



L-Inħawi tal-Għadira

Natura 2000 Management Plan (SAC / SPA)



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Project description

The Project "Management Planning and Implementation of Communication measures for Terrestrial Natura 2000 Sites in the Maltese Islands" was funded by the EAFRD and pioneered by MEPA. It aims to establish management plans or legal provisions for the management of all terrestrial Natura 2000 sites in the Maltese Islands, and to increase awareness of the Natura 2000 network amongst the general public and stakeholders.

The Project started in October 2012 and ended in March 2014. It is considered a milestone in the protection of Malta's rural environment and undertakes necessary actions required in management planning for the 34 terrestrial Natura 2000 sites: 27 terrestrial Special Areas of Conservation (SAC) and 7 Special Protection Areas (SPAs).

The Project involved gathering information, carrying out surveys, defining Conservation Objectives and identifying management measures with intensive stakeholder involvement. These management plans are not intended to restrain recreational or other economic activities within the sites, but rather to support sustainability of Malta's natural resources with the involvement of stakeholders. A Vision has been formulated for the ideal condition of each Natura 2000 site, to be achieved after a period of management.

The Project delivered awareness campaigns on Natura 2000 sites amongst public and specific target groups such as farmers and land managers. It set the ground and has equipped key stakeholders with knowledge and skills necessary to effectively participate in the management planning process. In that respect, the Project will help Malta fulfil its EU and international commitments by informing, educating, encouraging ownership, and building momentum for the implementation of the EU Natura 2000 network of protected areas whilst improving quality of life in rural communities.

Produced by

Epsilon International SA - Adi Associates Environmental Consultants Ltd Consortium, Malta
www.epsilon.gr // www.adi-associates.com // www.natura2000malta.org.mt

Management team

Epsilon International SA	Adi Associates Environmental Consultants Ltd
Despina Kallidromitou	Adrian Mallia
Marc Bonazountas	Rachel Xuereb

Key experts

Despina Kallidromitou, Thomas Arapis, Eman Calleja, Perit Philip B. Grech, Marlene Borg, Michael Parlato Trigona, Adrian Mallia

Team experts

Niki Kardakari, Krista Farrugia, Rachel Xuereb, Andrea Pace, Eilis McCullough, Edwin Lanfranco, John Borg, Athanasia Kassela, Dimitris Skarlatos, Fay Nakou, Elli Chourdaki

Contract

No. CT3101/2011, Malta Environmental Planning Authority (MEPA)
St. Francis Ravelin, Floriana, Malta, www.mepa.org.mt
Project leader: Mr Darrin T. Stevens

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For Information

Environment and Resources Authority	+35622923500	info@era.org.mt
Site Designation & Management Team (ERA)	+35622923665	protected.areas@era.org.mt
Adi Associates Environmental Consultants Ltd	+35621378172	info@adi-associates.com
Epsilon International S.A.	+302106898610	central@epsilon.gr

VISION STATEMENT FOR L-INĦAWI TAL-GĦADIRA

The vision for L-Inħawi tal-Għadira presents the desired result once this protected area has been managed for some time. The vision for the site is:

At L-Inħawi tal-Għadira, all natural habitats, native vegetation and wildlife have continued to flourish. The site will remain an important national beacon for environmental awareness and education. Visitors to the area will experience a unique connection with nature, and tourism and outdoor recreation will be carried out with sensitivity to the site's conservation needs.

Agricultural activities will be practised without disturbing the protected ecological features of the site. Local farmers and land owners will help protect the site's wonderful biodiversity, including its bird life.

The site will also enjoy full legal protection under national regulations and policies, to ensure its habitats and biodiversity are maintained and continue to develop.

EXECUTIVE SUMMARY

Introduction

The L-Inħawi tal-Għadira Special Area of Conservation (SAC) and Special Protection Area (SPA) (hereinafter referred to as L-Għadira) is found within the Mellieħa locality boundary. To the north of the site is the Marfa Ridge whilst to the south is the Mellieħa Ridge. The site incorporates a large part of the Mellieħa Valley and a small part of the southern part of the Marfa Ridge. The western part of the SAC/SPA adjoins the Rđumijiet ta' Malta: Ir-Ramla taċ-Ċirkewwa sar-Ramla tal-Mixquqa Management Plan area. The seaward area to the east of the site borders Il-Grigal ta' Malta Marine Protected Area.

The Inħawi tal-Għadira SAC is one of the larger SACs within the Maltese Islands. It extends over a surface area of 97.74 Ha, and supports a variety of habitats that include a small saltmarsh, a brackish wetland, sand dunes, garrigue/phrygana, steppe, a small valley and agricultural land. This SAC is also one of the richest in biodiversity, particularly for avifauna. It supports one of the most successful bird sanctuaries in the country, acting as a nesting and breeding site for a number of protected species. The latter aspect attracts many visitors to the area, making the Għadira reserve the most popular Wetland Reserve in Malta, with around 8,000 visitors a year, many of whom include school children. In view of this, this SAC is an important site for ecotourism and environmental education.

The Site's Biodiversity and the Factors Affecting It

The habitats of importance in this SAC (listed in the Habitats Directive under Annex I) include:

- Coastal lagoons (Habitat 1150);
- *Salicornia* (Twiggy Glasswort) and other annuals (plants that complete their lifecycle within one year) colonising mud and sand (Habitat 1310);
- Mediterranean salt meadows (subject to flooding by sea water) (Habitat 1410);
- Mediterranean and thermo-Atlantic halophilous scrubs perennial vegetation of marine saline muds) (Habitat 1420);
- Dunes supporting the dune species *Euphorbia terracina* (Coast Spurge) (Habitat 2220);
- Spiny spurge garrigues dominated by Mediterranean shrubby species such as Wild Thyme, Maltese Spurge and/or Wolfbane (Habitat 5330);
- Garrigue/phrygana dominated by the Shrubby Kidney Vetch and Wild Thyme (Habitat 5410); and
- Steppe dominated by the Mediterranean False Brome and Wild Thyme at this site (Habitat 6220).

Field surveys, desk studies and expert knowledge were applied to evaluate the conservation status of all Annex I habitats. Three discrete spatial units, the Għadira Bird Sanctuary, Is-Sdieri and Il-Bisqra are distinguished within the site, based on habitat type character and special designations.

The Coastal Lagoon at l- Għadira is considered as probably the best example of this habitat

in the Maltese Islands. The lagoon supports a thriving population of the endemic Annex II species, the Maltese Killifish and a considerable number of Annex I bird and migratory bird species. The lagoon also presents suitable foraging habitat for bats. Over 100 species of invertebrates are known from the reserve as well as the only species of amphibian in the Maltese Islands, the Painted Frog.

The main reason behind the creation of the Għadira wetland was to provide a variety of bird species with ideal breeding grounds, as well as an important feeding and resting area for migratory birds. The Black winged Stilt is establishing a breeding population within the Għadira lagoon, with 3 successful nesting pairs in 2013. Other breeding birds at the reserve include the Little Ringed Plover and the Moorhen, and the passerines the Zitting Cisticola, the Sardinian Warbler and Cetti's Warbler.

The Short-toed Lark has a breeding population of 3-5 pairs at the garrigue patch situated in the western end of the site.

The reserve is an important stopover in both spring and autumn migration periods. Over 100 migratory bird species have been recorded at L-Għadira Wetland Reserve and flocks of herons and egrets can exceed fifty birds at any one time. Passerines also winter within the reserve.

The dune habitat is heavily disturbed as a result of the road that intersects the dune system, disconnecting it from the beach. Reclamation for agriculture and habitat modification prior to the Wetland Reserve creation obliterated the largest part of the remaining inland dunes. Nowadays, a remnant habitat, of an area of 11,300 m² patch is present within the outer grove of the Għadira Wetland Reserve. This habitats patch is still densely vegetated with alien species, including invasive Acacia and ruderals. Two Annex II invertebrate species are known from this area, a cricket and a beetle.

The garrigue at Is-Sdieri is partially degraded, and planted pine trees have also replaced part of this habitat. The garrigue at Il-Bisqra is partially degraded. A section of it is being replaced by steppic grasslands as a result of trampling, and past reclamation practices in the area. Alien tree species, including Acacia are planted in the area.

Foresta 2000 has created safe roosting habitat and attracts raptor species. Migrant passerines rest and forage at the garrigue and arboreal habitats.

The conservation status of Annex I habitats, Annex II (Habitats Directive) species (the Killifish) and Annex I bird species (Birds Directive) as well as groups of wintering and migratory bird species was evaluated based on reference to desk studies and expert knowledge.

A number of activities exert pressure on the ecology of the site. The Għadira area is popular with tourists and experiences pressures from recreational activities as well as pressure from development including impacts from noise, trampling, habitat disturbance and habitat loss.

Overuse of fertilizers and pesticides from surrounding agricultural practices exerts pressure on the wetland from eutrophication and water pollution.

Acacia trees have been planted in the past on the garigue at il-Bisqra on land managed by the Mellieħa Holiday Complex.

Hunting is prohibited in the entire SAC/SPA site since the area falls within a Bird Sanctuary, however, poaching is practiced in the areas bordering the SAC/SPA. Poachers' intrusions and poaching within the Bird Sanctuary, resulting in losses of rare Annex I bird species, is not uncommon. Other activities that involve the removal or collection of animals also impacts wildlife at this site.

Trapping might be still present in private land and illegally practiced also in public land. As a practice it is responsible for vegetation clearings and habitat modification, disturbance of wildlife and direct biodiversity loss.

Localised dumping and burning of rubbish was evidenced amongst the Annex I habitats that are close to the access road.

Management Plan Objectives & Actions

Following the evaluation of the features of conservation importance on the site, as well as the factors, a **vision** was established for the site. This vision was developed together with local stakeholders. **Management Objectives** were then identified that seek to help achieve the vision.

One of the most important objectives is to ensure that each of the habitats identified above are conserved and improved. Species populations and their habitats also need to be conserved or improved as appropriate. Species specifically described in the Management Plan include in particular the Maltese Pyramidal Orchid, Maltese Spider Orchid, Sand Cricket, the Killifish, Leopard Snake, two bat species and important bird species. In addition to the important species listed in the Habitats and Birds Directive, the Management Plan seeks to ensure the conservation of species of national interest, for example, species that are endemic. Important Management Objectives in relation to the Għadira Reserve are to monitor, through constant recording and researching, flora and fauna species with the Wetland Reserve, to use the Wetland Reserve as an educational tool for visiting students and members of the public, and to maintain the Reserve as a disturbance free refuge for flora and fauna species. General management objectives are to ensure that existing agricultural activities conform to legislation, to complement tourism and outdoor recreation activities with the site's conservation needs and to raise public awareness and appreciation of the site among the general public

The full list of Management Objectives can be viewed in Chapter 3 of the Management Plan.

In order to achieve the Management Objectives, the Management Plan sets out a number of **Operational Objectives** and subsequent **Actions**, these are summarised in Chapter 4 of the Management Plan and are discussed briefly hereunder.

In order to achieve a number of Management Objectives related to habitat and species conservation, data gathering, monitoring and surveillance are the subject of various Operational Objectives. In addition, objectives that are to be implemented at the Reserve include: to assess the possibility of wetland enlargement and dune restoration at the coastal front, to maintain and monitor water quality and parameters, to gather records of fauna species that visit and breed at the reserve, to gather records of flora species found at the reserve, to increase knowledge of fauna and flora at the reserve through help from educational institutions, to cater for school visits and other visits between October and May

every year, to ensure no unauthorized intrusions/break ins into the reserve occur, to control and monitor access in such a way as to ensure that visitors are of no detriment, by means of excess disturbance, to the reserve, and to ensure adequate facilities to cater for visitors.

Other objectives include to increase species and number of breeding species, to ensure that tourist development and infrastructure is compatible with and does not have a negative impact on the ecological integrity of the Natura 2000 site, to maintain islands and salt marsh vegetation, to maintain and enhance the dune habitats, to remove alien and invasive species and to control ground predators

Other, more general objectives, include the need for patrolling within the site to ensure all activities are carried out legally and within the spirit of this Management Plan; to ensure that agriculture is practised in conformance with agri-environmental legislation, and to promote the site and educate people on the importance of the site.

The actions developed to fulfil the objectives are summarised below:

- Monitoring plans for Annex I habitats and Annex II species and Annex I breeding birds and of the breeding, wintering and staging wetland and woodland birds including implementation;
- Enforcement of the Code of Good Agricultural Practice and the Nitrates Action Programme;
- Assessing the possibility of extending the coastal lagoon habitat and dune restoration
- Ensure that tourist development and infrastructure is compatible with and does not negatively impact the ecological integrity of the Natura 2000 site.
- Building and maintenance of a database with baseline data for current and future management of the reserve
- Maintenance of sluice canal
- Creation of plan together with farmers for the reduction of the use of pesticide/fertilizers in the fields around the reserve
- Habitat and flora mapping of artificial islands.
- Maintenance and provision of ideal breeding conditions for the *Charadrius dubius*
- Creation of artificial islands made up of felled and dead dried trees
- Re-creation of open spaces in the sand dune area
- Monitoring of sand dune rehabilitation project
- Preparation of an action plan for the conservation of the *Brachytrupes megacephalus*
- Control impact of feral cat, stray dog and rat population on the reserve's fauna
- Maintenance of records and notes on a daily basis of all flora and fauna present at the reserve
- Identification and circulation of research projects to University and higher secondary students
- Maintain and increase numbers of breeding populations as well as breeding species at the lagoon – in conjunction with lagoon expansion
- Setting up of nest boxes for Spotted Flycatcher and Tree Sparrow
- Setting up of nesting rafts for Common Coot
- Maintenance of Kingfisher and Sand Martin artificial nest sites.
- Preparation of diverse educational programmes and promotion of these to primary and secondary schools.
- Promotion and advertisement through press releases and media events about the reserve and to allow visitor access during the weekend (through having on site weekend wardens)

- Maintenance of the reception centre and bird watching hide.
- Maintenance of the nature trail linking the reception centre to the bird watching hide
- Delivery of more information by means of signage placed along the nature trail and inside the buildings
- Maintenance of a 24 hour watch on the reserve
- Maintenance of the reserve boundary structures
- Signposting and interpretation panels.

Stakeholder Consultation

An important component of the Management Plan is stakeholder engagement. Stakeholders working together will be a crucial element in ascertaining long term successful management of the SAC/SPA.

In recognition of this vital stakeholder role, a number of stakeholder meetings were held during the drafting of the plan. During the meetings the stakeholders commented that there were problems of access, vandalism and theft, off-roading, dumping, water losses and damaged rubble walls. The participants suggested that the hydrological system should be maintained. This would include cleaning of the reserve's gate, the gutter and the surrounding area before the onset of the rainy season. More water collection measures should be implemented such as dams and reservoirs. The kiosk might also be relocated. The stakeholders also recommended incentives for the agricultural sector. A study regarding rabbits in the area is also required in order to assess whether they are a pest. Nature trails should be established since the site has a potential for off-season tourists. Enforcement and awareness remain important issues. Other suggestions included managing and protecting Il-Hofra wetland and removing concrete and rehabilitating the rocky coast.

Conclusion

This Management Plan is the first of its kind for the site with a timeframe of 5 years. During implementation, progress must be reported back to the Competent Authority at least on an annual basis. The Plan is a dynamic one whereby changes will be made as and if required based on the progress report findings and in discussion with the site manager, stakeholders, and the Competent Authority.



VISION STATEMENT FOR L-INĦAWI TAL-GĦADIRA	3
EXECUTIVE SUMMARY	4
1 INTRODUCTION	16
2 SITE DESCRIPTION	18
2.1 Location and Boundaries	18
2.2 Legal Status and Rights	20
2.2.1 Ownership	20
2.2.2 Legal Rights	20
2.2.3 Site Status	20
2.2.4 Applicable Planning Policies	33
2.2.5 Other Plans	37
2.3 Management Infrastructure	40
2.3.1 Facilities and Services	40
2.3.2 Health and Safety	42
2.4 Climate	44
2.5 Geology	46
2.5.1 Lithology	46
2.5.2 Structural Geology	47
2.6 Geomorphology	49
2.7 Soils and Substrates	50
2.8 Hydrology	52
2.8.1 Mellieħa Rift Valley and its Catchment	52
2.8.2 Inland Water Bodies	52
2.8.3 Ground Water Body	53
2.9 Ecosystems / Habitats, Vegetation and Ecological Processes	55
2.9.1 Description of SAC	55
2.9.2 Site History	55
2.9.3 Site Management	55
2.9.4 Recorded Trends	56
2.9.5 Methods	56
2.9.6 Assessment of Conservation Status	56
2.9.7 Vegetation Assemblages	56
2.9.8 Conservation Status	63
2.10 Species	73
2.10.1 Annex II Plant Species	73
2.10.2 Other Plant Species	73
2.10.3 Assessment of Conservation Status	74
2.10.4 Anthropogenic Factors Affecting the Conservation Status of the Annex I Habitats	105
2.11 Anthropogenic Activities Within the Site	105
2.11.1 Nature Conservation	105
2.11.2 Agriculture	106
2.11.3 Afforestation	106
2.11.4 Tourism and Recreation	106
2.11.5 Hunting and Fishing	106
2.11.6 Extraction	106
2.11.7 Water Use	106
2.11.8 Education, Demonstrations and Research	106
2.11.9 Other Uses	107
2.11.10 Past Human Land Uses	107

2.12	Anthropogenic Activities Outside The site	108
2.12.1	<i>Nature Conservation</i>	108
2.12.2	<i>Agriculture</i>	108
2.12.3	<i>Afforestation</i>	108
2.12.4	<i>Tourism and Recreation</i>	108
2.12.5	<i>Hunting and Fishing</i>	109
2.12.6	<i>Extraction</i>	109
2.12.7	<i>Water Use</i>	109
2.12.8	<i>Education, Demonstrations and Research</i>	109
2.12.9	<i>Other Uses</i>	109
2.12.10	<i>Past Human Land Uses</i>	109
2.13	Economic Aspects and Population	109
2.14	Stakeholder Consultation	110
2.14.1	<i>Organizations / Authorities and their Responsibilities</i>	110
2.14.2	<i>Stakeholder Engagement</i>	115
2.15	Cultural Heritage	115
2.15.1	<i>Archaeological Artefacts</i>	115
2.15.2	<i>National Historical Monuments</i>	116
2.15.3	<i>Cultural Events</i>	116
2.16	Landscape Features and Evaluation	118
2.17	Visitor Access	118
2.18	Socio-Economic Evaluation	121
3	EVALUATION & CONSERVATION OBJECTIVES	122
3.1	Evaluation of Features	122
3.1.1	<i>Annex I Habitats</i>	122
3.1.2	<i>Annex II Flora Species</i>	124
3.1.3	<i>Annex I and Annex II Fauna Species</i>	125
3.1.4	<i>Annex IV Species and/or Red Data Book Species</i>	127
3.1.5	<i>The Foresta 2000 Afforested Area</i>	128
3.1.6	<i>Agricultural Land</i>	129
3.2	Evaluation of Factors	129
3.2.1	<i>Legislation, Policies and Plans</i>	129
3.2.2	<i>Site Management: The Għadira Reserve</i>	130
3.2.3	<i>Development Plan: Reconstruction and Upgrading of Għadira Bay Promenade (TEN-T project X)</i>	130
3.2.4	<i>Recreation, Education, Research, Awareness Potential and Infrastructure</i>	132
3.2.5	<i>Tourism Development</i>	133
3.2.6	<i>Primary Sector Practices</i>	134
3.2.7	<i>Other Factors Impacting the Site</i>	135
3.3	Evaluation of Key Features and Definition of Conservation Objectives	137
3.4	SWOT Analysis	145
3.5	Vision Statement	146
3.6	Management and Operational Objectives for Site	147
4	MANAGEMENT ACTIONS	153
4.1	Formulation of Management Actions	153
4.2	Description of Management Actions	161
A.	Measures	161
4.2.1	<i>Code and Title of Action: M1. Implementation and enforcement of the Maltese Code of Good Agricultural Practice (CoGAP) and the Nitrates Action Programme in the agricultural land within the SAC</i>	161
4.2.2	<i>Code and Title of Action: M2. Tourism development and infrastructure shall be closely monitored for any potential impact on the ecological integrity of Natura 2000 site</i>	163
B.	Duties	164

4.2.3	<i>Code and Title of Action: D1. Implementation of patrolling</i>	164
4.2.4	<i>Code and Title of Action: D2. Maintenance of sluice canal</i>	164
4.2.5	<i>Code and Title of Action: D3. Maintenance of Kingfisher and Sand Martin artificial nest sites</i>	165
4.2.6	<i>Code and Title of Action: D4. Promotion and advertisement through press releases and media events about the Reserve and to allow visitor access during the weekend</i>	165
4.2.7	<i>Code and Title of Action: D5. Maintenance of the reception centre and bird watching hide</i>	165
4.2.8	<i>Code and Title of Action: D6. Maintenance of the natural trail linking the reception centre to the bird watching hide</i>	166
4.2.9	<i>Code and Title of Action: D7. Maintenance of a 24 hour watch at the reserve</i>	166
4.2.10	<i>Code and Title of Action: D8. Maintenance of the reserve boundary structures</i>	166
C.	Projects	167
4.2.11	<i>Code and Title of Action: P1. Elaboration of detailed monitoring programmes for the Annex I habitats 5330, 5410 and 6220*, the Annex II flora species Anacamptis urvilleana, Ophrys melitensis and Orobanche densiflora, the Annex II fauna species Zamenis situla, Rhinolophus hipposideros and Myotis punicus and the breeding bird species Himantopus himantopus, Calandrella brachydactyla and of the breeding, wintering and staging wetland and woodland birds</i>	167
4.2.12	<i>Code and Title of Action: P2. Elaboration of Action Plans for selected RDB species</i>	168
4.2.13	<i>Code and Title of Action: P3: Assess the possibility of extending the coastal lagoon habitat and dune restoration</i>	169
4.2.14	<i>Code and Title of Action: P4. Implementation of the monitoring plans for the Annex I habitats 5330, 5410 and 6220*, the Annex II flora species Anacamptis urvilleana, Ophrys melitensis and Orobanche densiflora, the Annex II fauna species Zamenis situla, Rhinolophus hipposideros and Myotis punicus and the breeding bird species Himantopus himantopus, Calandrella brachydactyla and of the breeding, wintering and staging wetland and woodland birds</i>	170
4.2.15	<i>Code and Title of Action: P5. Implementation of actions and recommendations prescribed by the Action Plans</i>	171
4.2.16	<i>Code and Title of Action: P6. Planning and implementation of an IAS control and / or eradication programme</i>	171
4.2.17	<i>Code and Title of Action: P7. Elaboration of a study for the design and technical specifications for warning / information / interpretation signposting and promotion material</i>	172
4.2.18	<i>Code and Title of Action: P8. Construction and installation of warning / information / interpretation signposting and production of promotion material</i>	172
4.2.19	<i>Code and Title of Action: P9. Prescription of a patrolling schedule</i>	173
4.2.20	<i>Code and Title of Action: P10. Building and maintenance of a database with baseline data for current and future management of the reserve</i>	173
4.2.21	<i>Code and Title of Action: P12. Creation of a plan together with farmers for the reduction of the use of pesticide/fertilizers in the fields around the reserve</i>	174
4.2.22	<i>Code and Title of Action: P13. Habitat and flora mapping of artificial islands</i>	174
4.2.23	<i>Code and Title of Action: P14. Maintenance and provision of ideal breeding conditions for Charadrius dubius</i>	174
4.2.24	<i>Code and Title of Action: P15. Creation of artificial islands made up of felled and dead dried trees</i>	175
4.2.25	<i>Code and Title of Action: P16. Re-creation of open spaces in the sand dune area</i>	175
4.2.26	<i>Code and Title of Action: P16. Monitoring of sand dune rehabilitation project</i>	175
4.2.27	<i>Code and Title of Action: P17. Preparation of an action plan for the conservation of the Brachytripes megacephalus and implementation</i>	176
4.2.28	<i>Code and Title of Action: P18. Control impact of feral cat and stray dogs and population on the reserve's fauna</i>	176
4.2.29	<i>Code and Title of Action: P19. Control impact of rat populations on the reserve's fauna</i>	177
4.2.30	<i>Code and Title of Action: P20. Maintenance of records and notes on a daily basis of all fauna present at the reserve</i>	177

4.2.31	Code and Title of Action: P21. Maintenance of records of flora species at the reserve	177
4.2.32	Code and Title of Action: P22. Identification and circulation of research projects to University and higher secondary students	178
4.2.33	Code and Title of Action: P23. Maintain and increase the number of breeding populations as well as breeding species in the lagoon – in conjunction with lagoon expansion	178
4.2.34	Code and Title of Action: P24. Setting up of nest boxes for Spotted Flycatcher and Tree Sparrow	178
4.2.35	Code and Title of Action: P25. Setting up of nesting rafts for Common Coot	179
4.2.36	Code and Title of Action: P26. Preparation of diverse educational programmes and promotion of these to primary and secondary schools	179
4.2.37	Code and Title of Action: P27. Delivery of more information by means of signage placed along the nature trail and inside the buildings	179
5	WORK PLAN STRUCTURE	180
6	REPORTING AND REVIEW PLAN	189
6.1	Annual Reporting and Review	189
6.2	The Five Year Reporting and Review	193
	BIBLIOGRAPHY	197

Tables

Table 1: Statutory and planning designations.....	23
Table 2: Marfa Action Plan policies; L-Inħawi tal-Għadira	35
Table 3: Site and surveying visits	56
Table 4: Conservation Status of Annex I habitats	64
Table 5: Assessment of Conservation Status of Annex II species	76
Table 6: Invertebrates of conservation importance	83
Table 7: Assessment of Annex II Species.....	86
Table 8: Breeding bird pairs at Għadira Reserve (Birdlife 2010).....	94
Table 9: Breeding Birds at Għadira Reserve listed as Annex I or regularly occurring migratory birds.....	95
Table 10: Assessment of Conservation Status of non-Annexed and Annex I bird species	98
Table 11: Anthropogenic Factors Affecting the Conservation Status of the Annex I Habitats .	105
Table 12: Summary of responsibilities of main stakeholders	111
Table 13: Protected structures.....	116
Table 14: Overview of relevant acts and policies per topic addressed.....	129
Table 15: Site Attributes.....	132
Table 16: Factors impacting the site	136
Table 17: KEY FEATURE: <i>Coastal Lagoons</i> (1150*).....	137
Table 18: KEY FEATURE: <i>Salicornia</i> and other annuals colonising mud and sand (1310)	137
Table 19: KEY FEATURE: <i>Mediterranean salt meadows (Juncetalia maritimi)</i> (1410)	138
Table 20: KEY FEATURE: <i>Mediterranean and thermo-Atlantic halophilous scrubs</i> (1420)	138
Table 21: KEY FEATURE: <i>Dunes with Euphorbia terracina</i> (2220).....	138
Table 22: KEY FEATURE: <i>Thermo-Mediterranean and pre-desert scrub</i> (5330).....	139
Table 23: KEY FEATURE: <i>West Mediterranean clifftop phrygas (Astragalo-Plantaginetum subulatae)</i> (5410)	139
Table 24: KEY FEATURE: <i>Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea</i> (6220*)	139
Table 25: KEY FEATURE: <i>Anacamptis urvilleana</i>	140
Table 26: KEY FEATURE: <i>Ophrys melitensis</i>	140
Table 27: KEY FEATURE: <i>Orobanche densiflora</i>	140
Table 28: KEY FEATURE: <i>Brachytrupes megacephalus</i>	141

Table 29: KEY FEATURE: <i>Aphanius fasciatus</i>	141
Table 30: KEY FEATURE: <i>Zamenis situla</i>	141
Table 31: KEY FEATURE: <i>Rhinolophus hipposideros</i>	142
Table 32: KEY FEATURE: <i>Myotis punicus</i>	142
Table 33: KEY FEATURE: <i>Himantopus himantopus</i>	143
Table 34: KEY FEATURE: <i>Calandrella brachydactyla</i>	143
Table 35: KEY FEATURE: Breeding Wetland Reserve species (<i>Gallinula chloropus, Charadrius dubius, Cettia cetti, Cisticola juncidis, Sylvia melanocephala</i>)	144
Table 36: KEY FEATURE: Annex I and not Annexed wintering wetland species (<i>Fulica atra, Podiceps nigricollis, Tachybaptus ruficollis, Anas crecca, Aythya ferina, Gallinago gallinago, Rallus aquaticus, Jynx torquilla, Emberiza schoeniclus, Scolopax rusticola</i>).....	144
Table 37: KEY FEATURE: Annex I and not annexed migratory waterfowl, waders and herons (<i>Aythya nyroca, Phoenicopterus ruber, Platalea leucorodia, Pluvialis apricaria, Gallinago media, Philomachus pugnax, Porzana porzana, Plegadis falcinellus, Larus melanocephalus, Larus genei, Sterna caspia, Caprimulgus europaeus, Acrocephalus scirpaceus Tringa glareola, Charadrius alexandrinus, Actitis hypoleucos, Alcedo atthis</i>).....	144
Table 38: KEY FEATURE: Annex I migratory raptors (<i>Circus aeruginosus, Pernis apivorus, Falco vespertinus, Falco naumanni, Milvus migrans, Circus pygargus, Pandion haliaetus</i>).....	145
Table 39: KEY FEATURE: Wintering and staging passerines (<i>Anthus campestris, Ficedula albicollis Ficedula parva, Lanius collurio, Erithacus rubecula Phylloscopus collybita, Phylloscopus sibilatrix, Phylloscopus trochilus Emberiza pusilla, Ficedula semitorquata, Saxicola rubetra, Acrocephalus schoenobaenus, Sylvia communis</i>)	145
Table 40: SWOT Matrix	146
Table 41: Prospect Matrix	146
Table 42: Vision Statement	147
Table 43: Management Objectives and Operational Objectives for site	149
Table 44: Operational Objectives and related priority rating, performance indicators, actions, category of actions and monitoring requirement.....	154
Table 45: Financial Plan.....	181
Table 46: List of actions, timeframe, deliverables and year of delivery, action total budget estimate and entities involved in the delivery of the actions	184
Table 47: Annual Reporting and Review summary	189
Table 48: Table template for recording new developments or trends affecting the site.....	192
Table 49: Table template for recording management plans updates during the annual reviews	193
Table 50: Five year reporting process questions	193
Table 51: List of proposed (initial) Performance Indicators for the assessment of the Operational Objectives.....	194
Table 52: Table template for proposed changes in Site Management Plan	196

Figures

Figure 1: Map of the Special Area of Conservation and Special Protection Area of L-Inħawi tal-Għadira (see ANNEX 6: Maps for A3 version)	19
Figure 2: L-Inħawi tal-Għadira Land Ownership Map (see ANNEX 6: Maps for A3 version).....	21
Figure 3: Site of Wetland Reserve L-Għadira l/o Mellieħa (GPD – Estate Management Department Map)	22
Figure 4: L-Inħawi tal-Għadira Special Area of Conservation.....	25
Figure 5: L-Inħawi tal-Għadira Special Protection Area Map.....	26
Figure 6: Area of Ecological Importance / Site of Scientific Importance (L-Għadira)	27
Figure 7: Għadira (Mellieħa) Bird Sanctuary	28

Figure 8: Area of Ecological Importance (Il-Ħofra [l/o Mellieħa]).....	29
Figure 9: Scheduled Property (GN 400/96)	30
Figure 10: Scheduling of Fortifications in the limits of Mellieħa (GN 895/02).....	31
Figure 11: Cart Ruts, Triq il-Qammieħ, Mellieħa (GN 1225/10).....	32
Figure 12: Ġhadira Isthmus Strategy Map with SAC/SPA boundary	36
Figure 13: L-Inħawi tal-Ġhadira Land Use Map (see ANNEX 6: Maps for A3 version)	43
Figure 14: Precipitation; dry/wet yrs compared 1930–2010 averages (NSO 2011).	44
Figure 15: Mean monthly temperature (NSO 2011)	45
Figure 16: Mean minimum and maximum air temperature [Based on the 30-year climate period] (NSO 2011).....	45
Figure 17: Wind rose for the period 1997-2006 (NSO 2011)	46
Figure 18: L-Inħawi tal-Ġhadira Geology Map (see ANNEX 6: Maps for A3 version).....	48
Figure 19: Composite aerial photograph of Mellieħa Bay (source: Google Earth), overlain with features from Directorate of Overseas Surveys 1:2500 scale map (surveyed in 1957 and published in 1959), and oblique air photos taken in 1950s and 1960s (Source: Kenneth Pye Associates Ltd 2009).....	50
Figure 20: L-Inħawi tal-Ġhadira Hydrology Map (see ANNEX 6: Maps for A3 version)	54
Figure 21: L-Inħawi tal-Ġhadira Habitats Map (see ANNEX 6: Maps for A3 version)	58
Figure 22: View of the SAC at l-Inħawi tal-Ġhadira.....	59
Figure 23: Habitat 1150 – Coastal Lagoons.....	59
Figure 24: Habitat 1310 – <i>Salicornia ramossissima</i> colonising low-lying mud islands	60
Figure 25: Habitat 1410 is relatively widespread within the bird sanctuary; here found growing along a footpath.....	60
Figure 26: <i>Juncus subulatus</i> growing along the bank of the secluded lagoon at the western end of the bird sanctuary.....	61
Figure 27: Habitat 5330 at is-Sdieri.....	61
Figure 28: Dumping and burning of rubbish in habitat 5330 at is-Sdieri.....	62
Figure 29: Habitat 5410 at il-Bisqra.....	62
Figure 30: Habitat 6220 dominated by <i>Brachypodium retusum</i> at il-Bisqra.....	63
Figure 31: L-Inħawi tal-Ġhadira Species Map (see ANNEX 6: Maps for A3 version).....	75
Figure 32: Monthly student visit statistics for 2009 (BirdLife Ġhadira Management Plan 2010-2014)	107
Figure 33: Students visiting Ġhadira 2002-2009 (BirdLife Ġhadira Management Plan 2010-2014)	107
Figure 34: L-Inħawi tal-Ġhadira Cultural Heritage Map (see ANNEX 6: Maps for A3 version) .	117
Figure 35: Landscapes of L-Inħawi tal-Ġhadira	118
Figure 36: Number of visitors recorded at Ġhadira NR over the five year period 2005-2009 (BirdLife Ġhadira Management Plan 2010-2014)	119
Figure 37: L-Inħawi tal-Ġhadira Visitor Access Map (see ANNEX 6: Maps for A3 version).....	120

Acronyms

ADI	Adi Associates Environmental Consultants Ltd
COGAP	Code of Good Agricultural Practice
EAFRD	European Agricultural Fund for Rural Development
EIA	Environmental Impact Assessment
EIONET	European Environmental Information and Observation Network
EPSILON	Epsilon International SA, Environmental Consultants
ERA	Environment and Resources Authority
EU	European Union
GIS	Geographic Information System
GN	Government Notice
IUCN	International Union for Conservation of Nature
LCA	Landscape Character Area
LN	Legal Notice
MAP	Mediterranean Action Plan
MEPA	Malta Environment & Planning Authority
MO	Management Objective
MP	Management Plan
MRA	Malta Resources Authority
N2K	Natura 2000
NGO	Non-Governmental Organization
NSO	National Statistics Office
NSRI	National Soil Resources Institute (Cranfield University, UK)
OO	Operational Objective
PA	Policy agreement
PA	Planning Authority
PARKS	Directorate for Parks, Afforestation and Countryside Restoration
RDB	Red data book
RSBP	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SDF	Standard data form
SMR	Statutory Management Requirements
SPA	Special Protection Area
SWOT	Strengths Weaknesses Opportunities & Threats analysis
UNEP	United Nations Environment Programme

1 INTRODUCTION

Europe has a wealth of biodiversity and Malta ought to protect its share of European biodiversity for the benefit of its People and of the Country. European and national legislation place a collective obligation on Malta and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation conditions. The Government, the Environment and Resources Authority (ERA) and other government agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites and of the network as a whole.

Sites of the Natura 2000 network are designated as Special Areas of Conservation (SAC) and Special Protection Areas (SPA) according to the Habitats and Birds Directives, respectively, where habitats and species are listed. The Directives are designated to afford protection to the most vulnerable of the species listed.

Managing a protected area is a continuous iterative process that requires sound planning based on knowledge of the site and its features, as well as factors that affect the site. Based on previous knowledge Conservation Objectives for the site are set, which require a line of measures and actions in order for the Objective to be achieved. A management plan aims to describe how the objectives can be reached and how the vision for the protected site can be realized. Typically, a management plan covers a five year period after which it is updated. These plans pave the way for subsequent investment in the rehabilitation and management of the protected areas and provide further commitment and guidance.

The present report is the Management Plan for L-Inħawi tal-Għadira Natura 2000 site (SAC and SPA) and is structured as follows:

- Chapter 1 provides an introduction
- Chapter 2 outlines information on the site from the designations set out in planning policies and legislations and provides current knowledge on physical and cultural characteristics, including the habitats and species and their conservation status
- Chapter 3 provides the evaluation of features and of factors impacting the site, followed by the SWOT analysis, Vision Statement, Management Objectives and Operational Objectives for the site
- Chapter 4 describes the management actions, i.e. the measures, duties and projects, to be accomplished in the course of the implementation of the Management Plan
- Chapter 5 indicates an annual Work Plan that needs to be prepared in advance of implementing the Management Plan to detail the timing of actions and the allocation of resources
- Chapter 6 provides guidance on the annual reporting and the five year reporting and review of the Management Plan.

The main text is followed by *Bibliography*, listing sources utilized for the preparation of the Management Plan, and *six Annexes*. The content of the Annexes is described below:

- Annex 1 describes the methodology adopted for the formulation of the Management Plan

- Annex 2 offers supplementary information in terms of Maltese Planning Policies that are relevant to the management plan site
- Annex 3 supplies a description of the methodology for assessing the conservation status of habitats and species
- Annex 4 includes supplementary information regarding several of the proposed management actions and their implementation
- Annex 5 contains revenue generation and self-financing opportunities
- Annex 6 contains the maps of the site in A3 format.

2 SITE DESCRIPTION

2.1 LOCATION AND BOUNDARIES

The L-Inħawi tal-Għadira Special Area of Conservation (SAC) and Special Protection Area (SPA) (hereinafter referred to as L-Għadira) is found within the Mellieħa locality boundary. L-Għadira is located at 35.9719N / 14.3461E. To the north of the site is the Marfa Ridge whilst to the south is the Mellieħa Ridge. The site incorporates a large part of the Mellieħa Valley and a small part of the southern part of the Marfa Ridge. The western part of the SAC/SPA adjoins the Rđumijiet ta' Malta: Ir-Ramla taċ-Ċirkewwa sar-Ramla tal-Mixquqa Management Plan area. The seaward area to the east of the site borders Il-Grigal ta' Malta Marine Protected Area.



Figure 1: Map of the Special Area of Conservation and Special Protection Area of L-Inħawi tal-Għadira (see ANNEX 6: Maps for A3 version)

2.2 LEGAL STATUS AND RIGHTS

2.2.1 Ownership

L-Inħawi tal-Għadira is practically all government property including the wetland reserve area. There are only a few pockets that are privately-owned (see Figure 2).

2.2.2 Legal Rights

It is unclear from the information provided what is the actual status of the area identified as government which were/are under lease and can be redeemed by the leaseholder.

The Għadira reserve is occupied by Birdlife Malta. This NGO pays an annual fee for the permit to occupy the area (see Figure 3). Permit 10/08 stipulates a number of conditions that the grantee has to honour:

- *This concession shall hold good during the pleasure of the Government and subject to the conditions of the management agreement with the Ministry for Rural Affairs and the Environment.*
- *The grantee shall at no time have any claim whatsoever for the compensation in respect of any expense he may incur in connection with or in consequence of this permit.*
- *The grantee is absolutely forbidden from transferring this concession to third parties either in whole or in part.*
- *The grantee is forbidden from carrying out any structural alterations and/or innovations to the property and undertakes to deliver the property on termination or earlier determination in the condition existing to date.*
- *This permit shall not exempt the grantee from the obligation of obtaining any other permit and/or license that may be required under any law and/or regulation in force from time to time.*
- *This permit is being issued on condition that vacation of property has to be carried out immediately on request.*

2.2.3 Site Status

The site is covered by a number of statutory and planning designations. The different designations are listed in Table 1.

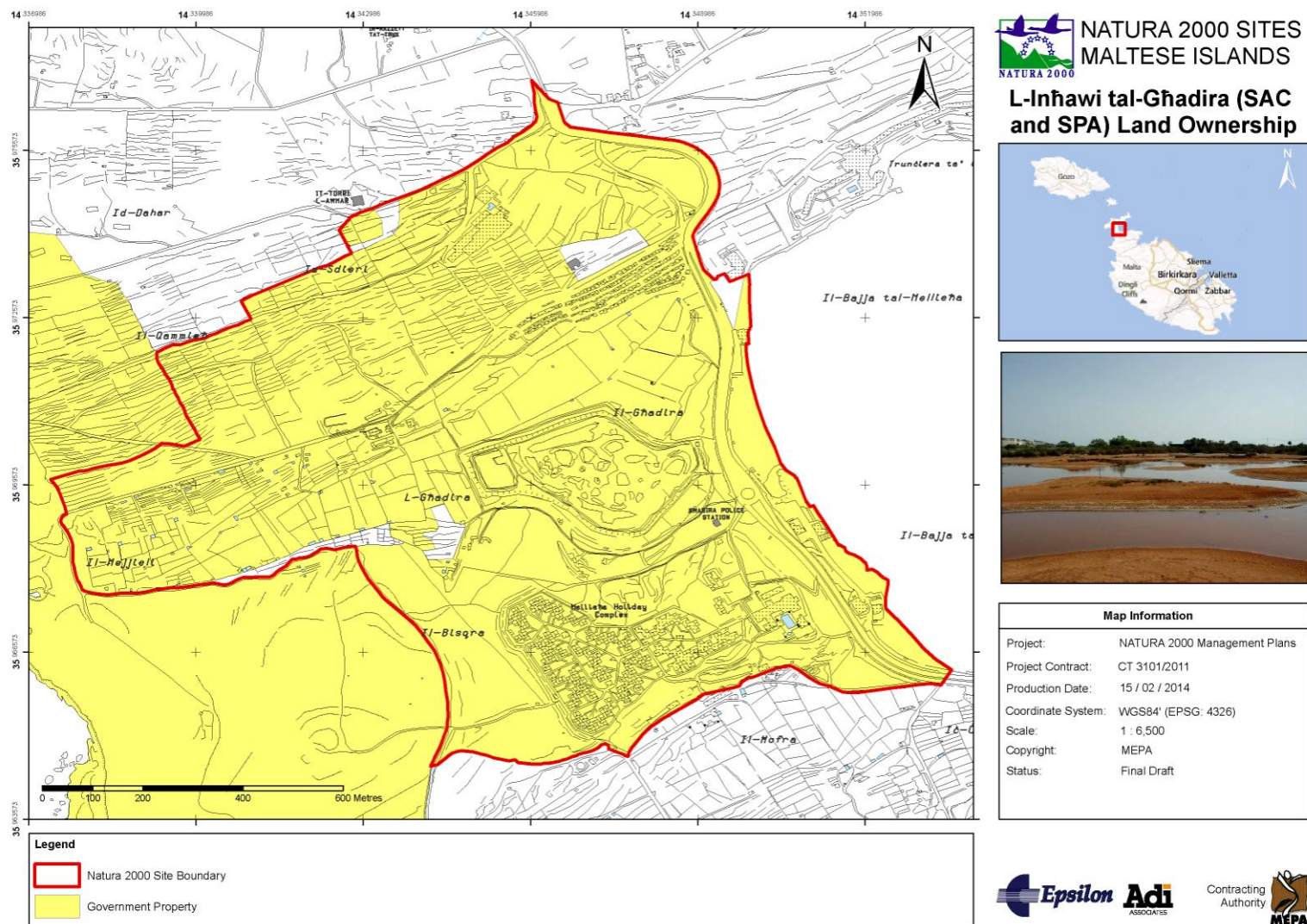


Figure 2: L-Inħawi tal-Għadira Land Ownership Map (see ANNEX 6: Maps for A3 version)

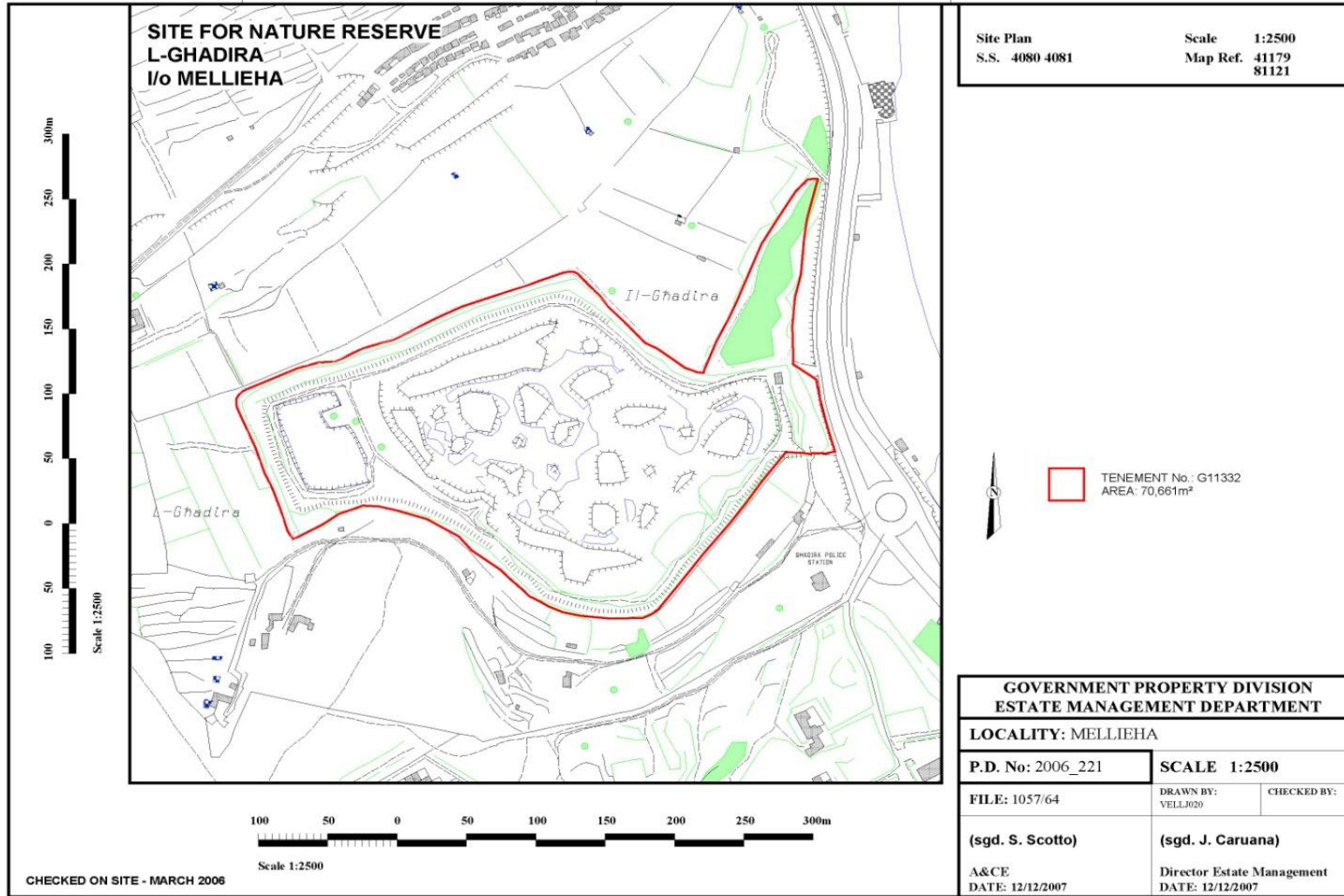


Figure 3: Site of Wetland Reserve L-Ghadira I/o Mellieha (GPD – Estate Management Department Map)

Table 1: Statutory and planning designations

Designation	Name	All / Part of site	Type	Policy / Legislation	Figure reference
Special Area of Conservation – International Importance(SAC)	L-Inħawi tal-Għadira	All	Environment	GN 112/07 LN 311/06	Figure 4
Special Protection Area (SPA)	L-Inħawi tal-Għadira	All	Environment	GN 112/07 LN 311/06	Figure 5
Area of Ecological Importance (Level 1), Site of Scientific Importance (Level 1)	L-Għadira area from il-Bajja tal-Mellieħa to lċ-Ċumnija in Mellieħa (Saline marshland and sand dune remnants at l-Għadira)	Part of the site	Environment	GN 491/06	Figure 6
Area of Ecological Importance (Level 2), Site of Scientific Importance (Level 1)	L-Għadira area from il-Bajja tal-Mellieħa to lċ-Ċumnija in Mellieħa (Garigue at il-Bisqra)	Part of the site and beyond	Environment	GN 491/06	Figure 6
Area of Ecological Importance (Level 2), Site of Scientific Importance (Level 2)	L-Għadira area from il-Bajja tal-Mellieħa to lċ-Ċumnija in Mellieħa (Abandoned fields and garigue at il-Qammieħ)	Part of the site and beyond	Environment	GN 491/06	Figure 6
Site of Scientific Importance (Level 2)	L-Għadira area from il-Bajja tal-Mellieħa to lċ-Ċumnija in Mellieħa (Clay slopes)	Part of the site	Environment	GN 491/06	Figure 6
Area of Ecological Importance (Level 3) (buffer zone)	L-Għadira area from il-Bajja tal-Mellieħa to lċ-Ċumnija in Mellieħa (Agricultural land in the areas of il-Mejjieli and l-Għadira)	Part of the site	Environment	GN 491/06	Figure 6
Area of Ecological Importance (Level 3) (buffer zone)	L-Għadira area from il-Bajja tal-Mellieħa to lċ-Ċumnija in Mellieħa (Abandoned fields and maquis at is-Sdieri)	Part of the site	Environment	GN 491/06	Figure 6
Site of Scientific Importance (Level 4)	L-Għadira area from il-Bajja tal-Mellieħa to lċ-Ċumnija in Mellieħa (Sandy beach)	Part of the site and beyond	Environment	GN 491/06	Figure 6

