GĦAR DALAM NATIONAL PARK - MASTERPLAN U INTERPRETATION STRATEGY

***17023. L-ONOR. REBEKAH BORG** staqsiet lill-Ministru għall-Wirt Nazzjonali, l-Arti u l-Gvern Lokali: Jista' l-Ministru jippreżenta l-masterplan u l-interpretation strategy li tħejjew għal Għar Dalam National Park u jgħid il-baġit li hemm imħejji għat-twettiq ta' dan il-proġett u jippreżenta skeda tal-programm ta' ħidma li huwa maħsub li jiġi segwit biex jiġi implimentat dan il-proġett?

04/03/2024

ONOR. OWEN BONNICI: Ninsab infurmat illi s'issa m'hemm l-ebda baġit speċifiku fuq il-proġett, madanakollu Heritage Malta għaddejja b'diversi xogħolijiet permezz ta' fondi ġenerati mill-operat tagħha. Dawn jikkonsistu minn tindif ta' Wied Dalam minn pjanti invażivi, anke b'koperazzjoni minn entitajiet oħrajn, li ġie segwit minn tħawil ta' siġar u pjanti indiġeni.

Infurmat ukoll li sar xogħol ta' restawr ta' ħitan tas-sejjieħ fil-wied u taħt Għar Dalam u bħalissa għaddej xogħol ta' restawr fuq in-naħa ta' Kaċċatura. B'koperazzjoni ma' entitajiet oħrajn sar ukoll tindif u ftuħ ta' sqaq pubbliku u restawr tal-ħitan tas-sejjieħ, bejn Wied Żembaq u ta' Kaċċatura.

Intant Heritage Malta wkoll akwistat artijiet fuq in-naħa ta' Borg in-Nadur sabiex ittejjeb l-aċċesibilta' għas-siti arkeoloġiċi li tamministra hi fuq din ix-xaqliba tal-Park. Saru wkoll disinni għal ċentru ta' viżitaturi ġdid għall-Park fejn Għar Dalam u fil-ġimgħat li ġejjin ser tiġi sottomessa applikazzjoni għall-permess ta' żvilupp lill-Awtorità tal-Ippjanar.

Finalment infurmat illi huwa pjanat ukoll li fix-xhur li ġejjin jsiru skavi arkaeoloġiċi kemm fil-Villa ta' Kaċċatura kif ukoll fid-daħla ta' Għar Dalam.

Intant, il-Management Plan li kien ġie approvat fl-2016 qed jiġi mqiegħed fuq il-Mejda tal-Kamra.

Seduta Numru 218
11/03/2024

GĦAR DALAM NATIONAL PARK

Management Plan Brief

APPROVED BY HERITAGE MALTA BOARD
27th SEPTEMBER 2016

Heritage Malta

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EXECUTIVE SUMMARY

Heritage Malta, as the National Agency entrusted with the management of national heritage sites, has taken the initiative to prepare this Management Plan Brief for a National Park at Għar Dalam as a tool to improve visitor experience to the sites under its responsibility. This Management Plan Brief was prepared by a multi-disciplinary team from within the agency and is primarily aimed at improving the visitor experience to the cultural and natural sites found around Għar Dalam. This was considered in the context of Government policy to improve the cultural infrastructure and the environmental quality of south-east Malta and in the framework of other initiatives already planned for the region.

This brief presents an overview of the natural and cultural characteristics of the park, which was already proposed in the Marsaxlokk Bay Local Plan way back in 1995 and reviewed a wider context, taking into consideration the existing policy and regulatory framework. Through a desk study based on information available from various sources, the report then presents a stocktake of the existing characteristics of the area to provide a comprehensive overview of the assets and issues. A land-use survey was also carried out and a series of meetings with a number of stakeholders were held. On the basis of the information gathered, an analysis of the strengths, weaknesses, opportunities and threats of the area are put forward.

