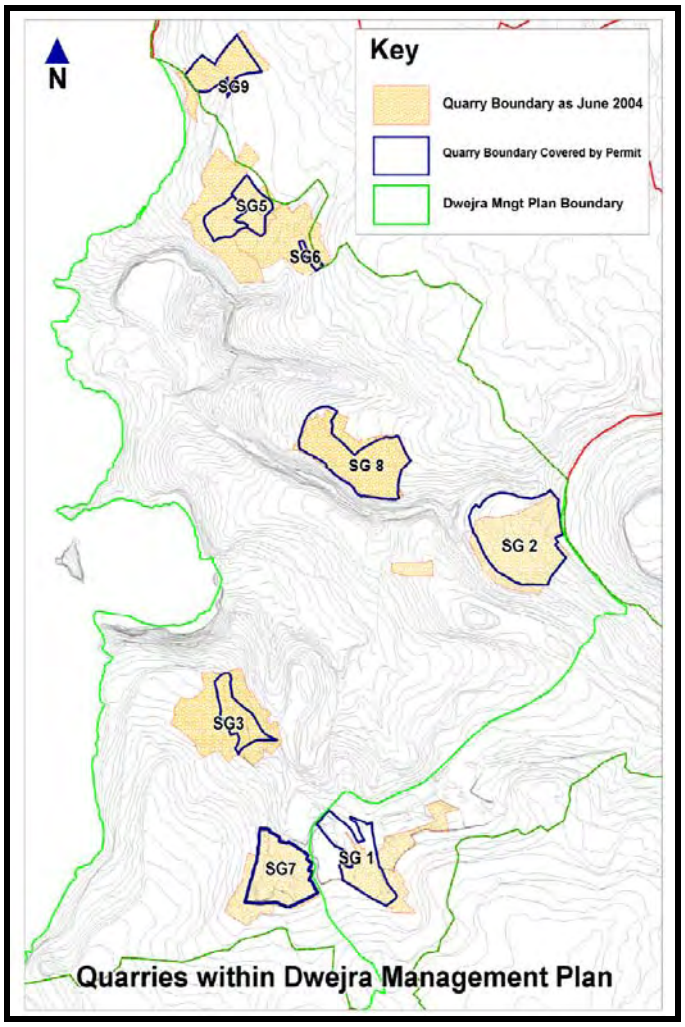
notes and references

[33] ----Narrow-front migration occurs along specific coasts, rivers, mountain ridges or possibly chains of oases as guidelines or leading lines. Broad-front migration occurs largely independently of geomorphologic and landscape features (Berthold 1996).

2.11.5.2 There are also secondary effects related to debris mounds, transport of sediment and dust and heavy vehicle traffic. Although some inactive and spent quarries have been rehabilitated into agricultural land, the permanent scars on the landscape are still visible. Deposition of rubble waste in and around valleys has also tended to negatively impact biotic communities by encouraging colonisation by weedy, invasive plants.

2.11.5.3 A key concern with quarries in the Dwejra area is infringement of legal boundaries (Figure 12). Only one quarry in the area operates within its legal limits, whilst all the others have exceeded their approved footprint and are subject to enforcement action by MEPA. There are also a number of pending applications for expansion.

Figure 12
Infringements of legal quarry limits in the Qawra/Dwejra area as of June 2004



Source: MEPA

Salt extraction

2.11.5.4 Some salt extraction has also taken place in the past through a system of saltpans hewn in the rock. However, it appears that such activity has now been discontinued or is minimal.

2.11.6 Water use

2.11.6.1 The flow of run-off through the area's water catchments is relatively low (see Section 2.7). This is due not only to the dry climate but also the good water-retention capability of the soil in both main watersheds, as well as the presence of numerous artificially-constructed dams which give the water time to infiltrate. It is also worth noting the presence of a number of cisterns scattered within the watersheds and used by farmers during the dry season for irrigation purposes.

2.11.6.2 Il-Qattara was exploited by locals as a source of freshwater in the past. Today campers often use the site for provision of freshwater. The site also holds an underground water gallery.

2.11.7 Education, demonstration and research

2.11.7.1 Dwejra possesses unique potential as an educational site. It lends itself to the study of geology, geomorphology, palaeontology, ecology, flora, fauna, evolutionary biology and history of the Maltese Islands, as well as to the evolution of the central Mediterranean Pelagian Block. In addition, there already exists a wealth of scientific knowledge on the area, with numerous studies having been conducted detailing the flora, fauna, geology, geomorphology, hydrology and other aspects of the Heritage Park. The area is in fact occasionally utilised for educational visits targeting both students and the general public.

2.11.7.2 However, there are still several areas where research is lacking and ought to be encouraged. These include research on lower plants in the area, research on marine species and quantitative research on the extent and the impact of activities in the area.

2.11.8 Other Uses

2.11.8.1 The leisure activities which take place within the Heritage Park area contribute towards maintaining the social fabric of the surrounding villages.

2.11.8.2 The Qawra/Dwejra area is also utilised for other purposes in addition to those listed above. One such use is for filming. The beauty of the area has made it a popular setting for filming of foreign films/TV series. Although potentially beneficial in economic terms, such activities have on occasion resulted in degradation of the area. This sector however has a positive potential for the Island.

2.11.8.3 Within the Dwejra area, one also finds a chapel dedicated to St. Anne and originally constructed in the 1950's. Mass is celebrated regularly therein. A fair is also organised annually by the Parish community and is usually held in the parking area. During the fair, however, visitors also tend to frequent other parts of the area.