Designation	Name	All / Part of site	Type	Policy / Legislation	Figure reference
Bird Sanctuary	Għadira (Mellieħa)	All site and beyond	Environment	LN 79/06 LN 144/93	Figure 7
Area of Ecological Importance (Level 1)	Il-Ħofra (l/o Mellieħa)	Part of the site	Environment	GN 288/95	Figure 8
Area of Ecological Importance (Buffer Zone)	Il-Ħofra (l/o Mellieħa)	Part of the site	Environment	GN 288/95	Figure 8
Wetland of International Importance	Għadira Reserve	Part of the site		RAMSAR Convention	N/A
Specially Protected Areas	L-Għadira	Part of the site	Environment	Protocol for Specially Protected Areas under the UN Barcelona Convention (Convention for the Protection of the Mediterranean Sea Against Pollution)	N/A
Area of High Landscape Value / Area of Ecological Importance	Scheduled Property (Iċ-Ċirkewwa to iċ-Ċumnija)	Small part is within the management plan area	Landscape	GN 400/96	Figure 9
Scheduling Fortifications in the limit of Mellieħa (Grade 2)	Machine Gun Emplacement	Part of the site	Architecture	GN 895/02	Figure 10
Scheduling Fortifications in the limit of Mellieħa (Buffer Zone)	World War II defence system buffer zone	Part of the site	Architecture	GN 895/02	Figure 10
Scheduling – Site of Archaeological Importance (Class B)	Cart Ruts, Triq il-Qammieħ, Mellieħa	Part of the site	Archaeology	GN 1225/10, GN 1260/10	Figure 11
Scheduling – Buffer Zone	Cart Ruts, Triq il-Qammieħ, Mellieħa	Part of the site	Archaeology	GN 1225/10, GN 1260/10	Figure 12

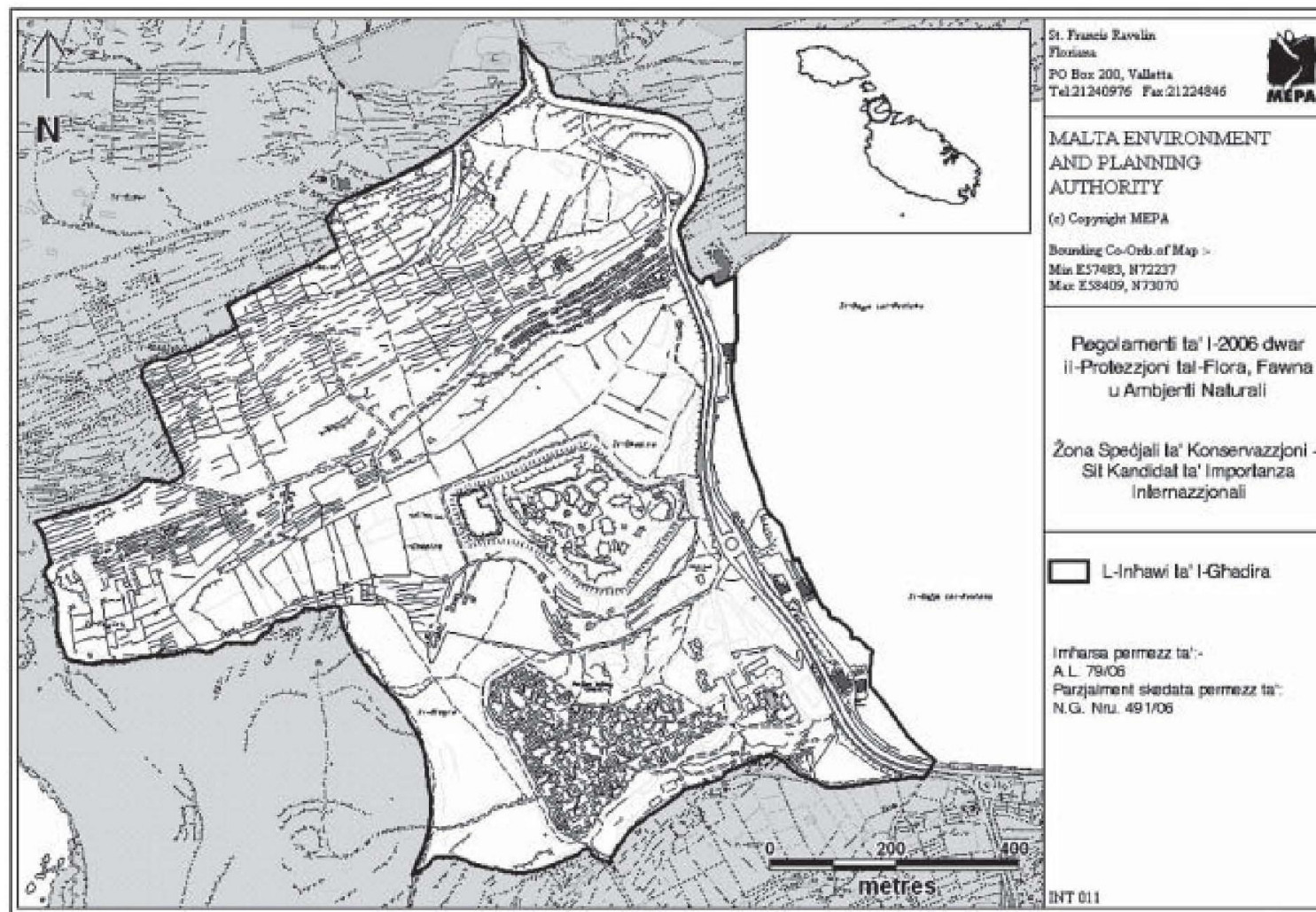


Figure 4: L-Inħawi tal-Għadira Special Area of Conservation

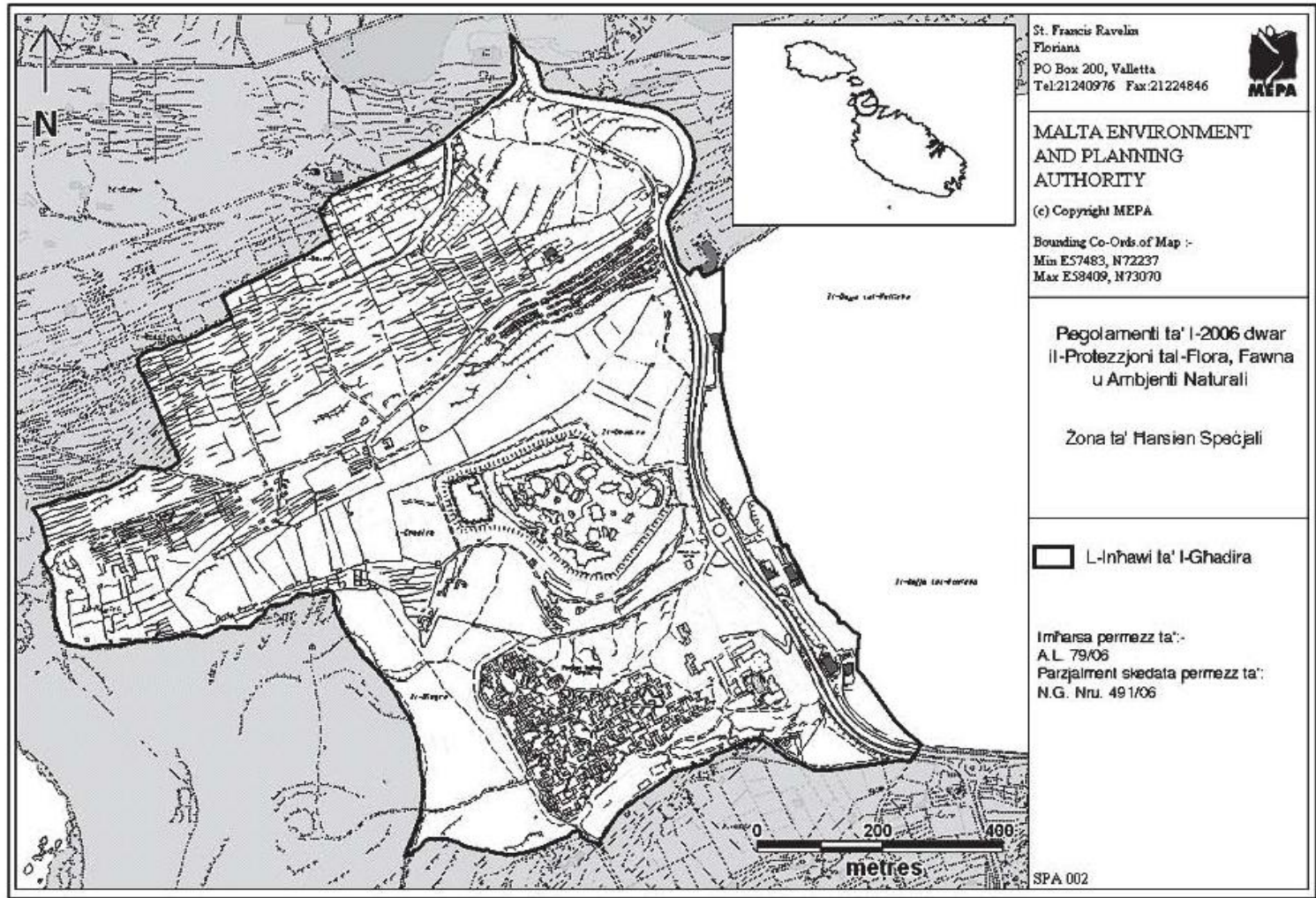
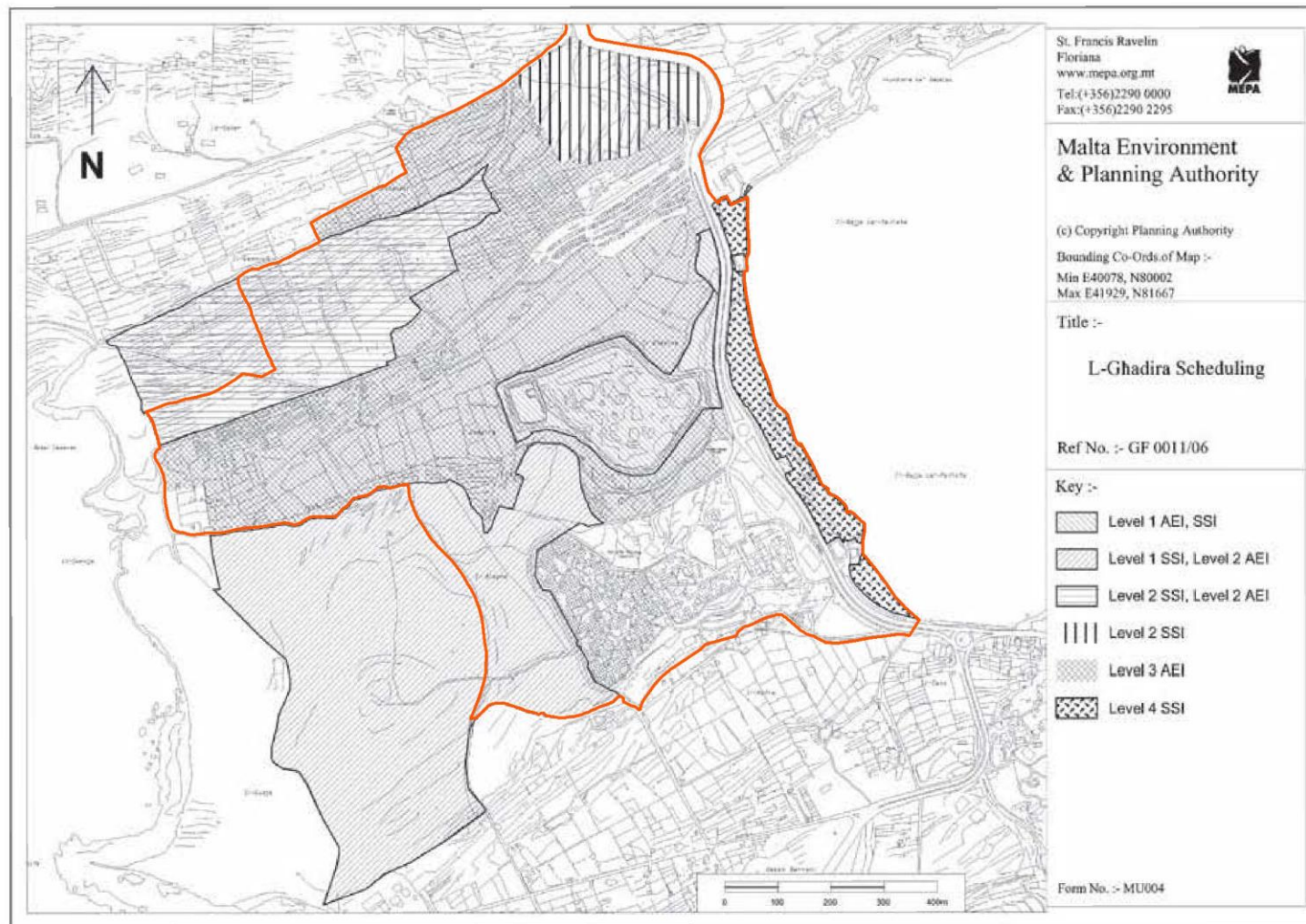


Figure 5: L-Inhawi tal-Ghadira Special Protection Area Map



Is-61a' Għadira, 2006

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Figure 6: Area of Ecological Importance / Site of Scientific Importance (L-Ghadira)

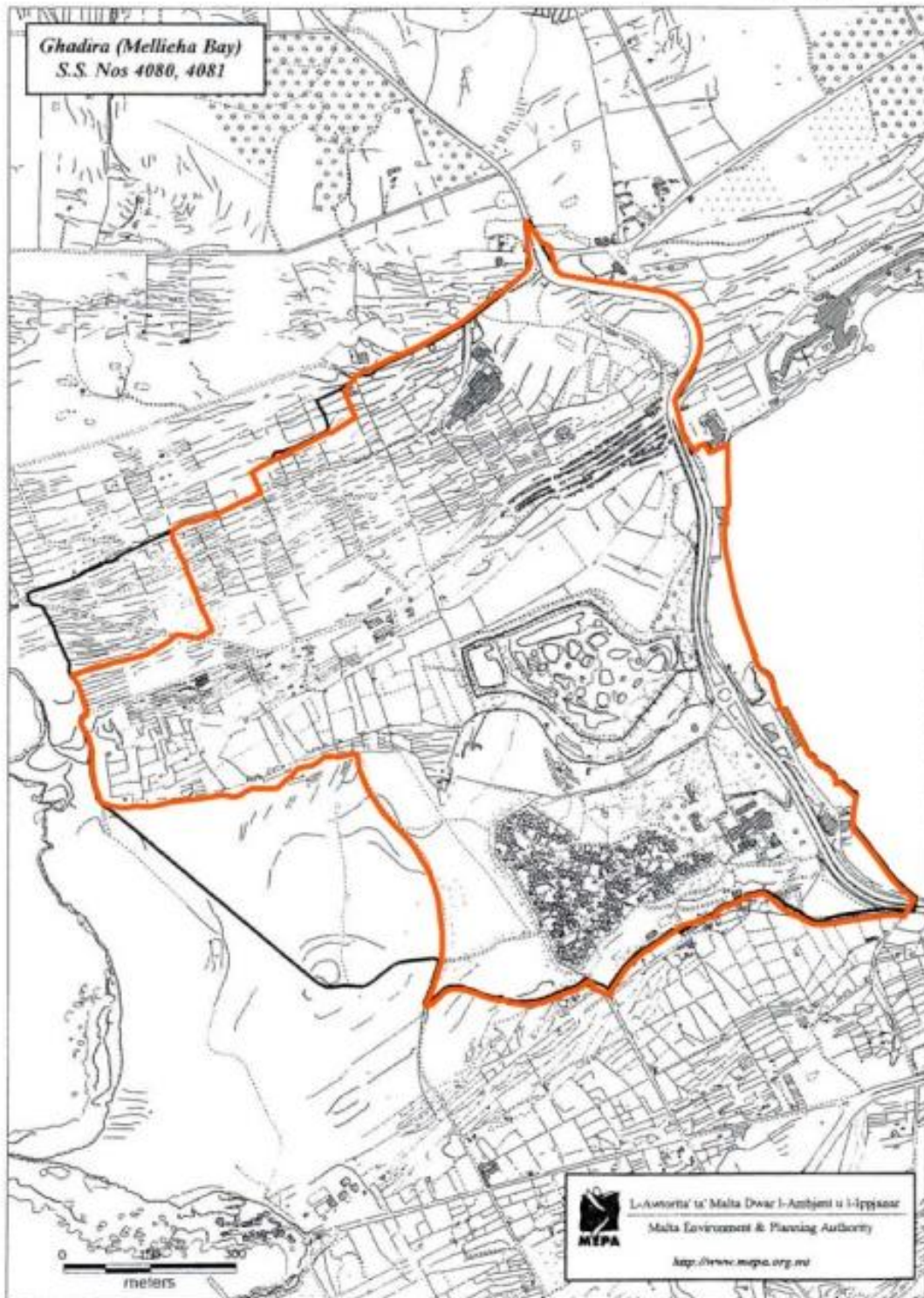


Figure 7: Ghadira (Mellicha) Bird Sanctuary

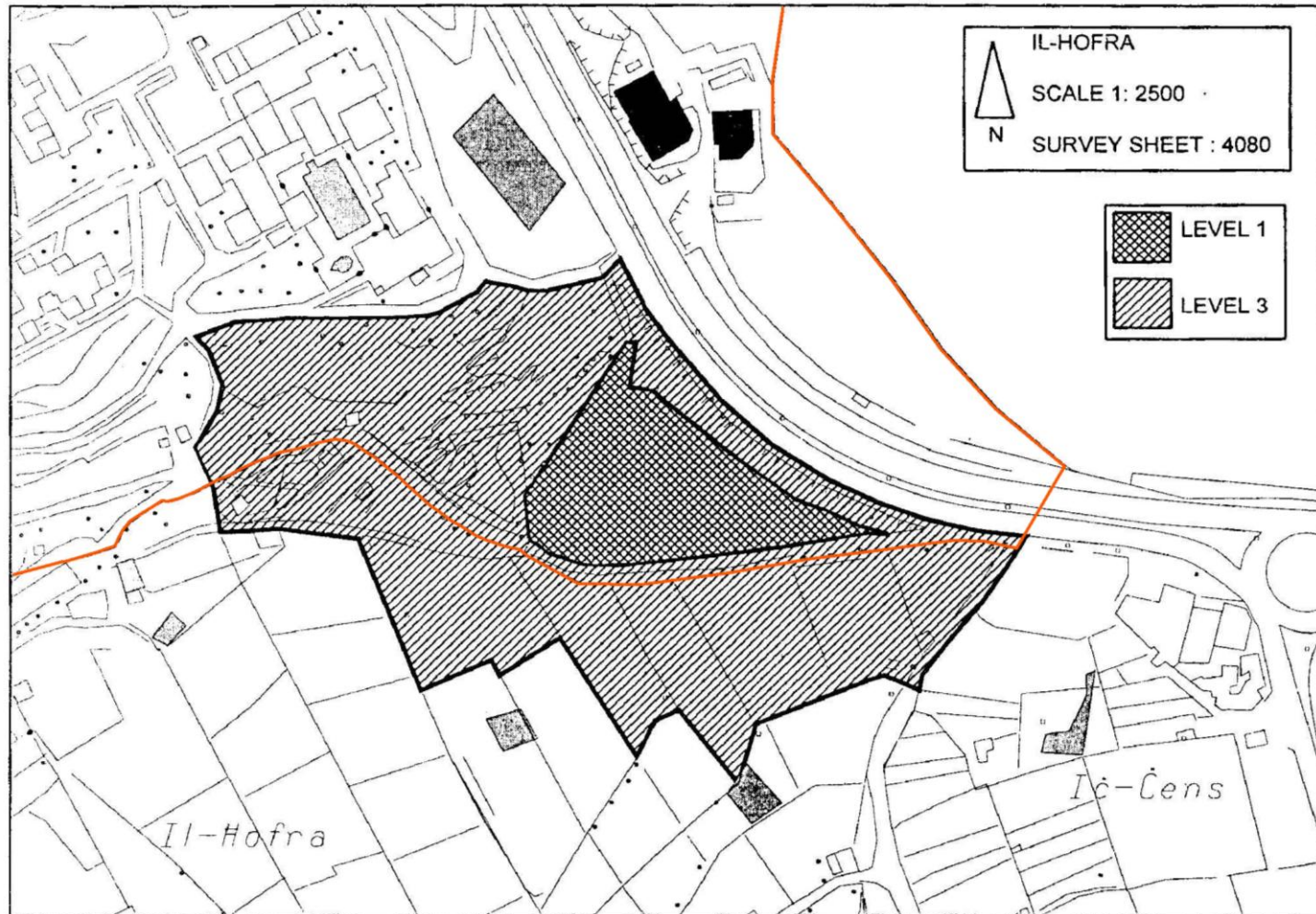


Figure 8: Area of Ecological Importance (Il-Hofra [l/o Mellieħa])

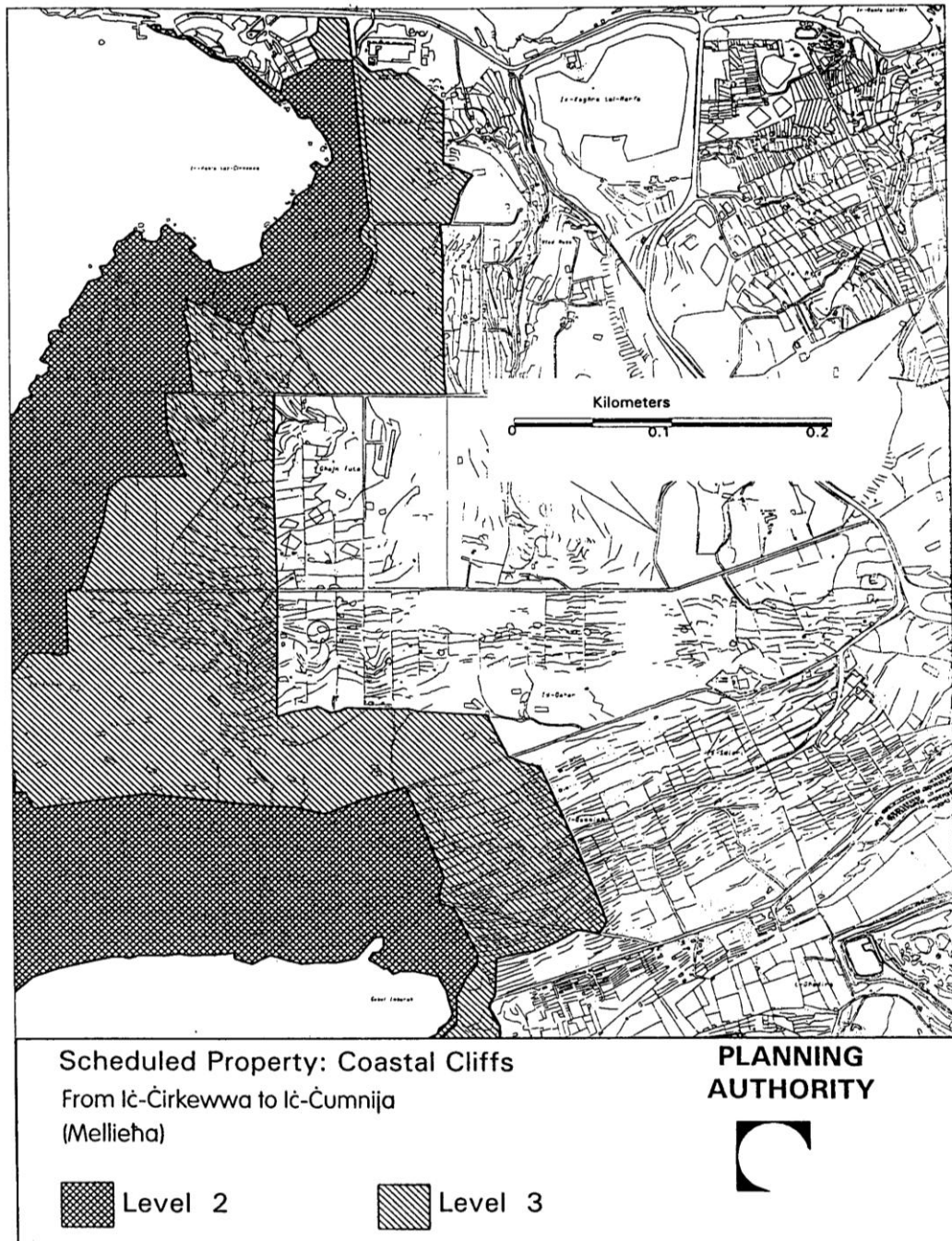
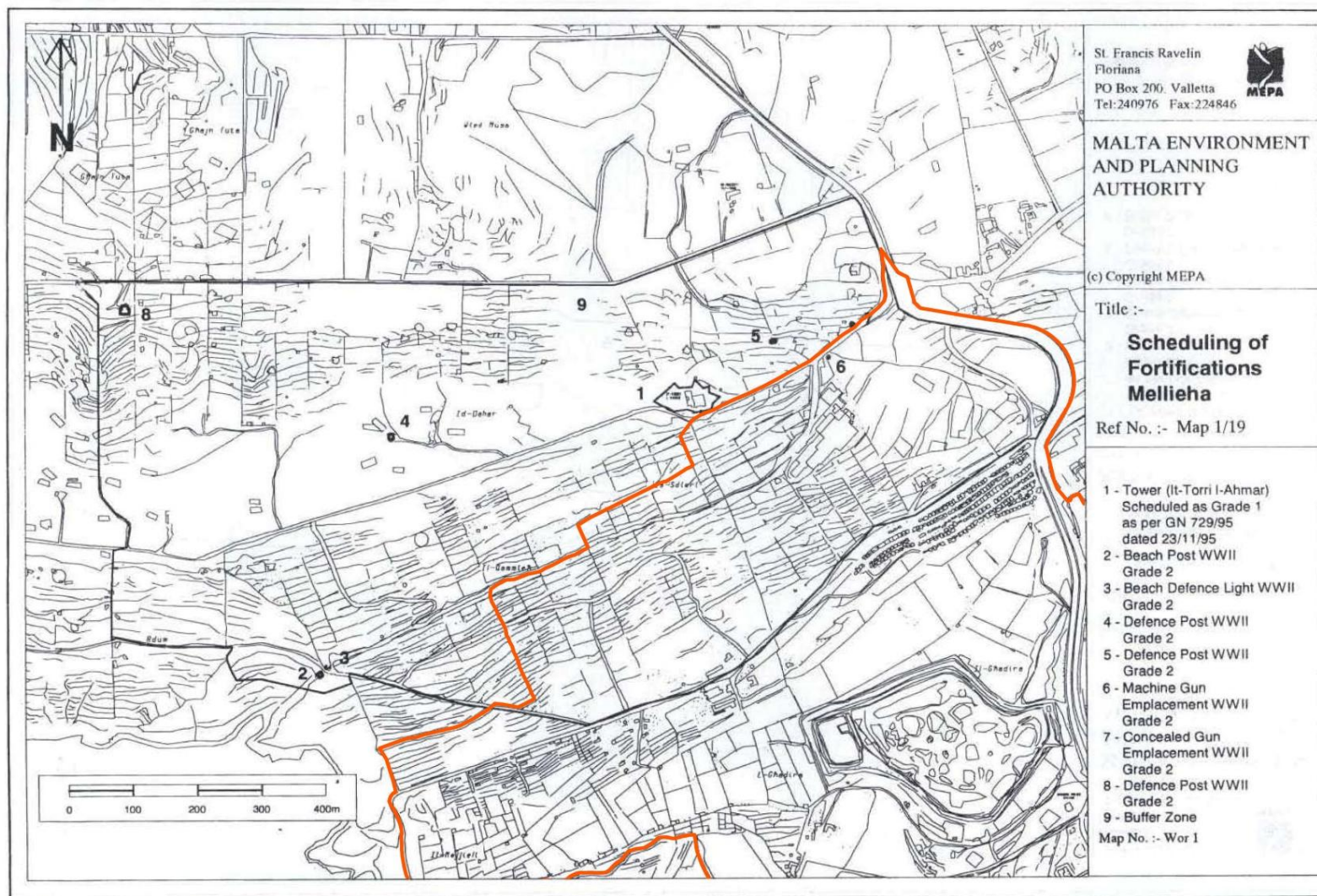


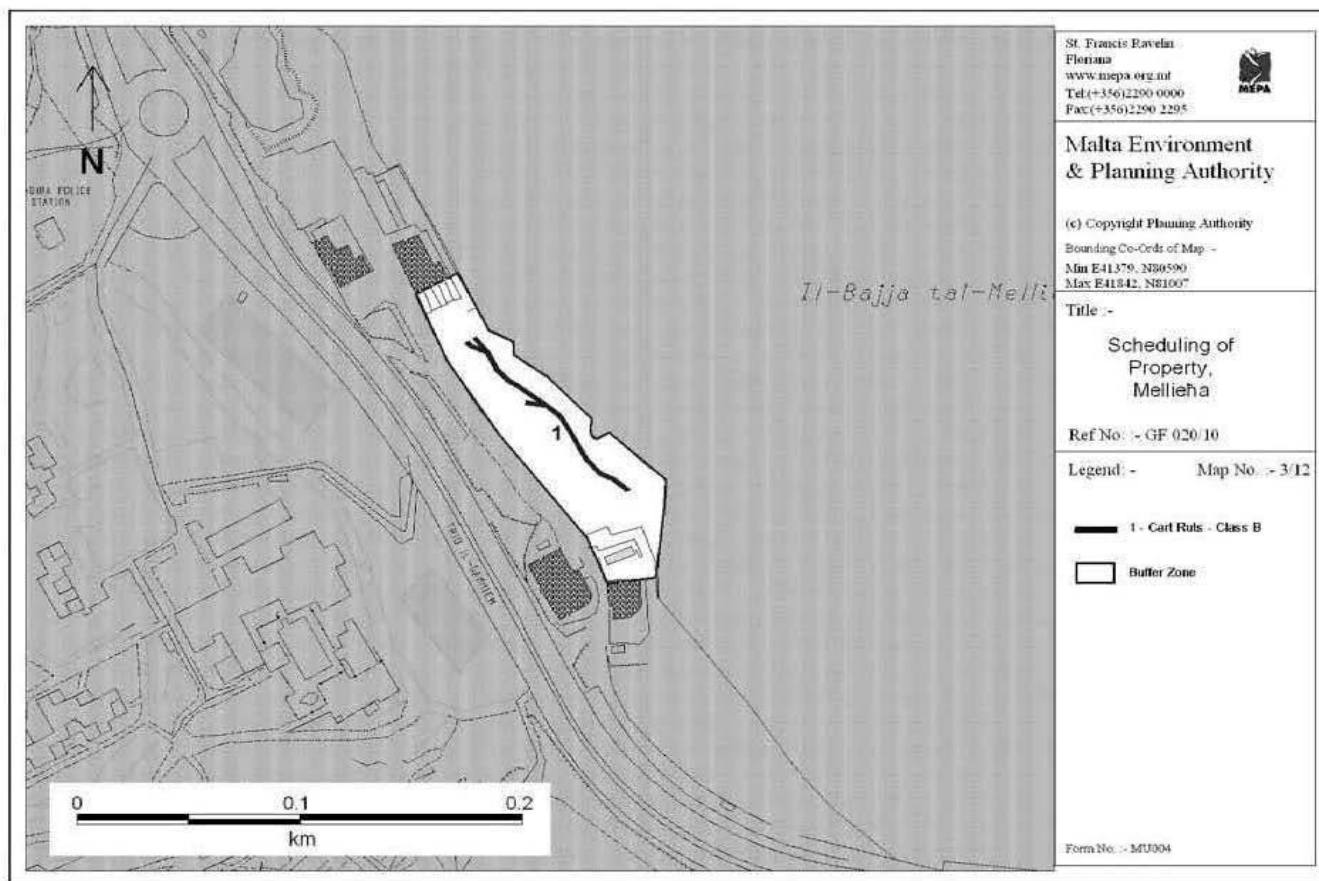
Figure 9: Scheduled Property (GN 400/96)



It-8 ta' Ottubru, 2002

8359

Figure 10: Scheduling of Fortifications in the limits of Mellieħa (GN 895/02)



L-10 ta' Dicembru, 2010

VERŻJONI ONLINE

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Figure 11: Cart Ruts, Triq il-Qammieħ, Mellieħa (GN 1225/10)

2.2.4 *Applicable Planning Policies*

2.2.4.1 *Structure Plan*

The Structure Plan for the Maltese Islands (1990)¹ has three main goals:

- “To encourage the further social and economic development of the Maltese Islands, and to ensure as far as possible that sufficient land and support infrastructure are available to accommodate it.”
- “To use land and buildings efficiently, and consequently, to channel urban development activity into existing and planned development areas, particularly through 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.”
- “To radically improve the quality of all aspects of the environment of both urban and rural areas.”

The Structure Plan policies were reviewed and assessed in order to determine those policies that are relevant to the management planning process. The identified policies are summarised in *ANNEX 2: Relevant Planning Policies*.

The policies related to the improvement and safeguarding of the agricultural sector and rural character are particularly important for this site (Policies AHF 1, 4, 8). The site also has a number of heritage and rural features.

Most of the rural conservation policies are relevant to the SAC/SPA due to the different protection levels assigned to the area. The area also sustains different habitats such as a saline marshland and sand dunes.

Since the SAC/SPA is a coastal site, Policy CZM 3 that deals with public access of the coastline is another policy that has to be taken into account through the management planning process.

2.2.4.2 *Local Plan*

The relevant local plan for the Għadira management plan area is the North West Local Plan (2006). The Local Plan presents a planning framework that highlights the land use issues to be adopted and implemented at a local level. Relevant policies are summarised in *ANNEX 2: Relevant Planning Policies*.

The Local Plan policies on Agriculture are important due to on-site agricultural activities (NWAG 1, 2). The Local Plan has a number of conservation policies that aim at protecting both the human and natural features of the site (Policies NWCO 3, 4, 6-8, 10, 13-15 and 18).

¹ The Structure Plan is currently under review.

2.2.4.3 Action Plan

The northern part of the Għadira SAC/SPA falls within the Marfa Action Plan Area (see Table 2).

Table 2: Marfa Action Plan policies; L-Inħawi tal-Għadira

Policy	Description	Relevance to management plan process
MLA 1	<p>The Malta Environment and Planning Authority will not permit the development of any structure or activity which, in the view of the Authority, would adversely affect Areas of High Landscape Value, (scheduled in accordance with Section 46 of the Development Planning Act 1992 and Scheduling of Coastal Cliffs (Government Notice 400) in the Action Plan area), as illustrated on Map 9.3 (Protected Areas) because it would:</p> <ul style="list-style-type: none"> i. Break a presently undisturbed skyline; or ii. visually dominate or disrupt its surroundings because of its mass, location or design; or iii. obstruct a pleasant or particularly a panoramic view of the cliffs; or iv. adversely affect any element of the visual composition, or distinctive character of the area, or adversely affect existing trees or shrubs; or v. introduce alien forms, materials, textures or colours to the natural landscape. 	A small part of the Għadira SAC/SPA includes an AHLV.
MRE 4	<p>Existing and proposed long distance footpaths and other access ways are identified and illustrated on Map 8.5 and will be protected from development that would adversely affect their route or character. Emphasis will be given to the provision of circular routes with access to picnic areas, carparks and toilet facilities.</p> <p>The Malta Environment and Planning Authority in conjunction with the Mellieħa Local Council and other appropriate agencies, will initiate a system of “Way Marking” of footpaths and access ways in order to protect rights of access for the public.</p>	L-Għadira SAC/SPA includes various footpaths some of which are located in the area’s northern part (which is part of the Marfa Action Plan Area).
MCO 2	Areas of Ecological Importance (Level 2 and 3) at Marfa are scheduled to regulate their conservation in accordance with Structure Plan Policy, Section 46 of the Development Planning Act 1992, Scheduling of Coastal Cliffs (Government Notice 400), as illustrated on Map 9.3 (Protected Areas).	L-Għadira SAC/SPA has Areas of Ecological Importance.
MCO 3	Sites of Scientific Importance are scheduled to regulate conservation in accordance with Structure Plan Policy and Section 46 of Development Planning Act 1992, as illustrated on Map 9.3.	L-Għadira SAC/SPA has Sites of Scientific Importance.
MCO 5	<p>Wherever possible, the Malta Environment and Planning Authority will protect areas of garrigue. The illegal deposit of soil, or the use for off-roading on such areas will not be permitted.</p> <p>A change of use of land from garrigue to beachroom and caravan site purposes will only be permitted on land for such purpose as illustrated on Map 10.1 and Policy MCZ 3 refers.</p>	L-Għadira SAC/SPA includes an area of garrigue.

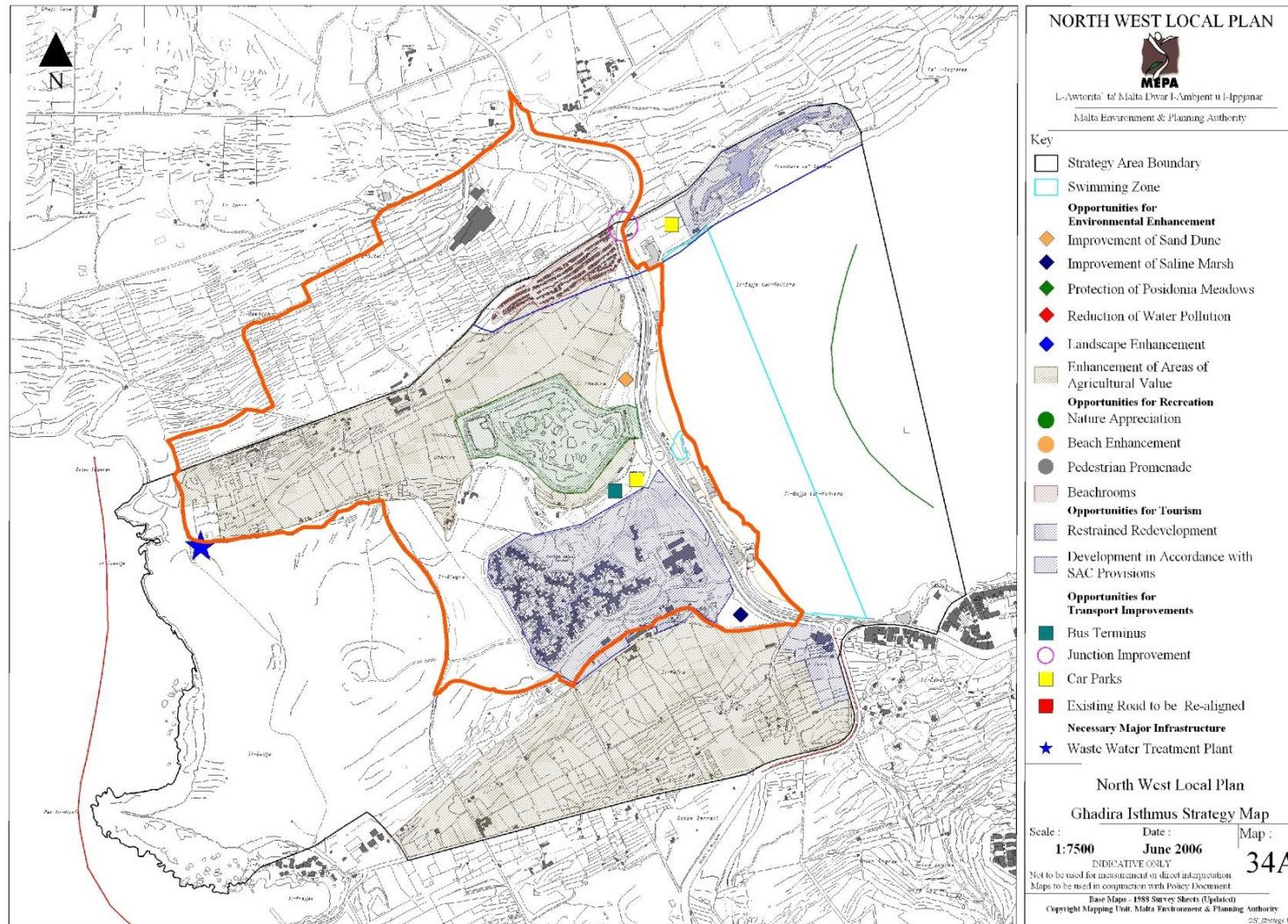


Figure 12: Ghadira Isthmus Strategy Map with SAC/SPA boundary

2.2.5 Other Plans

Other plans include topic papers that were compiled as part of the Structure Plan Review. The aim of these plans is to recognise the important issues and to recommend a strategic direction. In the case of this management plan, the most relevant topic papers are the following:

- Tourism Topic Paper
- Leisure and Recreation Topic Paper
- Coastal Strategy Topic Paper
- Rural Strategy Topic Paper
- Utilities Topic Paper
- Landscape Assessment Study of the Maltese Islands.

2.2.5.1 Tourism Topic Paper

This topic paper is particularly relevant for the management plan area because of the presence of L-Għadira sandy beach and the Mellieħa Bay, the Mellieħa Holiday Centre, the abandoned Festival Hotel and the adjacent area which consists of hotels and restaurants. The topic paper points out that *“tourism offers the opportunity to achieve cultural/environmental conservation and improve the socio-economic fabric of the local residents. It is concerned with the visitor’s experience, and, therefore, embraces wider considerations including hotels, transportation services, restaurants, attractions, the quality of the environment, the attitudes of the local residents, etc”*.

The topic paper also discusses the presence of Outside Development Zone developments and rural tourism. The topic paper argues that rural tourism should be supported by small-scale infrastructure and development rather than large-scale development. Thus in the cases where development is already in place, it would be better to restore and refurbish existing buildings. It is in this spirit that the authenticity of the rural tourism product can be preserved and safeguarded.

The topic paper includes the results and conclusions of a tour operators / travel agents survey. This survey identifies Għadira as an attraction for tourists. The topic paper identifies a number of activities that are essential for the provision of the rural tourism product. These include horse-riding, trekking, cycling, adventure tourism and nature watching. All these activities are either already present at the L-Għadira Area or else are possible to implement.

2.2.5.2 Leisure and Recreation Topic Paper

In the section dealing with Rural Recreational Areas, the Topic Paper identifies the Għadira wetland reserve as a place for bird watching and nature appreciation. Għadira is also important for its nautical sports and coastal activities. Hiring seacraft and umbrellas requires adequate spaces. This usage of space could present a conflict with other coastal uses. The situation is even worse when one takes into account the permanent structures present (for example kiosks and other beach concessions). The 1999 Public Attitudes Survey showed that only 15% of the respondents think that the Maltese beaches have adequate facilities.

2.2.5.3 Coastal Strategy Topic Paper

This topic paper provides a coastal boundary for Malta by taking into account ecological, physical and administrative factors. All of the management plan area falls within the Coastal Zone as defined by the topic paper.

The topic paper describes how coastal ecosystems have a very delicate natural equilibrium and are thus sensitive to both natural and anthropogenic disturbances. L-Għadira wetland reserve is an example of a saline marshland. Saline marshlands are a scarce habitat in the Maltese Islands. These habitats are maintained by water which originates directly or indirectly from precipitation and not from tidal influences. During the dry season the water collected starts evaporating becoming more brackish and eventually hyper-saline. Eventually it completely dries out up to the following wet season. The number of saline marshlands has reduced over the years and the existing ones are generally under threat from negative human impacts.

L-Għadira also supports another scarce habitat in the Maltese Islands; the sand dunes. There are only five remaining complete sand dune ecosystems. The road from Mellieħa to Ċirkewwa passes through this sand dune system.

The topic paper identifies various sectors that can have implications on the national coastal strategy. These sectors which are relevant include tourism and recreation, agriculture and infrastructure. The coastal strategy emphasises that the tourism and recreation industry should be safeguarded and access within the coastal area is protected as long as this does not cause unnecessary negative impacts. Coastal agriculture should also be protected as land abandonment could lead to land degradation and a change in the coastal landscape. The proposed coastal strategy identifies the following objectives:

- Protect coastal and marine habitats and biodiversity
- Protect cultural heritage
- Protect coastal uses that necessitate a coastal location
- Promote and protect public access and use
- Minimise existing and potential user conflicts.

The topic paper describes the Coastal Zone partially covered by the management plan boundary as Predominantly Rural Coast. The strategy for this specific type of coast is *“is to safeguard the natural and cultural heritage, including landscape. The type and level of new development acceptable within these areas should be minimal. Only development that is directed towards improving degraded areas and enhancing informal recreation, in conformity with the objective of safeguarding the coastal characteristic and heritage of such areas, will be acceptable. Existing legally approved uses and development within protected areas should be allowed to continue, provided that the value of the protected coast is not affected negatively.”*

2.2.5.4 Rural Strategy Topic Paper

This topic paper addresses three main aspects related to the management plan area, namely, agriculture, country side recreation and conservation.

Agriculture is considered a multifaceted practice which contributes *“towards food production, landscape enhancement, protection of the environmental and countryside recreation. In this*

regard, Government's emerging policy on agriculture follows the concept of 'integrated rural development', as outlined in the EU's Rural Development Programme".

The topic paper also discusses countryside recreation which it defines as “any pursuit or activity engaged upon during leisure time, or as part of provision for education and training, which makes use of the natural resources of the countryside”. The topic paper identifies the countryside recreational activities in Malta and their compatibility with other countryside recreational activities.

The topic paper touches upon the issue of visitor management and its importance in safeguarding sensitive areas. Visitor management is an essential tool for striking the right balance between rural conservation and countryside recreation. The topic paper calls for the management of rural areas and suggests the use of the IUCN Protected Area Management Categories (IUCN 1994)².

The topic paper referred to the Public Attitude Survey (PAS) published in 2000. The PAS identified those areas in the countryside that the public wants to see protected from development. Mellieħa Bay which forms part of the SAC/SPA got 94 mentions from 3,000 persons as a place that deserves protection.

2.2.5.5 Utilities Topic Paper

This topic paper is “a strategic assessment of Malta's requirements in the sectors of water, sewerage, electricity, telecommunications and postal services.”

This topic paper refers to the Mellieħa Holiday Complex which is found within the Għadira SAC/SPA. This complex “treats all the sewage it generates and reuses the treated effluent for irrigation of its landscaped areas. This treatment plant is important, not only because it is an example of good practice but also because it treats some of the sewage from the village of Mellieħa during the summer months when the demand for water for irrigation is at its peak”.

2.2.5.6 Landscape Assessment Study of the Maltese Islands

This study prescribes and describes the main character areas of the Maltese Islands. There are two Landscape Character Areas within the L-Għadira SAC/SPA.

The Għadira Isthmus (M3) connects the Marfa peninsula with the rest of Malta. This area is the narrowest tract of the Maltese Islands and there is less than 2km from one side to the other. The valley has a U-shape and the gradient is gentle and going from west to east. The eastern part is dominated by the Malta's largest sandy beach. The development in the area is limited to some hotels, a caravan settlement and a holiday village. The only major coastal road passes along the eastern coast. The area supports agricultural activity and the western part has an extent of garigue.

“Enhancing features: The Għadira sandy beach is one of the most popular in the Maltese Islands. Boats and yachts moored in the bay contribute to variety in the scenic composition.

² It is to be noted that the Topic Paper was written prior to EU accession and the promotion of international management categories at the time was geared more towards the IUCN concept of protected areas.

From higher ground, the Danish Village and the Għadira Nature Reserve dominate the inland areas. The reserve is a reconstructed saline marshland, one of the few remaining in Malta. It consists of a lake of brackish water with a number of sandy islands within. The surrounding shrubs and reeds shield the reserve from the main road. The Danish village has been very carefully integrated through creative design and soft landscaping and thus fits quite nicely in its context. The central-western garrigue area is relatively featureless when viewed from a distance but conveys a feeling of remoteness when experienced from close quarters. Il-Prajjet (Anchor Bay) is very picturesque but unfortunately was marred by development close by”.

“Detracting Features: The development at Tas-Sellum on the southern flank of il-Bajja tal-Mellieħa (Għadira Bay) has made a very negative contribution to the scenic qualities of the bay by virtue of its size, orthogonal massing and white colour. The hotel on the northern side of il-Bajja tal-Mellieħa (Għadira Bay) and the hotel at the end of Mellieħa bypass are rather unsympathetic to its backdrop. The coastal road close to the beach is very busy with through-traffic going to the ferry terminal. In summer, apart from an increase in traffic, the carriageway also serves to accommodate a large number of parked cars. The Mellieħa bypass is flanked by a trail of tipped construction debris. Tipping occurs near il-Prajjet (Anchor Bay) and near the western coast of this tract of land (known as Ic-Cumnija). A string of high-tension power line lattice towers, which transects the area, presents additional marring to the landscape”.