Heritage Malta believes that establishing a national park in this rich archaeological area located within an impressive landscape will safeguard its cultural and environmental resources, and give people an open area to enjoy and to enrich their knowledge. The brief sets out a vision which serves to promote and conserve the archaeological, architectural and natural heritage while facilitating visitor access, education and interpretation; facilitating the sustainable use of the Park's resources for recreation and other appropriate activities, encouraging research and maintaining its sense of peace and tranquillity.

In line with this vision, the brief recommends the following five objectives:

Recreation Objective: to provide opportunities for appropriate recreation and edutainment by capitalizing on the use of the existing cultural and natural heritage of the area.

Cultural and Natural Heritage Objective: to identify, document, protect and conserve the cultural and natural heritage assets within their landscape for their valuable reflection of the historical use and development of the area.

Interpretation Objective: to provide educational opportunities that promote knowledge, understanding and appreciation of natural and cultural values, environmental sensitivity and significance, and the associated conservation needs and how these are interlinked throughout space and time.

Management Objectives: to manage the public and private lands in the Park through partner collaboration and ongoing stakeholder and community involvement.

Economic Objective: to promote the Park as a node in south-east Malta as an affordable eco-tourism destination acting as a catalyst to boost local existing businesses and initiatives.

In order to achieve these objectives, forty-nine actions have been identified, with each objective given a level of priority. The brief concludes by recommending a joint management approach for the Park.

1 INTRODUCTION

1.1 Background

Heritage Malta is the national agency of the Government of Malta set up in 2002 under the provisions of the Cultural Heritage Act and entrusted with the management of all national museums, heritage sites and their collections in Malta and Gozo, including seven sites inscribed in the UNESCO World Heritage List. One of these sites is Għar Dalam and its Museum.

During the past months, the agency has been identifying how the visitor experience at Għar Dalam can be improved and what is required to improve the infrastructure of the site itself. This assessment led the agency to a holistic approach and view Għar Dalam in its surrounding landscape which resulted in a proposal for the setting up of a National Park. This Park is to be seen as a key node in the development of tourist infrastructure and environmental improvement in South-east Malta and an important link in a chain of attractions in the region, including In-Nwadar National Park between Xgħajra and Marsascala, and Xrobb l-Għaġin Park at Delimara.

A Management Plan for the Park is thus considered to be a requisite.

Heritage Malta set up a working group to prepare the Management Plan Brief for the proposed park. The group was made up of Perit Ruben Abela (Manager, Projects Office), Dr Josef Caruana (Curator, Prehistoric Sites), David Cardona (Principal Curator Phoenician, Roman and Medieval Sites), Perit Daphne Fenech (Senior Executive Projects Department) and Paul Portelli (Executive, Curatorial Division).

The aims of this Management Plan Brief are:

- To carry out a stock-take of the existing characteristics and uses, set out a vision, objectives and priority actions
- To provide a baseline study for eventual funding opportunities
- To recommend a way forward.

In compiling the brief, the working group consulted a wide range of stakeholders including local councils, public agencies, NGOs, farmers and other land users within the area.

1.2 The importance of the Għar Dalam Area

Għar Dalam area is considered to be the most archaeologically sensitive rural area in South-east Malta as it contains remains from different several archaeological periods. It is also here, precisely at Għar Dalam, that the earliest evidence of human settlement on Malta, some 7,400 years ago, was discovered. Besides these important archaeological sites, within the area there are a number of vernacular and military structures which add to the cultural heritage value of the area.

In the 1880s the awareness in Britain of the need to protect archaeological sites increased substantially, and this awareness also started spreading to its colonies (Grima 2011). Thus, a permanent commission to inspect Archaeological Monuments in Malta was set up in 1881 (Council of Government 1880-1881: 207). This commission resulted in conservation efforts taking place both in Borġ in-Nadur, and in Ta' Kaċċatura where in 1881 the site was acquired from the owner through its exchange with another piece of

Government owned land (Grima 2011). The government also acquired the land where the cistern was situated in subsequent years, and a wall was constructed around it. An effort to protect the remains by means of stewardship was also made in 1913, when permission was given to Tommaso Agius to cultivate the trees present on site, in exchange of which he was to guard the archaeological remains (Grima 2011). Unfortunately safeguarding the archaeological remains was not always successful, as happened with the destruction of the silo pits below Borġ in-Nadur, which occurred due to the construction of a road passing through them. The Commission ensured that the silo pits were duly recorded before their destruction.