2.11.8.4 The Site does not have any permanent residents but some boathouse owners often spend time at Qawra for leisure purposes. The nearest communities fall within the confines of three local councils:

- San Lawrenz, with a population of 562 residents;
- Għarb, with a population of 1035 residents; and
- Kercem, with a population of 1634 residents.

The Qawra/Dwejra area is subject to a range of human uses, presenting both a challenge and an opportunity for management. Whilst management of such activities is critical to ensure that the integrity of the Site and its features is not compromised, the area also has unique potential for serving cultural, economic, educational, recreational and tourism purposes.

2.12 Economic aspects and population

2.12.1.1 Economically, the Dwejra area is important for the following commercial activities:

Quarrying

2.12.1.2 (Refer to Section 2.11.5 above)

Agriculture

2.12.1.3 (Refer to Section 2.11.2 above)

Boat trips

2.12.1.4 This activity traditionally dates back some 50 years. It started out with fishermen taking out visitors through the tunnel linking the Inland Sea to the open sea, but with the growth of tourism to the area, it has since developed into a full-time job for many. The first official licenses for boat trips were issued in 1991 and to date, eight operators are licensed to operate in the Dwejra area. Other applicants are still awaiting a decision on their application. The license holders operate their own boats, most of which were recently converted to 4-stroke engines at the owners' own initiative to reduce environmental impact and noise levels. Seven of the eight boats are housed within the Qawra boathouses (Public Transport Authority, 1997).

Scuba diving

2.12.1.5 Diving has become one of the main niche tourism markets for the Maltese Islands, attracting more than 35,000 divers annually (together with an estimated 20,000 accompanying visitors) (Malta Tourism Authority, 2003). More than 30 licensed dive centres operate on the Islands. Dwejra is considered as a prime diving site with over eight possible dives of national and international merit. The 'Blue Hole', in particular, is considered one of the top dive sites in the Mediterranean. In one survey in DIVE magazine, for instance, it was listed as one of the top ten dive sites in Europe, and was advertised as

the Mediterranean's only known Blue Hole and a real geological anomaly.

2.12.1.6 One dive centre has been operating from Qawra for the past ten years but it is not yet officially recognised or licensed. The centre has on countless occasions provided services to divers, for instance those in need at sea, or even simply for accessories needed during dive preparation. This is currently the only point of reference for divers coming on site. Apart from this centre, the nearest dive centres are at Xlendi.

Guided tours/excursions

2.12.1.7 Dwejra is a very popular tourist destination, especially during the peak summer season. Guided tours and excursions often include a brief stop at Dwejra. Although insufficient to

do justice to the area, trips to Dwejra are often of short duration of necessity because of tight schedules. Major tourist attractions include the Inland Sea and the Azure Window. Some tourist guides encourage tourists to take a boat trip around the area (often entailing a commission for the guides). Such trips are also important for the souvenir shops in the area (refer to Section 2.12.1.7 below).

Amenities

2.12.1.8 A number of amenities are offered within the Dwejra area. A boathouse at Qawra serves as a bar whilst a fast food shack with tables and umbrellas operates from the car park area. A souvenir shop also sells items from an old building in the car park. In addition, the area is frequented by hawkers, especially during the peak season.

Conservation objectives and economic objectives often tend to conflict. Whilst some economic activities within the Qawra/Dwejra area can be easily reconciled with conservation, others will need to be modified whilst others may require a thorough rethinking. Management will formulate separate strategies regarding the different economic activities carried out within the site.

2.13 Past human land use

2.13.1.1 Historically the Dwejra area served various purposes. Agriculture has long been practised in the area. The numerous rubble walls and terraced fields are evidence of the extent of agricultural land use in the past. Quarrying for Globigerina and Lower Coralline Limestone blocks has also been historically important, evidence of which are two old quarries on site. Buildings constructed within the area have also served a variety of purposes. The Knights' Tower and the remains at it-Turretta indicate the use of the area as a coastal watch-post in the past. More recently, the boathouses at the Inland Sea and il-Port were used as shelters for boats and fishermen. The area was also traditionally important for medicinal plant collection, particularly with regard to the so-called Malta Fungus (Cynomorium coccineum) growing on Fungus Rock. The plant was once believed to have medicinal powers, and strict controls on its harvesting were implemented

Plate 19
Cynomorium coccineum

Photo: John J. Borg

by the Knights of St. John. Those caught gathering the plant unlawfully were punished by being sent to the galleys.

The Qawra/Dwejra area has long been utilised for a variety of purposes by Man. The key challenge for management will be reconciling human land use with conservation objectives within the site.

2.14 Cultural land use

2.14.1 Archaeological artefacts

2.14.1.1 The Dwejra area possesses a rich array of archaeological features. These include the following:

Plate 20
Cart ruts located at *Fuq it-Tieqa*

Cart ruts

2.14.1.2 The subject of much discussion and speculation, cart ruts (possibly dating back to the Bronze Age or to Roman times, Plate 20) still present an unresolved feature of archaeological importance in the landscape. They are less common in Gozo than in Malta; however, the Dwejra/Qawra area contains seven separate stretches of cart ruts. Originally these were almost certainly linked but have probably been cut up into several separate stretches through erosion of the bedrock. Some stretches are very well preserved and show unusual characteristics, such as differences in level between one rut and another.

Quarries

2.14.1.3 Two old quarries are found within the area, which may be considered to be of secondary importance. The large quarry at iż-Żerqa, however, is of particular interest as it appears to have been used for the cutting of unusually large blocks of stone.

Remains of a circular building

2.14.1.4 The remains of a circular structure are found on the bare sloping ground overlooking the Inland Sea. Its original purpose is to date unknown, although local tradition asserts that it served as a medieval chapel. However, it seems that the building technique resembles more that of a Bronze Age 'Cyclopean' or pre-classical structure