The northern part of the Għadira SAC/SPA includes the North Għadira Slopes (M2) Landscape Character Area. This Landscape Character Area forms part of a larger area that is the Marfa Ridge.

2.3 MANAGEMENT INFRASTRUCTURE

There are two areas managed for nature conservation reasons within the site. These are L-Għadira Wetland Reserve that is managed by Bird Life Malta and the Foresta 2000 area that is managed by three entities: Bird Life Malta, Din l-Art Ħelwa and PARKS.

2.3.1 Facilities and Services

The Għadira area includes a wetland reserve and extensive areas of agricultural land, which accounts for 25% of the total SAC/SPA area.

The area includes the Mellieħa Holiday Centre which is made up of 150 single floor holiday homes. The complex includes various facilities. The SAC/SPA includes another area dedicated to the hotel however this is abandoned. The Festival Hotel was only operational for a few years and was closed down due to structural problems since it was built above a clay slope. The area also has a group of beach rooms that are used mainly as summer residences.

On the eastern side of the SAC/SPA there is an arterial road that links Marfa to the rest of Malta. There are parking facilities on both sides of the road and there is also a promenade along the road and sandy beach. Temporary kiosks can be found along the promenade whilst kiosks and restaurants can be found in the sandy beach areas. During the summer months there are facilities such as hiring of water sports craft, umbrellas and deckchairs. Mellieħa Bay has a designated swimmers' zone as per Local Notice to Mariners Number 31 of 2012.

The Ministry for Resources and Rural Affairs had a plan to enhance the area by restoring rubble walls and footpaths and erecting interpretation panels (PA 02540/07 - *Habitat conservation, rubble wall repairs, afforestation and erosion control, maintenance of existing footpaths and installation of interpretation boards/signage*). The area also includes an afforestation project, the Foresta 2000 - Innova project. BirdLife, Din I-Art Helwa and PARKS have joined forces in the managing of the Foresta2000 site. The permit has not yet been issued.

There are various enforcement notices around the site. This indicates illegalities and illegal changes in use and modifications to permitted structures.

A gravity main sewer crosses the site. In the Mellieħa Valley there is an intake sewage pumping station and an electricity substation that is used for the Iċ-Ċumnija Sewage Treatment Plant. A part of the Sewage Treatment Plant is found within the SAC/SPA boundary. The Utilities Topic Paper states that the Mellieħa Hotel Centre has its own sewage treatment plant and uses the second class water for irrigating the landscaped areas.

The area is also important for its arterial road that passes along the Għadira sandy beach. Although the road falls within the EC's Trans-European Transport Network (TEN-T) programme and most of the arterial road has been upgraded, the road adjacent to the sandy beach has not yet been upgraded. In the November 2008, following an initial public consultation process, the then Ministry for Infrastructure and Communications (MITC) issued five different options for the road behind the sandy beach:

"1. Do Nothing

2. Upgrading of the existing road, including new link road around the Seabank Hotel, junction improvements near the Mellieħa Bay Hotel, better car parking facilities and upgraded promenade / pedestrian facilities.

3. Bridge Variant of Option 2, involving realignment of the road between the Għadira Nature Reserve and the Mellieħa Bay Hotel junction, with the 200 m long new section of road to be constructed on a 6 m high viaduct

4. Removal of a 420 m long section of the existing dual carriageway along the bay frontage and construction of an entirely new section of road around the western side of the Għadira Reserve, including a section of tunnel and 140 m long viaduct

5. Removal of virtually the entire length of existing road and construction of a new road around the western side of the Għadira Reserve, including a section of viaduct but without a tunnel" (Kenneth Pye Associates Ltd 2009).

MITC concluded that there could be significant benefits from the removal of the current arterial road and the creation of a larger beach which could possibly allow for the regeneration of the sand dune system. The project was criticised for the amount of agricultural land that would have been lost and the potential impact on Il-Ħofra saline marsh and the Għadira wetland reserve. The statuses of the applications for the re-routing are still pending. The Natural Heritage Panel, Heritage Advisory Committee (NHAC) recommended that the applications:

“should be refused in view of unacceptable negative impacts of these proposals. PA 00330/09 should be formally assessed through EIA Appropriate Assessment studies.. Such assessment should also consider two other options namely (i) a “do-nothing” option in which case the existing status quo is maintained with very minor interventions and (ii) a “do the minimum” option in which the necessary upgrading of the current road on the existing footprint is effected in order to rationalize traffic flow and parking”.

2.3.2 Health and Safety

This section is not intended to replace a Health and Safety Audit, it is a review of any records of past accidents or problems in the site and surrounding area and a summary of observations made during the site visit carried out during April 2013.

Mellieħa Bay has been graded at Grade A for its Water Quality, Facilities and Litter Control. With regards to Safety and Hinterland it was only rated a Grade C (Micallef and Williams 2003, 2004, as cited in Kenneth Pye Associates Ltd). This score resulted from issues related to pedestrian safety, noise levels and overall aesthetic appearance of the arterial road passing alongside the sandy beach.

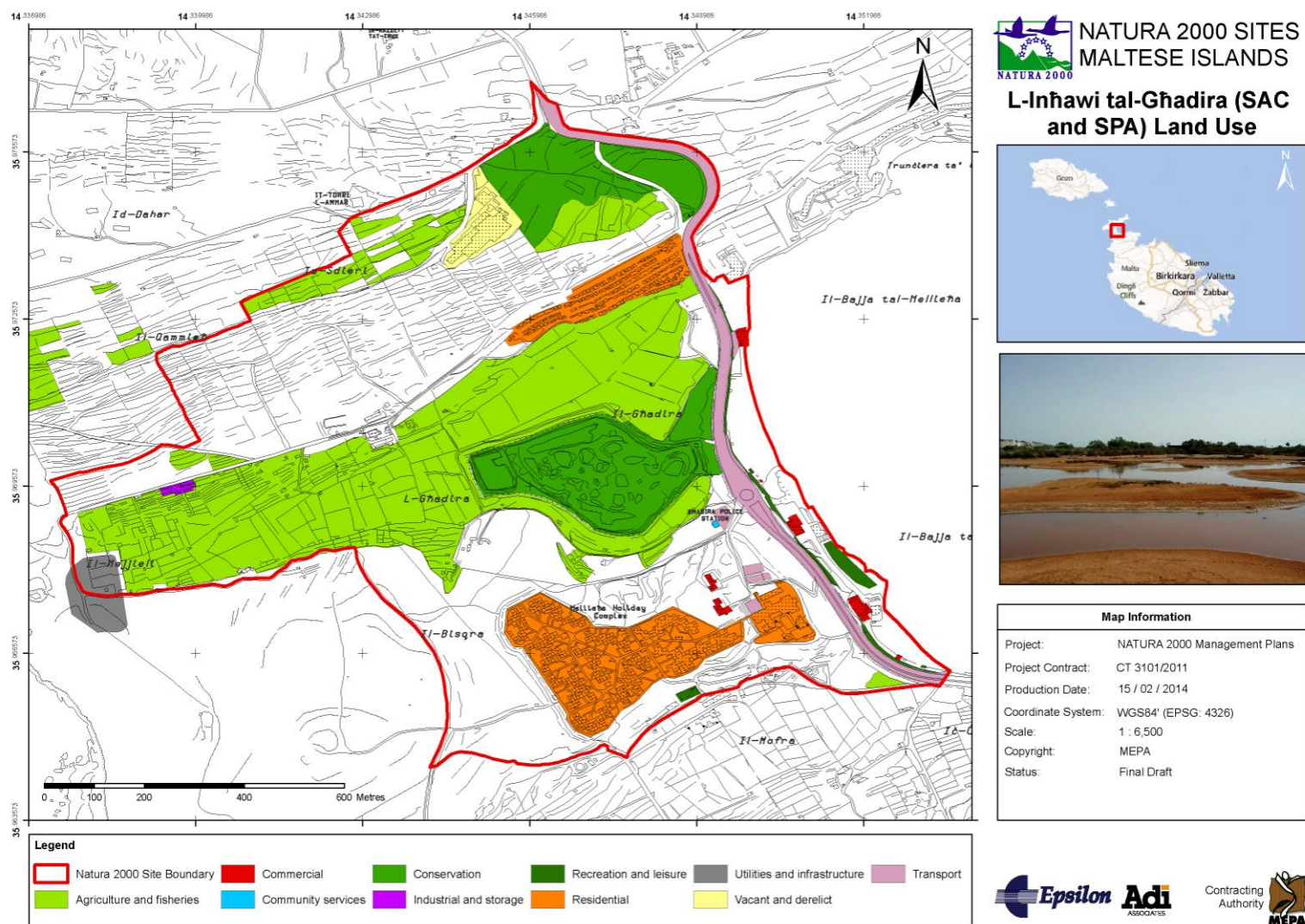


Figure 13: L-Inħawi tal-Għadira Land Use Map (see ANNEX 6: Maps for A3 version)

2.4 CLIMATE

The Maltese Islands’ climate is a typical Mediterranean one with mild wet winters and hot, dry summers. Precipitation is in the form of rain, hail, dew and soft rime. The average precipitation rate calculated over 30 years (1961-2010) is that of 553.12mm with a standard deviation of 156.99 mm (28.38 co-efficient of variation) (see Figure 14).

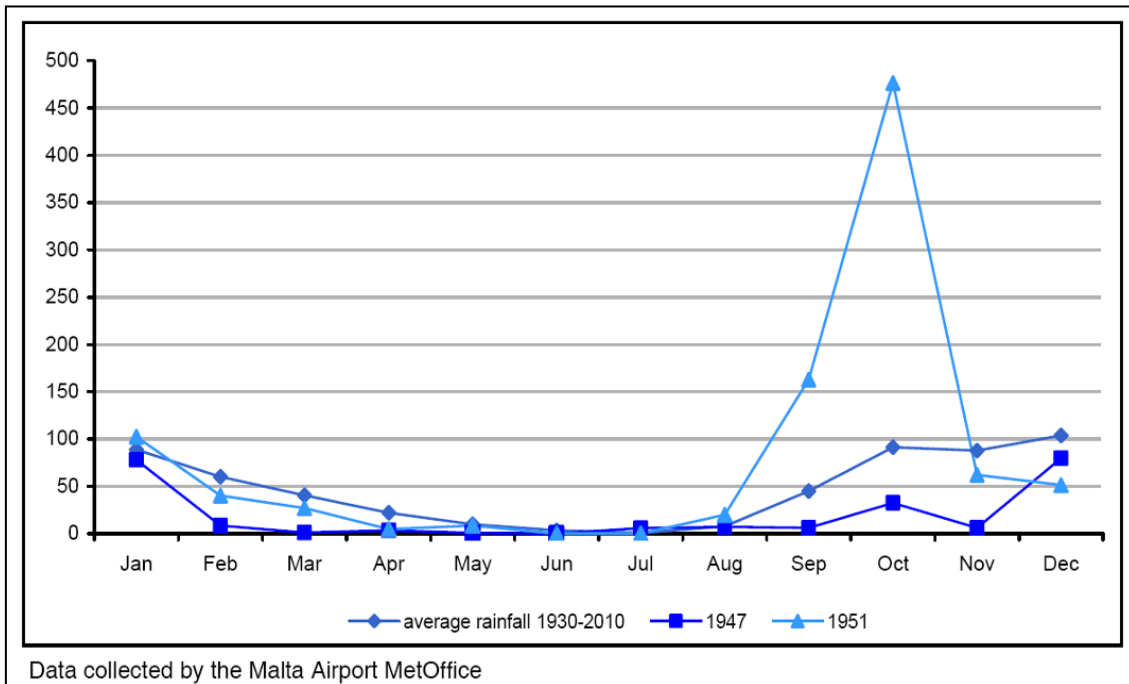


Figure 14: Precipitation; dry/wet yrs compared 1930–2010 averages (NSO 2011).

The average annual temperature is 18.62°C with a standard deviation of 0.40. The annual mean temperature varies from a minimum of 17.9 to a maximum of 19.7. The monthly temperature means vary from 12.4°C in winter to 26.3°C in summer. This variation is the result of the regional weather trends and the moderating influence of the sea (see Figure 15 and Figure 16). Grass-height minimum temperature is also recorded by the Meteorological Office and in this case temperatures less than 0°C were also recorded. The lowest minimum grass-height temperature was recorded in February 1983 when the temperature dropped to -5.1°C (NSO 2011).

Relative humidity during 1961 to 1990 varied from the monthly mean of 87% in January and 61% in June. The highest monthly relative humidity recorded was 89% in December 1993. The lowest monthly level was that of 54%, recorded in June 2006. The Maltese Islands receive a considerable amount of sunshine throughout the year with the most variable month being August due to the changes in weather that start during this month.

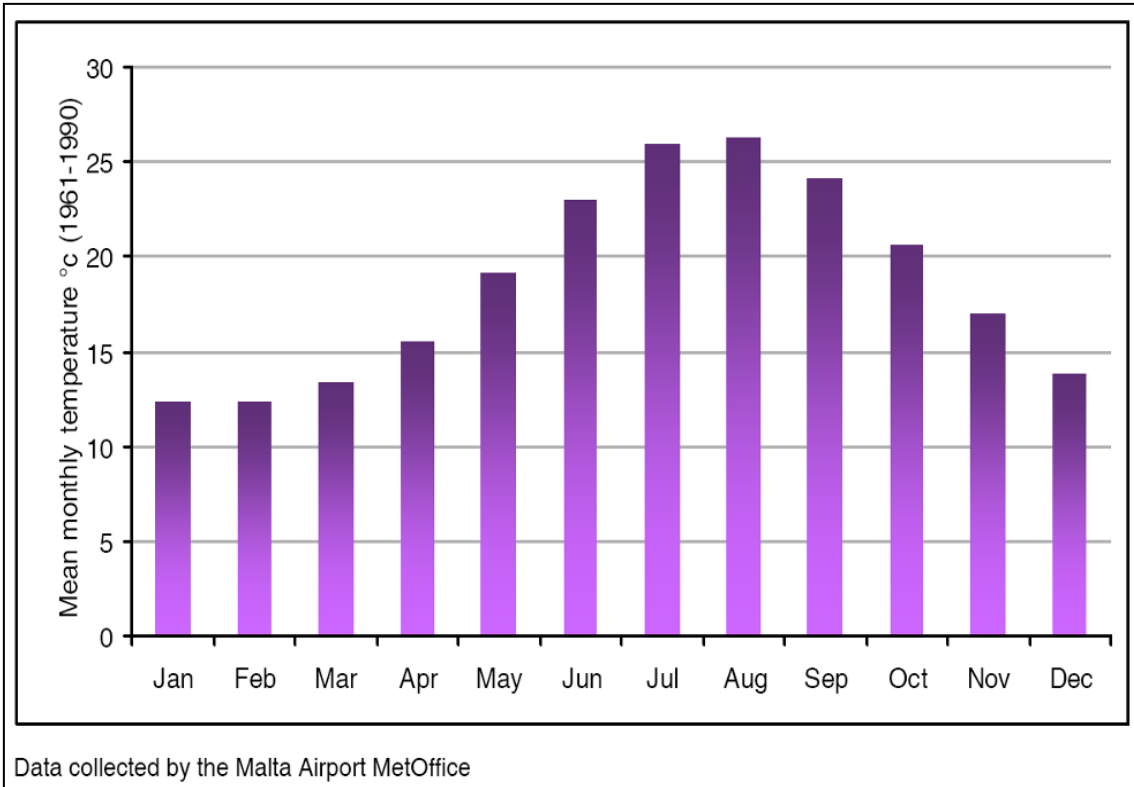


Figure 15: Mean monthly temperature (NSO 2011)

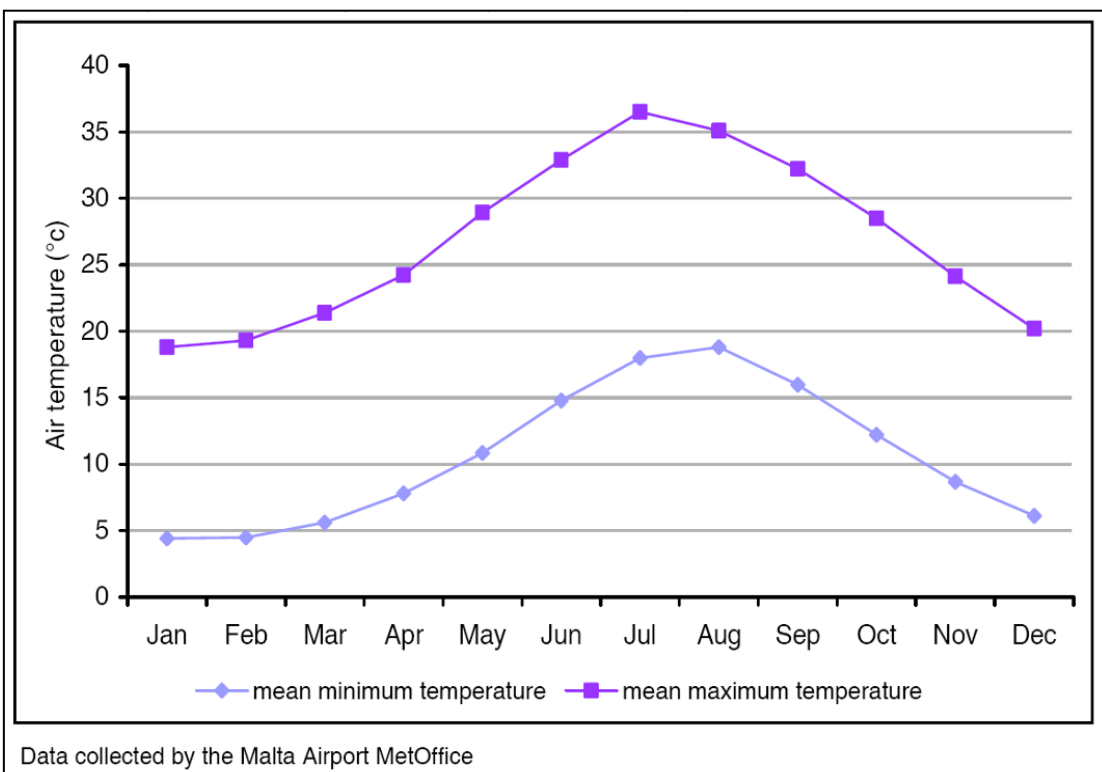


Figure 16: Mean minimum and maximum air temperature [Based on the 30-year climate period] (NSO 2011)

The mean annual wind speed over the 1961-1990 period is that of 16.3km/hr. The monthly means show that there is considerable variability. April had the highest mean monthly speed

(19.km/hr) over the same 30 year period. The most dominant wind is the North-westerly wind known as Il-Majjistral and blows on an average of 20.7% of days per year (see Figure 17).

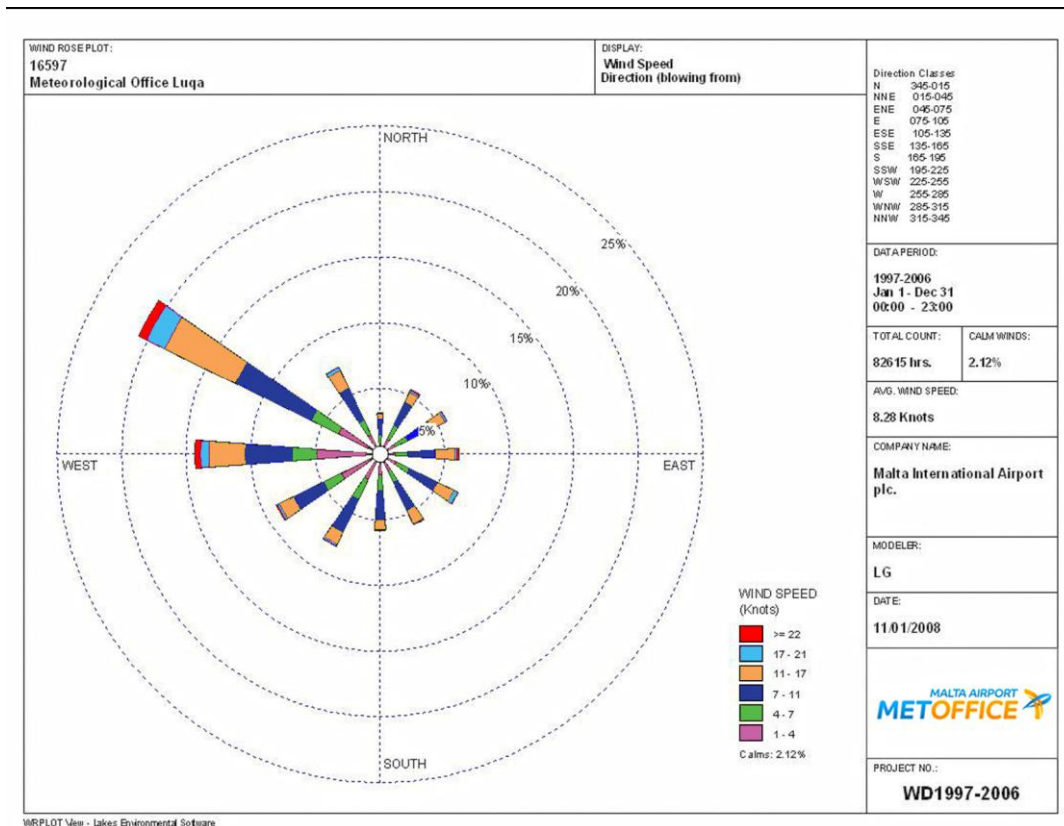


Figure 17: Wind rose for the period 1997-2006 (NSO 2011)

2.5 GEOLOGY

2.5.1 Lithology

The Maltese Islands were formed from marine sediments deposited on the Pelagian Spur during the Oligo-Miocene Age. The detaching of the Sicilian-Tunisian platform from the African Continent and the colliding movement between the African and Eurasian plates resulted in the creation of the Pantelleria Rift Systems. Faulting resulted in the subsiding of rifts and the uplifting of ridges like the Maltese Islands. Once these uplifted sections emerged from below the sea they were exposed to the elements and agents of erosion which sculptured the current landscapes.

The Maltese Islands are made up of following five limestone formations:

- Upper Coralline Limestone Formation
- Greensands Formation
- Blue Clay Formation
- Globigerina Limestone Formation
- Lower Coralline Limestone Formation.

L-Għadira's most prominent rock type is the Tal-Pitkal Member (Upper Coralline Limestone). To the north of the Tal-Pitkal member area is an area of Gebel Imbark Member (Upper Coralline Limestone). Further to the north east of the site one can find Blue Clay and small areas of Mtarfa Member (Upper Coralline Limestone) and Tal-Pitkal Member. The western part of the management plan area is characterised by a Blue Clay formation. The exposure of this formation corresponds to the Wied Liemu area (see Figure 18).

2.5.2 *Structural Geology*

The Maltese Islands have two main faulting systems. The Magħlaq Fault runs along the North-West – South-East Coast and has resulted in the North East tilt of the Maltese Islands. The Great Fault runs from Pembroke to Fomm ir-Riħ, dividing Malta into two main blocks. The north of the Great Fault is characterised by horst and grabens (i.e. ridges and rifts) whilst to the south of the Great Fault is flat land with the exception of the Rabat-Dingli Uplands. In the southern part of Malta, the Upper Coralline Limestone and Greensands formation have been eroded away and what remain are the Globigerina Limestone and the Lower Coralline Limestone formations. The predominant rock type is the Lower Globigerina Member.

L-Għadira management plan area is located in the area north of the Great Fault which is characterised by horsts and grabens. These features are also identifiable in the same management plan area. The site is part of the Mellieħa Valley (or Mellieħa Bay graben) and also includes a part of the Marfa Ridge. The valley is a rift valley. Rift valleys are created when parallel faults move apart and the central part slips down.

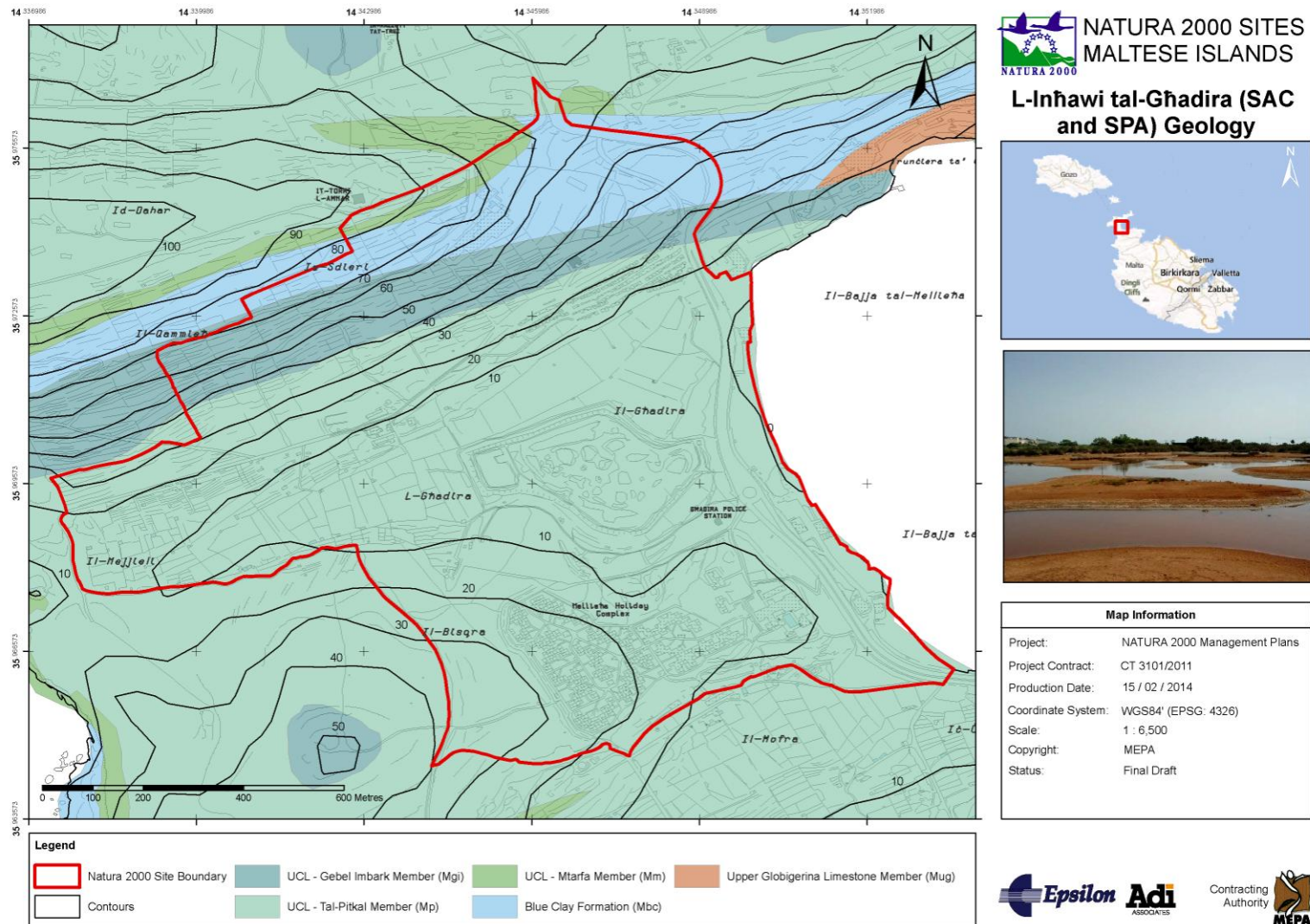


Figure 18: L-Inhawi tal-Ghadira Geology Map (see ANNEX 6: Maps for A3 version)

2.6 GEOMORPHOLOGY

The site's main geomorphological feature is its rift valley. Rift valleys have U-shaped basins. The Mellieħa Valley was created through the moving apart of the Marfa Ridge and Mellieħa Ridge during the Holocene (Post-glacial) marine flooding. The floor is tilting to the north east. *The Mellieħa Bay graben is a composite feature and has a smaller fault-bound block located along the central axis and the two flanking areas of lower ground (L-Għadira valley to the north and Il-Ħofra valley to the south)* (Kenneth Pye Associates Ltd). The valleys contain alluvial and colluvial deposits of the late Quaternary age.

Apart from the rift valley, another interesting geomorphological feature is related to the shoreline. The two main features are the sandy beach and the relics of the former sand dune system. The mid-1980s major programme to improve the arterial road led to a negative impact on the beach and the dunes. The scheme involved the alignment of the northern part of the Għadira road landwards and the widening of the road thus being closer *to the seaward limit of the vegetated dunes and obliterating the areas of embryo dunes further seaward*. The road was also raised thus limiting the sand being from the beach to the dunes even further (Kenneth Pye Associates Ltd 2009).

A quantitative assessment of shoreline stages was undertaken as part of the Għadira Beach Geomorphological Assessment: Scoping Study Report, for the TEN-T road improvement project. The study was done by comparing the 1957 and 2007 aerial photos. Nine points were taken to assess the changes in the water line and the 'back-beach line' (see Figure 19). In 8 of the 9 points the water line moved in a landward direction for 8 to 25 m. Between 1957 and 2007 there has been a widening of the beach of 3 to 25m in 7 of the 9 points. This apparent paradox can be explained by the fact that the 1980s road works included the landward realignment of the road (Kenneth Pye Associates Ltd 2009).

The Għadira beach itself comprises a northern and southern part that are divided by a rocky outcrop. The northern beach is larger than 1957 even though a large area of sand dune habitats has been destroyed after the 1980s road construction. Sand supplies to the dunes have also been cut off even though some sediment reaches the older dunes during north-easterly storms. Another threat to the remaining dune habitats is its dense vegetation. The southern beach has shrunk in size. The western side of the beach has gained sediment whilst the eastern side has been lost completely (Kenneth Pye Associates Ltd 2009).

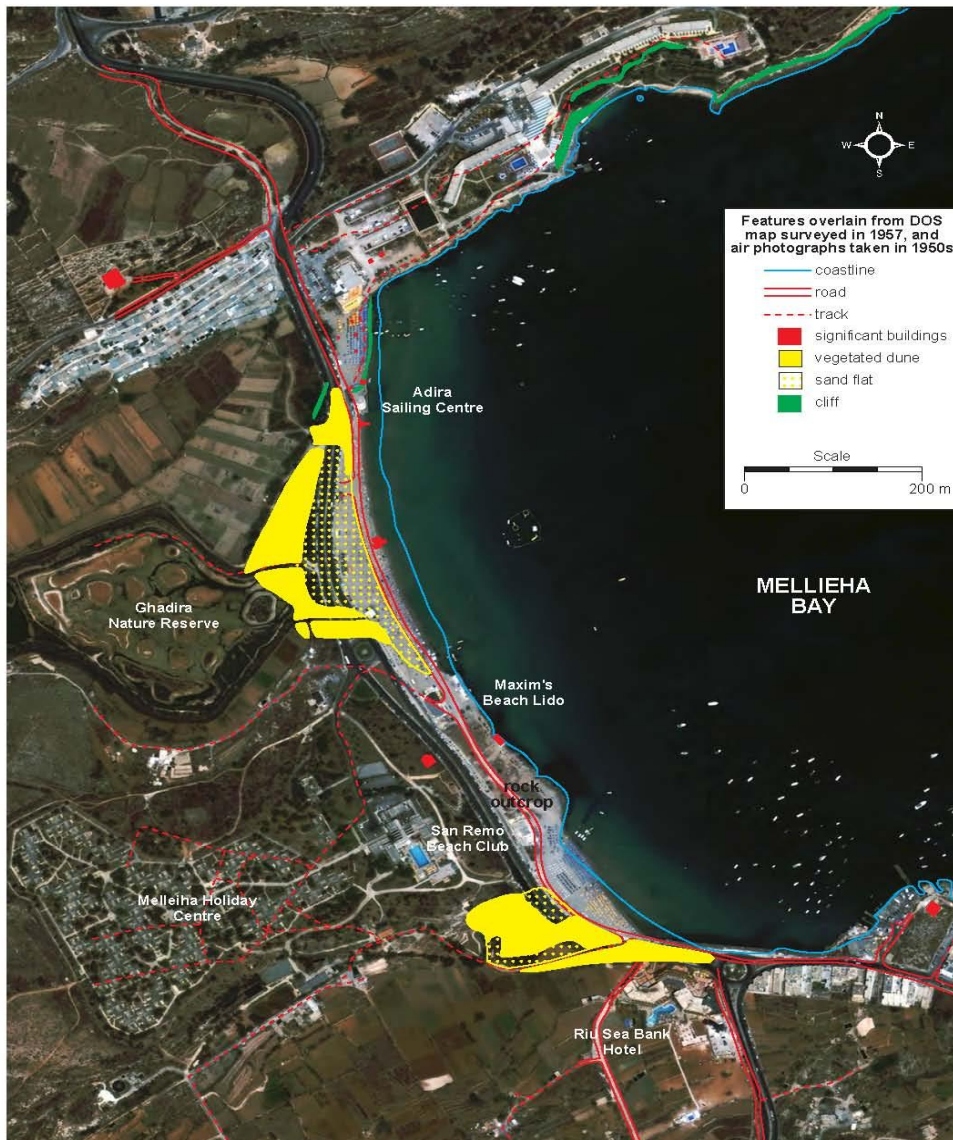


Figure 42 Composite aerial photograph of Melleiha Bay (source: Google Earth), overlain with features from Directorate of Overseas Surveys 1:2500 scale map (surveyed in 1957 and published in 1959), and oblique air photos taken in 1950s and 1960s.

Figure 19: Composite aerial photograph of Melleiha Bay (source: Google Earth), overlain with features from Directorate of Overseas Surveys 1:2500 scale map (surveyed in 1957 and published in 1959), and oblique air photos taken in 1950s and 1960s (Source: Kenneth Pye Associates Ltd 2009)

2.7 SOILS AND SUBSTRATES

The main sources of information about soils in the Maltese Islands are the study conducted by Lang in 1960 and the Soil Information System for the Maltese Islands (MALSIS) developed

between 2002 and 2004 by the National Soil Unit (Agricultural Services and Rural Development Division, Ministry for Rural Affairs and the Environment) with the technical assistants of specialists from the National Soil Resources Institute (NSRI) of Cranfield University in the UK. Prior to the MALSIS project, the Lang (1960) study remained the sole authoritative source of soil information.

There are various factors that have been crucial in understanding the nature of Maltese soil. These include the young age of the Maltese rocks, which has resulted in close similarities of the soil to the parent material, the climate that has hindered the creation of soil horizons, and anthropogenic activities that have resulted in modifications.

Lang (1960) used the Kubiena classification system to categorise the different soils of the Maltese Islands. He identified four main categories of soils, namely, the Carbonate Raw Soils, the Terra Soils, the Xerorendzinas and the Soil Complexes and Rdm Sequence. Carbonate Raw Soil is associated with the Blue Clay formation, Terra Rossa with Upper Coralline Limestone and Xerorendzinas with Globigerina Limestone.

According to Lang's 1960 survey map the dominant soils are L'Inglin complex which is found in 'strongly terraced Xaghra landscapes', and the Terra Soil (Xaghra Series) which is very fertile and is also found in karstic environments. L'inglin complex is found to the north of the wetland reserve and the Mellieħa Valley. Ix-Xaghra Series is found south of the wetland reserve and spans to Il-Bisqa area. The area where one finds the wetland reserve is composed of Xerorendzinas (Alcol Series). This soil type is found in the broader flat valley bottoms. The Alcol Series' parent materials are the valley loams (Quaternary and Recent) composed partly alluvial and partly colluvial material and are erosion products of Terra, rendzina, and carbonate raw soils, often stratified and generally, but not always, well sorted. In the northern part of the site there is also Carbonate Raw Soil (Fiddien Series). This soil type is associated with Blue Clay formations.

The MALSIS project resulted in numerous soil surveys between 2002 and 2004 around the Maltese Islands whereby many soil properties and characteristics were recorded. The management plan area is characterised mainly by Luvisols and Regosol followed by Leptosols (MEPA 2005). The soil in the area has medium organic carbon levels (20 – 60 g/kg). Conductivity in the north of the site is less than 500 $\mu\text{S}/\text{cm}$ whilst in the south of the site it is between 500 and 1000 $\mu\text{S}/\text{cm}$. Limitation to productivity is low. The probability of Zinc exceeding the limit level is also low. To the south east of the site, the copper levels are greater than 50 mg/kg.

In July 2009, a preliminary sediment survey of the shoreline stages was undertaken as part of the *Għadira Beach Geomorphological Assessment: Scoping Study Report*, for the TEN-T road improvement project. *Beach sediment samples were taken from three locations (upper backshore, just landward of the water mark, and below the water line at 1m depth) along eight profile lines. The samples were taken from the near surface (0-10cm depth interval) and analysed by dry sieving to determine the particle size distribution.*

The sediment samples consisted mainly of sand with less than 0.5% mud and less than 12% gravel. In the majority of the samples contain less than 2% gravel which consists of broken shells. The average sediment size was that of 176-370 μm . An exception to the rule was the sample taken below the water line close to Maxim's Beach Lido, where the sediments were coarser than average. The majority of samples can be described as *well sorted, very well-sorted* or *moderately sorted*. In this case the sample taken from below the water line close to Maxim's

Beach Lido was a *poorly sorted* sample. The data did not expose any onshore – offshore or alongshore trends.

The samples had 95.5 to 98.0% calcium carbonate content. *The acid insoluble residue in all cases was found to consist of dark greyish mud (all <63 µm in size) and fine grained organic matter.* The samples included different particle types: fragments of coralline limestone, modern marine algae, foraminifera, echinoderm spine fragments and shell debris. The sub-rounded to sub-angular and sub-equant particles' forms indicate that there has been a relatively low wave energy environment. The samples colours are mainly light brownish grey, whilst two of the samples were greyer.

2.8 HYDROLOGY

2.8.1 Mellieħa Rift Valley and its Catchment

The SAC/SPA is a rift valley or graben. The smaller fault-bound block located along the central part of the graben is flanked by two valleys: L-Għadira valley and Il-Hofra valley. L-Għadira is part of a 3.14 km² hydrological catchment. This catchment is of high significance to the SAC/SPA. It is also crossed by a watercourse (see Figure 20).

The drainage of the Mellieħa Bay is determined by the geology and topography of the area. *“A number of ephemeral streams once flowed from gorges (wied) cut in the north-facing slopes of the Mellieħa Ridge and drained into the sea via the Il Hofra depression. Today there is a drainage culvert under the road at the South Beach but discharges onto the beach are rare. A second system of ephemeral streams drained into the sea via the Il Għadira depression. The last major unconstrained flow occurred in 1957. Since construction of the Għadira Nature Reserve in the early 1980's floodwater discharge onto the beach has been restricted, and water levels within the Reserve by way of a sluice and culvert at the seaward end of the Reserve and a freshwater reservoir at the landward end” (Kenneth Pye Associates Ltd).*

The MAP CAMP Project “Malta” calculated water balances in surface water sheds in the North-Western Region. This included a calculation of the hydrological balance at Għadira. A surface area of 1.38km² was taken into account. The precipitation input was calculated to be 786,600m³ whilst the evapotranspiration losses and run-off were 495,558m³ and 47,196m³ respectively. The recharge accounts to 243,846m³ (UNEP/MAP 2003).

2.8.2 Inland Water Bodies

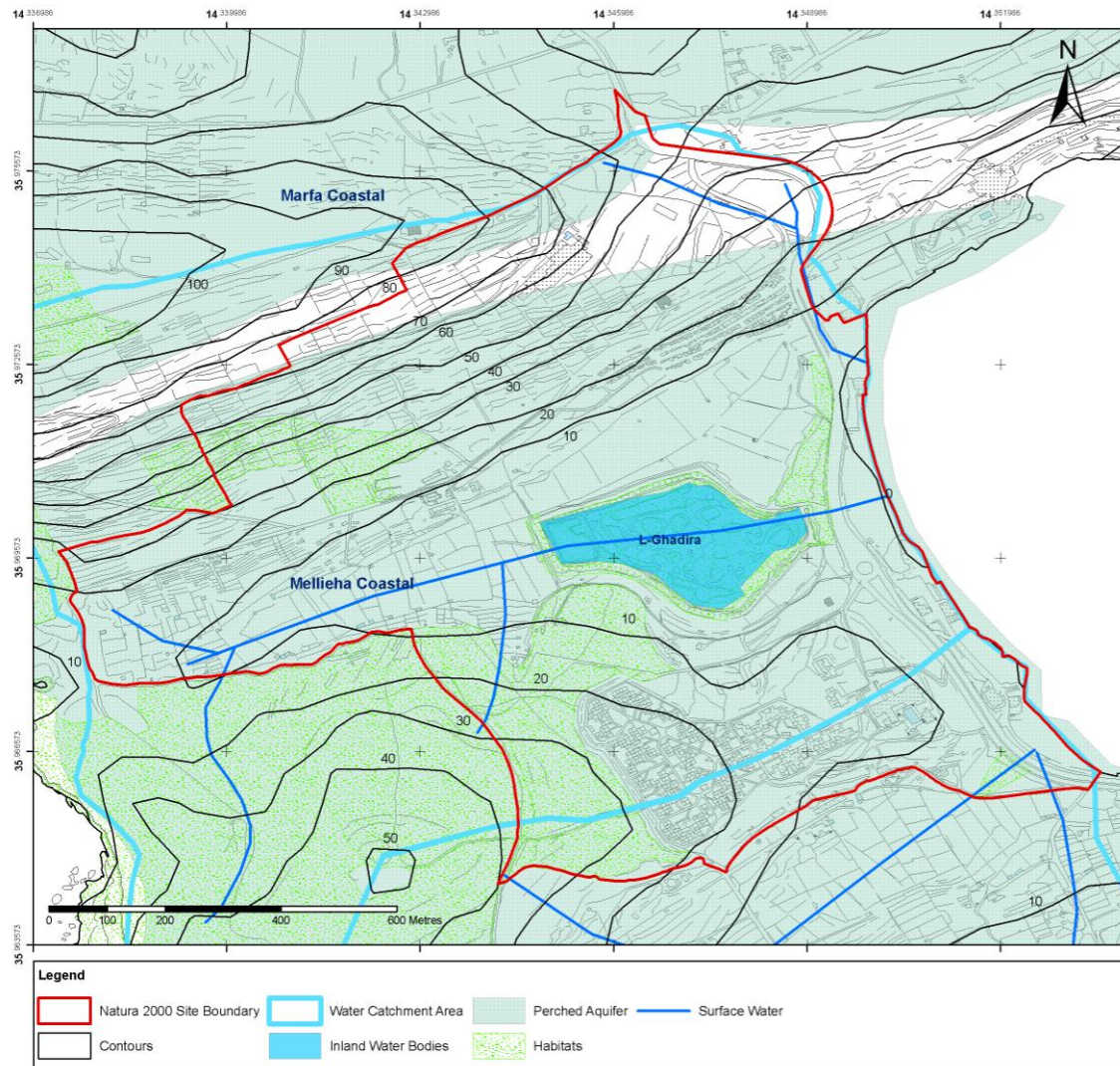
The reserve's wetland is an interesting hydrological feature. This inland surface water body is protected as a lake under the Water Framework Directive (2000/60/EC, LN 198/04). Studies undertaken between 1985 and 1986 showed that salinity in the reserve's wetland varied from 7 to 40%. In September at one particular station a measurement of 70% salinity was measured (Hill et al., 1990; Axiak, 1992, as cited in Kenneth Pye Associates Ltd). The salinity fluctuations are related to precipitation and sea water seepage. In summer the precipitation is at its lowest and the sea water seeps in the wetland. Increased evaporation contributes to increase the levels of salinity. *“Oxygen levels were generally high though nearanoxic conditions were recorded in some areas during the summer months, immediately after a phytoplankton bloom.*

As a result of the fluctuating and occasionally extreme environmental conditions, the lagoon was reported to have a relatively low macrofaunal species richness” (Borg et al., 1990 as cited in Kenneth Pye Associates Ltd).

The SAC/SPA includes Il-Hofra saline marshland too. This marshland has an area of 4,200m² and is characterised by a muddy substratum on which a pool of brackish water collects in the wet season. During the dry season, the water evaporates and becomes more brackish to hypersaline and finally disappears completely (Adi Associates 2009).

2.8.3 Ground Water Body

The aquifer in the area is the Mellieħa Coastal Groundwater Body found between the Marfa Ridge to the north and the Mellieħa Ridge to the south, see Figure 20 The aquifer is bound by the Għar Baqrat fault to the North and the Ras il-Griebeġ fault to the south. This aquifer covers an area of 2.9km². The maximum length is 1.8km and the maximum width is that of 5.0km (MRA 2005).



L-Inhawi tal-Ghadira (SAC and SPA) Hydrology



Map Information	
Project:	NATURA 2000 Management Plans
Project Contract:	CT 3101/2011
Production Date:	15 / 02 / 2014
Coordinate System:	WGS84' (EPSG: 4326)
Scale:	1 : 6,500
Copyright:	MEPA
Status:	Final Draft



Figure 20: L-Inhawi tal-Ghadira Hydrology Map (see ANNEX 6: Maps for A3 version)

2.9 ECOSYSTEMS / HABITATS, VEGETATION AND ECOLOGICAL PROCESSES

2.9.1 *Description of SAC*

The Inħawi tal-Għadira SAC is one of the larger SACs within the Maltese Islands. It extends over a surface area of 97.74 Ha, and supports a variety of habitats that include a small saltmarsh, a brackish wetland, sand dunes, garrigue/phrygana, steppe, a small valley and agricultural land. This SAC is also one of the richest in biodiversity, particularly for avifauna. It supports one of the most successful bird sanctuaries in the country, acting as a nesting and breeding site for a number of protected species. The latter aspect attracts many visitors to the area, making the Għadira reserve the most popular Wetland Reserve in Malta, with around 8,000 visitors a year, many of whom include school children. In view of this, this SAC is an important site for ecotourism and environmental education.

This SAC supports the highest number of listed species of any SAC in the Maltese Islands. In the last Standard Data Form (SDF, 2012) this SAC was designated as having seven Annex I habitats.

2.9.2 *Site History*

There is no relevant information.

2.9.3 *Site Management*

The land within the SAC falls under the management of a number of entities, including NGOs, private organisations, farmers, and government authorities. The largest proportion consists of agricultural land (28%). This is used by local farmers to grow various crops that include horticultural crops, cereals, olives, and vines. Evidence of irrigation equipment indicates water use in the area, with most of the valley being irrigated land otherwise classified as '*raba saqwi*' (see Figure 21). The southern part of the SAC, which supports the garigue/phrygana habitats, is mostly under private management falling under the auspices of the Mellieħa Holiday Centre. The northern flank of the SAC, at is-Sdieri, below the ridge is under the joint management of an NGO (Birdlife Malta) and the Government, being the focus of an afforestation project: Foresta 2000. This same area and garigue is also used by local shepherders to graze their animals. The bird sanctuary behind the beach at Għadira is under the full management of Birdlife Malta (NGO) through a management agreement with ERA. These different land users and land management practices have had an influence on the Annex I habitats and Annex II species recorded from this SAC. Whilst some have been beneficial, such as the management of the bird sanctuary, others have had a negative impact on the biodiversity of the SAC, as discussed below.

2.9.4 Recorded Trends

None are available.

2.9.5 Methods

The Standard Data Form (SDF, last updated in 2012-09) was used as a reference document prior to site visits and field survey work. The SDF was used to obtain an initial understanding of Annex I habitats and Annex II species that have been noted within the site.

Verification of the information presented in the Standard Data Form and accompanying habitats map was carried out through a number of site visits and field surveys during which, vegetation assemblages and habitats were identified and indicative maps were produced using GIS. It should be noted that the focus of the field surveys was to verify habitat mapping. No attempt was made to carry out an exhaustive survey of species present within the site. For a detailed list of species of interest previously recorded in the site, reference should be made to the Standard Data Form (2012).

The following site visits were carried out (see Table 3):

Table 3: Site and surveying visits

Date of site visit / field survey	Expert
10 February 2013	Dr Eman Calleja
8 March 2013	Dr Eman Calleja, Edwin Lanfranco, Krista Farrugia, Andrea Pace
11 April 2013	Thomas Arapis, Krista Farrugia, Niki Kardakari, Andrea Pace

Assessment of the plant communities within the SAC was carried out through a qualitative survey of species in a vegetative, flowering or fruiting stage. Classification of terrestrial habitats was carried out in accordance with Annex I, Habitats Directive.