In 1918 Temi Zammit had earmarked Borġ in-Nadur for expropriation; the three fields around the megalithic temple were subsequently expropriated in 1935 (Grima 2011).

After an act of vandalism on the temple remains in 1964, a local villager was also employed in order to guard the Borġ in-Nadur temple remains (Grima 2011). The megaliths also attracted the attention of vandals in the 1990's, with some of them being vandalised by means of aerosol paint. The site was then further protected by its scheduling by the planning authority in the 1990s.

The area is also important for its landscape value, characterised by two valleys, Wied Dalam and Wied Żembaq, almost running parallel to each other (Figure 1). The Natura 2000 site of Għar Dalam is the most important ecologically protected site within the area, however there are other surrounding sites which host important habitats.

Figure 1. Wied Dalam and Wied Żembaq. Source: Google Earth

1.3 Għar Dalam National Park

In 1928 the Antiquities Commission managed to protect around 5,000 feet of the Wied Dalam valley by Government Notice, the area extended between "Cala San Giorgio and Ta Haxun" and plans were set in motion in order to purchase the entire ravine, but these plans were reversed due to the Committee considering the remains well protected by just the government notice, without the need for the Government to incur the huge expenditure of 1,300 pounds in order to purchase the land. (Grima 2011)

The setting up of a Park in Wied Dalam has been proposed officially decades later, as part of the Marsaxlokk Bay Local Plan approved in May 1995.

1.4 Document structure

The documents starts with defining the area under study and its legal status, followed by a review of strategic and local policy documents affecting the site. Through a desk study based on information available from various sources, the report then presents a stocktake of the existing characteristics of the area to provide a comprehensive overview of the assets and issues. A land-use survey was also carried out.

On the basis of the information gathered, an analysis of the strengths, weaknesses, opportunities and threats of the area are put forward. It is after an understanding of this information that the second part of this brief was prepared, defining a vision, objectives, priority actions and a management framework.

2 SITE ANALYSIS

2.1 Location and Boundaries

The area under study is located in South-east Malta, right at the inner part of the Marsaxlokk Bay Harbour and including St George's Bay. (Figure 1) The entire area falls within the boundaries of Birżebbuġa Local Council and touching on its northern part to the boundaries of the Għaxaq Local Council. The site is easily reached by on-land trasnportation through the arterial road network which passes through its confines namely along Għar Dalam Road, which is connected further North to tal-Barrani Road leading to Marsa. Access to the site from sea is also possible by using the bething facilities available for small boats at St George's Bay.

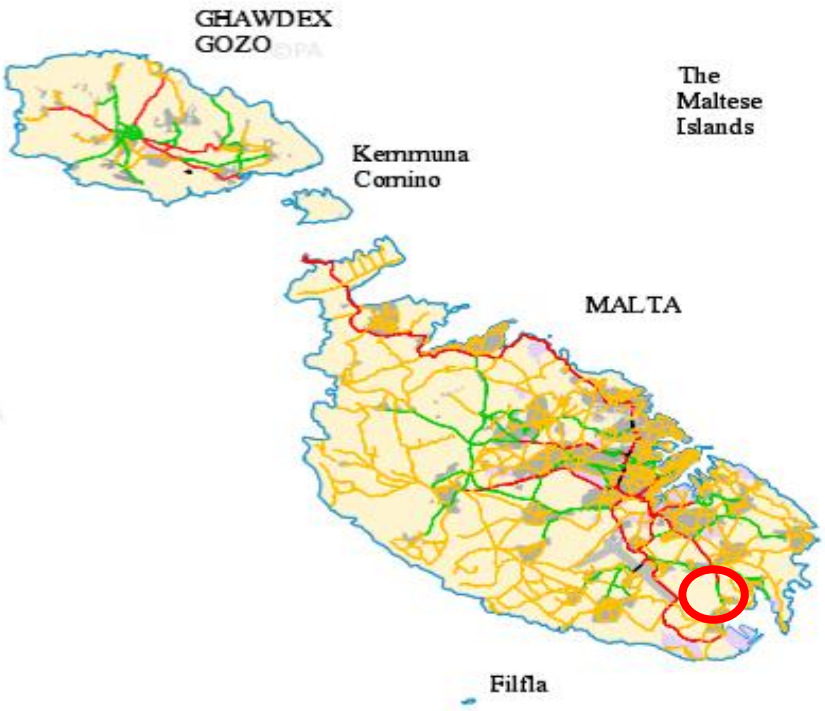


Figure 2. Site location. Source: PA MapServer 2016

The precise boundaries of the proposed Heritage Park will be defined at the end of this Management Plan Brief, however the area of study covered by this brief is confined by *Ir-Razzett ta' Pultu* and *Il-Gisa* to the north-west; the Enemed Fuel Station to the north; In-Nigret to the east; St George's Bay on the south-east; the urban areas of Birżebbuġa village to the south: and *Il-Brolli* on the west.

2.2 Legal Status

2.2.1 Site Status

The area includes a number of archaeological, historical and natural resources which are scheduled and protected under the Development Planning Act (CAP 552) or the Environment Protection Act (CAP 549) (Figure 3). The whole area being designated as an Area of Archaeological Importance (AAI) referred to as the Għar Dalam and Ta' Kaċċatura AAI, as per GN 358/98 issued on 5th May 1998. This scheduling extends also beyond the foreshore enclosing St George's Bay.