2.9.6 Assessment of Conservation Status

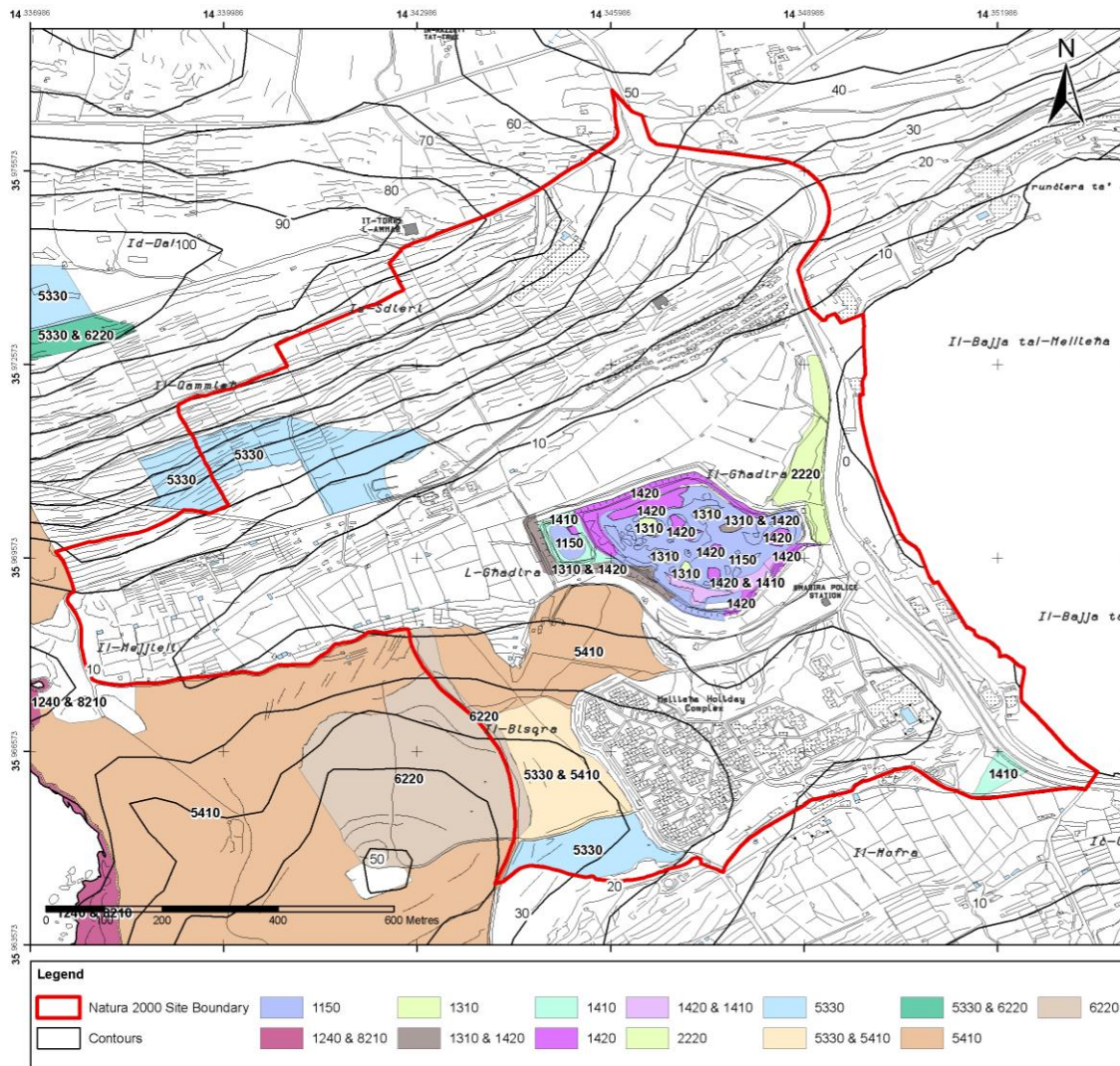
The conservation status of noted Annex I habitats was determined in accordance with the Methodology provided by MEPA. A full description of the methodology to assess conservation status is found in *ANNEX 3: Assessment Method of Conservation Status*.

2.9.7 Vegetation Assemblages

Figure 21 illustrates the habitats map for the SAC that was produced following the field surveys carried out as indicated above. Annex I habitats noted include:

- 1150 – Coastal Lagoons (see Figure 23)
- 1310 – Salicornia and other annuals colonising mud and sand (see Figure 24)
- 1410 – Mediterranean salt meadows (*Juncetalia maritimi*) (see Figure 25)

- 1420 – Mediterranean and thermo-Atlantic halophilous scrubs (see Figure 26)
- 2220 – Dunes with *Euphorbia terracina*
- 5330 – Thermo-Mediterranean and pre-desert scrub (see Figure 27)
- 5410 – West Mediterranean clifftop phrygas (*Astragalo-Plantaginetum subulatae*) (see Figure 29)
- 6220 – Pseudo-steppe with grasses and annuals of the *Thero-Brachypodietea* (see Figure 30).



**NATURA 2000 SITES
MALTESE ISLANDS**

**L-Inhawi tal-Ghadira (SAC
and SPA) Habitats**



Map Information	
Project:	NATURA 2000 Management Plans
Project Contract:	CT 3101/2011
Production Date:	15 / 02 / 2014
Coordinate System:	WGS84' (EPSG: 4326)
Scale:	1 : 6,500
Copyright:	MEPA
Status:	Final Draft



Figure 21: L-Inhawi tal-Ghadira Habitats Map (see ANNEX 6: Maps for A3 version)



Figure 22: View of the SAC at I-Inħawi tal-Għadira



Figure 23: Habitat 1150 – Coastal Lagoons



Figure 24: Habitat 1310 – *Salicornia ramosissima* colonising low-lying mud islands



Figure 25: Habitat 1410 is relatively widespread within the bird sanctuary; here found growing along a footpath



Figure 26: *Juncus subulatus* growing along the bank of the secluded lagoon at the western end of the bird sanctuary



Figure 27: Habitat 5330 at is-Sdieri



Figure 28: Dumping and burning of rubbish in habitat 5330 at is-Sdieri



Figure 29: Habitat 5410 at il-Bisqra



Figure 30: Habitat 6220 dominated by *Brachypodium retusum* at il-Bisqra

2.9.8 Conservation Status

In accordance with the methodology described in *ANNEX 3: Assessment Method of Conservation Status*, the conservation status was assessed for each of the Annex I habitats based on the vegetation assemblages as observed during the February/March 2013 survey. The habitats were evaluated in accordance with the criteria of area, structure and functions and future prospects.

Table 4 illustrates the conservation status assessment for Annex I habitats recorded at L-Inħawi tal-Għadira.

Table 4: Conservation Status of Annex I habitats

Annex I habitat	Code	Area	Structure & Function (including typical species)	Future Prospects (as regards area, structure & function)	Current condition
Coastal lagoon	1150*	<p>B2</p> <p>Area occupied: 30,900 m²</p> <p>This habitat occupies 3.2% of the total surface area of this SAC.</p> <p>The coastal lagoons are entirely enclosed within the perimeter of the Wetland Reserve. In spite of attracting a large number of bird species, the lagoons are still relatively small in comparison to other protected Natura 2000 coastal lagoons in Europe. Moreover, the low-lying topography of the surrounding landscape suggests that the lagoons might not be occupying the maximum extent of land available to this habitat, which is restricted to just two other sites in Malta. Extension of the habitat could potentially occur to the south and north of the enclosed reserve.</p> <p>In view of the rarity of this habitat in the Maltese Islands, coupled with the relative small size of these coastal lagoons compared to other such bird sanctuaries of international</p>	<p>B2</p> <p>The coastal lagoon at I-Għadira is probably the best example of this habitat in the Maltese Islands. The relative lack of pollution from agriculture or other sources (watershed for the lagoon is mainly garigue and a relatively small area of agricultural land in the valley upstream from the bird sanctuary), together with the enclosed Wetland Reserve itself, has led to the development of a richly diverse ecosystem. According to Deidun et al (2002)³ and Debono (2010)⁴ the lagoon supports a thriving population of the endemic Annex II species, <i>Aphanius fasciatus</i> (Killifish). The lagoon also provides food and shelter to a large number of Annex II bird species, some of which overwinter and even breed in the reserve. However, although a high species diversity has been recorded, numbers of each species, particularly of wetland species is restricted, largely as a result of lack of space.</p>	<p>B2</p> <p>In view of the inadequate prospects for the area and structure and function covered by this habitat, in the absence of lagoon extension, the future prospects for the coastal lagoons are considered to be inadequate and stable.</p> <p>An increase in the extent of this habitat would improve the future prospects for coastal lagoons in Malta since this is a very rare habitat, which has very little scope to increase in surface area in the Maltese Islands other than here and potentially at is-Simar.</p>	B

³ Deidun A., Diacono I., Tigano C. and Schembri P.J. (2002) Present distribution of the threatened killifish *Aphanius fasciatus* (Actinopterygii, Cyprinodontidae) in the Maltese Islands. In Central Mediterranean Naturalist. 3 (4) 177-180.

⁴ Debono J. (2010). In MaltaToday. 12th December 2010.

Annex I habitat	Code	Area	Structure & Function (including typical species)	Future Prospects (as regards area, structure & function)	Current condition
		importance, the the area is considered to be inadequate and stable .	In view of the above, whilst the structure is considered to be suitable, for wetland birds, the relatively low number of individuals that the site can consistently support means that its function in terms of its attractiveness to wetland birds (for which the lagoon was constructed) is considered to be inadequate and stable .		
Salicornia and other annuals colonizing mud and sand	1310	<p>B3</p> <p>Area occupied: 7,500 m²</p> <p>This habitat occupies around 0.8% of the total surface area of the SAC. It is found in the lower lying areas which are intermittently submerged by water. The slightly higher and drier terrain is instead occupied by habitats 1410/1420. Anecdotal evidence suggests that as the vegetation within the reserve matures, this habitat is gradually replaced by more permanent vegetation of habitats 1410 and 1420. The area occupied by this habitat has in fact been decreasing over the years (personal communication Alex Casha, March 2013), and now is mostly restricted to islands which are partially submerged during heavy rain events. In view of this, the area for this habitat is considered to be inadequate and deteriorating.</p>	<p>B3</p> <p>This habitat as a whole is well structured throughout the lagoon. It varies from excellent (I), in some of the lower-lying mud islands close to the small bird hide, to partially degraded (III) in other areas. The variation depends on the water level, which seems to influence the extent of other competing habitats; 1410/1420. The higher lying terrain is dominated by habitats 1410 /1420 while lower lying islands are dominated by habitat 1310. As seen in the salt marsh at il-Ballut ta' Marsaxlokk, habitat 1420 may directly compete with habitat 1310 to replace it unless factors exist to control the spread of <i>Anthrocnemum macrostachyum</i>. The degree of conservation of functions for this habitat is described as average or unfavourable, as it is vulnerable to the spread of habitat 1420, which has</p>	<p>B3</p> <p>In view of the decrease in area covered by this habitat, its inadequate prospects for the area, structure and functions, the future prospects are considered to be inadequate and stable.</p> <p>Since the processes influencing the area covered by this habitat are natural, there is little intervention that may be done other than scouring vegetation found at the boundary between habitat 1310 and 1420 when the former is being replaced by the latter.</p>	B

Annex I habitat	Code	Area	Structure & Function (including typical species)	Future Prospects (as regards area, structure & function)	Current condition
			<p>been spreading throughout the reserve (personal communication Alex Casha, March 2013). Where this habitat was present, the vegetation was dominated by <i>Salicornia ramosissima</i>.</p> <p>In view of the above, the structure and function of this habitat throughout the SAC are considered to be inadequate and potentially decreasing.</p>		
Mediterranean salt meadows	1410	<p>B2</p> <p>Area occupied: 9,100 m²</p> <p>This habitat occupies just 0.9% of the surface area of the entire SAC. It has a restricted and patchy distribution within the reserve, and is found bordering the waterline around and within the coastal lagoon. It is either found growing alone or in combination with habitat 1420.</p> <p>Whilst highly restricted and fragmented, there is very little scope for habitat expansion within the Għadira Sanctuary, except through the replacement of other habitats.</p> <p>In view of the above, the area covered by this habitat is considered to be inadequate though stable.</p>	<p>A</p> <p>This habitat is characterised by the dominance of <i>Juncus acutus</i>, <i>Inula crithmoides</i> and <i>Juncus subulatus</i>. As a whole it is well structured throughout the sanctuary. Though this habitat is evident in small areas, the largest and best structured section is found on one of the largest islands located on the southern end of the lagoon. The island is dominated by a combination of habitats 1410 and 1420. For the former habitat, the vegetation is dominated by <i>Juncus acutus</i>, <i>Juncus subulatus</i> and <i>Inula crithmoides</i>. The vegetation cover is 100%, while the average height of the vegetation in this area was over 50cm. <i>Juncus subulatus</i>, a rare species with a restricted distribution in the Maltese Islands, is relatively widespread within</p>	<p>B2</p> <p>In view of the restricted area covered by this habitat, inadequate prospects for the area, and favourable prospects for the structure and functions, the future prospects are considered to be inadequate but stable.</p> <p>In spite of the fact that the prospects for the structure and functions of this habitat are favourable, the lack of any available terrain to extend its restricted distribution does not provide favourable future prospects.</p>	B

Annex I habitat	Code	Area	Structure & Function (including typical species)	Future Prospects (as regards area, structure & function)	Current condition
			<p>the sanctuary.</p> <p>In view of the above, and the presence of a number of rare species typical of this habitat, the structure and function of this habitat as a whole throughout the SAC are considered to be favourable.</p>		
Mediterranean and thermo-Atlantic halophilous scrubs (Sarcornetia fruticosi)	1420	<p>B1</p> <p>Area occupied: 21,700 m²</p> <p>This habitat occupies 2.2% of the total area of the SAC. It has a patchy distribution within the reserve, and is found bordering the waterline around and within the coastal lagoon. In the north side of the sanctuary it also inhabits the raised banks enclosing the wetland. It is either found growing alone or in combination with habitats 1310 or 1410.</p> <p>The area covered by this habitat has been gradually increasing to occupy areas which were previously occupied by habitat 1310.</p> <p>In view of the extent of this habitat within the sanctuary, together with the increase in area over the years (Alex Casha personal communication, March 2013), the area for this habitat</p>	<p>B2</p> <p>The structure of this habitat was described on the whole as average due to the anthropogenic selection of non-related species during planting and establishment of the bird sanctuary. This is particularly so for the sections along the footpath. A number of tree and shrub species have been planted in these sections, including <i>Rhamnus alaternus</i>, <i>Tetraclinis articulata</i> and <i>Punica granatum</i>. Moreover, these areas are dominated by <i>Tamarix africana</i> while habitat 1420 dominates the undergrowth. The best examples of this habitat are found on some of the islands within the lagoon where trees are absent.</p> <p>There are good prospects for the conservation of functions of this habitat, as it has been noted to be spreading throughout the sanctuary (Alex Casha personal communication,</p>	<p>B2</p> <p>In view of the inadequate prospects for the area, structure and function of the habitat, and the presence of a tree cover dominated by atypical species in around half of the area covered by this habitat, the future prospects for this habitat are considered to be inadequate but stable.</p> <p>Though restoration would involve the removal of the atypical species of trees, the benefits would be outweighed by the potential loss of fodder and cover that is favoured by various rare avian species visiting the sanctuary.</p>	B

Annex I habitat	Code	Area	Structure & Function (including typical species)	Future Prospects (as regards area, structure & function)	Current condition
		is considered to be inadequate but increasing .	<p>March 2013). The vegetation is also very dense, covering 100% of the ground surface where it is found, and has an average height of at least 50cm. Restoration of the patches with a poor structure would involve the uprooting of the above-mentioned trees. However, one would have to weigh the benefits this could achieve as opposed to the potential loss of fodder from trees and cover that is essential in attracting such a diverse range of bird species to the lagoons.</p> <p>In view of the above, the structure and function of this habitat are considered to be inadequate but stable.</p>		
Dunes with Euphorbia terracina	2220	<p>B3</p> <p>Area occupied: 11,300 m²</p> <p>This habitat occupies just 1.2% of the entire SAC. This habitat is restricted to the remnant sand dune located behind the main road. In spite of the area covered, very little is actually inhabited by a Dune dominated by Euphorbia terracina. The potential for restoration however is very high, since this would only require the gradual replacement of alien species with typical dune species.</p>	<p>C2</p> <p>The dune remnant is heavily disturbed and the structure of the dune itself has been compromised both as a result of the road that interferes with the dune system, disconnecting it from the beach as well as a result of the species that have been planted there. These include <i>Acacia cyanophylla</i>, <i>Tamarix africana</i>, <i>Pistacia lentiscus</i>, <i>Tetraclinis articulata</i> and <i>Pinus halepensis</i>. The dune remnant includes only relatively small pockets of this habitat, which are characterised by the presence of <i>Pancratium maritimum</i>, interspersed</p>	<p>B</p> <p>In view of the area covered by this habitat, its bad prospects for the structure and function, together with the potential for habitat restoration, the future prospects are considered to be inadequate.</p> <p>A comprehensive restoration program would include the removal of alien tree species, atypical dune tree species, and a seeding program with species typical of this habitat. This would improve the future prospects for the habitat, which if done well, has</p>	C

Annex I habitat	Code	Area	Structure & Function (including typical species)	Future Prospects (as regards area, structure & function)	Current condition
		<p>According to Cassar & Stevens, (2002) the sand dunes at Għadira were larger in the past and were constituted of a shifting dune system that moved from year to year, in particular following a storm. Since the mid-1970s, road construction work along the beach, together with ill-conceived tree planting efforts on the dunes, have negatively affected the ecosystem, disrupting natural processes that had until then preserved the sand dunes. In view of this, the area for this habitat has been deteriorating, and is currently inadequate, in spite of the fact that this dune is still one of the largest in the country.</p>	<p>with ruderal species such as <i>Oxalis pes-caprae</i>. The presence of the road as well as the planting of inappropriate species has interfered with habitat function.</p> <p>In view of the above, the structure and function of this habitat are considered to be bad and stable.</p>	<p>the potential to reach a favourable condition within 5-10 years.</p>	
Thermo-Mediterranean and pre-desert scrub.	5330	<p>B3</p> <p>Area occupied: 69,700 m²</p> <p>This is the most extensive habitat occupying 7.2% of the SAC. It has a patchy distribution being located in two different areas. It occupies one landscape type: karstic coralline limestone. It is mostly found alone or in conjunction with habitat 5410. In spite of being the most widespread, this habitat is nowhere near reaching its maximum potential extent within this SAC. Some areas which had been previously occupied with this habitat</p>	<p>B3</p> <p>This habitat is the most widespread habitat. It was characterised by the dominance of species typical of habitat 5330 (refer to EIONET factsheet for Malta). It is either found growing alone or in combination with habitat 5410. It was characterised by the presence of a variety of species that included species characteristic of habitat 5330 (bold) but also species characteristic of habitat 5410(*), including: <i>Acacia cyanophylla</i>, <i>Anthyllis hermanniae</i>, <i>Bromus madritensis</i>, <i>Erica multiflora</i>, <i>Euphorbia melitensis</i>, <i>Hyparrhenia</i></p>	<p>B2</p> <p>In view of the inadequate and deteriorating prospects for the area and habitat, together with the negative anthropogenic factors affecting this habitat, the future prospects are considered to be inadequate and stable.</p> <p>These factors include localised dumping practices, presence of alien species, and localised grazing. The presence of the first two needs to be addressed if the future prospects for this habitat are to improve.</p>	B

Annex I habitat	Code	Area	Structure & Function (including typical species)	Future Prospects (as regards area, structure & function)	Current condition
		<p>(behind the Ghadira police station) have become so degraded, that they are no longer considered to support this habitat. Other areas have been replaced by an open pine woodland as part of the Foresta 2000 afforestation program.</p> <p>In view of the above, the the area covered by this habitat is considered to be inadequate and deteriorating.</p>	<p><i>hirta</i>[£], <i>Orchis collina</i>, <i>Orchis lactea</i>, <i>Periploca angustifolia ssp. laevigata</i>, <i>Pinus halepensis</i>, <i>Pistacia lentiscus</i>, <i>Stipa capensis</i>, <i>Teucrium fruticans</i>, <i>Thymus capitatus</i> and <i>Urginea pancration</i>.</p> <p>The structure of this habitat is generally average to well conserved. The best section of garrigue is that at il-Bisqra where the ground cover is around 80%, and various species of orchid are present.</p> <p>A number of negative factors are influencing this habitat, particularly in the section at il-Qammiegh/is-Sdieri. These include dumping and some grazing activity. The structure is here partially degraded, with a ground cover of less than 50% and an average vegetation height of less than 20cm. These factors could provide unfavourable prospects for the conservation of the functions of this habitat, particularly in this area. At is-Sdieri, beyond the access path, this habitat has been replaced by an open woodland of <i>Pinus halepensis</i>, planted as part of the Foresta 2000 project.</p> <p>In view of the above, the overall structure and function of this habitat</p>		

Annex I habitat	Code	Area	Structure & Function (including typical species)	Future Prospects (as regards area, structure & function)	Current condition
			were considered to be inadequate , and potentially deteriorating in view of the disturbance present in some areas.		
West Mediterranean clifftop phryganas	5410	<p>B2</p> <p>Area occupied: 67,250 m²</p> <p>This habitat is the second most extensive Annex I habitat, occupying 6.9% of the surface area of the SAC. It is found concentrated in one area, along the Bisqra promontory, just behind the Danish Village Holiday Complex. It grows either alone (two thirds of it) or in conjunction with habitat 5330 (around one third). It occupies one landscape type: karstic coralline limestone plateaux.</p> <p>In spite of being the second most extensive habitat, this habitat is still far from reaching its full extent within this SAC. In view of this, the area covered by this habitat is considered to be inadequate and stable.</p>	<p>B2</p> <p>This habitat is characterised by the dominance of species typical of habitat 5410 (refer to EIONET factsheet for Malta) in particular <i>Anthyllis hermanniae</i>. Other species include <i>Thymus capitatus</i>, <i>Euphorbia melitensis</i>, <i>Urginea pancracion</i>, <i>Periploca angustifolia ssp. laevigata</i>, <i>Hyparrhenia hirta</i>, <i>Erica multiflora</i>, <i>Teucrium fruticans</i> and <i>Pistacia lentiscus</i>. The degree of conservation of the structure of this habitat was partly degraded in the section which was co dominated by habitat 5330, and was well conserved elsewhere. A section of the phrygana was actually being replaced by steppic grasslands dominated by <i>Bromus madritensis</i> and <i>Stipa capensis</i>. The ground cover here was around 50%, whereas the prospects for the conservation of functions are average, due to the influence of trampling, and past reclamation practices in the area. There are also a considerable number of alien tree species, including <i>Acacia cyanophylla</i>, planted in the area.</p>	<p>B2</p> <p>In view of the extent of area covered by this habitat, inadequate prospects for the area, structure and function of the habitat, the future prospects are considered to be inadequate and stable.</p> <p>The presence of alien species is negatively impacting the degree of conservation of the structure of this habitat. Restoration should include the removal of any alien tree species, together with the control of excessive trampling.</p>	B

Annex I habitat	Code	Area	Structure & Function (including typical species)	Future Prospects (as regards area, structure & function)	Current condition
			<p>In view of the above information, the structure and function of this habitat were considered to be inadequate and stable.</p>		
<p>Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea</p>	<p>6220</p>	<p>C2</p> <p>Area occupied: 7,700 m²</p> <p>Habitat type 6220 occupies just 0.8% of the total surface area of the SAC. It occupies a very restricted area at il-Bisqra, at the western end of the SAC, adjacent to a long rubble wall. The habitat is in essence more extensive, and extends into an adjacent SAC. It occupies one landscape type: Karstic coralline limestone plateaux. In view of the relatively small area covered, together with the potential to occupy a much larger territory within this SAC, the area is considered to be bad and stable.</p>	<p>A</p> <p>This habitat is characterised by the dominance of <i>Thymus capitatus</i> with <i>Brachypodium retusum</i>. The structure is well conserved with a ground cover of approximately 80% and average vegetation height of 30cm. Other species included <i>Anthyllis hermanniae</i>, <i>Euphorbia melitensis</i>, <i>Urginea pancration</i>, <i>Periploca angustifolia ssp. laevigata</i>, <i>Hyparrhenia hirta</i>, <i>Erica multiflora</i> and <i>Teucrium fruticans</i>.</p> <p>The overall structure of this habitat and its counterpart in the adjacent SAC, is considered to be well conserved with good prospects for the conservation of its functions.</p> <p>In view of the above, the structure and function of this habitat are considered to be favourable.</p>	<p>B1</p> <p>In view of the restricted area covered by this habitat, bad prospects for the area, and favourable prospects for the structure and function of the habitat, the future prospects are considered to be inadequate.</p> <p>Since this habitat appears to be on the increase, the future prospects for the habitat are also improving.</p>	<p>B</p>

2.10 SPECIES

2.10.1 Annex II Plant Species

None of the three Annex II plant species⁵ recorded from this SAC were encountered during the survey.

Family Orchidaceae

Anacamptis urvilleana has been recorded from this site (SDF). It is an endemic species, which grows mainly in garigues and rocky steppes. Flowers are pale pink to white and occur in dense heads. *Anacamptis urvilleana* is endemic and is listed in the Red Data Book as Rare with Restricted distribution in the Maltese Islands. Its range within the site is illustrated in Figure 31. It is similar to the more common *Anacamptis pyramidalis*, however, hybridisation is not known to occur, probably due to the fact that the flowering periods are different. *Anacamptis urvilleana* flowers in early spring whereas *Anacamptis pyramidalis* flowers in late spring. The flowers of *Anacamptis urvilleana* are highly productive in terms of seed dispersal, however, as with all orchids, it is dependent on a specific fungus for successful seed germination and the plant takes approximately 10 years to mature (Weber & Kendzior)⁶. The symbiotic relationship with the fungus allows the plant to intake certain nutrients from the soil. This system, i.e. orchid mycorrhiza is highly sensitive to disturbance and any damage, including littering, transplanting and/or other interventions can affect the symbiosis to the detriment of the orchid.

Ophrys melitensis, until recently described as a subspecies of *Ophrys sphegodes*, is considered to be a recent species evolved from hybridisation between related species (Borg et al 2007⁷). This species is highly variable. The Maltese Spider Orchid, *Ophrys* sp. nov., as described in the Red Data Book is listed as endemic with a restricted distribution in the Maltese Islands.

Family Orobanchaceae

The form of *Orobanche densiflora* found in Malta is presumed to be endemic in the Red Data Book and it is described as rare with restricted distribution in the Maltese Islands. It is described from and restricted to sand dune habitats such as the one at L-Għadira. It is a parasite of *Lotus cytisoides*, a species that is found in habitat 2220. This species is an annual and has a compact, yellowish to light brown inflorescence.

2.10.2 Other Plant Species

The site supports a number of other plant species of interest as listed in the Standard Data Form, a number of which are listed in the Red Data Book including *Darniella melitensis* [Endemic], *Hedysarum spinosissimum* [V, Rest (MED+MI)], *Euphorbia melitensis* [Endemic], *Euphorbia terracina* [V, Rest (MI)], *Tamarix africana* [R, Rest (MED+MI)], *Limonium* sp. nov

⁵ *Anacamptis urvilleana*, *Ophrys melitensis* & *Orobanche densiflora*.

⁶ Weber, H.C., Kendzior, B. 2006. Flora of the Maltese Islands. A Field Guide. Margraf Publishers.

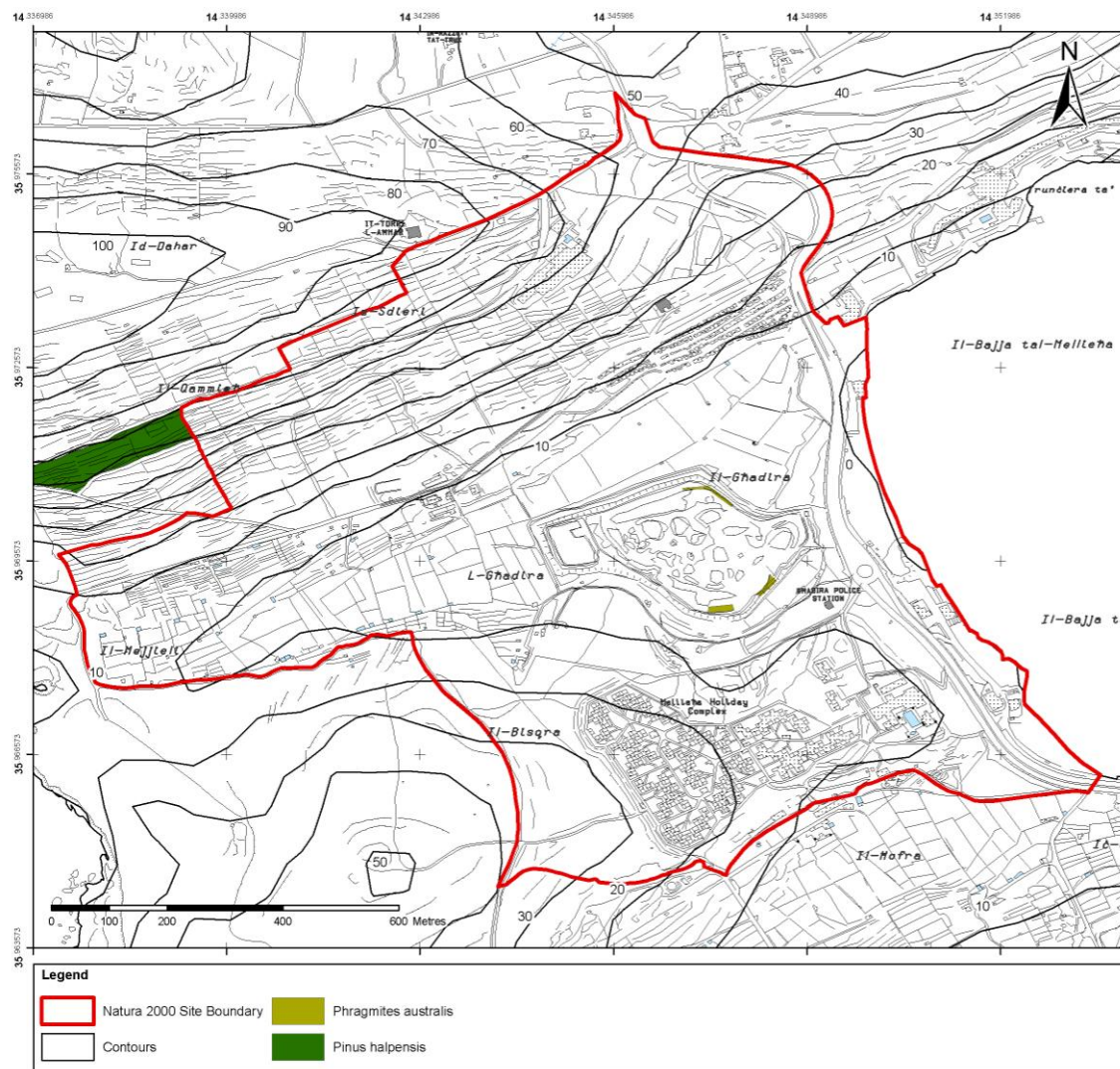
⁷ Borg, J.J., Lanfranco, E., Sultana, J. 2007. Nature in Gozo. Birdlife Malta.

[Endemic, E, Rest (MI)], *Periploca angustifolia* [Rest (MED)], *Urginea pancracion* [Rest (MED)], and *Carex extensa* [E, Rest (MI)].

Additional plant species that have only been recorded from a few other sites in the Maltese Islands include *Juncus acutus*, *Melilotus messanensis*, *Euphorbia chamaesyce*, *Elytrigia juncea*, *Ruppia drepanensis*, and *Juncus subulatus*.

2.10.3 Assessment of Conservation Status

The conservation status of the Annex II species was determined in accordance with the methodology provided by MEPA that uses the parameters of range, population size, habitat for the species and future prospects. The full methodology is found in *ANNEX 3: Assessment Method of Conservation Status*.



L-Inħawi tal-Għadira (SAC and SPA) Species



Map Information	
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Scale:	1 : 6,500
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Status:	Final Draft

Legend	
	Natura 2000 Site Boundary
	Phragmites australis
	Contours
	Pinus halpensis



Figure 31: L-Inħawi tal-Għadira Species Map (see ANNEX 6: Maps for A3 version)

Table 5: Assessment of Conservation Status of Annex II species

Annex II Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
<i>Anacamptis urvilleana</i>	4102	<p>C</p> <p><i>Anacamptis urvilleana</i> is listed in the Red Data Book as Rare with a Restricted distribution in the Maltese Islands.</p> <p>It is similar to the more common <i>Anacamptis pyramidalis</i>, however, hybridisation is not known to occur, probably due to the fact that the flowering periods do not overlap. <i>Anacamptis urvilleana</i> flowers in late winter/early spring whereas <i>Anacamptis pyramidalis</i> flowers in late spring. The flowers of <i>Anacamptis urvilleana</i> dependent on a specific fungus for successful seed germination. The symbiotic relationship with the fungus allows the plant to intake certain nutrients from the soil. This system, i.e. orchid mycorrhiza is highly sensitive to disturbance and any damage, including littering, transplanting and/or other</p>	<p>Indeterminate</p> <p>No data is available on the size of the population at site level. However from the poor data available to MEPA, it is assumed that the size of the population is not large.</p> <p>In the absence of more data, there is insufficient expert knowledge to safely assume the prospects for the size of the population, and whether the size of the population is increasing, decreasing or stable and will thus be left unassigned.</p>	<p>B</p> <p>It is an endemic species, which grows mainly in garigues and rocky steppes. Flowers are pale pink to white and occur in dense heads. This species flowers mainly in March and early April.</p> <p>The species is found in karstic habitats including phrygana and xeric grasslands, often subjected to human-induced pressures.</p> <p>This species was recorded from the westernmost corner of the SAC, which coincides with abandoned agricultural land or steppic terrain. This is not an Annex I habitat and has not been assessed as such. Nevertheless, the prospects for the habitat for the area are known as neither being favourable, nor bad, but rather inadequate.</p>	<p>B</p> <p>In view of the existing information, and the state of conservation of the habitats supporting this species, it is being assumed that the state of this species is Inadequate.</p>	<p>Indeterminate</p>

Annex II Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
		<p>interventions can affect the symbiosis to the detriment of the orchid.</p> <p>The SDF of 2012 records this species from this SAC, and the species maps prepared for the Article 11 surveillance report also suggests that the species is located in the western section of the SAC, in the Mejjeli area. Notwithstanding the above this species was not encountered during the field surveys, in spite of the fact that the timing of the surveys matched the flowering period for this species. This might suggest that the range for this species is indeed restricted to a small area, which could have been overlooked during the surveys. In view of the above, the range of the species is considered to be bad.</p>				
<i>Ophrys melitensis</i>	4105	<p>B</p> <p>The SDF of 2012 records this species from this SAC, and the species maps prepared for the Article 11 surveillance</p>	<p>B</p> <p>No data is available on the size of the population at site level. However from the assessment of the</p>	<p>B</p> <p>The species is found in karstic habitats including maquis, garrigue and xeric grasslands, often subjected to human-</p>	<p>B</p> <p>In view of the existing information, and the state of conservation of the habitat supporting this species, it is</p>	<p>B</p>

Annex II Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
		report also suggests that the species is located in the western section of the SAC, in the Mejjeli area. Notwithstanding the above this species was not encountered during the field surveys. It is most likely that the timing of the surveys did not match the flowering period for this species, and was not observed because it was not evident during the time. The SDF however suggests that this species is frequent within the SAC. In view of the above information, the prospects for the range of the species are considered to be neither bad nor favourable, but inadequate .	population size in the SDF of 2012, it is assumed that the size of the population is neither small nor large, but inadequate .	induced pressures. This species was recorded from the westernmost corner of the SAC, which coincides with abandoned agricultural land or steppic terrain. This is not an Annex I habitat and has not been assessed as such. Nevertheless, the the habitat for the area is known as neither being favourable, nor bad, but rather inadequate .	being assumed that the future prospects for this species are inadequate .	
<i>Orobanche densiflora</i>	4106	B According to the report for surveillance under Article 11 for Annex II species this species was previously thought to be confined to sand dunes, but has in the past 15 years been observed in coastal maritime phrygana communities within Mellieħa and eastern Malta. The SDF	B No data is available on the size of the population at site level. However from the assessment of the population size in the SDF of 2012, it is assumed that the size of the population is neither small nor large, but inadequate .	C2 The report for surveillance under Article 11 for Annex II species states that this species is dependent on its host species which according to 20 th century naturalists was <i>Lotus halophilous</i> . This latter species is now critically endangered and <i>Orobanche</i>	B In view of the existing information, and the state of conservation of the habitat supporting this species, it is being assumed that the future prospects for this species are inadequate . If the structure of the sand	C

Annex II Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
		<p>of 2012 records this species from this SAC as being frequent, and the species maps prepared for the Article 11 surveillance report record it from the sand dunes forming part of the bird sanctuary. Cassar & Stevens (2002) also record it from here as occurring in the endemic form <i>melitensis</i>. Notwithstanding the above this species was not encountered during the field surveys, most likely because the timing of the surveys did not match the flowering period for this species. In view of the above information, the prospects for the range of the species are considered to be neither bad nor favourable, but inadequate.</p>		<p><i>densiflora</i> has not been observed on this species in the last three decades. Instead it is now being observed on <i>Lotus cytisoides</i>, which is relatively frequent and is found in rocky coastal habitats and sand dunes.</p> <p>At Għadira, <i>Orobanche densiflora</i> is known from the sand dune habitats, which through this assessment has been found to have bad but stable, prospects for the structure and function of the habitat.</p>	<p>dune habitats is restored, the future prospects should improve.</p>	

2.10.3.1 Annex II fauna species

A. Mammals

Rhinolophus hipposideros and *Myotis punicus*⁸ have been recorded from this site.

Rhinolophus hipposideros

The Lesser Horse-shoe Bat is the smallest European Rhinolophid bat. The sub-species *R.h.minimus* present locally is smaller than its European congener. The head and body length ranges between 32 and 35mm, the forearm length 34 - 37mm, ear 11 - 15mm, and it is 4 - 5g in weight (Borg, 2005)⁹. Frequent and widely distributed, but highly vulnerable to disturbance. Numbers are on the decline due to disturbance, use of pesticides in agriculture, and reduced hunting areas. Males, which are first to arrive in the winter roosts, are generally more numerous than the females. Winter roosts are occupied between September and March, when the females move into the nurseries. The female of this species matures sexually in its first year and mating occurs from late summer to early autumn. Only an estimated half or two thirds of the females in a nursery give birth. A single offspring is born, usually between mid-May and early June. The young open their eyes after 8 - 10 days, and are completely independent at 5 - 6 weeks. In exceptional cases, this bat has been recorded to reach an age of twenty years, but the average life span is of only four years. It is a very skilful and fairly fast flier, with almost whirring wing movements; hunts in valley bottoms, along vegetated walls and along hedges, amongst bushes and shrubs. It flies very low to the ground at a height of around 5 meters. It is known to take prey from the ground, from rocks, and off leaves, but also in flight. Diet mainly includes small nocturnal beetles, moths, and mosquitoes. Its regular feeding spots are usually littered with insect remains.

Myotis punicus

The Mouse-eared bat of the Maltese Islands has long been a subject of debate amongst researchers. Its larger size, compared to its European congener, *Myotis blythii oxygnathus* has led to its confusion with the Greater Mouse-Eared Bat *Myotis myotis*.

It is uncommon and widely distributed, and exhibiting regular inter-island/colony movements. A declining species with over 50% of the population lost in the last ten years.

In Malta the species is essentially a cave dwelling bat, occasionally encountered also inside abandoned or seldom used human habitations. It feeds in valleys, cultivated land, and gardens.

Males are present in both winter roosts as well as in nurseries, where females start arriving by the end of March. The Lesser Mouse-eared bats roost by hanging freely from the ceiling, but may also enter narrow cracks. In winter roosts, the Lesser Mouse-eared Bat has been found in the company of Lesser Horseshoe bats and Grey Long-eared bats, although in separate clusters. Males wander more widely from one roost to another. Ringed individuals from

⁸ The species referred to in Annexes of the Habitats Directive is *Myotis blythii* s.l. is now considered as *Myotis punicus*. Consequently, *Myotis punicus* is still considered as an Annex II species.

⁹ Borg, J., J. 2005. Technical Appendix 7: Mammalia Baseline Survey. Supporting document for the Environmental Impact Statement for a Proposed Golf Course and Supporting Facilities at Ix-Xaghra I-Hamra and Tal-Qortin, I/o Mellieħa. Adi Associates Environmental Consultants Ltd.

roosts in Malta have been re-trapped on Gozo. Courtship takes place in late summer, and by early September, pairs engage in courting rituals.

Females mature in their second calendar year, when a single, naked pink coloured baby bat is born in late April or early May, depending on the weather. Unlike in most other bats, the young are left in a “crèche” with some females while the mother bat goes out hunting alone. The young first open their eyes when five or six days old and by the third week of their life, they are completely covered with fur. Adult teeth develop fully within 40 days from birth. They are able to fly when 20 days old and are independent after around 40 days. At least 95% of all young born manage to leave the nursery. The maximum age recorded for this species in Europe is 22 years. The oldest Lesser Mouse-eared bat in Malta, ringed when already an adult, was over 10 years of age when last caught in 1998. The average life span of this bat is of 4-5 years.

The bats emerge after dark and their flight is slow and at low altitude. They pick off food from ground and in mid-air. Their diet consists of Orthoptera - *Acrididae*, *Gryllidae*, *Tettigoniidae* 65% (*Platypleis intermedia* most abundant), Coleoptera - *Tenebrionidae*, *Scarabaeidae* 15%, Lepidoptera - *Sphingidae*, *Noctuidae* 20% (Borg 1998).

Its large size and roosting habits, makes this species particularly prone to attacks by vandals. At least two large nurseries have been destroyed in the late 1980s and early 1990s. Human disturbance in winter roosts, illegal taking, target shooting, and pesticides are some of the causes contributing to the decline in numbers.

B. Reptiles

One Annex II reptilian species is present on site, *Zamenis situla* (Leopard Snake). The subspecies *Zamenis situla leopardina* is listed in the Red Data Book. This species is listed as vulnerable and is considered of restricted distribution in the Mediterranean Region. It is an eastern Mediterranean subspecies that in the central Mediterranean is found in southern Italy, eastern Sicily and the Maltese Islands.

This species typically grows up to 1m long. Its dorsal colouration is pale brown with dark brown or reddish black-edged transverse spots and a forked black mark on the occiput and nape. Ventral colouration consists of black and white checkers. This is a common species, however, it is not frequently encountered since it prefers dark and sheltered localities. It is common in shaded valleys, often coiling itself around tree branches. Pozio (1983)¹⁰ reports that its preferred habitat is the typical Mediterranean maquis although it also has a great affinity for water. Malta’s Fourth Communication to the Convention on Biological Diversity (2010) also refers to *Zamenis situla* as having adapted to the urban environment, taking up residence in man-made structures. As indicated previously, *Zamenis situla* rarely moves in open, uncovered terrain being normally found in shrubs such as the Mastic Tree (*Pistacia lentisus*) and Sunrose (*Cistus* sp.) (Pozio, 1983). It is also found in areas of long grass or in rubble walls. The males are more active than the females and activity is greater in spring than in autumn. Sexual activity is dependent on temperature and is triggered following arousal from hibernation. This species forages for food at dawn and dusk, and feeds on young birds, lizards, geckos, frogs, mice, small rats, and small snakes. This species is one of the indigenous snakes of the Maltese Islands, and has been recorded from Malta, Gozo and Comino¹¹.

¹⁰ Pozio E. 1983. The biology of freelifving and captive *Elaphe situla*. *Litteratura serpentium* 3(3/2): 50-60.

¹¹ www.shadowservices.com

C. Fish

The Għadira, an important habitat wetland, provides habitat for the euryhaline cyprinodontid endemic fish *Aphanius fasciatus* (Maltese Killifish) [RDB: V, Rest (Med+MI)]. This fish species is currently described from four sites in the Maltese Islands (Zammit-Mangion & Deidun, 2010)¹².

As described in Zammit-Mangion et al (2011)¹³, the species is sexually dimorphic with a physiological capacity to tolerate abiotic constraints including hypoxia, hyposalinity and hypersalinity associated with coastal marshland habitats.

Deidun *et al* (2002)¹⁴ carried out a study of this species' distribution throughout the Maltese Islands. Historically, it had been recorded from nine localities, however, they confirmed it from four sites through their study, namely Marsa, Salini, Simar and Għadira. Large and thriving populations were recorded at Salini. The populations at Simar and Għadira were also healthy, however, these were introduced from Salini and Marsa, making the latter two localities the only sites where natural populations are present.

Zammit-Mangion & Deidun (2010) collected data on the morphology, sex ratio and phonology of the Għadira population. The study revealed that the *A. fasciatus* population at Għadira was exposed to extreme abiotic conditions during the peak summer months, including a rapid increase in habitat salinity, a decrease in oxygen concentration, an increase in aquatic temperature and decrease in water depth (up to 50%). These selective pressures resulted in a significant reduction in juveniles, reproductive activity, and number of male adults. Zammit-Mangion & Deidun (2010) describe that juveniles are less tolerant to reduced oxygen levels and increased salinity than adults. The more abundant presence of females during summer was postulated to be as a result of the reduction in water level and subsequent reduced extent of the reed bed that therefore offers less protection from predators to the prominently-coloured males.

As a result of the abiotic stress factors, coupled with the genetic isolation of the population, Zammit-Mangion & Deidun (2010) call for a high conservation priority to be assigned to this species and call for increasing protective measures during the reproduction and recruitment periods through late March to May, a re-introduction programme of the species to sites from where it was known to exist, and introducing a water monitoring programme.

D. Invertebrates

¹² Zammit-Mangion, M., Deidun, A. 2010. Management Recommendations for the Conservation of Threatened *Aphanius fasciatus* Nardo populations from two wetlands in the Maltese Islands. Società Italiana di Biologia Marina.

¹³ Zammit-Mangion, M., Deidun, A., Vassallo-Agius, R., Magri, M. 2011. Management of threatened *Aphanius fasciatus* at Il-Magħluq, Malta. Proceedings of the Tenth International Conference on the Mediterranean Coastal Environment, MEDCOAST, E. Ozhan (Editor), 25-29 October 2011, Rhodes, Greece.

¹⁴ Deidun A., Diacono I., Tigano C. and Schembri P.J. (2002) Present distribution of the threatened killifish *Aphanius fasciatus* (Actinopterygii, Cyprinodontidae) in the Maltese Islands. In Central Mediterranean Naturalist. 3 (4) 177-180.

Brachytrupes megacephalus is a large cricket inhabiting sand dunes and listed in the Red Data Book as vulnerable with a restricted distribution in the Maltese Islands. In fact, the Red Data Book specifies that this species is restricted to Għadira in Malta and Ramla in Gozo. However, subsequently other populations have been found in other coastal areas in the Maltese Islands. This species is stenotopic making it adapted to only a narrow range of environmental conditions. It is a nocturnal species and burrows in the sand using its large head to push sand whilst excavating with specialised tibia on the front and rear legs (Malta Entomological Society).

The Standard Data Form also makes reference to the endemic tenebrionid beetle *Pseudoseriscius cameroni*, stating that it used to occur in the dunes of the area, however, it is now likely to be extinct from the area due to the degraded nature of the dune area following road construction and the planting of alien and other inappropriate species.

2.10.3.2 Other fauna

A. Mammals

In the Għadira area other resident bat species include *Plecotus austriacus* [RDB: V], *Pipistrellus pipistrellus* [RDB:V], and *Pipistrellus kuhlii* [RDB:R] as resident bats. These species roost in the various farmhouses (John J Borg, personal communication). *Nyctalus noctula* [RDB: RR] has also been recorded as a passage migrant (John J Borg, personal communication). The SDF also lists *Suncus etruscus* [RDB: V?], *Mustela nivalis* [RDB: RR?].

B. Reptiles

Birdlife Malta note that *Coluber viridiflavus carbonarius* [RDB: V, Rest (MED+MI)] is present at the reserve and is known to predate nest broods of bird species nesting in the reserve. The SDF lists other reptilian species including another snake, *Telescopus fallax fallax* [RDB: V, Rest (MED+MI)], the geckos, *Tarentola mauritanica* [RDB: V] and *Hemidactylus turcicus turcicus* [RDB: V], the lizard, *Podarcis filfolensis maltensis* [RDB: Endemic (Malta, Gozo, Comino)], the skink, *Chalcides ocellatus tiligugu* [RDB: V, Rest (MED)], and the chameleon, *Chamaeleo chamaeleon* [RDB: V, Rest (MI)].

C. Amphibians

The only amphibian to occur in the Maltese Islands, the frog *Discoglossus pictus pictus* [RDB: V, Rest (MED+MI)] is known from the Għadira SAC.

D. Invertebrates

Invertebrates of conservation importance listed in the SDF are presented in Table 6.