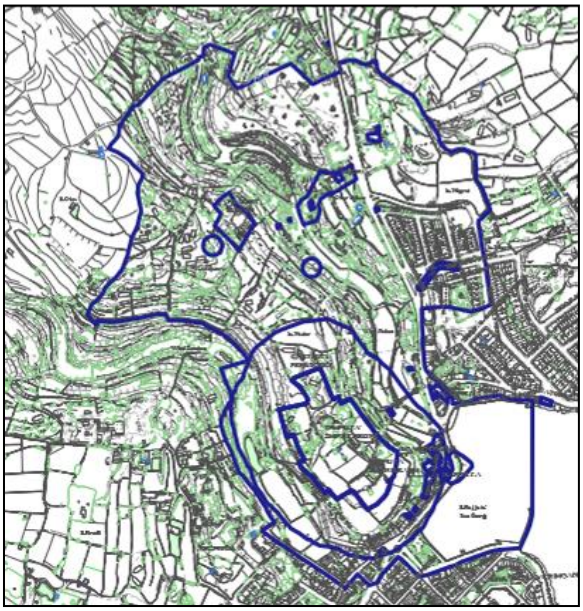


Figure 3. Scheduled areas. Source: PA Mapserver 2016

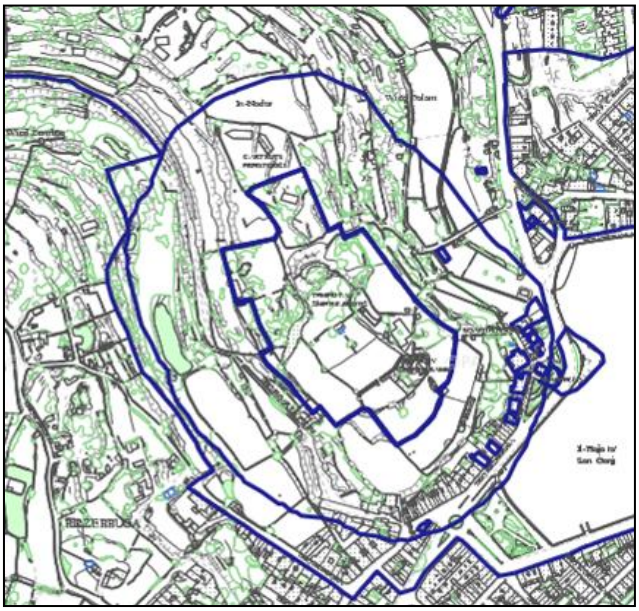


Figure 4. Borġ in-Nadur area. Source: PA Mapserver 2016

The Borġ in-Nadur Megalithic Temple[1] and Bronze Age Village[2] are scheduled as a Class A Site of Archaeological Importance with a 100m buffer zone around them. The Bronze-Age Cart Ruts and Silos on the foreshore are scheduled as Class B Site of Archaeological Importance[3] while the St George's Redoubt[4]

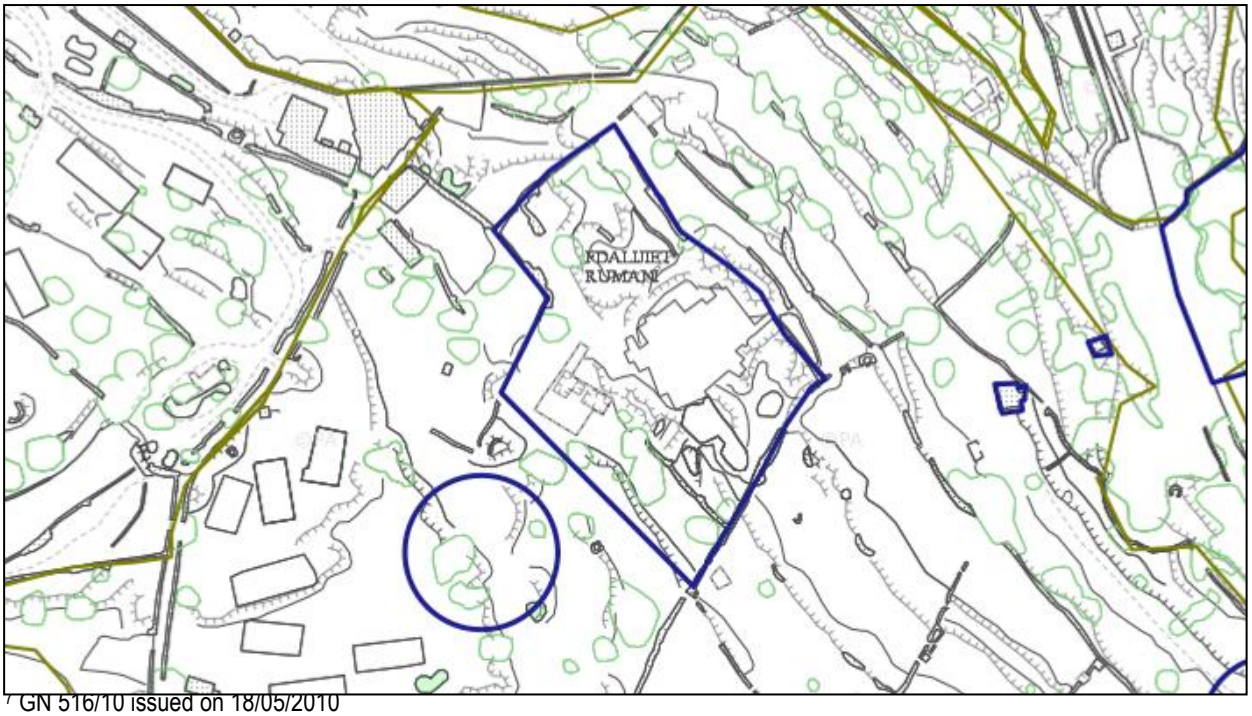
[1] GN 358/98 issued on 05/05/1998
[2] GN 573/95 issued on 30/08/1994
[3] GN 358/98 issued on 05/05/1998
[4] GN 729/95 issued on 23/11/1995

and Church[5] are scheduled as Grade 1 monuments. In the area there are also a number of buildings which have also been scheduled for their architectural importance (Figure 4).