Table 6: Invertebrates of conservation importance

Species	RDB status	Comments
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Species	RDB status	Comments
<i>Erodium siculus melitensis</i>	Endemic, Rest (MI)	Beetle, recorded from the sand dune at Għadira.
<i>Leptaleus rodriguesi</i>	Extinct, uncertain	Beetle, associated with saline marshlands
<i>Cyclodinus humilis</i>	Extinct, uncertain	Beetle, associated with saline marshlands
<i>Cyclodinus minutus</i>	Extinct, uncertain	Beetle, associated with saline marshlands
<i>Anthicus fenestratus</i>	Extinct, uncertain	Beetle, associated with saline marshlands
<i>Anthicus tristis</i>	Rare, uncertain	Beetle, associated with saline marshlands
<i>Protrama baronii</i>	Endemic to Malta only, uncertain, indeterminate status	An aphid reported from material from the nest of the ant <i>Camponotus barbaricus</i> at Mellieħa Bay in 1965, located on the roots of <i>Carduus</i> sp.
<i>Coleophora mellechella</i>	Very rare, Rest (MED)	Lepidopteran reported from Mellieħa.
<i>Prionyx viduatus</i>	Vulnerable, Rest (MI)	Sphecid wasp occurring exclusively in coastal areas with a system of sand dunes.
<i>Scarabeus semipunctatus</i>	Very rare	Associates with sandy areas and known only from Mellieħa and from a single specimen from Ramla l-Hamra, Gozo.
<i>Philanthus raptor siculus</i>	Vulnerable, Rest (MI)	Sphecid wasp occurring exclusively in coastal areas with a system of sand dunes.
<i>Odontura stenoxipha</i>	Vulnerable (uncertain), Rest (MI)	Longhorn grasshopper, apparently restricted to Għadira.
<i>Tetragnatha extensa</i>	Rare, Rest (MI)	Large spider associated with wetland habitats and locally has only been found at Salina, Għadira and il-Magħluq ta' Marsaskala.
<i>Smicromyrme</i> n.sp.	Endemic (uncertain), Vulnerable, Rest (MI)	Mutillid wasp remains undescribed. A single specimen was taken from Għadira.
<i>Tachyagetes</i> n.sp.	Endemic to Malta (uncertain), Rare	A small species of pompilid wasp known only from Għadira.
<i>Gammarus aequicauda</i>	Rare, Rest (MI-Malta, uncertain)	A brackish water amphipod species recorded locally only from the saline marshlands of Salina and Għadira.
<i>Allophylax picipes melitensis</i>	Endemic	Nocturnal ground beetle, widely distributed, including on the small islets.
<i>Ammobius rufus</i>	Rest (MI-Gozo, uncertain)	Nocturnal ground beetle, although previously reported from single localities in Malta including Mellieħa and Gnejna,

Species	RDB status	Comments
		the RDB suggests that it is now confined to Ramla in Gozo.
<i>Anoxia australis</i>	Rare, Rest (MI)	Dung beetle, associated with vines, first recorded from Għadira and probably introduced.
<i>Stenosis scombrii</i>	Endemic, indeterminate status	Nocturnal ground beetle.
<i>Stenosis melitana</i>	Endemic	Nocturnal ground beetle, widely distributed.

Table 7: Assessment of Annex II Species

Annex II Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
<i>Aphanius fasciatus</i>	1152	<p>A</p> <p>At Għadira, this species is distributed throughout the lagoon, and is known to be present in large numbers (Deidun, et al., 2002) (Zammit-Mangion & Deidun, 2010). This amounts to an approximate range of 30,900 m².</p> <p>In a comprehensive study by Zammit-Mangion carried out between May 2008 and October 2008 (2009), the population was found to exhibit an irregular distribution, as juveniles were found to inhabit the shallower areas whereas the larger adults inhabited the deeper sections of the lagoon.</p> <p>The population at Għadira is known to have originated from two separate morphologically distinct autochthonous populations that had until then been</p>	<p>A</p> <p>In a study carried out by Zammit-Mangion (2009), sampling of the killifish population at Għadira, together with a subsequent estimation of the population, has established this population as the largest in the country, with a conservative estimate of around sixty thousand individuals, compared to around 25,000 in the next largest population at Simar. Zammit-Mangion and other authors, have in fact described this population as thriving (Deidun, et al., 2002) (Zammit-Mangion & Deidun, 2010), in spite of a high mortality rate from extreme edaphic conditions during the summer months. This stress-induced mortality is known to arise from the “large seasonal fluctuations in abiotic factors, the stressful abiotic environment, especially</p>	<p>A</p> <p>Zammit-Mangion suggests that the habitat is an enclosed system bordered by a fence all around, and thus under limited influence from the surroundings (Zammit-Mangion, 2009), unlike the lagoons at il-Magħluq of Marsascalea (Zammit-Mangion, et al., 2011), and the Marsa ponds which are known to suffer from a lower water quality. The main influence on the abiotic and biotic conditions in the lagoon at Għadira is from agricultural runoff from a watershed that is predominantly garrigue, with a small area of agricultural land. This contrasts with Simar, Salini and Marsa, each of which receive water from a large watershed with intensive agricultural practices.</p> <p>This habitat supporting this species, the coastal lagoon or</p>	<p>A</p> <p>In view of the existing information, and the state of conservation of the habitats supporting this species, it is being assumed that the future prospects for this species are also favourable.</p> <p>Zammit-Mangion (2009) makes a number of recommendations to maintain favourable future prospects. The recommendations focus on two aspects; maintaining a suitable monitoring plan, and distributing the population throughout the country in other similar habitats to reduce the risk of accidental extinction in case of a sudden change in conditions at Għadira or Simar.</p>	<p>A</p>

Annex II Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
		<p>isolated: from is-Salini and Marsa (Deidun, et al., 2002). The fish now thrive and is considered to be the largest population in the country. The largest fish are found in the reservoir which contains a larger volume of water. In fact Zammit–Mangion suggests that the large volume of water provides more stable abiotic conditions, and thus fewer extremes, increasing the adult survival rate, resulting in older and larger individuals (2009).</p> <p>The size of the lagoon, being the largest of its type in the country, is large enough to ensure the long term survival of this species (Zammit-Mangion, 2009).</p> <p>In view of all the above information, the range of the population is thought to be favourable.</p>	<p>during the summer months and especially in terms of dissolved oxygen and water temperature.” (Zammit-Mangion, et al., 2011). In spite of this, the population at Għadira has been found to have a high recruitment rate (Zammit-Mangion, 2009).</p> <p>In view of this information, it is considered that the population of killifish within the lagoon at this site is favourable.</p>	Annex I habitat 1150, was found to have suitable structure and function of the habitat for the purposes of this species’ ecology. In view of all the above, the prospects for the habitat for this species are considered to be favourable .		
<i>Brachytrapes megacephalus</i>	4047	A Within the Għadira SAC the	B2 The species was first	B2 The typical habitat of <i>B.</i>	B2 Based on existing	B

Annex II Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
		<p>species is restricted to the sand dune remnants between the coastal road and the Wetland Reserve, since this is the habitat type that supports this species. Therefore, the range at this site is favourable.</p>	<p>recorded at Għadira by L.F.Cassar in 1977 on the basis of a dead specimen found in “coastal sands” (Cassar, 1979). In April-May 1983 a population of 19 males at Għadira was kept under observation by L.F. Cassar, who noted that the species occurred “within the Għadira sand dune area in a relatively well established population”. (Cassar, 1990). In 2008 L.F. Cassar and E. Conrad confirmed the presence of established populations at Ramla l-Hamra and Għadira. They were also of the opinion that the Għadira population appeared to exist in isolation and could possibly be vulnerable to the dynamics of small, isolated populations (Cassar & Conrad, 2008).</p> <p>In view of the available information, including the degraded nature and restricted area of the dune, to which this species is restricted, the size of</p>	<p><i>megacephalus</i> in Sicily and Malta is coastal sandy localities. Such habitats are very rare locally and this implies that the species is severely threatened due to scarcity of suitable habitat. (but see below re newly discovered localities).</p> <p><i>B. megacephalus</i> is fossorial and excavates burrows in the sand making up the dunes. The species is nocturnal and herbivorous, collecting plant food from the sand surface during the night. In the site where the species is found at the Għadira SAC the vegetation cover of the dune remnants provides enough food for the population. The habitat in general suffers from considerable anthropogenic pressures especially during the summer months including leisure activities, trampling, possible destruction of burrows by curious visitors and the taking of specimens by collectors. Possible flooding</p>	<p>information and the status of the habitat supporting the species the future prospects for the species at the Għadira SAC are being recorded as Inadequate and stable.</p>	

Annex II Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
			population is being assigned to the category inadequate but stable .	<p>of the burrows during rough seas and heavy rainfall is another possible threat, although the species is reputed to survive such flooding owing to its ability to swim (Petralia et al., 2003). Another possible threat at Għadira is that since the species occurs in the vicinity of cultivated fields, it may be perceived as a pest and persecuted as such (Cassar, 1979).</p> <p>No information is available on predators.</p> <p>In view of the information available, and the state of conservation of the sand dune remnant habitat supporting this species, the habitat for this species is considered to be inadequate and stable.</p>		
<i>Rhinolophus hipposideros</i>	1303	Indeterminate To date, roosts have not been recorded for this species within this site, although it is considered to	Indeterminate Number of bats in the area is indeterminate.	A Għadira supports a number of suitable potential cavities for roosts for this species. The Għadira Wetland	Indeterminate Presently, there is insufficient data to determine future prospects for this species at Għadira.	Indeterminate

Annex II Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
		be a resident in the area. The range within the site is therefore indeterminate.		Reserve and il-Hofra provide suitable foraging ground. The SAC therefore supports suitable roosting and foraging habitat.	Threats include disturbance or loss of roosts, habitat fragmentation, agricultural intensification and the use of pesticides in agricultural areas. A detailed, long term study is required in order to obtain a better understanding of this species' conservation status both at a national and site-specific level. Borg (2013) ¹⁵ presents a total of 17 roost sites for this species at a national level. Roosts within Għadira have not been located, however, Borg considers that it is likely that this area does contain roosts for this species (Borg, personal communication).	
<i>Myotis punicus</i>		B2 Roosts in a man-made shelter carved in Globigerina limestone (refer to map). The range of this species within this site is considered to be inadequate when	C2 3-5 roosting individuals (John J Borg, personal communication). The roost hosts a small number of this species, and population size is thus considered to be bad	A Favourable roosting habitat includes caves, tunnels, man-made shelters, etc. This habitat type is present within the SAC. In addition, the Għadira Wetland Reserve as	C A national study together with a second tier study of the site is required in order to understand better the future prospects of this species within this site. With	C

¹⁵ Borg, J.J. 2013. Roost occupancy and diet of the Lesser Horse-shoe Bat, *Rhinolophus hipposideros* (Bechstein, 1800) in Malta (Mammalia Chiroptera Rhinolophidae) S.IV, XXXVII (2). *Naturalista sicil.*

Annex II Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
		considering the area of the site and the presence of other potential suitable roosting habitat.	though stable. Another roosting population of this species was located at Ta'Pennellu, and hosted 15-20 individuals (last visited by John J Borg in 2013). Although not located within the SAC, individuals this population use Għadira as a foraging ground (John J Borg, personal communication). However, it is noted that more detailed research on the national population is required and the importance of this site in the context of the overall population should be understood. Once this data is obtained and analysed, the evaluation should be re-visited in order to provide a more robust result.	well as Il-Hofra z-Zghira provide ideal foraging ground.	the current data, future prospects are considered to be inadequate, largely in light of the very small population found within this SAC, which is then particularly vulnerable to roost disturbance. Threats include disturbance or loss of roosts, habitat fragmentation, agricultural intensification and the use of pesticides in agricultural areas.	
<i>Zamenis situla</i>	1293	Indeterminate This species has been noted from the Għadira Wetland Reserve. However, the species occurs in a variety of habitat types that are also found within this SAC and therefore it is likely that this	Indeterminate There is no data on the population size of this species at this site. The population size is therefore indeterminate .	A As reported in the EIONET fact sheet, local habitats for this species include garrigue, rocky steppes, valleys, field edges, gardens, dry stone walls, boulder and stone piles. Micro habitats include	Indeterminate In the absence of sufficient data of range and population within the site, the future prospects for this species are indeterminate. However, threats to the species include the use of pesticides,	Indeterminate

Annex II Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
		species has a more extended range within the site than has thus far been recorded. In the absence of further information, the range is therefore indeterminate.		crevices and cavities in walls and rocks, and among stones. The Ghadira SAC provides ample favourable habitat for this species.	restructuring of agricultural land holds, removal of specimens, and interventions to/within habitats and to habitat features that could result in disturbance.	

2.10.3.3 Birds

Breeding Birds

Table 8 presents breeding pair data for those species that breed within the Reserve. Table 9 provides additional information about these species at this site.

Table 8: Breeding bird pairs at Ghadira Reserve (Birdlife 2010)

Species	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<i>Charadrius dubius</i>	1	1	2	2	1	2	2	2	2	2(3)	3	3	6	8	3	4
<i>Gallinula chloropus</i>	0	(1)	1-2	1-2	4-5	4-5	6-8	8-10	8-10	10	10	10	10	10	10	10
<i>Cettia cetti</i> (number of males)	1	1	1-2	1-2	1-2	1-2	1	1	2	3	3	3	3	3	3-4	3-4
<i>Sylvia melanocephala</i>	6	6	5-6	5-6	5	6-7	8	8	10	8	8-10	10	8-10	10	8-10	8-10
<i>Cisticola juncidis</i> (number of males)	7-8	7-8	8	6	5	5	6	5	7	6	6	6	7	7	8-10	8-10

Sources: Personal communication Alex Casha; Birdlife Nature Reserves Progress Report, 2010.

Table 9: Breeding Birds at Għadira Reserve listed as Annex I or regularly occurring migratory birds

Species	Population size at Għadira (data from 1995-2010), breeding pairs		Description
	Min	Max	
<i>Gallinula chloropus</i>	0	10	The data presented in Table 8 illustrates that the breeding population increased since 1995 and appears to have stabilized from 2002, with a maximum of up to 10 breeding pairs a year consistently recorded. Sultana et al (2011) consider that this species probably bred for the first time at this site in 1986 following habitat engineering works, although regular breeding did not occur prior to 1997. This species mainly nests along the perimeter of the ditch, however, nests have also been noted in pockets of reedbed that occur in the main pool area (Sultana et al, 2011). During the winter, these birds often set up feeding groups, however, they are highly territorial during the breeding season. Nests are built generally in beds of <i>Phragmites australis</i> and Southern Reedmace. Up to two and sometimes three broods are raised in one breeding season. Clutch sizes range from 1 to 15. This species is a frequent spring and autumn migrant, and counts of up to 60 have been noted at Għadira (Sultana et al, 2011). Although tolerant to a degree of disturbance, persecution from hunters limits this species national distribution and L-Għadira Nature Reserve remains an important site for the conservation of this species. Threats to the species within the reserve are mainly from feral cats and dogs that may attack them, as well as nest predation by rodents. It is also restricted by breeding habitat and hunting. This bird's conservation status has been declared as secure by Birdlife International. Hunting of moorhen is allowed in the Maltese Islands (LN 45/1996), however, under the Birds Directive it is still protected during rearing and reproduction phases.
<i>Cettia cetti</i> (number of males)	1	4	Two races are recognised in the Western Palearctic. Feeds largely on invertebrates. Nationally, the breeding distribution of this species has increased significantly over the past 30 years. This species is mainly sedentary in Europe, although some dispersal of populations does occur. There is no evidence of migration of Maltese populations although they do disperse to other non-breeding areas during the winter. This species' preferred breeding habitat is damp, densely vegetated valleys. However, given the increase in the breeding population, other habitat types have now also been colonized for breeding including areas with relatively low tree cover, and below rocky inland cliffs, however, an important breeding requirement as recorded by Sultana et al (2011) is an overhead leaf canopy and nests are built in creeping vegetation (e.g. <i>Rubus ulmifolius</i> , <i>Hedera helix</i> , <i>Smilax aspera</i> , and <i>Rubia peregrina</i>). Up to 4 males have established their territory at L-Għadira reserve. The earliest nests are completed by end of March, are built by the females, and are nearly always well concealed, making them less vulnerable to predators. Generally, a clutch of 2 to 4 eggs is produced. Incubation and rearing is carried out by the female alone, the former lasts about 17 days and the young fledge after about 14 days. In Malta, single broods are generally known to occur. <i>Rattus</i> sp. are the main predators. The population of this

Species	Population size at Għadira (data from 1995-2010), breeding pairs		Description
	Min	Max	
			species has been on the increase throughout Europe and Birdlife International describes its population status as Secure.
<i>Sylvia melanocephala</i>	6	10	Four races are recognized, the nominate <i>melanocephala</i> , inhabits the Mediterranean including the Maltese Islands. Feeds mainly on invertebrates and fruit, also known to make use of bird tables, and drink nectar. Dispersal agent for several species of shrub. Breeding distribution for this species covers most of the larger islands of the Maltese Islands. Breeding occurs between mid-February and mid-July. Clutches of 4 eggs are most commonly recorded. Incubation takes about 13 days and the young fledge at 12-13 days old. Both male and female are involved in incubation and brooding. A small wooded area at the reserve (approx 1ha) supports the breeding population at Għadira (Sultana et al, 2011). This species sometimes carries ectoparasites including Hippoboscidae flies and <i>Penenirmus</i> sp. lice. The success of this species is attributed to its high adaptability. Threats to this species may include use of pesticides and insecticides, nest predation by snakes and rats, and urban development.
<i>Cisticola juncidis</i> (number of males)	4	5	Three races occur in the Western Palearctic. Feeds mainly on insects and arachnids. This is a common, widespread, and largely sedentary species. It breeds in a wide range of habitats, grasses and rushes provide most suitable habitat so wetlands and watercourses offer preferred breeding grounds. It also breeds in cereal fields and abandoned agricultural land. Breeding season ranges between mid-February to August. A clutch normally consists of 4-5 eggs. Incubation (about 12-13 days) and brooding (about 13-15 days) is carried out solely by the female. A female tends to raise about 3 broods a year. Aggressively defend their young. Polygynous. Following the breeding season, individuals often roost together in rushes and other grasses. Threat from nest/egg predation by snakes and rats, may be vulnerable to insecticides and pesticides, and urban development.
<i>Charadrius dubius</i>	1	8	European populations migrate over the Sahara desert towards tropical Africa, leaving their breeding grounds in June to mid-July. They leave the wintering grounds to return to breeding grounds from mid-March. The overall trend of this species is stable although trends of some populations remain unknown. This species breeds at Għadira. Fledging success was considered to be good at 57% in 2010 (Birdlife Progress Report, 2010). This species nests on the patches of shingle on some of the islands that were purposely created.
<i>Himantopus himantopus</i>	1	3	A frequent spring migrant, the first confirmed breeding of this species in Malta occurred in 2011 at the Għadira Reserve (Sultana et al, 2011). The second record of this breeding species was in 2013, when three breeding pairs were noted at Għadira (Birdlife Malta, personal communication).

Data sources: Personal communication John J Borg, Charles Coleiro, Birdlife Progress Reports, Sultana et al (2011).

Migratory Birds

Malta lies within the Mediterranean/Black Sea flyway, which is one of three Palearctic-African flyways connecting Europe with North Africa, which collectively constitute the largest bird migration system in the world. The Mediterranean Sea presents an obstacle to migratory birds, particularly species that rely on updrafts and thermals to support their soaring flight such as raptors, storks and cranes (Birdlife International). As a result, migration is concentrated around land bridges and narrow straits and Malta is along such a route.

The Standard Data Form lists 35 Annex I bird species that have been recorded from this site. Of these, only two species are known to breed within the SAC/SPA, namely *Himantopus himantopus* and *Chalandrella brachydactyla* (outside the Reserve though within the SAC area). Other species are migrants and include raptors, herons, waders and other waterfowl and wintering species. These groups are evaluated in terms of their conservation status at Għadira in Table 10.

2.10.3.4 Regularly Occurring Migratory Birds not Listed in Annex I of Council Directive 79/409/EEC

Over 100 migratory bird species not listed in Annex I have been recorded at L-Għadira Wetland Reserve including wintering wetland species, breeding wetland species, migratory waterfowl and waders and wetland and woodland passerines. These groups are evaluated in terms of their conservation status at Għadira in Table 10.

Table 10: Assessment of Conservation Status of non-Annexed and Annex I bird species

Bird Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
<i>Himantopus himantopus</i>		<p>B2</p> <p>When the Għadira wetland was restored, one of the main aims was to establish a breeding population of <i>Himantopus himantopus</i> (Sultana et al, 2011, citing Sultana and Gauci, 1982). This goal was recently reached in 2011 and repeated in 2013 when a total of three breeding pairs successfully bred at Għadira. The birds make use of the lagoon and its islands, favouring open views. However, the size of the lagoon in relation to the entire SPA is relatively small and therefore range within the site is considered to be inadequate.</p>	<p>Indeterminate</p> <p>The maximum number of breeding pairs recorded from this site was 3 in 2013. However, there is only one other breeding incident, where one pair was noted to have bred in 2011. With this lack of trend data, it is difficult to determine whether this species will consistently breed at the reserve. In particular, the small size of the reserve is a concern and considered unlikely to be able to support more than the three breeding pairs recorded in 2013. Sultana et al (2011) make specific reference to the territorial behaviour of this species.</p>	<p>B2</p> <p>Whilst the lagoon provides favourable habitat, it is considered that its small size makes it inadequate to consistently support a breeding population that can support more than 3 pairs in the long term given the strong territoriality exhibited by this bird as well as its need to have wide open views in order to successfully protect its nest.</p>	<p>Indeterminate</p> <p>Given the relatively recent breeding occurrences, the future of the breeding population at this site is considered to be indeterminate. As already iterated, breeding is extremely recent and therefore, there is limited experience with this species breeding in Malta. It is considered, however, that in order to be able to support a stable or increasing breeding population, the wetland at Għadira needs to expand.</p>	Indeterminate
<i>Calandrella brachydactyla</i>		<p>Indeterminate</p> <p>This species is known to breed in agricultural land, garrigue and steppe and</p>	<p>Indeterminate</p> <p>Breeding success of this species has been noted to be at just over 50% by</p>	<p>B</p> <p>The garrigue within the site, as well as agricultural land could provide breeding</p>	<p>Indeterminate</p> <p>Further data is required in order to be able to consider future prospects</p>	Indeterminate

Bird Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
		breeding pairs have been recorded from this SAC, however, specific distribution within the site needs to be studied further.	Sultana et al (2011). Data on the size of the breeding population of this species at this site is not available, however, Sultana et al (2011) notes the significant decline of this species on a national level. Data on the breeding population of this species at this site needs to be gathered over a long-term period.	habitat. As described above, areas of the garrigue are degraded and experiencing disturbance; there has also been loss of habitat. Loss habitat and deteriorating quality is one of the leading causes for this species decline, and therefore the habitat has been judged to be inadequate, also in accordance with the analysis presented above.	further. In the absence of interventions to manage threats, it is considered likely that the population will continue to decline. Threats to this species noted by Barbara & Raine (2010) include inappropriate access, fires, trampling, offroading, predation by rats, cats, dogs and <i>Coluber viridiflavus</i> , and inappropriate agriculture.	
Non-Annex I Breeding species		B2 Non-Annex I species that breed at the wetland include <i>Gallinula chloropus</i> , <i>Charadrius dubius</i> , <i>Cettia cetti</i> , <i>Cisticola juncidis</i> , <i>Sylvia melanocephala</i> . The size of the lagoon is relatively small in the context of the entire SPA and therefore it is considered that the range of species that breed within the reserve, most specifically, the wetland species such as	C2 Number of breeding birds recorded at Għadira over 15 years are presented in Table 8. Two of these species are dependent on the lagoon habitat. Breeding pairs for <i>Charadrius dubius</i> increased to 8 in 2008, but this number has consistently diminished in subsequent years whilst <i>Gallinula chloropus</i> breeding population seems to have stabilised at a approximately 10-15	B2 Whilst the habitat type provided by the Għadira lagoon is favourable, its limited size affects its function in providing suitable habitat for breeding wetland species.	C2 If the lagoon is maintained at its current size, the future prospects for non-Annex I breeding wetland species is considered to be bad in that it is not considered likely that additional pairs or species can be supported at the site.	C

Bird Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
		<i>Gallinula chloropus</i> and <i>Charadrius dubius</i> is inadequate.	breeding pairs. Given that the birds are territorial during the breeding season, it is unlikely that the site can support more breeding pairs. The population sizes of the breeding wetland non-Annex I species at the lagoon are considered to be bad in the long-term, in particular when considering that there are only limited sites within the Maltese Islands where these species breed. In particular, breeding of <i>Charadrius dubius</i> is confined to Għadira.			
Wintering wetland species		B2 Wintering species include waterfowl. The reedbed and tamarisk groves provide ideal habitat for species such as, <i>Tachybaptus ruficollis</i> <i>Anas crecca</i> , <i>Aythya ferina</i> , <i>Gallinago gallinago</i> , <i>Rallus aquaticus</i> , <i>Jynx torquilla</i> , <i>Emberiza schoeniclus</i> and <i>Scolopax rusticola</i> . However, the small size limits the availability of	B2 Ringing at the reserve helps to gather data on wintering species. The small size of the reserve restricts the number of individuals that the reserve can support. Knowing that the Maltese Islands lie within a major flyway, and the potential for the site to support individuals, it is considered that the population size that the reserve currently	B2 These species are dependent on the reedbeds and lagoons. The small size of the reserve limits the number of birds that can be supported during the winter and these habitats are thus considered to be inadequate at Għadira.	B2 In the absence of any favourable parameters, the future prospects for these species are considered to be inadequate. An increase in the reserve is considered to result in positive impacts when considering the evaluation parameters. Other threats to the	B

Bird Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
		suitable resources, thus limiting number of species that can winter at the wetland. Due to the small size of the area supporting wintering species, the range is thus considered to be inadequate.	supports is considered to be inadequate.		reserve include direct attacks as noted in the 2009 report where the reserve suffered a break-in and an arson attack.	
Migratory waterfowl and waders including Annex I migratory herons		B2 The only suitable habitat within this SAC is the Għadira Wetland Reserve and Il-Hofra z-Zghira. In light that this habitat type comprises only a small percentage of the overall habitat available, range is considered to be inadequate .	B2 Although a large species diversity has been recorded at the reserve, generally, it is not common for large flocks to necessarily stop at the reserve. Relatively large flocks, are seen flying over the reserve. One example is the record of <i>Plegadis falcinellus</i> , whereby 130 individuals were counted by Fenech et al (1980 ¹⁶). It is considered probable that migratory populations would benefit from an increase to the Għadira reserve that would allow for increased resource availability and therefore help to ensure a favourable	B2 These species use the reserve and flooded fields behind the reserve. At Għadira as well as at Il-Hofra, waders such as Dunlin, <i>Calidris alpina</i> , and Little Stints, <i>Calidris minuta</i> , are the most regular. Little Ringed Plovers, <i>Charadrius dubius</i> , which breeds in the Għadira Wetland Reserve is also known to visit the small pond known as Il-Hofra. Little Bitterns, <i>Ixobrychus minutus</i> and Squacco Heron, <i>Ardeola ralloides</i> have been recorded on various occasions in previous years (John Borg, personal	B2 Threatened by illegal hunting, there is a need for improved enforcement. These species use the reserve and flooded fields behind the reserve. It is considered that if the wetland were allowed to extend to include the fields, these species would be less vulnerable to disturbance including poaching. Birdlife research includes ringing of bird species and retrapping and weighing specimens. This	C

¹⁶ 130 birds in total. Fenech, A., Galea, R.1980. Il-Merill. No.21

Bird Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
			<p>staging post for migratory waders and herons.</p>	<p>communication). Unlike their larger cousins these small herons prefer to skulk in thick vegetation rather than linger in the open.</p> <p>Although the habitat is present, it is considered to be too small and thus too vulnerable to potential threats to ensure long-term sustainability, and is thereby judged to be inadequate. It is therefore considered important that the marshland/lagoon habitat type is extended to improve the conservation status for these birds.</p>	<p>monitoring has revealed that a number of species gain significantly in weight whilst occupying the reserve, illustrating the importance of the reserve for long distance migratory species. Examples for which data exists include <i>Calidris minuta</i>, <i>Calidris alpina</i>, <i>Calidris ferruginea</i> and <i>Actitis hypoleucos</i>.</p> <p>In the absence of an extension to the reserve, and in view of its importance for migratory birds seeking wintering grounds ensuring the threats to birds, the future prospects for these species at this site is considered to be inadequate.</p>	
Migratory raptors		<p>B2</p> <p>The limited area of suitable habitat coupled with the threat from poaching, means that the range for these species is restricted within the SPA.</p>	<p>B2</p> <p>These species do not tend to occur in large numbers at this SPA, although larger numbers are seen flying overhead. Population size of migratory raptors at this</p>	<p>B2</p> <p>These birds make use of trees within the reserve and fields (<i>Circus</i> sp.). Foresta 2000 could provide roosting site for these species which then use the wetland habitat</p>	<p>C2</p> <p>Possible threats include poaching and change in land use. Conservation measures required include enforcement, monitoring of habitats,</p>	C

Bird Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
		The range is thus considered to be inadequate.	SPA is thus considered to be inadequate.	of the Għadira reserve for foraging. However, the relatively small area of habitat available, and the threat from poaching in the area translates to an inadequate habitat for migratory raptors.	food availability and population trends. These threats contribute to considering that future prospects for these species are bad .	
Wintering and staging Passeriformes		B2 Given the various habitats that these species frequent the distribution of passerines within this site includes Foresta 2000, Tamarisk trees and reed beds in the reserve as well as open ground. However, the limited extent of the habitats of importance results in the conclusion that the range is inadequate and should be improved by increasing suitable habitat.	B2 In 2010, large numbers of <i>Phylloscopus collybita</i> were present at the reserve, and 877 individuals were ringed. The second and third most common birds ringed in 2010 were <i>Phylloscopus sibilatrix</i> and <i>Eritachus rubecula</i> , respectively. On the other hand, relatively low numbers were recorded of a number of species including <i>Actitis hypoleucos</i> and <i>Alcedo atthis</i> . Uncommon and rare species noted at the reserve in 2010 included <i>Anthus spinoletta</i> (remained at the reserve through winter), <i>Emberiza pusilla</i> , and 6 <i>Ficedula semitorquata</i> . The bird ringing data kept by Birdlife Malta illustrate that migrant	B2 Habitats of importance include trees, reed beds, open ground (agriculture, garrigue). Foresta 2000 provides tree habitat; the reserve includes Tamarisk trees and reed beds though their extent is limited. Open ground is also available within this SAC/SPA. It is considered that the extent of the reed bed is relatively small in the context of the entire site. Therefore, the habitat is considered to be inadequate yet stable. Passerines, such as chats and warblers are also regular visitors during migration to the relatively degraded Il-Hofra marshland that lies southeast of the reserve.	B2 In light of the other parameters, the future prospects for passerines are considered to be inadequate. An extension of the reserve could improve the the other parameters and therefore the future prospects	B

Bird Species	Code	Range	Size of population	Habitat for the species	Future prospects	Current condition
			<p>passerines occur in the largest numbers at the reserve compared to other species groups. In effect, however, in particular when considering that the Maltese Islands lie within one of the main flyways, the size of the reserve (including in particular the reed beds, etc) is considered to be potentially restricting both the number of individuals that make use of the reserve, the duration of stay, as well as species that make use of the reserve as a staging post.</p>	<p>The Whinchat, <i>Saxicola rubetra</i>, Sedge Warbler, <i>Acrocephalus schoenobaenus</i>, Common Whitethroat, <i>Sylvia communis</i>, Wood Warbler <i>Phylloscopus sibilatrix</i>, and Willow warbler, <i>Phylloscopus trochilus</i> are regular visitors to the area. However, this remnant marshland is small in size, adjacent to a busy road and close to development. The habitat is thus considered to be inadequate.</p>		

2.10.4 Anthropogenic Factors Affecting the Conservation Status of the Annex I Habitats

The table below summarises the factors that could affect habitats at Għadira.

Table 11: Anthropogenic Factors Affecting the Conservation Status of the Annex I Habitats

Threat	Degree	Spread of impact	Background info
Dumping of and burning of rubbish amongst the Annex I habitats.	Mild	Localised	There was evidence of dumping of material in the Annex I habitats that are close to an access road (see Figure 28). Some of the rubbish was burnt.
Planting of alien species in Annex I habitats	Low	Localised	Acacia trees have been planted in the past on garrigue at il-Bisqra on land managed by the Mellieħa Holiday Complex. These should be removed through collaboration with the hotel management.
Planting of alien and non-characteristic species within Natura 2000 habitats.	Mild	Localised on sand dunes	A number of trees that are not characteristic of sand dunes have in the past been planted on the dunes at Għadira. This is limiting the development of characteristic sand dune flora in a protected and monitored area. These include <i>Acacia cyanophylla</i> , amongst others. These alien trees should be gradually removed to allow sand dunes species to take over and spread.
Grazing on Natura 2000 habitats	Medium	Localised	The garrigue at is-Sdieri is degraded partly due to grazing pressure from local shepherders. The grazing frequency should be monitored and if need be, reduced to enable sustainable plant growth and development within the garrigue.

2.11 ANTHROPOGENIC ACTIVITIES WITHIN THE SITE

2.11.1 Nature Conservation

The site includes two main initiatives related to nature conservation: the Għadira Wetland reserve and the Foresta2000 project. The wetland reserve was a saline marshland and is now a permanent wetland with pools. The reserve was created in the early 1980's by the Malta Ornithological Society (now BirdLife Malta) and was modelled on the UK Minsmere RSBP Reserve¹⁷.

¹⁷ Personal communication with Mr. Alex Casha, Managing Warden, Għadira Natural Reserve (2013).

2.11.2 Agriculture

Agriculture is a principal land use in the management plan area. This is particularly concentrated in the area behind the Għadira wetland reserve and accounts for a 25% of the land cover in the SAC/SPA.

2.11.3 Afforestation

The area includes areas that are part of the Foresta 2000 – The Malta Innova Pilot Project Area.

2.11.4 Tourism and Recreation

Mellieħa Bay has one of the most popular beaches in Malta. The Għadira beach is a pull factor both for locals and visitors. The site includes the Mellieħa Holiday Complex together with temporary kiosks that can be found along the promenade whilst kiosks and restaurants can be found in the sandy beach areas. During the summer months the area is very busy and there are seasonal facilities such as the hiring of water sports craft, umbrellas and deckchairs. There is also an area with beach rooms which are used as temporary dwellings.

2.11.5 Hunting and Fishing

Up to 1978 the Għadira salt marsh was used as a hunting reserve. In 1980 the area was declared as a wetland reserve and hunting was prohibited within the reserve and within 500m from it. Hunting is also prohibited in the entire SAC/SPA site since the area falls within a bird sanctuary. Illegal hunting in the area is an issue.

2.11.6 Extraction

None identified.

2.11.7 Water Use

Water levels within the Għadira Wetland reserve are regulated through a sluice and culvert at the seaward side and a freshwater reservoir at the landward side. The Regional Environmental Assessment for Mellieħa Bay identified that irrigation in the area can be a problem both vis-à-vis quantity and quality (Adi Associates 2004).

2.11.8 Education, Demonstrations and Research

The Għadira wetland reserve is visited by different schools throughout the year. The Għadira Wetland reserve Management Plan 2010-2014 showed that in 2008, 2315 school children, together with 200 teachers/guardians visited the site. These came in 94 visits from 60 different schools and institutions. The groups are accompanied by a field teacher who prepared different activities according to the age of the visitors. Visitor statistics are summarised in Figure 32 and Figure 33.

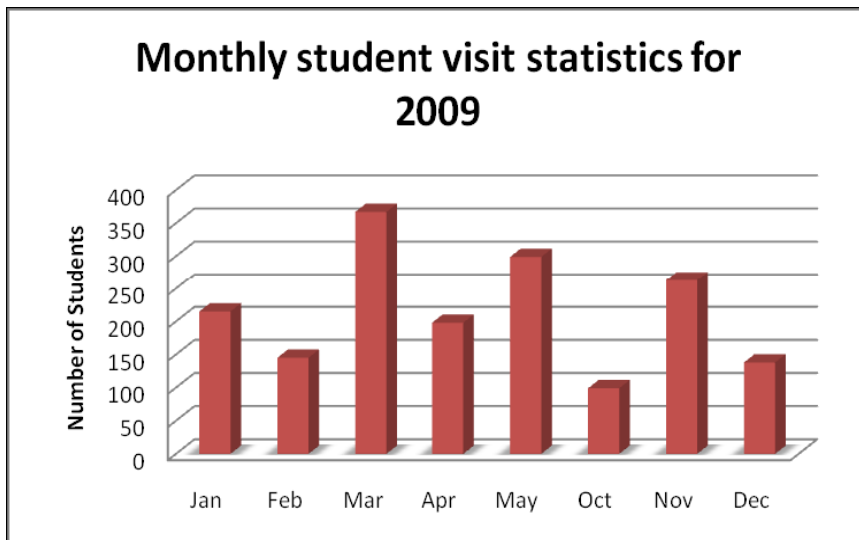


Figure 32: Monthly student visit statistics for 2009 (BirdLife Għadira Management Plan 2010-2014)

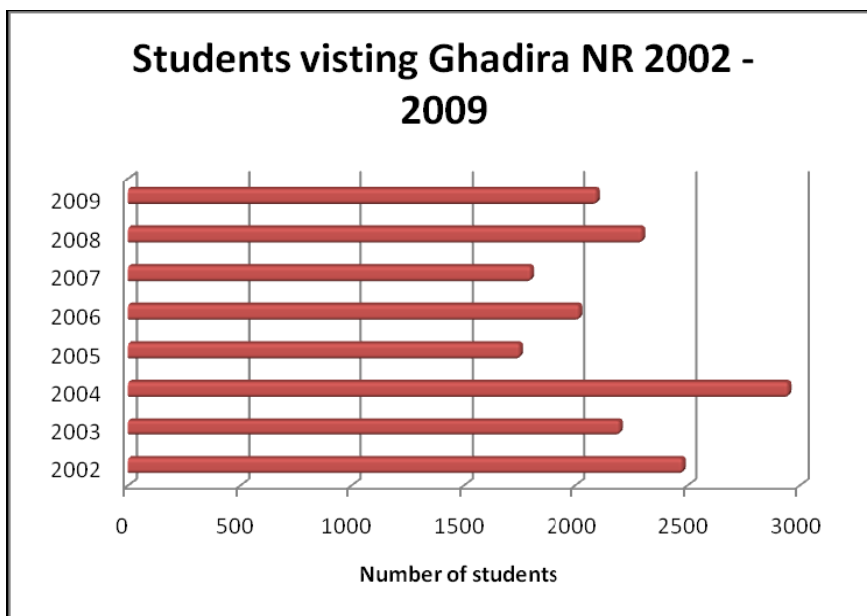


Figure 33: Students visiting Għadira 2002-2009 (BirdLife Għadira Management Plan 2010-2014)

2.11.9 Other Uses

There are various walking routes within the Mellieħa Bay area both within and outside the site.

2.11.10 Past Human Land Uses

In the past, Mellieħa Valley had different uses. The current wetland reserve was used as salt pans (Saline Vecchie) and these date back to the pre-17th century (Archaeology Services Co-Operative Ltd 2012).

Another main land usage was that related to military use. The Knights constructed a redoubt in the rocky part of the Ghadira beach close to where there are the cart ruts. This structure was dismantled by the British in the mid-19th century. In 1915, during the Gallipoli campaign, the British used the area for a military camp and hospital. This structure was replaced by the Mellieħa Hotel Centre also known as the Danish Village (Archaeology Services Co-Operative Ltd 2012, Kenneth Pye Associates Ltd 2009). The camp was retained until World War II. Numerous shallow craters and shrapnel in the karstic area of il-Bistra behind the Danish Village, are the remnants of bombs fired from German and Italian war planes. Locals still remember Allied landing barges, landing on the sandy beaches of Mellieħa Bay. They recall the large amount of sand these barges used to shift when landing on the beach.

The area was relatively sparsely settled in the nineteenth century (Kenneth Pye Associates Ltd 2009). In fact, the Crown Property Plans and the Notarial deeds show that like most of the areas surrounding Mellieħa, this area was reclaimed for agricultural purposes by the British government in the 19th century.

Prior to the setting up of the wetland reserve, the saline marshland was used as a hunting reserve. During the summer months the same area was used for camping.

2.12 ANTHROPOGENIC ACTIVITIES OUTSIDE THE SITE

The human impacts and threats outside the management plan area were also evaluated since these two could have a direct or indirect impact on the site. The following land uses / activities were observed.

2.12.1 Nature Conservation

The closest nature conservation initiative is the Majjistral Natural Park located along the coastal cliffs from the Anchor Bay area to Golden Bay.

2.12.2 Agriculture

Agriculture is present even outside the site.

2.12.3 Afforestation

There have been other afforestation projects on the Marfa Ridge in the vicinity of the SAC/SPA.

2.12.4 Tourism and Recreation

The area includes a number of hotels (for example Seabank All Inclusive Resort, Mellieħa Bay Hotel) and a number of restaurants and bars which are particularly concentrated close to the South Beach beneath the Mellieħa Ridge.

2.12.5 *Hunting and Fishing*

Hunting is practiced in the areas bordering the SAC/SPA.

2.12.6 *Extraction*

None identified.

2.12.7 *Water Use*

The drainage of the Mellieħa Bay is determined by the geology and topography of the area. The Marfa Coastal Groundwater Body and the Mellieħa Perched Groundwater Body are found to the north and to the south of the Mellieħa Coastal Groundwater Body respectively.

2.12.8 *Education, Demonstrations and Research*

There are a number of cultural features outside the Għadira SAC/SPA.

2.12.9 *Other Uses*

There are various walking routes within the Mellieħa Bay area both within and outside the site.

2.12.10 *Past Human Land Uses*

The surrounding human land uses comprise the Mellieħa settlement and agricultural land.

2.13 ECONOMIC ASPECTS AND POPULATION

The SAC/SPA includes a seasonal settlement which is found in the north eastern part of the site. This group of beach rooms is easily identified from the common green colour that is used for all of the rooms. The legal status of these rooms is unknown.

The area is an important one for the tourism, recreation and leisure industries. The SAC/SPA includes the Mellieħa Holiday Centre and a number of kiosks and restaurants along the Mellieħa Bay beach. There are other hotels and restaurants outside the SAC/SPA. The main attraction of the area is the long sandy beach.

The wetland reserve attracts bird watchers and people interested in the environment. BirdLife Malta receives 11,646.87EUR for the management of the site through an agreement that there is between the Ecosystems Management Unit (MEPA), the Office of the Prime Minister and BirdLife Malta. This has to cover the expenses incurred including tool repair and maintenance, water irrigation and all utility bills. At the reception centre of the reserve, visitors have the opportunity to buy memorabilia and also give donations for new projects within the reserve. The sale of souvenirs generates 1,200EUR profit per annum. BirdLife also maintains a tree nursery for planting. Extra trees and shrubs are sold to generate money for the reserve. The

wetland reserve has six full time government employees. The managing warden takes care of the general management of the site whilst the field teacher guides school visitors through the site. The remaining four employees are watchmen. During the weekends there are part-timers employed by BirdLife to guide visitors from the general public.

2.14 STAKEHOLDER CONSULTATION

2.14.1 *Organizations / Authorities and their Responsibilities*

The key entities that have either a direct or indirect role in the management of the site are described in Table 12. This table includes the different categories of stakeholders.

Table 12: Summary of responsibilities of main stakeholders

Group	Stakeholder	Responsibility of stakeholder
Government entities	Office of the Prime Minister	Responsible for ERA.
	Ministry for Sustainable Development, the Environment and Climate Change	The management plan area is found outside the development zone in an area. The SAC/SPA includes natural habitats and an afforested area.
	Ministry for Tourism	Important in relation to role in the promotion of heritage as tourism assets. Specific interest in ensuring that tourism assets, including cultural and natural heritage, are safeguarded, enhanced and positively promoted, and that access to tourist sites is not compromised.
	Department of Agriculture	Important in relation to agricultural portfolio and expertise. Specific interest in ensuring that agricultural land / activities are safeguarded and that the livelihood of farmers is not compromised.
	Directorate for Parks, Afforestation and Countryside Restoration	Important in relation to forestry and land management. Specific interest in ensuring that forested areas are safeguarded, enhanced and positively promoted
	Malta Environment and Planning Authority	Regulatory body for planning and environmental protection issues. Contractor for the Natura 2000 Management Plan Project. Responsible for planning and environmental protection. Contractor for the Natura 2000 Management Plan Project. Can delegate management of the site or part of the site to other entities.
	Malta Tourism Authority	Important in relation to role in the promotion of heritage as tourism assets. Specific interest in ensuring that tourism assets, including cultural and natural heritage, are safeguarded, enhanced and positively promoted, and that access to tourist sites is not compromised.
	Tourism and Sustainable Development Unit	Specific interest in ensuring that natural and cultural heritage is safeguarded, enhanced and positively promoted
National entities	Malta Hotels & Restaurants Association	Represents the interests of various hotels in Malta & Gozo.

Group	Stakeholder	Responsibility of stakeholder
		Specific interest in representing the interests of the various hotels operating in the area.
Local Councils	Mellieħa Local Council	The site falls within the Mellieħa locality boundary. Responsible for embellishment works, road surfacing, cleansing and maintenance and promotion of local cultural and natural heritage.
NGOs	Birdlife Malta	Have the expertise on bird species and their habitats. They are also responsible for the Għadira wetland reserve. Specific interest in ensuring that birds species and habitats are safeguarded and enhanced.
	Din l-Art Helwa	This organisation might be interested in this site. The site is responsible for the Red Tower which borders the Għadira SAC/SPA. Interested in archaeology and cultural heritage.
	Hunters Association (FKNK)	Important in relation to expertise on bird species and their habitats. Specific interest in ensuring that birds species and habitats are safeguarded and enhanced.
	Nature Trust Malta	Nature Trust might be interested in this site. Promote nature conservation and environmental protection.
	Ramblers Association	Represent hikers and ramblers. The activities within and outside the site may have an impact on the SAC/SPA. Specific interest in ensuring that use of / access to the site by ramblers is not compromised.
Land owners	Lands Department	Specific interest and expectation that management plan does not compromise rights as land owner.
Land managers	Birdlife Malta	Have the expertise on bird species and their habitats. They are also responsible for the Għadira wetland reserve. Specific interest in ensuring that birds species and habitats are safeguarded and enhanced.
Public and private operators	Beach equipment kiosk owners / operators	Important as businesses operating in the vicinity of the site.

Group	Stakeholder	Responsibility of stakeholder
		Specific interest and expectation that management plan will not compromise current use of land / activities, access rights, etc.)
	Birdlife Malta	Important as businesses operating in the vicinity of the site. Specific interest and expectation that management plan will not compromise current use of land / activities, access rights, etc.)
	Mellieħa Holiday Centre (Danish Village)	Important as businesses operating in the vicinity of the site. Specific interest and expectation that management plan will not compromise current use of land / activities, access rights, etc.)
	Mellieħa Bay Hotel	Important as businesses operating in the vicinity of the site. Specific interest and expectation that management plan will not compromise current use of land / activities, access rights, etc.)
	Restaurant & food kiosk owners / operators	Important as businesses operating in the vicinity of the site. Specific interest and expectation that management plan will not compromise current use of land / activities, access rights, etc.)
	Seabank Hotel	Important as businesses operating in the vicinity of the site. Specific interest and expectation that management plan will not compromise current use of land / activities, access rights, etc.)
	Water sports owners / operators	Important as businesses operating in the vicinity of the site. Specific interest and expectation that management plan will not compromise current use of land / activities, access rights, etc.)
Residents	Residents of green huts	Expectation that management plan will not compromise current lifestyle (use of land / activities, access rights, etc.)
	Other local residents	Expectation that management plan will not compromise current lifestyle (use of land / activities, access rights, etc.)
Farmers / cooperatives	Local farmers	Important as persons working / carrying out activities on land in the vicinity of the site.
		Expectation that management plan will not compromise current use of land / activities,

Group	Stakeholder	Responsibility of stakeholder
		access rights, livelihood, etc.)
Site visitors / other land users	Bathers	Recreational visitors to / users of the site and areas in the vicinity of the site. Expectation that management plan will not compromise current use of the site / surrounding areas for recreation.
	Campers	Recreational visitors to / users of the site and areas in the vicinity of the site. Expectation that management plan will not compromise current use of the site / surrounding areas for recreation.
	Hunters	Recreational visitors to / users of the site and areas in the vicinity of the site. Expectation that management plan will not compromise current use of the site / surrounding areas for recreation.
	Local / foreign tourists	Recreational visitors to / users of the site and areas in the vicinity of the site. Expectation that management plan will not compromise current use of the site / surrounding areas for recreation.
	Ramblers	Recreational visitors to / users of the site and areas in the vicinity of the site. Expectation that management plan will not compromise current use of the site / surrounding areas for recreation.

2.14.2 Stakeholder Engagement

An important component of the Management Plan is stakeholder engagement. A number of stakeholder meetings have been undertaken in the drafting of the plan. Amongst the stakeholders that were consulted was the Mellieħa Local Council.

A meeting with the Għadira Wetland Reserve site manager was also held on site. The site manager highlighted the main issues related to the reserve and the surrounding area.

A public event was also held in the locality of Mellieħa where an exhibition was organised covering all the Natura2000 sites in Mellieħa. A stakeholder workshop was also organised. During this workshop stakeholders were given information on the benefits of Natura 2000 and information on the site, a 'visioning' exercise was carried out where stakeholders were asked to envision the area in 2018, if the site were ideally managed was. The exercise was facilitated by the Consultants who drafted the Management Plan.

The participants noted that there were problems of access, vandalism and theft, off-roading, dumping, water losses and damaged rubble walls. The participants suggested that the hydrological system should be maintained. This would include cleaning of the reserve's gate, the gutter and the surrounding area before the onset of the rainy season. More water collection measures should be implemented such as dams and reservoirs. The kiosk might also be relocated. The stakeholders also recommended incentives for the agricultural sector. A study regarding rabbits in the area is also required in order to assess whether they are a pest. Nature trails should be established since the site has a potential for off-season tourists. Enforcement and awareness remain important issues. Other suggestions included managing and protecting Il-Hofra wetland and removing concrete and rehabilitating the rocky coast.

2.15 CULTURAL HERITAGE

2.15.1 Archaeological Artefacts

Cart-ruts are present at Il-Bisqra, behind the Għadira Reserve.

Outside the SAC/SPA, surrounding the Għadira area are a number of archaeological sites. To the east are the remains of a 2nd century wreck that was excavated by Honor Frost in the 1967. To the north east of the SAC, is a complex of Għar Baqrat caves. To the south is the complex of caves at Is-Sellum, where pottery shards dating to the Roman period were identified. To the south west are another two troglodyte clusters, one at Il-Wied ta' Ġnien Ingraw, and the other at il-Wied ta' San Niklaw. Several authors including Abela, Houel and Mayr referred to the Ġnien Ingraw complex as Calypso's cave. In the Wied of San Niklaw, a small complex of rock cut-tombs have been identified whilst one of the caves houses the remnants of a Medieval frescoes. Alongside the valley pottery shards dating from prehistoric to the Roman period have been found. To the north west of the SAC are other troglodyte dwellings and a rock-cut tomb. Classical pottery shards were also identified. Rubble walls are also found extensively throughout the site.

Whilst there is no direct evidence, these clusters may indicate that the Saline Vecchie could have been used in ancient times.

2.15.2 National Historical Monuments

The site includes scheduled cultural sites and areas. To the North of the site is a scheduled World War II defence system buffer zone. A Grade 2 Machine Gun Emplacement falls within the site’s boundary too (see Figure 10).

On the rocky shore between the North Għadira Beach and the South Għadira Beach are Class B Cart Ruts. The area is surrounded by a buffer zone (see Figure 11).

2.15.3 Cultural Events

There are no cultural events happening within the SAC/SPA however there are the ‘*Iljieli Mellieħin*’ which has become a locality annual summer event apart from the village Festa. There is also the Christmas activity, ‘*Milied Mellieħi*’.

The Red Tower area has also been used by historical re-enactors for multi-period camps and displays.

Table 13: Protected structures

Designation	Name	All / part of site	Type	Policy / Legislation	Figure reference
Scheduling Fortifications in the limit of Mellieħa (Grade 2)	Machine Gun Emplacement	Part of the site	Architecture	GN 895/02	Figure 10
Scheduling Fortifications in the limit of Mellieħa (Buffer Zone)	World War II defence system buffer zone	Part of the site	Architecture	GN 895/02	Figure 10
Scheduling – Site of Archaeological Importance (Class B)	Cart Ruts, Triq il-Qammieħ, Mellieħa	Part of the site	Archaeology	GN 1225/10, GN 1260/10	Figure 11

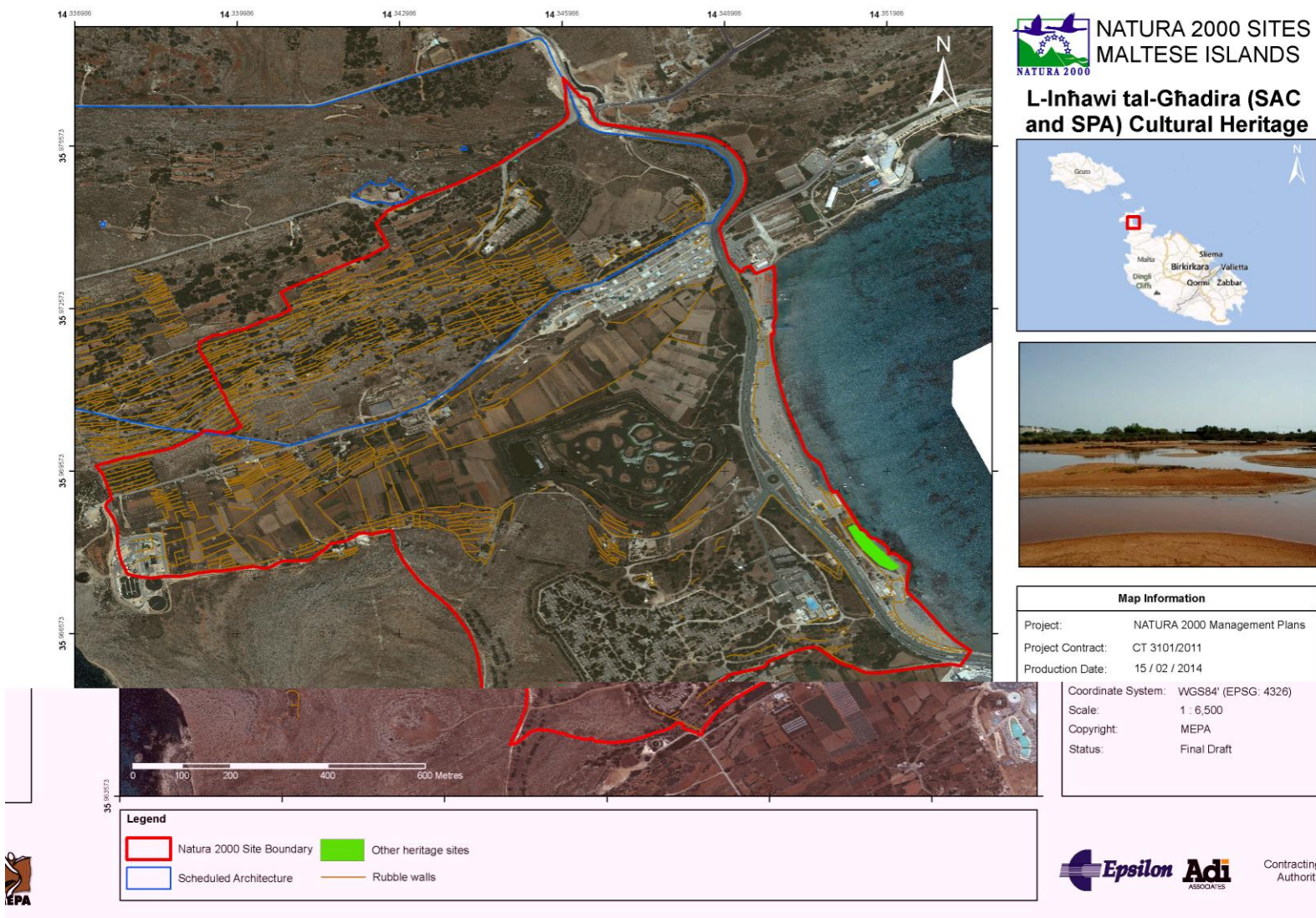


Figure 34: L-Inħawi tal-Għadira Cultural Heritage Map (see ANNEX 6: Maps for A3 version)

2.16 LANDSCAPE FEATURES AND EVALUATION

The Landscape Assessment Study of the Maltese Islands identified two Landscape Character Areas within the L-Għadira SAC/SPA: the Għadira Isthmus (M3), that connects the Marfa peninsula with the rest of Malta and the North Għadira Slopes (M2), which forms part of a larger area that is the Marfa Ridge.

The Regional Environmental Assessment for Mellieħa Bay identified six Landscape Character Areas, five of which fall within the SAC/SPA. These are the following:

- Southern Valley LCA,
- Central Upland LCA,
- Northern Valley LCA,
- Marfa Ridge LCA,
- Beach LCA (Adi Associates 2004).

The site is a rift valley with the Marfa Ridge (to the north) and Mellieħa Ridge (to the south). The rift valley is further divided into three areas; a *smaller fault-bound block located along the central axis and the two flanking areas of lower ground (L-Għadira valley to the north and Il-#ofra valley to the south)* (Kenneth Pye Associates Ltd).

The area includes extensive stretches of agricultural land. The western side of the SAC/SPA (Taċ-Ċumnija) includes some cliffs, whilst the eastern side includes L-Għadira beach. The Marfa Ridge offers excellent views of the wetland reserve and includes the Foresta 2000 afforestation project. This project has been undertaken on some clay slopes. The slopes were first stabilised and then afforested.



Figure 35: Landscapes of L-Inħawi tal-Għadira

2.17 VISITOR ACCESS

The main access point for L-Għadira SAC/SPA is from the arterial road. The road has sufficient parking spaces even though there can be parking problems during the summer months. Public transport routes also pass through this arterial road.

There are different routes that can be used for hiking and trekking. The site is accessed through the various footpaths from the Marfa Ridge or else from the road adjacent to the green beach

rooms' area. Another route is that located at the side of the Mellieħa Holiday Centre. There are also a number of country roads from the Mellieħa By-Pass behind the Seabank All Inclusive Resort.

Visitor access to the wetland reserve for the general public is limited to the weekends between September and May (see Figure 36). The reserve is opened in this time period to coincide with the autumn and spring migrations that are the prime time for avifauna species present in the reserve. In addition, during the summer months the water levels of the wetland are very low and in the driest summers can also dry out. The reserve opens from 10:00 to 16:00. The Għadira Management Plan 2010-2014 pointed out that there are plans to extend the hours to dusk provided that this will not negatively impact the ecosystem. On average 3,700 people visit the reserve annually. The majority of the locals visit the site on Sundays which is the busiest day whilst tourists prefer Saturdays. During the 2009 weekends, 58% of the visitors were locals whilst 42% were tourists.

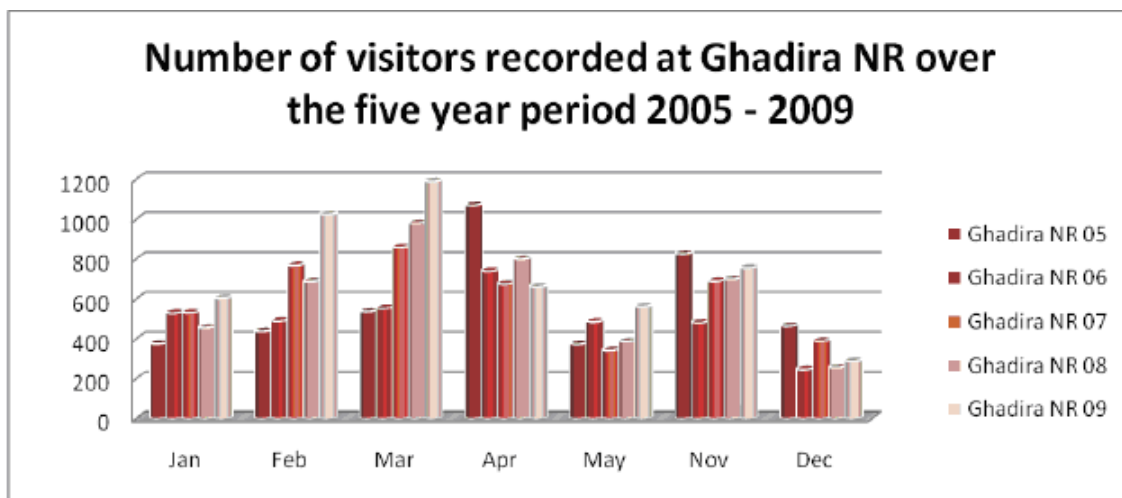
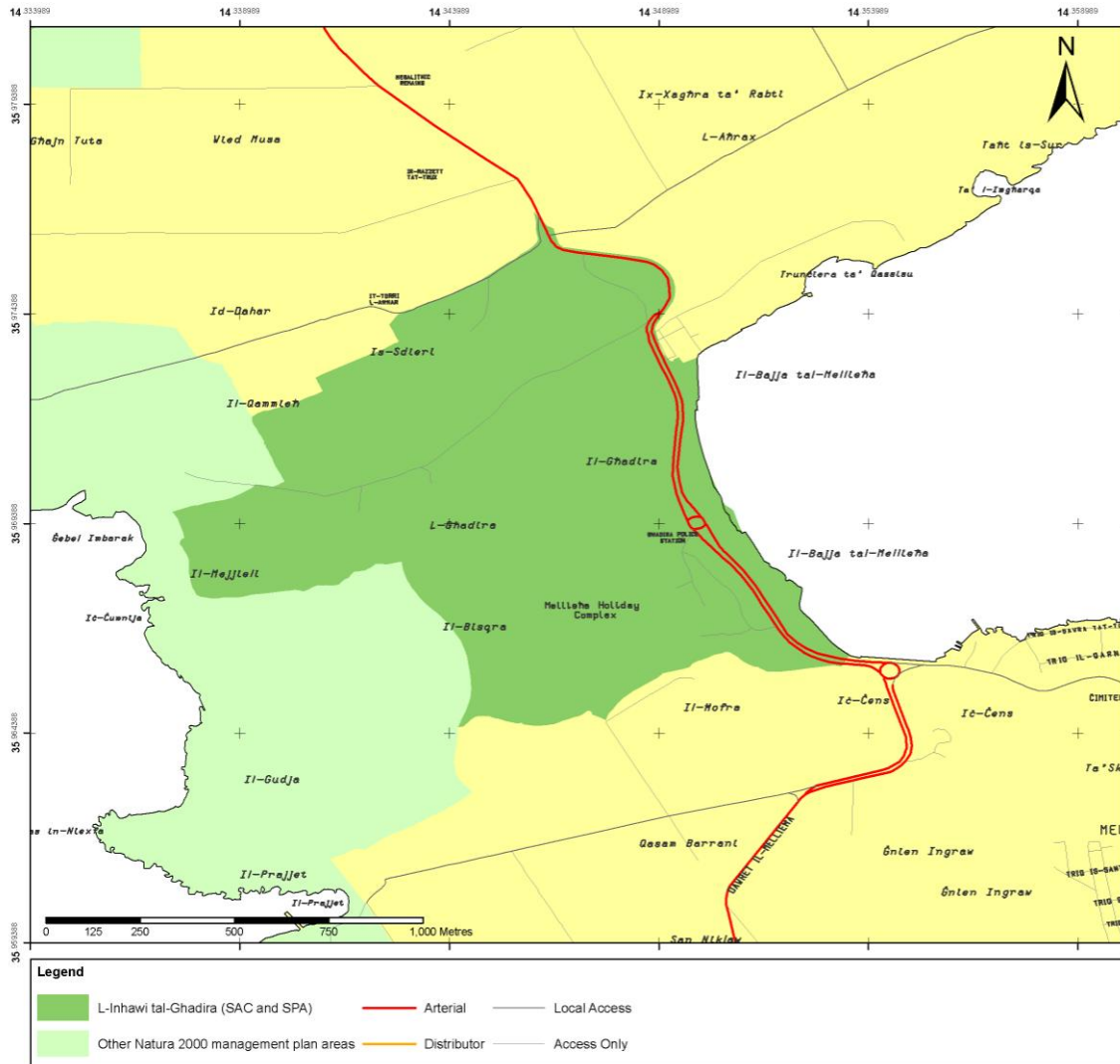


Figure 36: Number of visitors recorded at Għadira NR over the five year period 2005-2009 (BirdLife Għadira Management Plan 2010-2014)



**NATURA 2000 SITES
MALTESE ISLANDS**

**L-Inhawi tal-Ghadira (SAC
and SPA) Visitor Access**



Map Information	
Project:	NATURA 2000 Management Plans
Project Contract:	CT 3101/2011
Production Date:	15 / 02 / 2014
Coordinate System:	WGS84' (EPSG: 4326)
Scale:	1 : 10,000
Copyright:	MEPA
Status:	Final Draft



Figure 37: L-Inhawi tal-Ghadira Visitor Access Map (see ANNEX 6: Maps for A3 version)

2.18 SOCIO-ECONOMIC EVALUATION

The previous sections have highlighted the features and the uses making up L-Inħawi tal-Għadira SAC/SPA. The main ecological feature of the SAC/SPA is the Wetland Reserve. The context of the site is that of a rift valley with two ridges on both sides. The rift valley ends at the sea at Mellieħa Bay.

One of the main socio-economic activities in the area is agriculture. It is not known what the total revenue from this economic activity is. The surrounding area is also a tourist and recreational destination. The site has also a potential to be developed as an eco-tourist destination. The main attractions are the Wetland Reserve and L-Għadira beach. Catering establishments located at the back of the beach provide their services to bathers throughout summer. These are supplemented by mobile kiosks. The beach and its facilities provide an important area for recreation especially in the summer months. The arterial road is used for parking of cars of the bathers and users of the beach. This exerts pressure on the area during the summer months.

L-Għadira Wetland Reserve is also being used for educational awareness of school children and the general public and recreational/scientific activities such as bird watching and photography.

3 EVALUATION & CONSERVATION OBJECTIVES

As described in *ANNEX 1: Management Plan Development*, the first phase of evaluation is an important step for diagnosing important issues for the management of the site and identifying needs for further input. A provisional *list of features and factors* was derived from the Standard Data Forms and the data collected and presented in Chapter 2 of this MP.

The second phase of evaluation is a *conclusive step* regarding the issues previously identified, this phase consolidates known information, allowing the application of a SWOT analysis which supports a proposed vision and site management (conservation) objectives.

3.1 EVALUATION OF FEATURES

The features that were identified as key components of the SAC are the eight Annex I habitats, the three Annex II flora species and six Annex II fauna species, as well as a considerable number of Annex I bird species, two of which having a breeding status within the site. Important features are the Annex IV endemics and rare species recorded for the site and the low intensity agricultural land surrounding the wetland area.

3.1.1 Annex I Habitats

The following eight Annex I habitat types were identified and mapped during the field survey carried out in the context of this study:

- 1150* – Coastal Lagoons
- 1310 – *Salicornia* and other annuals colonising mud and sand
- 1410 – Mediterranean salt meadows (*Juncetalia maritimi*)
- 1420 – Mediterranean and thermo-Atlantic halophilous scrubs
- 2220 – Dunes with *Euphorbia terracina*
- 5330 – Thermo-Mediterranean and pre-desert scrub
- 5410 – West Mediterranean clifftop phrygas (*Astragalo-Plantaginetum subulatae*)
- 6220* – Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea.

Three discrete spatial units, the Għadira Bird Sanctuary, Is-Sdieri and Il-Bisqra are distinguished within the site, based on habitat type character and special designations.

L-Għadira Wetland Reserve

The **Coastal Lagoon** (priority habitat 1150*) at I- Għadira is considered as probably the best example of this habitat in the Maltese Islands. It consists of a generally shallow pool with fluctuating salinity and water levels and a number of islands, and is bordered by a variety of wetland and dry-habitat vegetation.

Water levels are regulated through a sluice and culvert at the seaward side and a freshwater reservoir at the landward side. Oxygen levels are generally kept high, however due to the

fluctuating and occasionally extreme environmental conditions the lagoon exhibits relatively low macrofaunal species richness.

The lagoon supports a thriving population of the endemic Annex II species, *Aphanius fasciatus* and a considerable number of Annex I bird and migratory bird species. It was assigned a B2 value for the conservation of structure and an overall conservation status value of B.

Salicornia and other annuals colonising mud and sand (1310) habitat type lies within the Wetland Reserve. Its conservation status varies from excellent, in some of the lower-lying mud islands close to the small bird hide, to partially degraded in other areas with an overall conservation status of B.

Mediterranean salt meadows (1410) habitat type is evident in small areas throughout the sanctuary. The habitat as a whole is well structured throughout the sanctuary and it was assigned an A value for the conservation of structure and an overall conservation status value of B.

Mediterranean and thermo-Atlantic halophilous scrubs (1420) habitat type was assigned a B2 value for the conservation of structure and an overall conservation status value of B.

The best examples of this habitat are found on some of the islets within the lagoon. The rest of its original habitat has largely been modified during the establishment of the bird sanctuary, where various trees were planted, presumably for sheltering the lagoon and creating favourable habitats for various bird species. There are good prospects for the conservation of this habitat, as it has been noted to be spreading throughout the sanctuary.

Dunes with Euphorbia terracina (2220) habitat type is heavily disturbed, as a result of the road that intersects the dune system, disconnecting it from the beach. Reclamation for agriculture and habitat modification prior (plantings of *Acacia* and *Eucalyptus* species) and after (plantings for buffering the coastal lagoon) the Wetland Reserve creation obliterated the largest part of remaining inland dunes. Nowadays, a remnant habitat, of an area of 11,300 m² patch is present within the outer grove of the Għadira Wetland Reserve. This habitats patch is still densely vegetated with alien species, including invasive *Acacia cyanophylla* and ruderals.

Due to the preceding influences this remnant habitat patch was assigned a C2 value for its structure and function and a B for future prospects with an overall conservation status of C.

The unfavourable conservation status regarding size is hard to ameliorate although certain development projects (see below 1.1.2.7.) include such an option. However, the representativity of the habitat can be improved if systematic removal of inappropriate vegetation is carried out.

In the context of the BirdLife Malta Management Plan 2010 (see below 1.1.2.1.) a restoration action focusing on alien species removal is being implemented.

Is-Sdieri

Thermo-Mediterranean and pre-desert scrub (5330) garigue in Is-Sdieri is partially degraded, with a ground cover of less than 50% and an average vegetation height of less than 20cm. It was assigned an overall conservation value of C. Negative factors influencing the vegetation that were recognised during the fieldwork include dumping and grazing by sheep. Restoration

prospects for this habitat were rated B as dumping can be limited whereas the magnitude and trends of the grazing factor have to be monitored.

Planted pine trees have also replaced part of this habitat (see Foresta 2000 Project below).

Thermo-Mediterranean and pre-desert scrub (5330) garrigue/phrygana in Il-Bisqra is well conserved with good prospects for the conservation of its functions and it was assigned an overall conservation value of B.

Il-Bisqra

West Mediterranean clifftop phryganas (5410) habitat type in Il-Bisqra is considered as partly degraded and it was assigned an overall conservation value of C. A section of it is being replaced by steppic grasslands as a result of trampling, and past reclamation practices in the area. Alien tree species, including *Acacia cyanophylla* are planted in the area. Restoration is possible with an average effort, if access to the area is limited and alien trees removed.

Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea (6220*) habitat type in Il-Bisqra is well conserved and it was assigned an overall conservation value of B.

3.1.2 Annex II Flora Species

The following three Annex II plant species are present in the site:

- *Anacamptis urvilleana*
- *Ophrys melitensis*
- *Orobanche densiflora*

Anacamptis urvilleana is an endemic species listed in the Red Data Book as Rare with Restricted distribution in the Maltese Islands. It grows mainly in garigues and rocky steppes. The flowers of *Anacamptis urvilleana* are highly productive in terms of seed dispersal, however, as with all orchids, it is dependent on a specific fungus for successful seed germination and the plant takes approximately 10 years to mature. This system, i.e. orchid mycorrhiza, is highly sensitive to disturbance and any damage, including littering, transplanting and/or other interventions can affect the symbiosis to the detriment of the orchid.

The conservation status of *Anacamptis urvilleana* is insufficiently known and no mapping of its main distribution exists. The SDF threat reference about trampling may apply to it and casual collection can also be anticipated.

Ophrys melitensis, as described in the Red Data Book is listed as endemic with a restricted distribution in the Maltese Islands.

The form of ***Orobanche densiflora*** found in Malta is presumed to be endemic in the Red Data Book and it is described as rare with restricted distribution in the Maltese Islands. It is described from and restricted to sand dune habitats such as the one at L-Għadira. It is a parasite of *Lotus cytisoides*, a species that is found in habitat 2220.

None of these species were recorded during the 2013 survey.

3.1.3 Annex I and Annex II Fauna Species

The Inħawi tal-Għadira SAC extends over a surface area of approximately 98 Ha and it is one of the larger SACs within the Maltese Islands. This SAC is also one of the richest in biodiversity, supports the highest number of annexed species and it is particularly important for avifauna. It supports one of the most successful bird sanctuaries in the country, acting as a nesting and breeding site for a number of protected species.

3.1.3.1 Annex I Birds of the Birds Directive

As stated by Birdlife (2010), the main reason behind the creation of the Għadira wetland was to provide a variety of bird species with ideal breeding grounds, as well as an important feeding and resting area for migratory birds.

The Standard Data Form lists 35 Annex I bird species present in the site.

The Black winged Stilt *Himantopus himantopus* is establishing a breeding population within the Għadira lagoon, with 3 successful nesting pairs in 2013.

Calandrella brachydactyla has a breeding population of 3-5 pairs at the garrigue patch situated in the western end of the site.

Regularly occurring Annex I Migratory birds

The reserve is an important stopover in both spring and autumn migration periods. Over 100 migratory bird species have been recorded at L-Għadira Wetland Reserve. Recorded Annex I migrants include *Aythya nyroca*, *Phoenicopiterus ruber*, *Platalea leucorodia*, *Pluvialis apricaria*, *Gallinago media*, *Philomachus pugnax*, *Porzana porzana*, *Plegadis falcinellus*, *Larus melanocephalus*, *Larus genei*, *Sterna caspia*, *Caprimulgus europaeus*, *Acrocephalus scirpaceus*, *Tringa glareola*, *Charadrius alexandrinus* and *Alcedo atthis*.

Flocks of herons and egrets can exceed fifty birds at any one time, species include *Casmerodius alba*, *Egretta garzetta*, *Ardeola ralloides*, *Ardea purpurea*, *Nycticorax nycticorax* and *Ixobrychus minutus*.

Annex I passerines wintering within the Wetland Reserve include *Acrocephalus melanopogon* and *Luscinia svecica*.

Migratory Raptors

Habitat improvement through tree planting achieved by Foresta 2000 has created safe roosting habitat and attracts species like *Circus aeruginosus*, *Pernis apivorus*, *Falco vespertinus*, *Falco naumanni*, *Milvus migrans*, *Circus pygargus*, and *Pandion haliaetus*.

Migrant passerines, resting and foraging at the garrigue and arboreal habitats within the site include *Anthus campestris*, *Ficedula albicollis* *Ficedula parva* and *Lanius collurio*.

Other birds

Five more species breed in the Wetland Reserve, namely *Charadrius dubius*, *Gallinula chloropus*, *Cettia cetti*, *Sylvia melanocephala* and *Cisticola juncidis*, with stable or increasing nesting pairs. Wintering species include *Erithacus rubecula* and waterfowl like *Fulica atra* and *Podiceps nigricollis*.

3.1.3.2 Habitats Directive Annex II species

Invertebrates

Two species are recorded in the site's SDF:

- *Brachytrupes megacephalus*
- *Pseudoseriscius cameroni*

Brachytrupes megacephalus is a large nocturnal cricket inhabiting sand dunes and listed in the Red Data Book as vulnerable with a restricted distribution in the Maltese Islands. In fact, the Red Data Book specifies that this species is restricted to Għadira in Malta and Ramla in Gozo. However, subsequently other populations have been found in other coastal areas in the Maltese Islands. This species is stenotopic and associated with the sand dune, which was identified above as being in a degraded state with a conservation status of C. Given its dependence on this habitat type this has been assigned a conservation status of C.

In the context of the BirdLife Malta Management Plan 2010 (see below 1.1.2.1.), an Action Plan is being drafted for the species, focusing on the restoration of the sand dune habitat.

The endemic beetle ***Pseudoseriscius cameroni***, which used to occur in the dunes, is now likely to be extinct due to the degraded nature of the dune area following road construction and the planting of alien and other inappropriate species.

Fish

One Annex II fish species is present on site:

- *Aphanius fasciatus*

The coastal lagoon provides habitat for the euryhaline cyprinodontid endemic fish ***Aphanius fasciatus*** (Maltese Killifish) [RDB: V, Rest (Med+MI)]. This fish species is currently described from four sites in the Maltese Islands and it has been introduced to Għadira from Is Salini which holds natural populations.

This fish is extremely important to the food web within the Wetland Reserve since a wide range of shoreline birds feed exclusively on it. The coastal lagoon is described above as being of good conservation status and pollution of the pools is not considered to be significant. Therefore, the conservation status for *Aphanius fasciatus* at Għadira is A.

According to the BirdLife Malta Wetland Reserves Progress Report 2008, an annual monitoring programme is carried out for the species while an Action Plan has been drafted aiming at the establishment of a threshold that will represent the population of the species.

Research results published in 2010 reveal that extreme abiotic conditions, typical of the lagoon systems (decrease in water depth, increase in aquatic temperature, increase in habitat salinity, decrease in oxygen concentration, etc) lead to a significant reduction in juveniles, reproductive activity, and number of male adults. Therefore, certain conservation actions are proposed that include increasing protective measures during the reproduction and recruitment periods through late March to May, a re-introduction programme of the species to sites from where it was known to exist, and introducing a water monitoring programme.

Reptiles

One Annex II reptilian species is present on site:

- *Zamenis situla*

The subspecies *Zamenis situla leopardina* is listed in the Red Data Book as vulnerable and it is considered to be of restricted distribution in the Mediterranean Region. It is an eastern Mediterranean subspecies that in the central Mediterranean is found in southern Italy, eastern Sicily and the Maltese Islands, Malta, Gozo and Comino.

This species is dependent on typical Mediterranean maquis, normally found in shrubs such as *Pistacia lentisus* and *Cistus spp.* It is also found in areas of long grass or in rubble walls. Relevant habitat types surveyed as described above determined that their structure and function varies from good to average with generally good restoration possibility. The site includes agricultural land with surrounding boundary walls that also provide ideal habitat.

Mammals

Two Annex II bats are present on site:

- *Rhinolophus hipposideros*
- *Myotis punicus*

The sub-species *Rhinolophus hipposideros minimus* present locally is highly vulnerable to disturbance, use of agricultural pesticides, and reduced hunting areas. Winter roosts are occupied between September and March, when the females move into the nurseries. It hunts in valley bottoms, along vegetated walls and along hedges, amongst bushes and shrubs. Diet mainly includes small nocturnal beetles, moths, and mosquitoes.

Myotis punicus is uncommon and widely distributed, and exhibiting regular inter-island/colony movements. A declining species with over 50% of the population lost in the last ten years. In Malta the species is essentially a cave dwelling bat, occasionally encountered also inside abandoned or seldom used human habitations. It feeds in valleys, cultivated land, and gardens. Human disturbance in winter roosts, illegal taking, target shooting, and pesticides are some of the causes contributing to the decline in numbers.

3.1.4 Annex IV Species and/or Red Data Book Species

Plants

The site supports a number of plant species of interest as listed in the Standard Data Form, a number of which are listed in the Red Data Book including *Darniella melitensis* [Endemic], *Hedysarum spinosissimum* [V, Rest (MED+MI)], *Euphorbia melitensis* [Endemic], *Euphorbia terracina* [V, Rest (MI)], *Tamarix africana* [R, Rest (MED+MI)], *Limonium* sp. nov [Endemic, E, Rest (MI)], *Periploca angustifolia* [Rest (MED)], *Urginea pancracion* [Rest (MED)], and *Carex extensa* [E, Rest (MI)].

Additional plant species that have only been recorded from a few other sites in the Maltese Islands include *Juncus acutus*, *Melilotus messanensis*, *Euphorbia chamaesyce*, *Elytrigia juncea*, *Ruppia drepanensis*, and *Juncus subulatus*.

According to BirdLife Malta (2010) the latest count (2006) at Għadira lists over 150 insect species, but this is far below the actual number that occurs. Most insects that occur at Għadira are eurytopic and are attracted to the site due to the floristic variety and the presence of permanent water. Thirteen species of Odonata have so far been confirmed at the site attracted by water. Over 100 species of moths have so far been identified from the site. A variety of insects also live on and in the sand, which is the main substrate at Għadira.

To date about 20 identified spider species have been confirmed at Għadira.

Amphibians

The Painted Frog *Discoglossus pictus pictus* is frequent among vegetation and in the small artificial fresh water ponds.

Mammals

Mammals recorded within the BirdLife Malta Reserve include the Wild Rabbit *Oryctolagus cuniculus*, the Pygmy White-toothed Shrew *Suncus etruscus*, the Weasel *Mustela nivalis* and the Pipistrelle *Pipistrellus pipistrellus* and. Other bat species resident in the Għadira area include *Plecotus austriacus* [RDB: V] and *Pipistrellus kuhlii* [RDB:R]. *Nyctalus noctula* [RDB: RR] has also been recorded as a passage migrant.

Site specific data on populations, conservation status and trends of the above species outside the Reserve and within the boundaries of the site is insufficient. No published site specific or general data/guidelines exist on measures and recommendations required for their conservation.

3.1.5 The Foresta 2000 Afforested Area

Foresta 2000 is a long term project, commenced in 2003 with the aim to *recover an area and plant a Mediterranean forest that would become an attraction for both Maltese and foreigners wanting to explore and enjoy nature*. Responsible for its implementation are BirdLife Malta, the heritage organisation Din l-Art Helwa and PARKS, the afforestation department of the Ministry for Sustainable Development, Environment and Climate Change.

The area to be afforested covers about 104 Ha of abandoned fields at the west slope of Marfa Ridge. A part of the Foresta 2000 project area, at Is-Sdieri, was later (2004) included in the Għadira SAC/SPA.

3.1.6 Agricultural Land

Agriculture is a principal land use in the management plan area and accounts for a 25% of the land cover in the SAC/SPA. This is particularly concentrated in the area adjacent to the Għadira Wetland Reserve where it has developed in the expense of the lagoon-dune system that once dominated this part of the coastal zone.

The majority of the farming activity carried out is on a part time basis and no full time farmers are present. Crops include horticultural crops, cereals, olives, and vines whilst irrigation is also present.

3.2 EVALUATION OF FACTORS

The principal factor identified as affecting the site features is the designated and long managed for conservation Għadira Wetland Reserve which constitutes the core area of the site. The recreational and educational potential and characteristics, also associated with the reserve management is a second eminent factor.

The position of the SAC/SPA at Mellieħa Bay, one of the most popular beaches in Malta and associated road and other infrastructure development plans may become a decisive factor to the natural characteristics and the key features of the SAC/SPA.

3.2.1 Legislation, Policies and Plans

A series of legislative measures policies applying to the site are relevant and consistent to its conservation management

Table 14: Overview of relevant acts and policies per topic addressed

Topic	Act / Policy
Access	<ul style="list-style-type: none"> Rural Strategy Topic Paper Coastal Strategy Topic Paper Structure Plan CZM 3 Marfa Action Plan MRE4
Natural resources protection	<ul style="list-style-type: none"> Structure Plan SET 11, SET 12, BEN 5, RCO4 North West Local Plan NWCO3, NWCO4, NWCO6, NWCO7 NWCO8 NWCO 13 Coastal Strategy Topic Paper Utilities Topic Paper
Agricultural policies	<ul style="list-style-type: none"> Agri environmental legislation Structure Plan AHF 1 AHF 4 AHF 8 RCO5 RCO6 RCO8 RCO9 North West Local Plan NWAG 1 NWAG 2 Rural Strategy Topic Paper
Tourism, Recreation, education, research, awareness potential & infrastructure	<ul style="list-style-type: none"> Tourism Topic Paper: Leisure and Recreation Topic Paper Rural Strategy Topic Paper

Topic	Act / Policy
	<ul style="list-style-type: none"> • North West Local Plan NWRE2, NWRE6 • Marfa Action Plan MRE 4
Landscape	<ul style="list-style-type: none"> • The Landscape Assessment Study of The Maltese Islands • Structure Plan ARC 2 • North West Local Plan NWLA 1 • Marfa Action Plan MLA 1

3.2.2 Site Management: The Għadira Reserve

Għadira Reserve was created in the early 1980s by the Malta Ornithological Society (now BirdLife Malta), modelled on the UK Minsmere RSBP Reserve. The area was declared a Wetland Reserve in 1980 and its management has been entrusted to BirdLife Malta, through a long-standing agreement with the Maltese Government endorsed in the late 1990s.

Management Content: The Wetland Reserve management is executed according to successive five year Management Plans and corresponding biannual Work Plans and Budgets submitted and approved by the MEPA. The Wetland Reserve Management Plan approved for the period 2010-2014 is currently in use and its provisions have been taken into account throughout the preparation of this Management Plan.

Staff: The management structure includes six full time government employees, who work within the Wetland Reserve. The 2011-2012 Management Agreement foresaw one Site Manager, one Managing Warden, responsible for the day to day running of the Wetland Reserve, an Assistant Managing Warden and three Watchmen working on a 24hour rota system. In the weekends a group of part-timers are employed to guide the visitors around the reserve.

Finances: BirdLife Malta receives the sum of € 11,646.87 annually for the management of the reserve. The reserve generates € 1,200- a year in profit from the sale of small items and souvenirs at the visitor’s reception centre. No fees are charged for entrance to the reserve but people are encouraged to leave donations, with the money going towards new projects that are carried out within the reserve. The status and popularity of the reserve makes it attractive to prospective sponsors and several agreements have been reached with companies, banks or private entities that result in extra funding for the reserve. Such funds are usually tied down to a specific project that needs to be carried out within a pre-established timeframe.

3.2.3 Development Plan: Reconstruction and Upgrading of Għadira Bay Promenade (TEN-T project X)

The plan is part of the EC’s Trans-European Transport Network (TEN-T) programme and refers to the 1.5 km road project officially described as NA 4, Jct. Seabank Hotel, Għadira to NA 3, Armier Junction, which passes along the Għadira sandy beach.

Following an initial public consultation process, the former Ministry for Infrastructure and Communications (MITC) (2008) issued the five different construction options:

“1. Do Nothing

- 2. Upgrading of the existing road, including new link road around the Seabank Hotel, junction improvements near the Mellieħa Bay Hotel, better car parking facilities and upgraded promenade / pedestrian facilities*
- 3. Bridge Variant of Option 2, involving realignment of the road between the Għadira Wetland Reserve and the Mellieħa Bay Hotel junction, with the 200 m long new section of road to be constructed on a 6 m high viaduct*
- 4 Removal of a 420 m long section of the existing dual carriageway along the bay frontage and construction of an entirely new section of road around the western side of the Għadira Reserve, including a section of tunnel and 140 m long viaduct*
- 5. Removal of virtually the entire length of existing road and construction of a new road around the western side of the Għadira Reserve, including a section of viaduct but without a tunnel”*

An external investigation report, the Għadira Beach Geomorphological Assessment (2009), claimed that: *“Removal of the road and associated seawall / promenade would create a much wider beach over which storm wave energy could be dissipated, and would significantly increase the rate of wind-blown sand transport from the beach to the dunes”.*

MITC also concluded that there could be significant benefits from the removal of the current arterial road and the creation of a larger beach which could possibly allow for the regeneration of the sand dune system.

Two entities have submitted formal positions as regards the plan:

- The Natural Heritage Panel, Heritage Advisory Committee (NHAC) recommended that the applications: *“should be refused in view of unacceptable negative impacts of these proposals. PA 00330/09 should be formally assessed through EIA Appropriate Assessment studies. Such assessment should also consider two other options namely (i) a “do-nothing” option in which case the existing status quo is maintained with very minor interventions and (ii) a “do the minimum” option in which the necessary upgrading of the current road on the existing footprint is effected in order to rationalize traffic flow and parking.*
- BirdLife Malta, manager of the Għadira Reserve, in the BirdLife Malta position paper on Ten-T Projects: Threats to Natura 2000 sites in Malta (2007) states that: *“The reconstruction and upgrading of Għadira Bay Promenade (TEN-T project X) will have serious and unacceptable impacts on the Għadira Reserve and the wider Għadira SPA/SAC designated area. These impacts are described as follows:*
 - ***Destruction of small marsh.*** *The construction of the first roundabout in the proposal will result in the complete destruction of a small area of marshland. While the area of this marsh is small, due to the rarity of this habitat in Malta, it is very important that this habitat type is protected. This habitat type is important for migratory passerines and waders.*

- ***A loss of land within the area of the Reserve. The road runs through a section of the BirdLife Malta Għadira Reserve, resulting in loss of an area of remnant sand dunes that are both in the Għadira Wetland Reserve and within the Għadira SPA/SAC.***
- ***The proposed elevated section of the road will result in unacceptably high levels of disturbance to the migratory species that utilise the site.***

The statuses of the related applications are still pending.

It is evident that this plan presents both opportunities and threats to the various features of the protected area. The reappraisal of the above applications should be based on clearer priorities as regards the protected features of the SAC/SPA and the reassessment of the current or additional options should proceed accordingly.

It is, however, admissible that the possibility of dune regeneration after the removal of the arterial road is an important and challenging conservation target.

3.2.4 Recreation, Education, Research, Awareness Potential and Infrastructure

Being the first ever Wetland Reserve in the Maltese Islands the Għadira Wetland Reserve is known to most locals as a haven for birds and nature as a whole and as a very important educational tool for children and it is the most popular Wetland Reserve in Malta.

The reserve is visited by different schools throughout the year. The Għadira Wetland Reserve Management Plan 2010-2014 showed that in 2008, 2315 school children, together with 200 teachers/guardians visited the site. These came in 94 visits from 60 different schools and institutions. Depending on the age and grade of the visiting classes the field teacher prepares a detailed and hands on lesson about nature appreciation, with older pupils being given more information like ecosystems, food webs and food chains.

The Wetland Reserve also attracts bird watchers and people interested in nature. On average 3,700 people visit the reserve annually. The majority of the locals visit the site on Sundays which is the busiest day whilst tourists prefer Saturdays. The close proximity of four hotels to the reserve offers also an additional amenity option to their tenants. During the 2009 weekends, 58% of the visitors were locals whilst 42% were tourists.

Visitor access to the Wetland Reserve for the general public is limited to the weekends between September and May from 10:00 to 16:00. The reserve is opened in this time period to coincide with the autumn and spring migrations that are the prime time for avifauna species present in the reserve.

Table 15: Site Attributes

Site Attribute	Description
Visitor access	<p>The main access point for L-Għadira SAC/SPA is from the arterial road. The road has sufficient parking spaces even though there can be parking problems during the summer months. Public transport routes also pass through this arterial road.</p> <p>There are different routes that can be used for hiking and trekking. The</p>

Site Attribute	Description
	site is accessed through the various footpaths from the Marfa Ridge or else from the road adjacent to the green beach rooms' area. Another route is that located at the side of the Mellieħa Holiday Centre. There are also a number of country roads from the Mellieħa By-Pass behind the Seabank All Inclusive Resort.
Landscape and aesthetic qualities	<p>The Landscape Assessment Study of the Maltese Islands identified two Landscape Character Areas within the L-Għadira SAC/SPA: the Għadira Isthmus (M3), that connects the Marfa peninsula with the rest of Malta and the North Għadira Slopes (M2), which forms part of a larger area that is the Marfa Ridge.</p> <p>The Regional Environmental Assessment for Mellieħa Bay identified six Landscape Character Areas, four of which fall within the SAC/SPA. These are the following:</p> <ul style="list-style-type: none"> • Southern Valley LCA, • Central Upland LCA, • Northern Valley LCA, • Marfa Ridge LCA
National historical monuments	The site includes scheduled cultural sites and areas. To the North of the site is a scheduled World War II defence system buffer zone. A Grade 2 Machine Gun Emplacement falls within the site's boundary. On the rocky shore between the North Għadira Beach and the South Għadira Beach there are Class B Cart Ruts.

3.2.5 Tourism Development

Mellieħa Bay has a designated swimmers' zone as per Local Notice to Mariners Number 31 of 2012 and it is actually one of the most popular beaches in Malta.

The Għadira area is an attraction for tourists. It is important for its nautical sports and coastal activities as well as horse-riding, trekking, cycling, adventure tourism and nature watching.

An arterial road on the eastern side of the SAC/SPA links Marfa to the rest of Malta. There are parking facilities on both sides of the road and there is also a promenade along the road and sandy beach.

The area includes a number of hotels, restaurants, kiosks and bars which are particularly concentrated close to the South Beach beneath the Mellieħa Ridge.

Three main establishments have been identified namely the Mellieħa Holiday Complex also known as the Danish Village complex, the Mellieħa Bay Hotel and the Sea Bank Hotel.

The SAC/SPA includes a summer settlement which is found in the north eastern part of the site. The legal status of these beach rooms is unknown.

Several temporary kiosks can be found along the promenade whilst kiosks and restaurants can be found in the sandy beach areas. During the summer months the area is very busy and there are seasonal facilities such as the hiring of water sports craft, umbrellas and deckchairs.

In at least one case, there is a direct influence to the protected area by a specific touristic activity. As described in Birdlife Management Plan 2010, there is a sealing off a sluice canal that controls flooding within the reserve. This problem has been caused by an illegal development by the owners of a temporary kiosk (the Marea kiosk). As described in the document: *“Regular contact is kept with the owners so that this canal is opened in case of emergencies (in the winter months as a result of flooding), though pressure is being made on the relevant authorities to address and remedy the situation by removing the illegal structure.”*

A North West Plan policy statement, namely the NWML18, is particularly important as regards tourism development and infrastructure since its objective is: *To resolve competing spatial demands on Ghadira Bay and its environs by giving priority to the conservation and management of the natural and cultural environment of the area, including the landscape, and protecting it from environmentally unsustainable development whilst reducing congestion and its adverse environmental impacts, and improving the overall environmental quality of the area.*

3.2.6 Primary Sector Practices

The following issues can be attributed to past and present negative agricultural practices within the site:

Modification of hydrographic functioning, general / modifying structures of inland water courses / Water abstractions from surface waters / siltation rate changes, dumping, depositing of dredged deposits / use of biocides, hormones and chemicals/ fertilization/ Pollution to surface waters (limnic, terrestrial, marine & brackish)/ pollution to groundwater (point sources and diffuse sources)/ diffuse groundwater pollution due to agricultural and forestry activities/ soil pollution and solid waste (excluding discharges) / erosion / silting up/ drying out/ accumulation of organic material/ eutrophication (natural).

Two Structure Plan Policies applicable to the site are particularly related to the agricultural activity taking place in site:

- RCO 8: In Rural Conservation Areas, individual cultivators will be required to illustrate to the Planning Authority how any planned agricultural development will not harm the ecological, archaeological, and scenic value of the Area.
- RCO 9: In Rural Conservation Areas, individual cultivators will be required to put forward proposals to the Planning Authority for the cultivation of abandoned or derelict agricultural plots and for the restitution of ecologically, archaeologically, or scenically valuable environments which have been degraded because of agricultural malpractice or neglect. Where scientifically important species have become established on abandoned agricultural land, they will be protected and no reversion to agriculture will be required.

Grazing abandonment / lack of mowing / abandonment of pastoral systems, lack of grazing.

As assessed during the fieldwork the Thermo-Mediterranean and pre-desert scrub (5330) garigue habitat at is-Sdieri is degraded partly due to grazing pressure from local sheepherders. The effect of grazing in the habitat structure is considered as medium and at this stage it is suggested that the grazing parameter should be also monitored in the process of assessing the favourable conservation status of the particular habitat type.

3.2.7 Other Factors Impacting the Site

The following have been recorded from the SAC's SDF and/or noted during the field surveys:

Invasive and non native trees / planting on open ground (non-native trees). Acacia trees have been planted in the past on the garigue at il-Bisqra on land managed by the Mellieħa Holiday Complex.

Hunting is prohibited in the entire SAC/SPA site since the area falls within a Bird Sanctuary, but illegal hunting is practiced in the areas bordering the SAC/SPA. Hunters' intrusions and poaching within the Bird Sanctuary, resulting in losses of rare Annex I bird species, is not uncommon.

Addressing this threat requires at first a more intense and strict guarding of the protected area. A North West Plan Policy statement, namely the NWCO8, is particularly relevant to this issue as it foresees that: *the area of sanctuaries for birds within the existing Wetland Reserves at l-Għadira, Is-Simar and Ta' Qali will be enlarged.*

This is considered a most important action towards the amelioration of the situation and it should be pursued with high priority.

Trapping. This activity might be still present in private land and illegally practiced also in public land. As a practice it is responsible for vegetation clearings and habitat modification, disturbance of wildlife and direct biodiversity loss.

Taking and removal of animals (terrestrial) / collection of animals (insects, reptiles, amphibians) / trapping, poisoning, poaching / other forms of taking animals / Taking / Removal of terrestrial plants, general. As with illegal hunting, this issue calls for a more intense and strict guarding of the protected area.

Disposal of inert materials, disposal of household / recreational facility waste localised dumping and burning of rubbish was evidenced amongst the Annex I habitats that are close to the access road.

Table 16 summarises the above identified factors and identifies potential and current impacts that are affecting the site's habitats and species of conservation importance (Annex I habitats and Annex II species). These impacts are described in terms of the intensity of the impact, i.e. whether it is mild, medium or high, whereby:

- Mild impact describes those impacts that are currently not resulting in or are expected to result in significant negative effects within the next 5 years (this programming period). Factors resulting in mild impacts are not considered to be of high priority for the first programming period.
- Medium impact describes those impacts that could result in or are resulting in impacts that are or are likely to, in the short to medium term result in certain significant negative effects. Factors resulting in medium impacts may require monitoring to

better qualify the degree of impact over time and whether the viability of habitats and species are being significantly negatively affected.

- High impact describes those impacts that are resulting in or could result in significant negative effects such that the integrity of the habitat or species population is at risk. The management of factors resulting in high impacts will be given priority for this programming period (next 5 years).
- Unknown - In cases where too little information or evidence is currently available, impacts are described as unknown. The management of the site for the first programming period would require surveillance or other monitoring measures to determine the extent of this impact.

Impacts also have a spatial context and their extent can be defined as being Localised or Widespread, whereby:

- A Localised impact is one that has a limited spatial effect that is confined to one or a number of areas.
- A Widespread impact is one that has an extensive spatial effect and is affecting much of the site

Table 16: Factors impacting the site

Factor	Resulting effect/impact	Intensity /Extent
Outdoor sports and leisure activities, recreational activities / motorised vehicles /paths, tracks, cycling tracks / walking, horseriding and non-motorised vehicles/ camping and caravans/ other sport / leisure complexes/	Intrusion, trampling, overuse, noise nuisance, noise pollution	High/Widespread
Roads, motorways / Urbanised areas, human habitation /discontinuous urbanisation / other patterns of habitation /structures, buildings in the landscape	Habitat loss, disturbance, overall site degradation	High/ Widespread
Modification of hydrographic functioning, general / modifying structures of inland water courses / Water abstractions from surface waters / siltation rate changes, dumping, depositing of dredged deposits / use of biocides, hormones and chemicals/ fertilization/	Pollution to surface and groundwater waters Erosion / silting up/ drying out/ accumulation of organic material/ eutrophication	High/Localised
Planting of invasive and non native trees	Habitat modification and loss of representativity, competition with indigenous species	Medium/Localised
Trapping derogation	Habitat modification and vegetation removal	Medium/Widespread
Illegal activities: Taking and removal of animals (terrestrial) / collection of animals(insects, reptiles, amphibians) /	Negative effects on Annex II and IV species populations, overall biodiversity decline	Unknown/Widespread

Factor	Resulting effect/impact	Intensity /Extent
trapping, poisoning, poaching / other forms of taking animals / Taking / Removal of terrestrial plants, general. Disposal of inert materials, disposal of household / recreational facility waste	Overall site degradation	

3.3 EVALUATION OF KEY FEATURES AND DEFINITION OF CONSERVATION OBJECTIVES

Key features in this site are the Annex I habitats, Annex II species and Annex I birds present within its boundaries. Based on the assessment of the conservation status as given in Chapter 2, the Targeted Condition for each key feature to be achieved within the next 20 years is given in the following tables. This is followed by the definition of respective Management Objectives by which the targeted condition will be achieved. The factors specifically influencing the key features are also identified, whenever applicable. The operational objectives and actions addressing the management objectives associated with each key feature are presented in subsequent sections of the Management Plan.

In the evaluation tables presented below, it should be noted that the targeted condition for future prospects will be addressed by operational objectives and actions controlling the factors identified for each feature.

Table 17: KEY FEATURE: *Coastal Lagoons* (1150*)

Parameter	Current Condition	Targeted Condition	Management Objective
Area	B2	The area of habitat 1150* is increased.	MO1. To expand the size of the lagoon habitat 1150* and improve its structure and function in favour of wetland birds
Structure & Function (including typical species)	B2	The structure and function of the habitat 1150* are improved in terms of the habitat's ability to attract and adequately support wetland species.	
Future Prospects (as regards area, structure & function)	B2	The future prospects of habitat 1150* are improved.	
Factors	Restricted size of lagoon habitat		

Table 18: KEY FEATURE: *Salicornia* and other annuals colonising mud and sand (1310)

Parameter	Current Condition	Targeted Condition	Management Objective
Area	B3	The area of habitat 1310 is increased.	MO2. To expand the size of habitat 1310 and improve its structure and function in favour of wetland birds
Structure & Function (including	B3	The structure and function of habitat	

Parameter	Current Condition	Targeted Condition	Management Objective
typical species)		1310 are improved	
Future Prospects (as regards area, structure & function)	B3	The future prospects for habitat 1310 are improved.	
Factors	Restricted size of habitat		

Table 19: KEY FEATURE: *Mediterranean salt meadows (Juncetalia maritimi)* (1410)

Parameter	Current Condition	Targeted Condition	Management Objective
Area	B2	The area of habitat 1410 is increased.	MO3. To expand the size of the habitat 1410 and maintain its structure and function in favour of wetland birds
Structure & Function (including typical species)	A	The structure and function of habitat 1410 are maintained.	
Future Prospects (as regards area, structure & function)	B2	The future prospects for habitat 1410 are improved	
Factors	Restricted size of habitat		

Table 20: KEY FEATURE: *Mediterranean and thermo-Atlantic halophilous scrubs* (1420)

Parameter	Current Condition	Targeted Condition	Management Objective
Area	B1	The area of habitat 1420 is increased without encroaching on habitat 1310.	MO4. To expand the size of the habitat 1420 and maintain its structure and function in favour of wetland birds
Structure & Function (including typical species)	B2	The structure and function of habitat 1420 are maintained.	
Future Prospects (as regards area, structure & function)	B2	The future prospects of habitat 1420 are improved	
Factors	Restricted size of habitat		

Table 21: KEY FEATURE: *Dunes with Euphorbia terracina* (2220)

Parameter	Current Condition	Targeted Condition	Management Objective
Area	B3	The area of habitat 2220 is increased.	MO5. To expand the size of habitat 2220 and improve its structure and function
Structure & Function (including typical species)	C2	The structure and function of habitat 2220 are improved.	
Future Prospects (as regards area,	B	The future prospects of habitat 2220 are	

Parameter	Current Condition	Targeted Condition	Management Objective
structure & function)		improved.	
Factors	Restricted size and fragmentation of habitat Presence of alien species		

Table 22: KEY FEATURE: *Thermo-Mediterranean and pre-desert scrub* (5330)

Parameter	Current Condition	Targeted Condition	Management Objective
Area	B3	The area for habitat 5330 is naturally extended into adjacent degraded areas.	MO6. To ensure that the area of habitat 5330 is allowed to naturally expand and its structure and function are improved
Structure & Function (including typical species)	B3	The structure and function of habitat 5330 are improved.	
Future Prospects (as regards area, structure & function)	B2	The future prospects for habitat 5330 are improved.	
Factors	Dumping Presence of alien species Localised grazing		

Table 23: KEY FEATURE: *West Mediterranean cliff-top phryganas (Astragalo-Plantaginetum subulatae)* (5410)

Parameter	Current Condition	Targeted Condition	Management Objective
Area	B2	The area for habitat 5410 is naturally extended	MO7. To ensure that the area of habitat 5410 is allowed to naturally expand and its structure and function are improved
Structure & Function (including typical species)	B2	The structure and function of habitat 5410 are improved.	
Future Prospects (as regards area, structure & function)	B2	The future prospects for habitat 5410 are improved.	
Factors	Localised trampling Presence of invasive alien species, including <i>Acacia cyanophylla</i>		

Table 24: KEY FEATURE: *Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea* (6220*)

Parameter	Current Condition	Targeted Condition	Management Objective
Area	C2	The area of habitat 6220* is naturally increased	MO8. To ensure that the area of habitat 6220* is allowed to naturally expand and its structure are maintained
Structure & Function (including typical species)	A	The structure and function of habitat 6220* remain	

Parameter	Current Condition	Targeted Condition	Management Objective
		favourable.	
Future Prospects (as regards area, structure & function)	B1	The future prospects for habitat 6220* are improved.	
Factors	None presently identified		

Table 25: KEY FEATURE: *Anacamptis urvilleana*

Parameter	Current Condition	Targeted Condition	Management Objective
Range	C	The range of <i>Anacamptis urvilleana</i> is increased.	MO9. To ensure that the range of <i>Anacamptis urvilleana</i> is increased and its population size is at least maintained
Size of population	Indeterminate	The population size of <i>Anacamptis urvilleana</i> is at least maintained.	
Habitat	B	The habitat for <i>Anacamptis urvilleana</i> is allowed to improve naturally.	
Future prospects	B	The future prospects for <i>Anacamptis urvilleana</i> are maintained.	
Factors	Species vulnerable to disturbance, trampling, littering and transplanting		

Table 26: KEY FEATURE: *Ophrys melitensis*

Parameter	Current Condition	Targeted Condition	Management Objective
Range	B	The range of <i>Ophrys melitensis</i> is improved.	MO10. To ensure that the range and the population size of <i>Ophrys melitensis</i> are improved
Size of population	B	The population size of <i>Ophrys melitensis</i> is improved.	
Habitat	B	The habitat for <i>Ophrys melitensis</i> is naturally improved.	
Future prospects	B	The future prospects for <i>Ophrys melitensis</i> are improved.	
Factors	Species' habitats often subjected to human-induced pressures including trampling, clearance of vegetation to set up trapping sites, littering and localised dumping		

Table 27: KEY FEATURE: *Orobanche densiflora*

Parameter	Current Condition	Targeted Condition	Management Objective
Range	B	The range of <i>Orobanche densiflora</i> is maintained	MO11. To ensure that the range and the

Parameter	Current Condition	Targeted Condition	Management Objective
Size of population	B	The population size of <i>Orobanche densiflora</i> is maintained.	population size of <i>Orobanche densiflora</i> are maintained
Habitat	C2	The habitat for <i>Orobanche densiflora</i> is improved.	
Future prospects	B	The future prospects for <i>Orobanche densiflora</i> are improved.	
Factors	Restricted size and fragmentation of species' habitat		

Table 28: KEY FEATURE: *Brachytrupes megacephalus*

Parameter	Current Condition	Targeted Condition	Management Objective
Range	A	The range of <i>Brachytrupes megacephalus</i> is maintained	MO12. To ensure that the range and the population size of <i>Brachytrupes megacephalus</i> are maintained
Size of population	B2	The population size of <i>Brachytrupes megacephalus</i> is at least maintained.	
Habitat	B2	The dune habitat upon which <i>Brachytrupes megacephalus</i> depends is improved.	
Future prospects	B2	The future prospects for <i>Brachytrupes megacephalus</i> are improved.	
Factors	Restricted size and fragmentation of species' habitat Threats from leisure activities, trampling, possible destruction of burrows		

Table 29: KEY FEATURE: *Aphanius fasciatus*

Parameter	Current Condition	Targeted Condition	Management Objective
Range	A	The range of <i>Aphanius fasciatus</i> remains favourable.	MO13. To ensure that the range and population of <i>Aphanius fasciatus</i> remains favourable.
Size of population	A	The population size of <i>Aphanius fasciatus</i> remains favourable.	
Habitat	A	The habitat for <i>Aphanius fasciatus</i> is favourable.	
Future prospects	A	The future prospects for <i>Aphanius fasciatus</i> remain favourable.	
Factors	Possible sudden change in abiotic conditions of Għadira lagoon		

Table 30: KEY FEATURE: *Zamenis situla*

Parameter	Current Condition	Targeted Condition	Management Objective
Range	Indeterminate	<i>Zamenis situla</i> occupies its full range within the site.	MO14. To ensure that <i>Zamenis situla</i> occupies its full range within the site. MO15. To ensure the long term maintenance of the range, population and habitat of <i>Zamenis situla</i> at this site.
Size of population	Indeterminate	The population size of <i>Zamenis situla</i> is at least maintained.	
Habitat	A	The habitat for <i>Zamenis situla</i> is maintained.	
Future prospects	Indeterminate	The future prospects for <i>Zamenis situla</i> are favourable.	
Factors	Taking Accidental or deliberate killings		

Table 31: KEY FEATURE: *Rhinolophus hipposideros*

Parameter	Current Condition	Targeted Condition	Management Objective
Range	Indeterminate	The range of <i>Rhinolophus hipposideros</i> is at least maintained.	MO16. To ensure the long term maintenance of the range, population size and habitat of <i>Rhinolophus hipposideros</i>
Size of population	Indeterminate	The population size of <i>Rhinolophus hipposideros</i> is at least maintained.	
Habitat	A	The habitat for <i>Rhinolophus hipposideros</i> remains in a favourable condition.	
Future prospects	Indeterminate	The future prospects for <i>Rhinolophus hipposideros</i> are favourable.	
Factors	Accidental or deliberate killings Threats from agriculture intensification Reduced hunting areas nationwide Reduced roosting areas nationwide		

Table 32: KEY FEATURE: *Myotis punicus*

Parameter	Current Condition	Targeted Condition	Management Objective
Range	B2	The range of <i>Myotis punicus</i> is extended with the establishment of one additional roost.	MO17. To ensure that the range of <i>Myotis punicus</i> is extended and its population size and habitat are maintained
Size of population	C2	The population size of <i>Myotis punicus</i> is maintained	
Habitat	A	The habitat for <i>Myotis punicus</i> remains in a favourable condition.	

Parameter	Current Condition	Targeted Condition	Management Objective
Future prospects	C	Future prospects for <i>Myotis punicus</i> are improved.	
Factors	Deficiency of roosting sites Accidental or deliberate killings Threats from agriculture intensification Reduced hunting areas nationwide		

Table 33: KEY FEATURE: *Himantopus himantopus*

Parameter	Current Condition	Targeted Condition	Management Objective
Range	B2	The range for <i>Himantopus himantopus</i> is increased.	MO18. To ensure that the range and nesting habitat of <i>Himantopus himantopus</i> are increased and the species becomes a consistent breeder at Għadira
Size of population	Indeterminate	<i>Himantopus himantopus</i> is a consistent breeder at Għadira.	
Habitat	B2	The nesting habitat of <i>Himantopus himantopus</i> is increased.	
Future prospects	Indeterminate	The lagoon size is increased to ensure favourable future prospects for <i>Himantopus himantopus</i> at Għadira.	
Factors	Restricted size of lagoon habitat		

Table 34: KEY FEATURE: *Calandrella brachydactyla*

Parameter	Current Condition	Targeted Condition	Management Objective
Range	Indeterminate	The range of <i>Calandrella brachydactyla</i> is increased	MO19. To ensure that the range and population size of <i>Calandrella brachydactyla</i> are increased
Size of population	Indeterminate	The population size of <i>Calandrella brachydactyla</i> is increased.	
Habitat	B	The habitat for <i>Calandrella brachydactyla</i> is improved.	
Future prospects	Indeterminate	The future prospects for <i>Calandrella brachydactyla</i> are improved	
Factors	Nest disturbance Habitat disturbance		

Table 35: KEY FEATURE: **Breeding Wetland Reserve species** (*Gallinula chloropus*, *Charadrius dubius*, *Cettia cetti*, *Cisticola juncidis*, *Sylvia melanocephala*)

Parameter	Current Condition	Targeted Condition	Management Objective
Range	B2	The range of breeding species is increased	MO20. To ensure that the range and population size of breeding, wintering and staging wetland and woodland birds are increased
Size of population	C2	The breeding pairs of wetland species are increased	
Habitat	B2	The nesting habitat of wetland species has been extended	
Future prospects	C2	The future prospects of breeding species have improved	
Factors	Limited size of nesting and foraging lagoon habitat		

Table 36: KEY FEATURE: **Annex I and not Annexed wintering wetland species** (*Fulica atra*, *Podiceps nigricollis*, *Tachybaptus ruficollis*, *Anas crecca*, *Aythya ferina*, *Gallinago gallinago*, *Rallus aquaticus*, *Jynx torquilla*, *Emberiza schoeniclus*, *Scolopax rusticola*)

Parameter	Current Condition	Targeted Condition	Management Objective
Range	B2	The range of wintering wetland species is increased	MO20. To ensure that the range and population size of breeding, wintering and staging wetland and woodland birds are increased
Size of population	B2	The population size of wintering wetland species is increased	
Habitat	B2	The reedbed and open water habitats have been extended	
Future prospects	B2	The future prospects of wintering wetland species have improved	
Factors	Limited size of roosting and foraging habitat		

Table 37: KEY FEATURE: **Annex I and not annexed migratory waterfowl, waders and herons** (*Aythya nyroca*, *Phoenicopterus ruber*, *Platalea leucorodia*, *Pluvialis apricaria*, *Gallinago media*, *Philomachus pugnax*, *Porzana porzana*, *Plegadis falcinellus*, *Larus melanocephalus*, *Larus genei*, *Sterna caspia*, *Caprimulgus europaeus*, *Acrocephalus scirpaceus*, *Tringa glareola*, *Charadrius alexandrinus*, *Actitis hypoleucos*, *Alcedo atthis*)

Parameter	Current Condition	Targeted Condition	Management Objective
Range	B2	The range of migratory waterfowl and waders is increased	MO20. To ensure that the range and population size of breeding, wintering and staging wetland and woodland birds are increased
Size of population	B2	The population size of migratory waterfowl and waders is increased	
Habitat	B2	The reedbed and open	

Parameter	Current Condition	Targeted Condition	Management Objective
		water habitats have been extended	
Future prospects	B2	The Future prospects of migratory waterfowl and waders have improved	
Factors	Limited size of roosting and foraging lagoon habitat		

Table 38: KEY FEATURE: **Annex I migratory raptors** (*Circus aeruginosus*, *Pernis apivorus*, *Falco vespertinus*, *Falco naumanni*, *Milvus migrans*, *Circus pygargus*, *Pandion haliaetus*)

Parameter	Current Condition	Targeted Condition	Management Objective
Range	B2	The range of migratory raptors is increased	MO20. To ensure that the range and population size of breeding, wintering and staging wetland and woodland birds are increased
Size of population	B2	The population size of migratory raptors is increased	
Habitat	B2	Foraging (wetland) habitat has been extended	
Future prospects	C2	The future prospects of migratory raptors have improved	
Factors	Limited size of roosting habitat, poaching and disturbance on roosting grounds		

Table 39: KEY FEATURE: **Wintering and staging passerines** (*Anthus campestris*, *Ficedula albicollis*, *Ficedula parva*, *Lanius collurio*, *Erithacus rubecula*, *Phylloscopus collybita*, *Phylloscopus sibilatrix*, *Phylloscopus trochilus*, *Emberiza pusilla*, *Ficedula semitorquata*, *Saxicola rubetra*, *Acrocephalus schoenobaenus*, *Sylvia communis*)

Parameter	Current Condition	Targeted Condition	Management Objective
Range	B2	The range of wintering and staging passerines is increased	MO20. To ensure that the range and population size of breeding, wintering and staging wetland birds are increased
Size of population	B2	The population size of wintering and staging passerines is increased	
Habitat	B2	Foraging and roosting habitat for wintering and staging passerines is maintained.	
Future prospects	B2	Future prospects of wintering and staging passerines have improved.	
Factors	Limited size of roosting and foraging wetland habitat		

3.4 SWOT ANALYSIS

In this step the site features are summarized and assigned a positive (*strengths*) or a negative (*weaknesses*) value. Similarly, the factors influencing the site are summarized and assigned a positive (*opportunities*) or a negative (*threats*) value.

Table 40: SWOT Matrix

FEATURES		FACTORS	
<i>Strengths (S)</i>		<i>Opportunities (O)</i>	
S1. Eight Annex I habitats present S2. Three Annex II flora species S3. Two Annex I nesting birds S4. Annex I and migratory birds present S5. Five Annex II fauna species S6. Annex IV species present		O1. Part of SAC/SPA already under conservation management O2. Recreation, education, research and awareness potential and infrastructure established O3. Policies concerning mass tourism development control O4. TEN-T Development Plan	
<i>Weaknesses (W)</i>		<i>Threats (T)</i>	
W1 Limited size of wetland habitat W1. Dune habitat confined and heavily degraded W2. Lack of Favourable Reference Values for some Annex I habitats W3. Insufficient knowledge on some Annex II flora species conservation status and lack of Favourable Reference Values W4. Insufficient knowledge on some Annex II fauna species conservation status W5. Insufficient knowledge on some Annex I birds conservation status W6. Insufficient knowledge on RDB fauna species conservation requirements		T1. Mass tourism infrastructure and activities overdeveloped T2. Negative agricultural practices T3. Planting of invasive and non native T4. Insufficient wardening and law enforcement T5. TEN-T Development Plan	

3.5 VISION STATEMENT

The Prospect Matrix for the site is depicted in Table 41.

Table 41: Prospect Matrix

Principal objectives of conservation							
Prospects		Annex I habitats	Annex II flora	Annex II fauna	Annex I birds	Annex IV species	Whole site
Institutional prospects	Existing legal framework						O1 T2 T4

Principal objectives of conservation							
Prospects		Annex I habitats	Annex II flora	Annex II fauna	Annex I birds	Annex IV species	Whole site
	Policies & development plans						O3 O4 T1 T2 T5
Ecological prospects	Conservation status	W2	W3	W4	W5	W6	
	Size & Integrity	W1			W1		
	Naturalness	W2					T3
Social prospects	Education, recreation, research and nature enjoyment						O2 O3 T1
	Creation of revenue						O1

Table 42: Vision Statement

<ul style="list-style-type: none"> All natural habitats, native flora and wildlife present at the SAC are sustained The site is an educational, environmental awareness and nature enjoyment centre of nationwide importance Agriculture is practiced without disturbing the protected ecological features of the site and contributes to the conservation of the site's biodiversity Tourism and outdoor recreation are practiced in harmony with the site's conservation needs The site is receiving full legal protection implemented according to national legislation and local policies.

3.6 MANAGEMENT AND OPERATIONAL OBJECTIVES FOR SITE

The Management Objectives define the policies through which the vision will be achieved and they can also be viewed as the Mission through which the Vision will be reached. Each Management Objective corresponds to a vision statement and it is derived by addressing the issue present in each cell of the particular line. Management Objectives for Annex I habitats and Annex II species have been derived from Section 3.3.

For every Management Objective (MO) defined, a number of Operational Objectives (OO) are assigned. These are the objectives to which all the management work is directly related and lay the groundwork for management actions.

The Management Objectives arising from the Vision Statement and the respective Operational Objectives are depicted in Table 43.

Table 43: Management Objectives and Operational Objectives for site

Vision	Management objective (MO)	Operational Objective (OO)
All natural habitats, native flora and wildlife present at the SAC are sustained.	MO1. To expand the size of the lagoon habitat 1150* and improve its structure and function in favour of wetland birds	OO1.1. To assess the possibility of wetland enlargement and dune restoration at the coastal front OO1.2. To maintain and monitor water quality and parameters
	MO2. To expand the size of habitat 1310 and improve its structure and function in favour of wetland birds	OO1.1. To assess the possibility of wetland enlargement and dune restoration at the coastal front OO2.1. To maintain islands and salt marsh vegetation
	MO3. To expand the size of the habitat 1410 and maintain its structure and function in favour of wetland birds	OO1.1. To assess the possibility of wetland enlargement and dune restoration at the coastal front OO3.1. To maintain islands and salt marsh vegetation
	MO4. To expand the size of the habitat 1420 and maintain its structure and function in favour of wetland birds	OO1.1. To assess the possibility of wetland enlargement and dune restoration at the coastal front OO4.1. To maintain islands and salt marsh vegetation
	MO5. To expand the size of habitat 2220 and improve its structure and function	OO1.1. To assess the possibility of wetland enlargement and dune restoration at the coastal front OO5.1. To maintain and enhance the dune habitat 2220
	MO6. To ensure that the area of habitat 5330 is allowed to naturally expand and its structure and function are improved	OO6.1. To undertake annual inspections to monitor the size, structure and function of habitat 5330 and establish its Favourable Reference Values OO6.2. To remove alien and invasive species from habitat 5330
	MO7. To ensure that the area of habitat 5410 is allowed to naturally expand and its structure and function are improved	OO7.1. To undertake annual inspections to monitor the size, structure and function of habitat 5410 and establish its Favourable Reference Values OO7.2. To remove alien and invasive species from habitat 5410
	MO8. To ensure that the area of habitat 6220* is allowed to naturally expand and its structure are maintained	OO8.1. To undertake annual inspections to monitor the size, structure and function of habitat 6220* and establish its Favourable Reference Values

Vision	Management objective (MO)	Operational Objective (OO)
	MO9. To ensure that the range of <i>Anacamptis urvilleana</i> is increased and its population size is at least maintained	OO9.1. To undertake seasonal inspections to monitor the range, assess and monitor the population size of <i>Anacamptis urvilleana</i> and establish its favourable conservation status within the site.
	MO10. To ensure that the range and the population size of <i>Ophrys melitensis</i> are improved	OO10.1. To undertake seasonal inspections to monitor the range, assess and monitor the population size of <i>Ophrys melitensis</i> and establish its favourable conservation status within the site.
	MO11. To ensure that the range and the population size of <i>Orobanche densiflora</i> are maintained	OO11.1. To undertake seasonal inspections to monitor the range, assess and monitor the population size of <i>Orobanche densiflora</i> and establish its favourable conservation status within the site.
	MO12. To ensure that the range and the population size of <i>Brachytrupes megacephalus</i> are maintained	OO12.1. To conserve, maintain and improve current population of Annex II listed <i>Brachytrupes megacephalus</i> .
	MO13. To ensure that the range and population of <i>Aphanius fasciatus</i> remains favourable.	OO13.1. To conserve and maintain current population of Annex II listed <i>Aphanius fasciatus</i> .
	MO14. To ensure that <i>Zamenis situla</i> occupies its full range within the site.	OO14.1. To determine the range and population of <i>Zamenis situla</i> within the site and the possible factors affecting its population.
	MO15. To ensure the long term maintenance of the range, population and habitat of <i>Zamenis situla</i> at this site.	OO15.1. To undertake seasonal surveillance of the species to monitor trends in the range and population size of <i>Zamenis situla</i> .
	MO16. To ensure the long term maintenance of the range, population size and habitat of <i>Rhinolophus hipposideros</i>	OO16.1. To fully assess the range and future prospects of <i>Rhinolophus hipposideros</i> in order to determine objectives for the next management period OO16.2. To monitor the range and population size of <i>Rhinolophus hipposideros</i>
	MO17. To ensure that the range of <i>Myotis punicus</i> is extended and its population size and habitat are maintained	OO17.1. To monitor the range and population size of <i>Myotis punicus</i>
	MO18. To ensure that the range and nesting habitat of	OO18.1. To monitor the range and population size of

Vision	Management objective (MO)	Operational Objective (OO)
	<i>Himantopus himantopus</i> are increased and the species becomes a consistent breeder at Għadira	<i>Himantopus himantopus</i> .
	MO19. To ensure that the range and population size of <i>Calandrella brachydactyla</i> are increased	OO19.1. To monitor the range and population size of <i>Calandrella brachydactyla</i>
	MO20. To ensure that the range and population size of breeding, wintering and staging wetland and woodland birds are increased	OO20.1. To monitor the range and population size of breeding, wintering and staging wetland and woodland birds
	MO21. To maintain healthy populations of the RDB fauna present in the site	OO21.1. To elaborate Action Plans for RDB species and apply the actions and the recommendations prescribed
		OO21.2. To control ground predators
	MO22. To monitor, through constant recording and researching, flora and fauna species with the Wetland Reserve	OO22.1. To gather records of fauna species that visit and breed at the reserve
		OO22.2. To gather records of flora species found at the reserve.
OO22.3. To increase knowledge of fauna and flora at the reserve through help from educational institutions		
OO22.4. To increase species and number of breeding species		
The site is an educational, environmental awareness and nature enjoyment centre of nationwide importance.	MO23. To raise public awareness and appreciation of the site among the general public.	OO23.1. To design, construct and install information/interpretation/warning signposting and produce promotion material.
	MO24. To use the Wetland Reserve as an educational tool for visiting students and members of the public	OO24.1. To cater for daily school visits running between October and May every year
		OO24.2. To cater for weekend visits by the members of the public between the months of October and May
OO24.3. To ensure adequate facilities to cater for visitors		
Agriculture is practiced without disturbing the protected ecological features of the site and contributes to the conservation of the site's biodiversity.	MO25. To ensure that existing agricultural activities conform to legislation	OO25.1. To enforce compliance of compulsory CoGAP measures and promote the implementation of the voluntary ones.

Natura 2000 Management Plan

Vision	Management objective (MO)	Operational Objective (OO)
Tourism and outdoor recreation are practiced in harmony with the site’s conservation needs	MO26. To complement tourism and outdoor recreation activities with the site’s conservation needs	OO26.1. To ensure that tourist development and infrastructure is compatible with and does not negatively impact the site’s ecological integrity.
The site is receiving full legal protection implemented according to national legislation and local policies.	MO27. To ensure that no illegal activities take place within the site	OO27.1. To patrol the site
	MO28. To maintain the Reserve as a disturbance free refuge for flora and fauna species	OO28.1. To ensure no unauthorized intrusions/break ins into the reserve occur
		OO28.2. To control and monitor access in such a way as to ensure that visitors are of no detriment, by means of excess disturbance, to the reserve

NOTE: Shaded cells show objectives defined for the Ghadira Reserve

4 MANAGEMENT ACTIONS

Following the establishment of Management Objectives and Operational Objectives, the following section of the Management Plan describes the Management Actions. One or more management actions are defined for each operational objective and the fulfilment of operational objectives is achieved through the implementation of these actions.

4.1 FORMULATION OF MANAGEMENT ACTIONS

The first step in the formulation of Management Actions is the setting of a **priority rating** for the operational objectives identified above. The priority rating is defined as follows:

- **Critical:** The fulfilment of this objective is a prerequisite for the implementation of the Management Plan as a whole. It must be dealt with within the first two years of the implementation period.
- **High:** The objective is of main importance and its fulfilment is a prerequisite for the implementation of a major part of the Management Plan. To be accomplished within the first three years of the implementation period.
- **Medium:** The objective is of main importance but it either follows the accomplishment of another objective or it can be accomplished at any time within the five year period of the implementation period.
- **Low:** The objective is of complementary importance. To be accomplished within the last two years of the Management Plan, it may also be transferred to the next management period.

For each operational objective one or more **titles of actions** are defined. Each action is directly linked to the delivery of a specific operational objective and it requires a single procedure for its accomplishment. The management actions are described in further detail in subsequent sections.

The proposed actions are **categorised** as follows:

- **Measures:** Regulations and restrictions imposed by the central or local administration.
- **Duties:** Routine or recurring management activities, assigned by the administration to some competent entity
- **Projects:** Planned activities of a definite time range to accomplish particular targets

Appropriate **performance indicators** are given to enable measurement of the effectiveness of each action and the **monitoring requirements** of each action are also defined.

For the Operational Objectives identified for the site, the priority ratings, the actions and respective performance indicators and monitoring requirements are shown in Table 44.

Table 44: Operational Objectives and related priority rating, performance indicators, actions, category of actions and monitoring requirement

Operational Objective (OO)	Priority rating	Title of Action	Code of action	Category of action	Performance Indicators	Monitoring requirements/Mean of Verification	
OO6.1. / OO7.1. / OO8.1. To undertake annual inspections to monitor the size, structure and function and determine the favourable conservation status of Annex I habitats 5330, 5410 and 6220*	High	Elaboration of detailed monitoring programmes for the Annex I habitats 5330, 5410 and 6220*, the Annex II flora species <i>Anacamptis urvilleana</i> , <i>Ophrys melitensis</i> and <i>Orobanche densiflora</i> , the Annex II fauna species <i>Zamenis situla</i> , <i>Rhinolophus hipposideros</i> and <i>Myotis punicus</i> and the breeding bird species <i>Himantopus himantopus</i> , <i>Calandrella brachydactyla</i> and of the breeding, wintering and staging wetland and woodland birds	P1.	Project	Number of monitoring plans for the Annex I habitats, the Annex II species and the bird species present in the site	Progress reports	
OO9.1. / OO10.1. / OO11.1. To undertake seasonal inspections to monitor the range, assess and monitor the population size of <i>Anacamptis urvilleana</i> , <i>Ophrys melitensis</i> and <i>Orobanche densiflora</i> and determine the favourable conservation status of <i>Anacamptis urvilleana</i> and <i>Ophrys melitensis</i> .		Implementation of the monitoring plans for the Annex I habitats 5330, 5410 and 6220*, the Annex II flora species <i>Anacamptis urvilleana</i> , <i>Ophrys melitensis</i> and <i>Orobanche densiflora</i> , the Annex II fauna species <i>Zamenis situla</i> , <i>Rhinolophus hipposideros</i> and <i>Myotis punicus</i> and the breeding bird species <i>Himantopus himantopus</i> , <i>Calandrella brachydactyla</i> and of the breeding, wintering and staging wetland and woodland birds	P4.	Project	Number of reports for the Annex I habitats, the Annex II species and the birds present in the site	Progress reports	
OO14.1. / OO15.1. To undertake seasonal surveillance of the species to determine and monitor trends in the range, population size and possible factors affecting the population of <i>Zamenis situla</i> within the site.							
OO16.1. / OO16.2. / OO17.1. To assess and monitor the range, population size and future prospects of <i>Rhinolophus hipposideros</i> and <i>Myotis punicus</i>							
OO18.1. / OO19.1. / OO20.1. To monitor the range and population size of <i>Himantopus himantopus</i> , <i>Calandrella brachydactyla</i> and of the breeding, wintering and staging wetland							

Operational Objective (OO)	Priority rating	Title of Action	Code of action	Category of action	Performance Indicators	Monitoring requirements/Means of Verification
and woodland birds						
OO1.1. To assess the possibility of wetland enlargement and dune restoration at the coastal front	Medium	Assess the possibility of extending the coastal lagoon habitat and dune restoration	P3.	Project	Delivery of the study	Progress reports
OO6.2. / OO7.2. To remove alien and invasive species from habitats 5330 and 5410	Medium	Planning and implementation of an IAS control and / or eradication programme	P6.	Project	Percentage decrease in cover by alien tree species at the end of the five year period of MP implementation	Progress reports Habitat monitoring reports (Action P4)
OO21.1. To elaborate Action Plans for RDB species and apply the actions and the recommendations prescribed	High	Elaboration of Action Plans for selected RDB species	P2.	Project	Number of Action Plans for the RDB species and species groups present in the site	Progress reports
		Implementation of actions and recommendations prescribed by	P5.	Project	Delivery of actions as they will emerge	Progress reports

Operational Objective (OO)	Priority rating	Title of Action	Code of action	Category of action	Performance Indicators	Monitoring requirements/Means of Verification
		the Action Plans			from action P2.	
OO23.1. To design, construct and install information/interpretation/warning signposting and produce promotion material.	High	Elaboration of a study for the design and technical specifications for information / interpretation / warning signposting and promotion material	P7.	Project	Timely delivery of the technical study	Progress reports
		Construction and installation of information / interpretation / warning signposting and production of promotion material	P8.	Project	Timely installation of signposting and production of promotion material	Progress reports
OO25.1. To enforce compliance of compulsory CoGAP measures and promote the implementation of the voluntary ones.	High	Implementation and enforcement of the Maltese Code of Good Agricultural Practice (CoGAP) and Nitrates Action Programme in the agricultural land within the SAC	M1.	Measure	Annual percentage of cultivations under compliance with CoGAP	Keeping record of Department of Agriculture formal statistics concerning cultivations under compliance
OO26.1. To ensure that tourist development and infrastructure is compatible with and does not negatively impact the site's ecological integrity.	High	Tourist development and infrastructure shall be closely monitored for any potential impact on the ecological integrity of Natura 2000 site.	M2.	Measure	Delivery of action	Progress reports
OO27.1. To patrol the site	High	Prescription of a patrolling schedule	P9.	Project	Timely delivery of action	Progress reports
		Implementation of the patrolling schedule	D1.	Duty	Percentage annual decrease of incidents	Ordered reporting and annual review
OO1.2. To maintain and monitor water quality and parameters OO13.1. To conserve and maintain current	High	Building and maintenance of a database with baseline data for current and future management of the reserve.	P10.	Project	Database in place	Annual progress report

Operational Objective (OO)	Priority rating	Title of Action	Code of action	Category of action	Performance Indicators	Monitoring requirements/Means of Verification
population of Annex II listed <i>Aphanius fasciatus</i> .		Maintenance of sluice canal	D2.	Project	Log of maintenance carried out	Progress reports
		Creation of plan together with farmers for the reduction of the use of pesticide/fertilizers in the fields around the reserve	P11.	Project	Plan drawn up	Progress reports
OO2.1. / OO3.1. /OO4.1. To maintain islands and salt marsh vegetation	High	Habitat and flora mapping of artificial islands.	P12.	Project	Survey report	Progress reports
		Maintenance and provision of ideal breeding conditions for the <i>Charadrius dubius</i>	P13.	Project	Records of shingle area available to be taken before the start of every breeding season	Progress reports
		Creation of artificial islands made up of felled and dead dried trees	P14.	Project	Presence of additional islands in the lagoon	Progress reports
OO5.1. To maintain and enhance the dune habitat 2220	High	Re-creation of open spaces in the sand dune area	P15.	Project	No of Acacia trees removed from the dune environment per year	Progress reports
		Monitoring of sand dune rehabilitation project	P16.	Project	Improved conservation status of sand dune habitat	Progress reports
OO12.1. To conserve, maintain and improve current population of Annex II listed <i>Brachytrupes megacephalus</i> .	High	Preparation of an action plan for the conservation of the <i>Brachytrupes megacephalus</i>	P17.	Project	Action plan drawn up	Progress reports
OO21.2. To control ground predators	High	Control impact of feral cat and stray dog population on the reserve's fauna	P18.	Project	Number of birds/nests lost to these predators	Progress reports

Operational Objective (OO)	Priority rating	Title of Action	Code of action	Category of action	Performance Indicators	Monitoring requirements/Means of Verification
		Control impact of rat populations on the reserve's fauna	P19.	Project	Number of birds/nests lost to these predators	Progress reports
OO22.1. To gather records of fauna species that visit and breed at the reserve	High	Maintenance of records and notes on a daily basis of all fauna present at the reserve	P20.	Project	Daily records	Progress reports
OO22.2. To gather records of flora species found at the reserve.		Maintenance of records of flora species at the reserve	P21.	Project	Seasonal records	Progress reports
OO22.3. To increase knowledge of fauna and flora at the reserve through help from educational institutions	Medium	Identification and circulation of research projects to University and higher secondary students	P22.	Project	Number of research projects taken up at the reserve	Progress reports
OO22.4. To increase species and number of breeding species	Medium	Maintain and increase numbers of breeding populations as well as breeding species at the lagoon – in conjunction with lagoon expansion	P23.	Project	Breeding pairs of breeding populations per season Species recorded breeding	Progress reports
		Setting up of nest boxes for Spotted Flycatcher and Tree Sparrow	P24.	Project	Number of nest boxes set up Number of nest boxes occupied by the targeted species	Progress reports
		Setting up of nesting rafts for Common Coot	P25.	Project	Number of nesting rafts set up Number of breeding pairs making use of	Progress reports

Operational Objective (OO)	Priority rating	Title of Action	Code of action	Category of action	Performance Indicators	Monitoring requirements/Means of Verification
					the nesting rafts	
		Maintenance of Kingfisher and Sand Martin artificial nest sites.	D3.	Duty	Maintenance records Number of breeding pairs of the targeted species making use of the artificial nest sites	Progress reports
OO24.2. To cater for weekend visits by the members of the public between the months of October and May	High	Preparation of diverse educational programmes and promotion of these to primary and secondary schools.	P26.	Project	Educational material issued and promoted every year	Progress reports
OO24.3. To ensure adequate facilities to cater for visitors		Promotion and advertisement through press releases and media events about the reserve and to allow visitor access during the weekend (through having on site weekend wardens)	D4.	Duty	Reserve opening hours Promotion and advertisement of the reserve	Progress reports
		Maintenance of the reception centre and bird watching hide.	D5.	Duty	Records of maintenance work carried out	Progress reports
		Maintenance of the nature trail linking the reception centre to the bird watching hide	D6.	Duty	Records of maintenance work carried out	Progress reports
		Delivery of more information by means of signage placed along the nature trail and inside the buildings	P27.	Project	Number of additional signs installed	Progress reports

Natura 2000 Management Plan

Operational Objective (OO)	Priority rating	Title of Action	Code of action	Category of action	Performance Indicators	Monitoring requirements/Means of Verification
OO28.1. To ensure no unauthorized intrusions/break ins into the reserve occur OO28.2. To control and monitor access in such a way as to ensure that visitors are of no detriment, by means of excess disturbance, to the reserve	High	Maintenance of a 24 hour watch on the reserve	D7.	Duty	Installation of surveillance equipment Presence of watchmen on site	Progress reports
		Maintenance of the reserve boundary structures	D8.	Duty	Record of maintenance to the boundary fence	Progress reports

4.2 DESCRIPTION OF MANAGEMENT ACTIONS

For each action the following details are given:

Code/Title	Each action is given a code number with an initial M, P or D corresponding to Measures, Projects, Duties and a serial number.
Description	A description of the action to be delivered is given.
Expected results	A brief description of the output (deliverable) is given.
Priority rating	Priority in accordance to the prioritisation given in Table 16 and a time span for the completion of each action is given.
Constraints	Any foreseen constraints to the delivery of the action are stated and alternatives are suggested. It is noted that reference is made mainly to technical or institutional constraints and drawbacks foreseen. Constraints such as conflicting interests, social disputes or the funding requirements, which should have been resolved by the time of implementation, are not included.

A. MEASURES

4.2.1 ***Code and Title of Action: M1. Implementation and enforcement of the Maltese Code of Good Agricultural Practice (CoGAP) and the Nitrates Action Programme in the agricultural land within the SAC***

Description	This measure requires the Department of Agriculture, in consultation with ERA, to ensure that the Maltese Code of Good Agricultural Practice (CoGAP) that applies to the surrounding agricultural land, is put into force. Since the land area within the SAC comprises agricultural land the implementation of the following codes are to be given priority: 41, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54. In accordance with the CoGAP, where farmers enter into any agri-environment commitment and/or are in receipt of compensatory allowances in Less Favoured Areas ¹⁸ the following codes must also be implemented: 10, 19, 56, 76, 86, 87, 89, 91, 92, 93, 94, 95, 96, 97, 100. Strong liaison with the farmers is required so that they understand the importance of the CoGAP as well as their position within a Natura 2000 Site.
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Furthermore, it is recommended that all agricultural land within the SAC

¹⁸ This has been renamed Areas Under Natural Constraints or ANC under the CAP and Rural Development Policy for 2014-2020

is subject to the requirements of CoGAP related to Good Farming (in particular Codes 56, 76, 86, 87, 89, 91, 92, 93, 94, 95, 96, 97, 100) and Voluntary Actions (in particular Codes 36, 37, 38, 39, 40, 42, 43, 55, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 77, 78, 79, 80, 81, 82, 83, 84, 85, 88, 90, 98, 99).

The obligations emanating from the Nitrates Action Programme (2011) must also be met by the farmers and enforced by the Department of Agriculture.

The obligations emanating from the Pesticides Control Act and its subsidiary legislation must also be met by the farmers and enforced by the competent authority.

Farmers in the SAC are also encouraged to take up the measures prescribed in Malta's Rural Development Plan 2014-2020 particularly those that will assist the farmer to contribute towards landscape management and ecological conservation. This will allow farmers to provide an active role in contributing to meeting the SAC's conservation objectives.

The implementation of the CoGAP, the Nitrates Action Programme, and regulations concerning use of pesticides will also contribute towards the following measure set by Malta's National Biodiversity Strategy and Action Plan 2012-2020 that is aimed at the reduction of the direct pressures of biodiversity:

- Farmers receiving financial assistance under the Common Agricultural Policy are compliant with the Statutory Management Requirements (SMR) in line with EU and national legislation

This measure will be implemented in cooperation with the Department of Agriculture, as the competent authority for the agricultural sector. The success of this measure will be monitored through the formal statistics kept and processed by the Department of Agriculture, regarding CoGAP and statistics from those parcels receiving financial assistance under the EAFRD (2007-2013 and 2014-2020).

Expected results	Agriculture is practiced without disturbing the protected ecological features of the site and contributes to the conservation of the site's biodiversity.
Priority rating	High. To be accomplished within the first 2 years from the start of MP implementation period and monitored throughout the duration of the MP.
Constraints	Although no major constraints are foreseen, the level of awareness of farmers on the requirements emerging from their obligation as described in the CoGAP and the Nitrates Action Programme may be low and this may need to be addressed by the Management Group.

4.2.2 Code and Title of Action: M2. Tourism development and infrastructure shall be closely monitored for any potential impact on the ecological integrity of Natura 2000 site

Description This measure requires PA to proceed assess proposed tourist development and infrastructure in terms of the following:

(i) Protect and enhance the natural and cultural environment by:

- Maintaining all current statutory protection levels
- Prohibiting development, which adversely affects statutory protected areas and the ecological integrity of protected areas
- Identifying further terrestrial and marine areas/sites for protection
- Identifying opportunities for environmental enhancement
- Ensuring that the wastewater treatment plant is being operated in accordance with environmental permitting conditions and that associated environmental impacts are properly mitigated and monitored.
- Require an environmental cost-benefit analysis assessing proposed development with respect to the ecological importance of the site.

(ii) Improve transportation problems by:

- Managing access
- Improving pedestrian safety
- Improving the bus terminus
- Managing car-parking provision
- Encouraging traffic management schemes
- Encouraging junction improvements
- Realigning sections of the dual carriageway.

(iii) Control tourism related development by:

- Identifying sustainable tourism related development opportunities on existing tourism development sites
- Defining boundaries and policy constraints for tourism related development opportunity areas on existing tourism development sites
- Prohibiting establishment of new tourism related facilities outside the identified areas.

(iv) Manage recreation activities by:

- Safeguarding the beach for public use
- Rationalising commercial use of beach
- Rationalising the development of beachroom accommodation
- Safeguarding the Wetland Reserve as a recreational use
- Considering a beach management plan
- Identifying opportunities for environmentally friendly

recreation.

Expected results	The institutional safeguarding of the protected area against uncontrolled tourism development
Priority rating	High. To be accomplished within the first 2 years from the start of MP implementation period.
Constraints	Coordination among different administrative authorities is the prerequisite for the accomplishment of this action.

B. DUTIES

4.2.3 Code and Title of Action: D1. Implementation of patrolling

Description	<p>ERA will provide for the engagement of the proper staff to carry out the scheduled tasks specified by Action P9. This may be in addition to the systems already provided by the state for the control of illegal activities in a nationwide scale and to the police patrolling system already provided to the Ghadira Reserve.</p> <p>The progress and success of this action will be monitored through monthly and annual reports as specified by Action P9.</p>
Expected results	The prevention of illegal activities and reporting on the site's status and emergency issues.
Priority rating	High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.
Constraints	Coordination among different administrative authorities is the prerequisite for the accomplishment of this action

4.2.4 Code and Title of Action: D2. Maintenance of sluice canal

Description	The canal must be kept free from blockages (e.g. from sand) to allow excess water to reach the bay and avoid flooding further inland. The sluice canal is checked as necessary, depending on the rainy season. This is unblocked at the beach and requires a contractor with appropriate machinery. This action is required, on average, once a year.
Expected results	Avoid flooding of the lagoon and the agricultural land.
Priority rating	High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints No major constraints foreseen

4.2.5 Code and Title of Action: D3. Maintenance of Kingfisher and Sand Martin artificial nest sites

Description An artificial wall filled with sand and including a number of nesting holes has been erected by the current site manager (BLM) with the aim of attracting Kingfisher and Sand Martin and to encourage breeding within this artificial habitat. Maintenance of this structure is required to make sure the holes remain useable and available to these species.

Expected results Establish breeding population of Kingfisher and Sand Martin.

Priority rating Medium To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints No constraints foreseen

4.2.6 Code and Title of Action: D4. Promotion and advertisement through press releases and media events about the Reserve and to allow visitor access during the weekend

Description The reserve is open to the public from October to May; it is closed between June to September since this is the peak of the breeding season and therefore disturbance must be kept to a minimum. Press releases and media events are organized to promote the reserve and its opening hours as well as any other events that may be organized at the site. During the weekend, weekend wardens are present on site that greet visitors and educate them about the site. The weekend wardens need to be trained on a regular basis.

Expected results Increased awareness.

Priority rating High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints Coordination among different administrative authorities is the prerequisite for the accomplishment of this action

4.2.7 Code and Title of Action: D5. Maintenance of the reception centre and bird watching hide

Description Upkeep of the structures used by the public is required. Intervention, including painting, plastering, is generally needed every two years, particularly as a result of the saline environment that the structures are exposed to.

Expected results Improved site facilities.

Priority rating High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints No major constraints foreseen.

4.2.8 Code and Title of Action: D6. Maintenance of the natural trail linking the reception centre to the bird watching hide

Description This involves regular tree pruning and resurfacing of the nature trail every 5 years. A hedge cutter is used and must be serviced at least 3 times a year.

Expected results Improved visitor access.

Priority rating High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints No major constraints foreseen.

4.2.9 Code and Title of Action: D7. Maintenance of a 24 hour watch at the reserve

Description The current roster of 4 watchmen at the site is to be maintained and security increased by means of the setting up of surveillance equipment.

Expected results Reduced break-ins and killing/taking of birds.

Priority rating High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints No major constraints foreseen.

4.2.10 Code and Title of Action: D8. Maintenance of the reserve boundary structures

Description Maintain and repair the boundary fence as and when necessary, in particular following damage from break-ins.

Expected results Reduced break-ins and killing/taking of birds.

Priority rating High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints No major constraints foreseen.

C. PROJECTS

4.2.11 **Code and Title of Action: P1. Elaboration of detailed monitoring programmes for the Annex I habitats 5330, 5410 and 6220*, the Annex II flora species *Anacamptis urvilleana*, *Ophrys melitensis* and *Orobanche densiflora*, the Annex II fauna species *Zamenis situla*, *Rhinolophus hipposideros* and *Myotis punicus* and the breeding bird species *Himantopus himantopus*, *Calandrella brachydactyla* and of the breeding, wintering and staging wetland and woodland birds**

Description In the course of the preparation of the present Management Plan, a method for the evaluation of the conservation status of Annex I habitats and Annex II species of the Habitats Directive and of the Annex I species of the Birds Directive at the site scale was developed in accordance with the methodology provided by MEPA (See chapter 2). This methodology was applied to give the assessment of the conservation status of the foretold habitats and species per N2K site in year 2013.

This work has set the basis for the formulation of national Standard Monitoring Protocols (plans) for the foretold habitats and species. This is a task to be accomplished within the first period of implementation of the Management Plans.

The Standard Monitoring plans will also deal with the determination of the Favourable Reference Values which will then inform the Favourable Conservation Status to be assessed for habitats and species.

During the first period of implementation of the MP, Favourable Reference Values will be determined for the following habitats and species:

Annex I habitats:

- 5330 – Thermo-Mediterranean and pre-desert scrub
- 5410 – West Mediterranean clifftop phryganas
- 6220* – Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea.

Annex II flora species:

- *Anacamptis pyramidalis*
- *Ophrys melitensis*
- *Orobanche densiflora*

Annex II fauna species

- *Zamenis situla*
- *Rhinolophus hipposideros*
- *Myotis punicus*

Birds

- *Himantopus himantopus*
- *Calandrella brachydactyla*

- Garrigue/scrubland passerines
- Woodland passerines

The Standard Monitoring plans will be applied to the sites through Action P4 in order to:

- Assess the conservation status of habitats and species within 5 years from the 2013 assessment
- Determine the Favourable Reference Values and the Favourable of Conservation Status for the above listed Annex I habitats and Annex II species
- Enable the five year revision of the Management Plan, i.e. the review of Operational Objectives and subsequent management actions.

Guidelines for the elaboration of the standard monitoring plans are given in *ANNEX 4: Specifications of Management Actions*.

Expected results	Three standard monitoring plans for the Annex I habitats, and nine standard monitoring plans for the Annex II species and the birds present in the site.
Priority rating	High. Monitoring Plans to be delivered within the first two years from the start of the MP implementation period
Constraints	No major constraints foreseen

4.2.12 Code and Title of Action: P2. Elaboration of Action Plans for selected RDB species

Description The Competent Authority will prepare guidelines for the elaboration of National Species Action Plans for endemic and threatened species and prepare a priority list based on the national and international status of the species and on the species' presence within the Natura 2000 sites. For these species, Actions Plans should be prepared on a national level as part of the Management Plans implemented in each Natura 2000 site. The Action Plans can be either single species Action Plans or tackle groups of species and should justify and propose tailored conservation measures for every species or group. These plans will guide the implementation of Action P5.

General Guidelines for the elaboration of the Action Plans are given in *ANNEX 4: Specifications of Management Actions*.

For this site Action Plans are recommended for the following species/species groups:

- Amphibian: *Discoglossus pictus*

Expected results	One national Action Plan for the conservation of threatened Red Data Book species present in the site
Priority rating	Medium. Action Plans to be delivered within the first three years from the start of MP implementation period
Constraints	No major constraints foreseen

4.2.13 Code and Title of Action: P3: Assess the possibility of extending the coastal lagoon habitat and dune restoration

Description The appropriateness of this study arises from the 2008 options analysis undertaken by the Government to relocate the road passing behind the Għadira sandy beach – this specific option discusses the removal of arterial road and consequent rehabilitation of the lost coastal dune system. This plan offers the opportunity to include in the analysis, as a further option, the possible expansion of the Għadira lagoon.

The Għadira Beach Geomorphological Assessment (2009) study has shown that:

- The South Beach and part of the North Beach at Għadira have experienced negative effects as a result of hardening of the shoreline, including total loss of sandy beach at the eastern end of the South Beach and a reduction in the extent of the North Beach near the Adira Sailing Club and Għadira Wetland Reserve;
- Construction of the present road in the 1980's resulted in loss of much of the sand flat, ephemeral pool and embryo dunes which formerly existed in front of the older sand dunes at Għadira North Beach, and cut off the sand supply to those dunes
- Removal of the road and associated seawall / promenade would create a much wider beach over which storm wave energy could be dissipated, and would significantly increase the rate of wind-blown sand transport from the beach to the dunes

In the light of these findings, it is suggested that a combined ecological, geomorphological/sedimentological and socioeconomic study and assessment of the option to restore the dune system, both as an ecological resource and as a natural flood defense is conducted.

This study will be mainly based on the:

- Findings and conclusions of the Għadira Beach Geomorphological Assessment (2009)
- Assessment of Favourable Conservation Status of the Annex I habitat 2220 - Dunes with *Euphorbia terracina*, resulting from Action P3.

Work elements will include:

- Analysis of historical aerial photography, ground photography and topographic survey data, airborne topographic survey and construction of a digital elevation model
- Determination of former occupation and extent of the sand flat and embryo dunes obliterated following construction of the 1980's road, promenade and seawall
- A bathymetric survey and survey of marine biotopes in Mellieħa Bay, with particular attention to the extent and condition of Posidonia (seagrass) meadows
- Measurement of hydrodynamic processes (water levels, waves, near-surface and near-bed currents, wind) at offshore and nearshore locations in Mellieħa Bay and numerical modelling of hydrodynamic processes and beach response under present conditions and future sea level, wind energy and shoreline management scenarios
- Collection of seabed sediment samples for determination of particle size and compositional characteristics
- Shallow drillings to determine the nature and thickness of sediments below the present beach, road and seaward end of the Għadira Reserve followed by particle size and compositional analysis of sediment samples
- Analysis of soil / sediment and water characteristics of the Għadira Reserve and adjoining terrestrial areas
- Suitable socioeconomic data analysis

Expected results A study that will assess the physical and socioeconomic potential and possibilities to expand the lagoon and dune habitat to part of its former extent

Priority rating Medium/ Low.

Constraints This study can be implemented independently or follow developments related to broader policies regarding the Għadira coastal front. It is also dependent on Government's priorities for this section of the TEN-T network.

4.2.14 Code and Title of Action: P4. Implementation of the monitoring plans for the Annex I habitats 5330, 5410 and 6220*, the Annex II flora species *Anacamptis urvilleana*, *Ophrys melitensis* and *Orobanche densiflora*, the Annex II fauna species *Zamenis situla*, *Rhinolophus hipposideros* and *Myotis punicus* and the breeding bird species *Himantopus himantopus*, *Calandrella brachydactyla* and of the breeding, wintering and staging wetland and woodland birds

Description ERA will provide for the implementation of the monitoring plans according to the specifications provided for in the respective studies (Action P1).

Expected results Three reports on the conservation status of the Annex I habitats, and

nine reports on the conservation status for the Annex II species and the birds present in the site. Four reports concerning the Favourable Reference Values of Annex I habitat 5330 and 6220* and the Annex II flora species *Anacamptis urvilleana* and *Ophrys melitensis*.

Priority rating	Implementation will follow the delivery of the relevant monitoring plans (Action P1), therefore it may start from the second year of the MP implementation period. In any case it cannot exceed a 5 years period from the previous first assessment, i.e. the 2013 year assessment undertaken in the context of the MP preparation.
Constraints	No major constraints foreseen

4.2.15 Code and Title of Action: P5. Implementation of actions and recommendations prescribed by the Action Plans

Description	Following the prescriptions of the species specific Action Plans (Action P2) ERA or the Site Manager will have to judge which of them are applicable to the site and decide on the urgency for their implementation.
Expected results	A series of actions that will mitigate possible adverse effects on RDB species and lead to an overall improvement of the site quality for them.
Priority rating	Medium. To start after the delivery of the relevant Action Plans (Action P2).
Constraints	Although these are usually low cost, small scale/microhabitat management actions, their exact nature and extent cannot be foretold and possible constraints cannot be foreseen at this point.

4.2.16 Code and Title of Action: P6. Planning and implementation of an IAS control and / or eradication programme

Description	Based on the “Guidelines on managing non-native plant invaders and restoring native plant communities in terrestrial settings in the Maltese Islands” (MEPA 2013) and the site specific guidelines given in <i>ANNEX 4: Specifications of Management Actions</i> , the competent authority or the Site Manager will proceed with a site specific schedule for the gradual eradication of the IAS and restoration of native communities present within the first management plan implementation period.
Expected results	A technical plan that will guide the gradual eradication of alien and invasive plant species from the Annex I habitats and other sensitive areas within the Natura 2000 sites. Delivery of the eradication and rehabilitation actions foreseen for the first management implementation period.
Priority rating	Medium. Study to start at the second year of the MP implementation

period

- Constraints
- Collaboration with the Mellieħa Holiday Complex (Danish Village) must be sought as regards removal of alien plants in Il-Bisqra garrigue.
 - Ownership rights may prohibit the eradication of alien tree clumps present within private land adjacent to Annex I habitats.

4.2.17 Code and Title of Action: P7. Elaboration of a study for the design and technical specifications for warning / information / interpretation signposting and promotion material

Description	<p>A technical study will be elaborated which will:</p> <ul style="list-style-type: none"> • Define the contents and design layouts of the signposting and the promotion material based on the features identified in the current MP and following consultations with ERA • Prescribe technical specifications for the implementation of the respective technical works • The study will include the analytical budget for the implementation of the required technical works. <p>The study will check the existing signage within the Għadira Reserve and suggest any replacements needed so that uniformity and branding are ensured.</p> <p>General guidelines as regards contents of signposting/promotion material and indicative posting places are given in <i>ANNEX 4: Specifications of Management Actions</i>.</p>
Expected results	A study and accompanying technical specifications that will guide the implementation of the relevant action (Action P8).
Priority rating	High. To be completed within the first two years from the start of the MP implementation period
Constraints	No major constraints foreseen

4.2.18 Code and Title of Action: P8. Construction and installation of warning / information / interpretation signposting and production of promotion material

Description	ERA will provide for the implementation of the technical works according to the specifications provided for in the respective study (Action P7).
Expected results	The installation of infrastructure and facilities prerequisite for visitor attraction and raising of awareness and appreciation for the site
Priority rating	High. To start after the completion of the respective study (Action P7).

Constraints No major constraints foreseen

4.2.19 Code and Title of Action: P9. Prescription of a patrolling schedule

Description A document prescribing the patrolling requirements and annual schedules will be prepared. Illegal activities already identified by the Għadira Management Plan should be set as priorities for control and prevention. This schedule will be also based on the annual Work Plan (see below) and will be revised according to the requirements arising from the progress of the management actions.

An initial set of patrolling and reporting requirements and proposed routines, staff and equipment needed is given in *ANNEX 4: Specifications of Management Actions*.

Expected results The annual schedule of patrolling the site as it will be implemented through the relevant action (Action D1)

Priority rating High. To be delivered within the first year from the start of the MP implementation period

Constraints No major constraints foreseen

4.2.20 Code and Title of Action: P10. Building and maintenance of a database with baseline data for current and future management of the reserve

Description Water quality is already monitored by the Site Manager although due to funding problems, this is not always carried out on a regular basis. Monitored parameters include nitrates, phosphates, chlorophyll *a*, temperature, dissolved oxygen, salinity, conductivity, turbidity and pH while pesticide levels are not monitored. Monitoring data were also collected by the competent authorities as part of the WFD implementation. This action calls for the integration of the existing monitoring protocols to the WFD and the Nitrates Action Programme requirements and to maintain a database with the water quality parameters. Monitoring of this Action will also consider implementation of Action P12 on the creation of a plan with the farmers to reduce chemical input in their farming methods. ERA needs to be consulted during the implementation of this action.

The progress and success of this action will be monitored through annual reports.

Expected results Monitoring of the water quality in the lagoon.

Priority rating High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints No major constraints foreseen

4.2.21 Code and Title of Action: P12. Creation of a plan together with farmers for the reduction of the use of pesticide/fertilizers in the fields around the reserve

Description This action is complementary to Action M1 and will help in managing water quality at the lagoon and aims to reduce influx from pollutants associated with agriculture. It requires coordination between the site manager (BLM) and farmers in the area. Prior to the actual drawing up of the plan, a rapport must be built between the Site Manager and the farmers in the area. Developing the working relationship will facilitate the implementation of this Action.

Expected results A plan that facilitates farmers to reduce their input when farming.

Priority rating High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints The relationship between BLM, the authorities involved in action M1 and the farmers needs to be well-established before this action can be a success.

4.2.22 Code and Title of Action: P13. Habitat and flora mapping of artificial islands

Description Habitats and flora on all islets are surveyed on an annual basis. This is an ongoing action and is required to ensure that habitat status is not being negatively impacted by any external factor. This is part of the duties of the site manager.

Expected results Records of habitat and species on site are maintained.

Priority rating High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints No major constraints foreseen

4.2.23 Code and Title of Action: P14. Maintenance and provision of ideal breeding conditions for Charadrius dubius

Description This action involves the setting up of a number of shingle patches and maintenance of the shingle patches, which provide suitable nesting ground for this species. The shingle material is sourced locally. This action will be implemented on average every 3 years. Implementation will be restricted to the month of September to avoid this species' breeding season (March to August) whilst ensuring that water levels are low enough to allow for wading through the lagoon.

Expected results	Maintain favourable breeding habitat for <i>Charadrius dubius</i> .
Priority rating	High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.
Constraints	No major constraints foreseen.

4.2.24 Code and Title of Action: P15. Creation of artificial islands made up of felled and dead dried trees

Description	Felled material from Acacia (from the dune area) as well as material from other species (pruning) is dried over a number of months and transferred to the lagoon during the summer months thus creating ideal habitat for waterfowl and heron species. Islands are replenished as necessary. This is an ongoing action to be carried out during the summer months when low water levels permit wading to selected areas.
Expected results	Creation of ideal habitat and potential breeding grounds for the Little Egret and for wintering and migratory waterfowl and heron species.
Priority rating	High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.
Constraints	No major constraints foreseen

4.2.25 Code and Title of Action: P16. Re-creation of open spaces in the sand dune area

Description	This Action calls for the continued removal of Acacia from the dune. Acacia trees are to be manually felled using chain saws and removed from the site. They are then dried at another location and reused within the reserve as required (see previous Action). The leaf litter is raked away. Saplings are removed manually as required. This is an ongoing action. At least one to two trees should be removed once a year. Works are to be limited to between August to January to avoid the breeding season of Cetti's and Sardinian Warblers.
Expected results	Removal of Acacia from the sand dune habitat and re-colonisation of sand dune species.
Priority rating	High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.
Constraints	No major constraints foreseen.

4.2.26 Code and Title of Action: P16. Monitoring of sand dune rehabilitation project

Description	This action requires monitoring of the planting of dune species carried out during the 2010-2014 planning period (refer to BLM Management Plan) to ensure rehabilitation of sand dune and improved conservation status of this habitat type.
Expected results	Recorded improved Conservation Status of the dune habitat.
Priority rating	High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.
Constraints	This action needs to be in line and maybe revised according to the findings and recommendations of actions P3 and P4. Otherwise no major constraints foreseen.

4.2.27 Code and Title of Action: P17. Preparation of an action plan for the conservation of the *Brachytrupes megacephalus* and implementation

Description	The competent authority will prepare guidelines for the elaboration of National Species Action Plans for <i>Brachytrupes megacephalus</i> and prepare a priority list based on the national and international status of the species and on the species' presence within the Natura 2000 sites. For these species, Actions Plans should be prepared on a national level as part of the Management Plans implemented in each Natura 2000 site. Once the Action Plan is available, the Site Manager will identify priority Actions for implementation during this 5-year planning period.
Expected results	National Action Plan for <i>Brachytrupes megacephalus</i> .
Priority rating	Medium. To start in the third year of the implementation of the Management Plan implementation period.
Constraints	Consistency with the National Action Plan elaboration and implementation (Actions P2 and P5) needs to be ensured. Otherwise, no major constraints foreseen.

4.2.28 Code and Title of Action: P18. Control impact of feral cat and stray dogs and population on the reserve's fauna

Description	<p>Feral cats pose a threat to ground nesting birds at the reserve through predation. Baited live trapping of cats, which are set up whenever the population has increased is currently carried out and will continue at the reserve. The cats are sent to animal shelters. The site manager provides a donation to ensure that the cats are neutered and looked after.</p> <p>Stray dogs are also caught in traps as provided by the Animal Welfare Department.</p>
Expected results	Reduced disturbance to birds in the reserve including predation on breeding species.

Priority rating High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints No major constraints foreseen.

4.2.29 Code and Title of Action: P19. Control impact of rat populations on the reserve's fauna

Description Baiting with poison will be carried out. Bait stations are checked and replenished on a monthly basis.

Expected results Reduce predation on ground nesting birds.

Priority rating High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints No major constraints foreseen.

4.2.30 Code and Title of Action: P20. Maintenance of records and notes on a daily basis of all fauna present at the reserve

Description Daily log is maintained of bird sightings and all other faunal species including invertebrates.

Expected results Maintenance of Reserve records.

Priority rating High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints No major constraints foreseen.

4.2.31 Code and Title of Action: P21. Maintenance of records of flora species at the reserve

Description Seasonal survey of flora is carried out by the site's managing warden. As identified above, a computer is needed on site in order to ensure data is digitized.

Expected results Maintenance of reserve records.

Priority rating High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.

Constraints No major constraints foreseen.

4.2.32 Code and Title of Action: P22. Identification and circulation of research projects to University and higher secondary students

Description	The aim of this action is to attract more University students to offer use of the site for research projects. This could add value to the information already collected by the Site Manager to further inform management of the site. An agreement/contact will be made with the University to attempt to facilitate implementation of this action.
Expected results	Extended data about the site. Raised awareness, environmental education.
Priority rating	Medium. To start in the second year of the implementation of the Management Plan implementation period and continue throughout.
Constraints	Coordination of field work to minimize disturbance to birds present at the reserve.

4.2.33 Code and Title of Action: P23. Maintain and increase the number of breeding populations as well as breeding species in the lagoon – in conjunction with lagoon expansion

Description	Refer to Action P3 related to lagoon expansion. Other management measures that may encourage breeding could also be implemented as deemed appropriate by the Site Manager.
Expected results	Improved conservation status of birds at the site.
Priority rating	Medium. To start in the third year of the implementation of the Management Plan implementation period and continue throughout.
Constraints	This action depends upon the successful implementation of P3.

4.2.34 Code and Title of Action: P24. Setting up of nest boxes for Spotted Flycatcher and Tree Sparrow

Description	Nest boxes for these arboreal species are made on site from plywood. Nest boxes for the Spotted Flycatcher will be erected in the Aleppo Pines and nest boxes for the tree sparrows are erected on the onsite buildings. This action will create additional favourable breeding habitat. The target is to establish 6 nest boxes for each species.
Expected results	Extension of breeding habitat for this species.
Priority rating	Medium. To start in the third year of the implementation of the Management Plan implementation period and continue throughout.
Constraints	No constraints foreseen

4.2.35 Code and Title of Action: P25. Setting up of nesting rafts for Common Coot

Description	Although one nesting raft has already been set up, another is needed. A nesting raft consists of a small floating wooden structure with thick vegetation on top which is placed in the middle of the lagoon. Materials needed include marine plywood and jablo floats.
Expected results	Establish the Common Coot as an annual breeding species at the reserve.
Priority rating	Medium. To start in the second year of the implementation of the Management Plan implementation period and continue throughout.
Constraints	No major constraints foreseen.

4.2.36 Code and Title of Action: P26. Preparation of diverse educational programmes and promotion of these to primary and secondary schools

Description	On site field teachers that are seconded from the Education Department and specialize in environmental education are available on site. BLM sends an information pack to each school at the start of the scholastic year. The pack is revised on an annual basis and is drawn up to reflect the national curriculum as compiled by the Education Department. During school visits, BLM provides items to enhance the educational experience including, for instance, weather stations, magnifying glasses, and binoculars.
Expected results	Increased awareness and environmental education.
Priority rating	High. To start in the first year of the implementation of the Management Plan implementation period and continue throughout.
Constraints	No major constraints foreseen.

4.2.37 Code and Title of Action: P27. Delivery of more information by means of signage placed along the nature trail and inside the buildings

Description	Additional educational material will be included on site to enhance visitor experience. Implementation of this action includes signage design, printing and installation.
Expected results	Increased signage and increased awareness.
Priority rating	High. To start in the second year of the implementation of the Management Plan implementation period and continue throughout.
Constraints	The design and content of these signs will be in accordance with the standards that will be set through Action P7. Otherwise, no constraints foreseen.

5 WORK PLAN STRUCTURE

Prior to the Management Plan implementation, a detailed work plan must be prepared by ERA. This is made on an annual basis and reviewed at the end of each year. In order to prepare a functional work plan **the management scheme, the overall management strategy, the methods of implementation/operation and the available financial and human resources must have been defined by the Administration / Government.** Revenue generating and funding opportunities have been identified in *ANNEX 5: Cost Recovery Mechanisms*.

The preparation of the work plan will be based on:

- The preceding description of the Management actions
- An indication of the financial resources needed annually for the implementation of each action as given in Table 45. It must be noted that, for a number of actions, costs cannot be estimated at this stage; therefore this exercise provides only a basis for the allocation of resources.
- The annual time schedule for the implementation of each action, checklist of the expected deliverables and year of delivery of each action and the entity proposed as responsible to deliver the actions, as shown in Table 46.

Table 45: Financial Plan

Action	Expenditure per year (€)					Total expenditure (€)
	1 st year	2 nd year	3 rd year	4 th year	5 th year	
M1. Implementation and enforcement of the Maltese Code of Good Agricultural Practice (CoGAP) and Nitrates Action Programme in the agricultural land within the SAC	25,000	25,000	25,000	25,000	25,000	125,000
M2. Tourism development and infrastructure shall be closely monitored for any potential impact on the ecological integrity of Natura 2000 site	2,000	0	0	0	0	2,000
D1. Implementation of the patrolling schedule	20,000	20,000	20,000	20,000	20,000	100,000
D2. Maintenance of sluice canal	500	500	500	500	500	2,500
D3. Maintenance of Kingfisher and Sand Martin artificial nest sites	100	100	100	100	100	500
D4. Promotion and advertisement through press releases and media events about the reserve and to allow visitor access during the weekend (through having on site weekend wardens)	1,000	1,000	1,000	1,000	1,000	5,000
D5. Maintenance of the reception centre and bird watching hide.	1,000	1,000	1,000	1,000	1,000	5,000
D6. Maintenance of the nature trail linking the reception centre to the bird watching hide	1,000	1,000	1,000	1,000	1,000	5,000
D7. Maintenance of a 24 hour watch on the reserve	30,000	30,000	30,000	30,000	30,000	150,000
D8. Maintenance of the reserve boundary structures	1,000	1,000	1,000	1,000	1,000	5,000
P1. Elaboration of detailed monitoring programmes for the Annex I habitats 5330, 5410 and 6220*, the Annex II flora species <i>Anacamptis urvilleana</i> , <i>Ophrys melitensis</i> and <i>Orobanche densiflora</i> , the Annex II fauna species <i>Zamenis situla</i> , <i>Rhinolophus hipposideros</i> and <i>Myotis punicus</i> and the breeding bird species <i>Himantopus himantopus</i> , <i>Calandrella brachydactyla</i> and of the breeding, wintering and staging wetland and woodland birds	8,000	8,000	0	0	0	16,000¹⁹

¹⁹ Cost is calculated for the horizontal action but site specificity has been taken into consideration in terms of the number of habitats and species present on site

Action	Expenditure per year (€)					Total expenditure (€)
	1 st year	2 nd year	3 rd year	4 th year	5 th year	
P2. Elaboration of Action Plans for selected RDB species	3,000	3,000	0	0	0	6,000²⁰
P3. Assess the possibility of extending the coastal lagoon habitat and dune restoration	0	0	0	3,000	3,000	6,000
P4. Implementation of the monitoring plans for the Annex I habitats 5330, 5410 and 6220*, the Annex II flora species <i>Anacamptis urvilleana</i> , <i>Ophrys melitensis</i> and <i>Orobancha densiflora</i> , the Annex II fauna species <i>Zamenis situla</i> , <i>Rhinolophus hipposideros</i> and <i>Myotis punicus</i> and the breeding bird species <i>Himantopus himantopus</i> , <i>Calandrella brachydactyla</i> and of the breeding, wintering and staging wetland and woodland birds	0	0	#	#	#	#
P5. Implementation of actions and recommendations prescribed by the Action Plans	0	0	#	#	#	#
P6. Planning and implementation of an IAS control and / or eradication programme	0	1,000	1,000	1,000	1,000	4,000
P7. Elaboration of a study for the design and technical specifications for warning / information / interpretation signposting and promotion material	1,000	0	0	0	0	1,000²¹
P8. Construction and installation of / information / interpretation / warning signposting and production of promotion material	0	#	0	0	0	#
P9. Prescription of a patrolling schedule	0	0	0	0	0	0²²
P10. Building and maintenance of a database with baseline data for current and future management of the reserve	1,000	1,000	1,000	1,000	1,000	5,000
P11. Creation of plan together with farmers for the reduction of the use of pesticide/fertilizers in the fields around the reserve	500	500	500	500	500	2,500
P12. Habitat and flora mapping of artificial islands	250	250	250	250	250	1,250

²⁰ Cost is calculated for the horizontal action but site specificity has been taken into consideration in terms of the number of habitats and species present on site

²¹ Cost is calculated for the horizontal action and is not assigned a per site cost

²² The patrolling schedule has been prepared as part of this Management Plan. Only fine-tuning may be required and this is not anticipated to require additional costs

To be derived derived by the respective studies/plans/schedules at a later stage.

Action	Expenditure per year (€)					Total expenditure (€)
	1 st year	2 nd year	3 rd year	4 th year	5 th year	
P13. Maintenance and provision of ideal breeding conditions for the <i>Charadrius dubius</i>	300	0	0	0	0	300
P14. Creation of artificial islands made up of felled and dead dried trees	250	250	250	250	250	1,250
P15. Re-creation of open spaces in the sand dune area	250	250	250	250	250	1,250
P16. Monitoring of sand dune rehabilitation project	250	250	250	250	250	1,250
P17. Preparation of an action plan for the conservation of the <i>Brachytripes megacephalus</i> and implementation	0	0	1,000	1,000	1,000	3,000
P18. Control impact of feral cat population on the reserve's fauna	400	400	400	400	400	2,000
P19. Control impact of rat populations on the reserve's fauna	100	100	100	100	100	500
P20. Maintenance of records and notes on a daily basis of all fauna present at the reserve	250	250	250	250	250	1,250
P21. Maintenance of records of flora species at the reserve	250	250	250	250	250	1,250
P22. Identification and circulation of research projects to University and higher secondary students	0	250	250	250	250	1,000
P23. Maintain and increase numbers of breeding populations as well as breeding species at the lagoon	0	0	500	500	500	1,500
P24. Setting up of nest boxes for Spotted Flycatcher and Tree Sparrow	0	0	100	100	100	300
P25. Setting up of nesting rafts for Common Coot	0	250	250	250	250	1,000
P26. Preparation of diverse educational programmes and promotion of these to primary and secondary schools.	500	500	500	500	500	2500
P27. Delivery of more information by means of signage placed along the nature trail and inside the buildings	0	200	200	200	200	800
ANNUAL EXPENDITURE	97,900	96,300+	86,900+	89,900+	89,900+	460,900+
GRAND TOTAL						460,900+

Table 46: List of actions, timeframe, deliverables and year of delivery, action total budget estimate and entities involved in the delivery of the actions

Action	Timeframe(Years)					Deliverable	Year of Delivery	Budget (€) (derived from financial plan)	Involvement
	1	2	3	4	5				
M1. Implementation and enforcement of the Maltese Code of Good Agricultural Practice (CoGAP) and Nitrates Action Programme in the agricultural land within the SAC						Processed formal statistical data showing compliance rates	Continuous	125,000	ERA / DEPARTMENT OF AGRICULTURE
M2. Tourism development and infrastructure shall be closely monitored for any potential impact on the ecological integrity of Natura 2000 site						Issue of regulation	1 st year	2,000	PA
D1. Implementation of the patrolling schedule						Monthly and annual patrolling reports	From 1 st year on	100,000	ERA / ENTITY WITH EXECUTIVE POWERS
D2. Maintenance of sluice canal						Delivery of action	Continuous	2,500	BIRDLIFE MALTA
D3. Maintenance of Kingfisher and Sand Martin artificial nest sites						Delivery of action	Continuous	500	BIRDLIFE MALTA
D4. Promotion and advertisement through press releases and media events about the reserve and to allow visitor access during the weekend (through having on site weekend wardens)						Press releases	Continuous	5,000	BIRDLIFE MALTA
D5. Maintenance of the reception centre and bird watching hide.						Delivery of action	Continuous	5,000	BIRDLIFE MALTA
D6. Maintenance of the nature trail linking the reception centre to the bird watching hide						Delivery of action	Continuous	5,000	BIRDLIFE MALTA
D7. Maintenance of a 24 hour watch on the reserve						Monthly and annual patrolling reports	Continuous	150,000	BIRDLIFE MALTA
D8. Maintenance of the reserve boundary structures						Delivery of action	Continuous	5,000	BIRDLIFE MALTA

Action	Timeframe(Years)					Deliverable	Year of Delivery	Budget (€) (derived from financial plan)	Involvement
	1	2	3	4	5				
P1. Elaboration of detailed monitoring programmes for the Annex I habitats 5330, 5410 and 6220*, the Annex II flora species <i>Anacamptis urvilleana</i> , <i>Ophrys melitensis</i> and <i>Orobanche densiflora</i> , the Annex II fauna species <i>Zamenis situla</i> , <i>Rhinolophus hipposideros</i> and <i>Myotis punicus</i> and the breeding bird species <i>Himantopus himantopus</i> , <i>Calandrella brachydactyla</i> and of the breeding, wintering and staging wetland and woodland birds						Three standard monitoring plans for the Annex I habitats and nine standard monitoring plans for the Annex II species and the birds present in the site	2 nd year	16,000 ²³	ERA
P2. Elaboration of Action Plans for selected RDB species						One National Action Plan for the RDB species present in the site	2 nd year	6,000	ERA
P3. Assess the possibility of extending the coastal lagoon habitat and dune restoration						One feasibility study	From 3 rd year on	6,000	ERA
P4. Implementation of the monitoring plans for the Annex I habitats 5330, 5410 and 6220*, the Annex II flora species <i>Anacamptis urvilleana</i> , <i>Ophrys melitensis</i> and <i>Orobanche densiflora</i> , the Annex II fauna species <i>Zamenis situla</i> , <i>Rhinolophus hipposideros</i> and <i>Myotis punicus</i> and the breeding bird species <i>Himantopus himantopus</i> , <i>Calandrella brachydactyla</i> and of the breeding, wintering and staging wetland and woodland birds						Three reports on the conservation status of the Annex I habitats and nine reports on the conservation status for the Annex II species and the birds present in the site. Favourable Reference Values for two Annex I habitats and two Annex II species.	From 3 rd year on	#	ERA
P5. Implementation of actions and						Delivery of the	From 3 rd year	#	ERA

²³ Cost is calculated for the horizontal action and is not assigned a per site cost

²³ Cost is calculated for the horizontal action and is not assigned a per site cost

Action	Timeframe(Years)					Deliverable	Year of Delivery	Budget (€) (derived from financial plan)	Involvement
	1	2	3	4	5				
recommendations prescribed by the Action Plans						conservation actions prescribed by the Action Plans	on		
P6. Planning and implementation of an IAS control and / or eradication programme						A plan for IAS species eradication plan and resulting works	From 2 nd year on	4,000	ERA
P7. Elaboration of a study for the design and technical specifications for warning / information / interpretation signposting and promotion material						A technical study for N2K signposting and production of promotion material	1 st year	1,000	ERA
P8. Construction and installation of / information / interpretation / warning signposting and production of promotion material						Delivery of works prescribed by the technical study (Action P7)	2 nd year	#	ERA
P9. Prescription of a patrolling schedule						One patrolling schedule note	1 st year	0	ERA /ENTITY WITH EXECUTIVE POWERS
P10. Building and maintenance of a database with baseline data for current and future management of the reserve						Creation and maintenance of a digital database	Continuous	5,000	BIRDLIFE MALTA
P11. Creation of plan together with farmers for the reduction of the use of pesticide/fertilizers in the fields around the reserve						A plan for the reduction of agrochemicals in fields	Continuous	2,500	BIRDLIFE MALTA
P12. Habitat and flora mapping of artificial islands						Records of habitat and flora within the Reserve	Continuous	2,500	BIRDLIFE MALTA
P13. Maintenance and provision of ideal breeding conditions for the <i>Charadrius dubius</i>						Creation of shingle patches as a nesting habitat	Continuous	300	BIRDLIFE MALTA
P14. Creation of artificial islands made up of felled and dead dried trees						Creation of artificial islands as a nesting habitat	Continuous	2,500	BIRDLIFE MALTA
P15. Re-creation of open spaces in the sand dune area						Delivery of action	Continuous	2,500	BIRDLIFE MALTA

Action	Timeframe(Years)					Deliverable	Year of Delivery	Budget (€) (derived from financial plan)	Involvement
	1	2	3	4	5				
P16. Monitoring of sand dune rehabilitation project						Monitoring records	Continuous	2,500	BIRDLIFE MALTA
P17. Preparation of an action plan for the conservation of the <i>Brachytrupes megacephalus</i> and implementation						Delivery of Action Plan and actions foreseen by it	Continuous	3,000	BIRDLIFE MALTA
P18. Control impact of feral cat population on the reserve's fauna						Delivery of action	Continuous	2,000	BIRDLIFE MALTA
P19. Control impact of rat populations on the reserve's fauna						Delivery of action	Continuous	500	BIRDLIFE MALTA
P20. Maintenance of records and notes on a daily basis of all fauna present at the reserve						Maintenance of Reserve records	Continuous	2,500	BIRDLIFE MALTA
P21. Maintenance of records of flora species at the reserve						Maintenance of Reserve records	Continuous	2,500	BIRDLIFE MALTA
P22. Identification and circulation of research projects to University and higher secondary students						Research projects outputs	Continuous	1,000	BIRDLIFE MALTA
P23. Maintain and increase numbers of breeding populations as well as breeding species at the lagoon						Delivery of actions	Continuous	1,500	BIRDLIFE MALTA
P24. Setting up of nest boxes for Spotted Flycatcher and Tree Sparrow						Delivery of actions	Continuous	300	BIRDLIFE MALTA
P25. Setting up of nesting rafts for Common Coot						Delivery of actions	Continuous	1,000	BIRDLIFE MALTA
P26. Preparation of diverse educational programmes and promotion of these to primary and secondary schools.						Educational programmes	Continuous	2500	BIRDLIFE MALTA
P27. Delivery of more information by means of signage placed along the nature trail and inside the buildings						Interpretation signposts	Continuous	800	BIRDLIFE MALTA

PROPOSED MANAGEMENT STRUCTURE FOR THE SITE

Part of the site, namely the Ghadira Reserve is already under the management of BIRDLIFE MALTA. From table 3 the following authorities/entities are involved in the site management:

ERA	: Competent authority
DEPARTMENT OF AGRICULTURE	: Competent authority
ENTITY WITH EXECUTIVE POWERS	: Competent authority
BIRDLIFE MALTA	: Ghadira Reserve Manager

- ERA is the leading authority and responsible for the overall management of the site.
- PA is responsible for the implementation of actions M2
- ERA is responsible for the implementation of actions M3, P1, P2, P3, P4, P5, P6, P7 and P8
- ERA and the Department of Agriculture will collaborate and join forces for the implementation of action M1
- ERA and the patrolling entity will collaborate and join forces for the implementation of actions D1 and P9.
- ERA will receive and approve the scheduled/annual reports delivered by the patrolling entity for action P9.
- BIRDLIFE MALTA is responsible for the implementation of actions D2, D3, D4, D5, D6, D7, D8, P10, P11, P12, P13, P14, P15, P16, P17, P18, P19, P20, P21, P22, P23, P24, P25, P26 and P27.
- BIRDLIFE MALTA will collaborate and facilitate ERA for the implementation of actions P3, P4, P5, P6, P8 and P9. BIRDLIFE MALTA will collaborate and facilitate the patrolling entity for the implementation of action D1.
- BIRDLIFE MALTA is responsible for the composition of the annual reports for the Ghadira Reserve.

ERA is responsible for the compilation of the annual reports and reviews and for the five year revision of the Management Plan (see next chapter).

6 REPORTING AND REVIEW PLAN

Review is an evaluation of the effectiveness of all or part of a management plan in achieving the stated objectives. Reporting on what has been achieved is a prerequisite for the preparation of a review.

6.1 ANNUAL REPORTING AND REVIEW

The section provides guidance on how to keep record of the basic annual reporting obligations and of the assessments and decisions made during the reviewing. Table 47 summarizes the basic annual recording and reporting obligations.

Table 47: Annual Reporting and Review summary

Action	Start of implementation	End of 1 st year	End of 2 nd year	End of 3 rd year	End of 4 th year	End of 5 th year
Detailed Work plan	Delivery of Work plan					
M1. Implementation and enforcement of the Maltese Code of Good Agricultural Practice (CoGAP) and Nitrates Action Programme in the agricultural land within the SAC		Progress record	Progress record	Progress record	Progress record	Progress record
M2. Tourism development and infrastructure shall be closely monitored for any potential impact on the ecological integrity of Natura 2000 site		Date of delivery				
D1. Implementation of the patrolling schedule		Progress record	Progress record	Progress record	Progress record	Progress record
D2. Maintenance of sluice canal		Progress record	Progress record	Progress record	Progress record	Progress record
D3. Maintenance of Kingfisher and Sand Martin artificial nest sites		Progress record	Progress record	Progress record	Progress record	Progress record
D4. Promotion and advertisement through press releases and media events about the reserve and to allow visitor access during the weekend (through having on site weekend wardens)		Progress record	Progress record	Progress record	Progress record	Progress record
D5. Maintenance of the reception centre and bird watching hide.		Progress record	Progress record	Progress record	Progress record	Progress record
D6. Maintenance of the nature trail linking the		Progress record	Progress record	Progress record	Progress record	Progress record

Action	Start of implementation	End of 1 st year	End of 2 nd year	End of 3 rd year	End of 4 th year	End of 5 th year
reception centre to the bird watching hide						
D7. Maintenance of a 24 hour watch on the reserve		Progress record	Progress record	Progress record	Progress record	Progress record
D8. Maintenance of the reserve boundary structures		Progress record	Progress record	Progress record	Progress record	Progress record
P1. Elaboration of detailed monitoring programmes for the Annex I habitats 5330, 5410 and 6220*, the Annex II flora species <i>Anacamptis urvilleana</i> , <i>Ophrys melitensis</i> and <i>Orobanche densiflora</i> , the Annex II fauna species <i>Zamenis situla</i> , <i>Rhinolophus hipposideros</i> and <i>Myotis punicus</i> and the breeding bird species <i>Himantopus himantopus</i> , <i>Calandrella brachydactyla</i> and of the breeding, wintering and staging wetland and woodland birds		Progress record	Date of delivery			
P2. Elaboration of Action Plans for selected RDB species		Progress record	Date of delivery			
P3. Assess the possibility of extending the coastal lagoon habitat and dune restoration				Progress record	Progress record	Date of delivery
P4. Implementation of the monitoring plans for the Annex I habitats 5330, 5410 and 6220*, the Annex II flora species <i>Anacamptis urvilleana</i> , <i>Ophrys melitensis</i> and <i>Orobanche densiflora</i> , the Annex II fauna species <i>Zamenis situla</i> , <i>Rhinolophus hipposideros</i> and <i>Myotis punicus</i> and the breeding bird species <i>Himantopus himantopus</i> , <i>Calandrella brachydactyla</i> and of the breeding, wintering and staging wetland and woodland birds				Progress record	Progress record	Date of delivery
P5. Implementation of actions and recommendations prescribed by the Action Plans				Progress record	Progress record	Date of delivery


Action	Start of implementation	End of 1 st year	End of 2 nd year	End of 3 rd year	End of 4 th year	End of 5 th year
P6. Planning and implementation of an IAS control and / or eradication programme			Progress record	Progress record	Progress record	Progress record
P7. Elaboration of a study for the design and technical specifications for warning / information / interpretation signposting and promotion material		Date of delivery				
P8. Construction and installation of / information / interpretation / warning signposting and production of promotion material			Date of delivery			
P9. Prescription of a patrolling schedule		Date of delivery				
P10. Building and maintenance of a database with baseline data for current and future management of the reserve		Progress record	Progress record	Progress record	Progress record	Progress record
P11. Creation of plan together with farmers for the reduction of the use of pesticide/fertilizers in the fields around the reserve		Progress record	Progress record	Progress record	Progress record	Progress record
P12. Habitat and flora mapping of artificial islands		Progress record	Progress record	Progress record	Progress record	Progress record
P13. Maintenance and provision of ideal breeding conditions for the <i>Charadrius dubius</i>		Progress record	Progress record	Progress record	Progress record	Progress record
P14. Creation of artificial islands made up of felled and dead dried trees		Progress record	Progress record	Progress record	Progress record	Progress record
P15. Re-creation of open spaces in the sand dune area		Progress record	Progress record	Progress record	Progress record	Progress record
P16. Monitoring of sand dune rehabilitation project		Progress record	Progress record	Progress record	Progress record	Progress record
P17. Preparation of an action plan for the conservation of the <i>Brachytripes megacephalus</i> and implementation			Progress record	Progress record	Progress record	Progress record
P18. Control impact of feral cat population on the reserve's fauna		Progress record	Progress record	Progress record	Progress record	Progress record
P19. Control impact of rat populations on the reserve's fauna		Progress record	Progress record	Progress record	Progress record	Progress record

Action	Start of implementation	End of 1 st year	End of 2 nd year	End of 3 rd year	End of 4 th year	End of 5 th year
P20. Maintenance of records and notes on a daily basis of all fauna present at the reserve		Progress record	Progress record	Progress record	Progress record	Progress record
P21. Maintenance of records of flora species at the reserve		Progress record	Progress record	Progress record	Progress record	Progress record
P22. Identification and circulation of research projects to University and higher secondary students			Progress record	Progress record	Progress record	Progress record
P23. Maintain and increase numbers of breeding populations as well as breeding species at the lagoon				Progress record	Progress record	Progress record
P24. Setting up of nest boxes for Spotted Flycatcher and Tree Sparrow				Progress record	Progress record	Progress record
P25. Setting up of nesting rafts for Common Coot			Progress record	Progress record	Progress record	Progress record
P26. Preparation of diverse educational programmes and promotion of these to primary and secondary schools.		Progress record	Progress record	Progress record	Progress record	Progress record
P27. Delivery of more information by means of signage placed along the nature trail and inside the buildings			Progress record	Progress record	Progress record	Progress record

For each management action the following questions should be answered:

- Was each the management action implemented within the planned time period, was it achieved completely or significantly altered?
- Were the steps towards implementation being recorded?
- Were the effects being monitored?

Table 48: Table template for recording new developments or trends affecting the site

New Developments or Trends			
	Within the Site	Outside the Site	Impact
			
Positive Developments			
Negative Developments			

The following format can be used to keep a record of any changes made to the Management Plan document during the annual reviews:

Table 49: Table template for recording management plans updates during the annual reviews

Management Plan Updates			
Chapter	Sections	Principal author	Date
1. Background			
2. Site description			
3. Evaluation and Objectives			
4. Management Actions			
5. Work Plan Structure			
6. Reporting and Review Plan			

6.2 THE FIVE YEAR REPORTING AND REVIEW

The five year report (Table 50) is largely the compilation of the deeds and results recorded in the annual reports together with an in depth evaluation of the five year management of the site. This section provides some guidance for the site assessment and the reviewing process. The following set of questions should be asked by the reviewer.

Table 50: Five year reporting process questions

Contents	Questions
Site Description	<ul style="list-style-type: none"> Has the site been described in detail, adequate for its management? Were changes in the biological /physical systems of the site, including both the impacts of management and natural processes being systematically recorded?
Definition of Boundaries	<ul style="list-style-type: none"> Is the site big enough to conserve the special features? Are the site boundaries relevant in that they permit effective conservation of the resource on site? Are the site boundaries identifiable on the ground?
Legal Powers	<ul style="list-style-type: none"> Was there an adequate body of national conservation law, local bye-laws or regulations to implement the objectives? Were there sufficient legal powers to implement the measures? Comment on the level and significance of law-enforcement. Has there been adequate patrol staff?
Operational Objectives	<ul style="list-style-type: none"> For each OO the following questions should be answered: Was the operational objective S.M.A.R.T.? Was it fulfilled through the implementation of the relevant action or alternatively? Was there any significant deviation from the Operational Objective?
Changes in the Planned	<ul style="list-style-type: none"> Has the planned management had to change within the plan period? Was the change significant?

Contents	Questions
Management	<ul style="list-style-type: none"> • What caused the change? • Has the management plan been reviewed to take this change into account?
Changes Proposed	

A list of **performance indicators** must be derived to assess the appropriateness of the Operational Objectives defined of the first Management Plan implementation period. The final list of indicators will evolve gradually as management progresses, but an initial list, derived directly from the expected results of the respective to each Operational Objective action (s) is given below:

Table 51: List of proposed (initial) Performance Indicators for the assessment of the Operational Objectives

Operational Objective (OO)	Performance Indicators
<p>OO6.1. / OO7.1. / OO8.1. To undertake annual inspections to monitor the size, structure and function and determine the favourable conservation status of Annex I habitats 5330, 5410 and 6220*</p> <p>OO9.1. / OO10.1. / OO11.1. To undertake seasonal inspections to monitor the range, assess and monitor the population size of <i>Anacamptis urvilleana</i>, <i>Ophrys melitensis</i> and <i>Orobanche densiflora</i> and determine the favourable conservation status of <i>Anacamptis urvilleana</i> and <i>Ophrys melitensis</i>.</p> <p>OO14.1. / OO15.1. To undertake seasonal surveillance of the species to determine and monitor trends in the range, population size and possible factors affecting the population of <i>Zamenis situla</i> within the site.</p> <p>OO16.1. / OO16.2. / OO17.1. To assess and monitor the range, population size and future prospects of <i>Rhinolophus hipposideros</i> and <i>Myotis punicus</i></p> <p>OO18.1. / OO19.1. / OO20.1. To monitor the range and population size of <i>Himantopus himantopus</i>, <i>Calandrella brachydactyla</i> and of the breeding, wintering and staging wetland and woodland birds</p>	<ul style="list-style-type: none"> • Standard monitoring plans for habitats and species, valid for the next 20 years, have been finalised and tested in the field • Reports assessing the conservation status of habitats and species under standard methodology, valid for 5 years, have been finalised • Favourable Conservation Status for the appointed habitats and species, valid for the next 20 years, have been determined
OO1.1. To assess the possibility of wetland enlargement and dune restoration at the coastal front	A plan that will guide future steps towards the achievement of the Management Objectives for the lagoon and dune habitats has been produced
OO6.2. / OO7.2. To remove alien and invasive species from habitats 5330 and 5410	<ul style="list-style-type: none"> • A national plan for the consistent eradication of IAS from the Natura 2000 sites has been

Operational Objective (OO)	Performance Indicators
OO5.1. To maintain and enhance the dune habitat 2220	<p>produced</p> <ul style="list-style-type: none"> A significant area of Annex I habitats has been cleared from IAS and/or further interventions are programmed for the next management period
<p>OO21.1. To elaborate Action Plans for RDB species and apply the actions and the recommendations prescribed</p> <p>OO12.1. To conserve, maintain and improve current population of Annex II listed <i>Brachytrupes megacephalus</i>.</p>	<ul style="list-style-type: none"> National Species Action Plans, valid for at least 5 years have been produced A number of concrete conservation actions emerging from the Action Plans have been implemented or else programmed for the next management period
OO23.1. To design, construct and install information/interpretation/warning signposting and produce promotion material.	A study introducing a brand system of signage and promotion of the Maltese Natura 2000 network has been produced
OO25.1. To enforce compliance of compulsory CoGAP measures and promote the implementation of the voluntary ones.	<ul style="list-style-type: none"> A system of recording cultivations under compliance has been established 100% compliance has been reached and/or trends for the next management period are encouraging (positive)
OO26.1. To enforce NWML18 policy related with control of tourist development and infrastructure	A legislative instrument for the prevention of further degradation of the natural and landscape value of the site caused by the uncontrolled tourist development has been prepared.
OO27.1. To patrol the site	<ul style="list-style-type: none"> A standard patrolling system covering the whole national N2k network has been established and functional Significant percentage decrease in illegal incidents has been recorded and/or trends for the next management period are encouraging (positive)
<p>OO1.2. To maintain and monitor water quality and parameters</p> <p>OO2.1. / OO3.1. /OO4.1. To maintain islands and salt marsh vegetation</p> <p>OO13.1. To conserve and maintain current population of Annex II listed <i>Aphanius fasciatus</i>.</p>	The Għadira wetland maintains its nature conservation value as verified by the conservation status of fauna wetland species present hosted in the wetland
OO21.2. To control ground predators	Għadira Reserve key ecological features safeguarded against introduced predator species
<p>OO22.1. To gather records of fauna species that visit and breed at the reserve</p> <p>OO22.2. To gather records of flora species found at the reserve.</p> <p>OO22.3. To increase knowledge of fauna and flora at the reserve through help from educational institutions</p>	Għadira Reserve biodiversity trends are fully recorded
OO22.4. To increase species and number of breeding species	Għadira Reserve biodiversity is conserved and improved as verified by records of species and species numbers

Operational Objective (OO)	Performance Indicators
OO24.2. To cater for weekend visits by the members of the public between the months of October and May	Ghadira Reserve continues to effectively serve the objective of raising environmental awareness and public recreation purposes as verified by records of visits and numbers of visitors
OO24.3. To ensure adequate facilities to cater for visitors	Ghadira Reserve adequately equipped with visitor facilities
OO28.1. To ensure no unauthorized intrusions/break ins into the reserve occur OO28.2. To control and monitor access in such a way as to ensure that visitors are of no detriment, by means of excess disturbance, to the reserve	Ghadira Reserve is safeguarded against disturbance by intruders or visitors

Table 52 should be used to record of any changes that are proposed to the under review Management Plan document.

Table 52: Table template for proposed changes in Site Management Plan

Type of Recommended Change(s)	Details
Information (research needed)	
Management Objectives	
Operational Objectives	
Strategies	
Management Policy	
Management practices	
Resourcing – Staff	
Finances	

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