Għar Dalam cave is scheduled as a Class A Site of Archaeological Importance[6] and also a Special Area of Conservation and Natura 2000 site under the Habitats Directive (92/43/EEC) (Figure 5a). Another site which is scheduled as a Level 1 Site of Scientific Interest within the area is Għar il-Friefet[7] (Figure 5b).

Figure 5(a). Għar Dalam scheduled area and 5(b) Għar il-Friefet and buffer zone. Source: PA Mapserver 2016

Another important archaeological site which is scheduled as a Class A Site of Archaeological Interest is the Ta' Kaċċatura Punico-Roman Remains[8] (Figure 6). Around this area there are other important archaeological features, vernacular buildings and military structures which have also been scheduled under the Development Planning Act.



[7] GN 516/10 issued on 18/05/2010
[8] GN 358/98 issued on 05/05/1998

Figure 6. Ta' Kaċċatura. Source: PA Mapserver 2016

The upper part of Wied Żembaq is a Tree Protection Area under the Trees and Woodlands Protection Regulations, 2011[9] as per GN 473 of.2011 mainly for the pear trees which grow in the valley bed in this area (Figure 7).

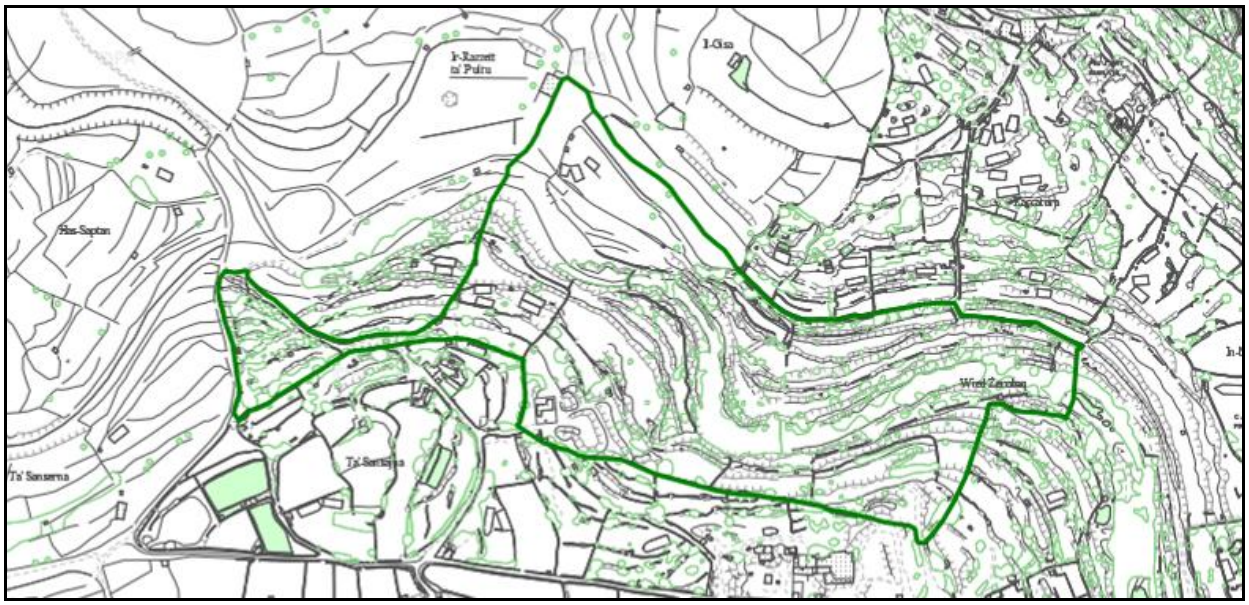


Figure 7. Tree Protection Area in Wied Żembaq, Source: PA Mapserver 2016

There are areas which are also declared as no trapping zones under environmental subsidiary legislation[10], except for cultivated agricultural land officially registered with the Department of Agriculture prior to end July 2014 (Figure 8).

[9] GN 473/11 issued on 24/05/2011

[10] S.L. 504.71

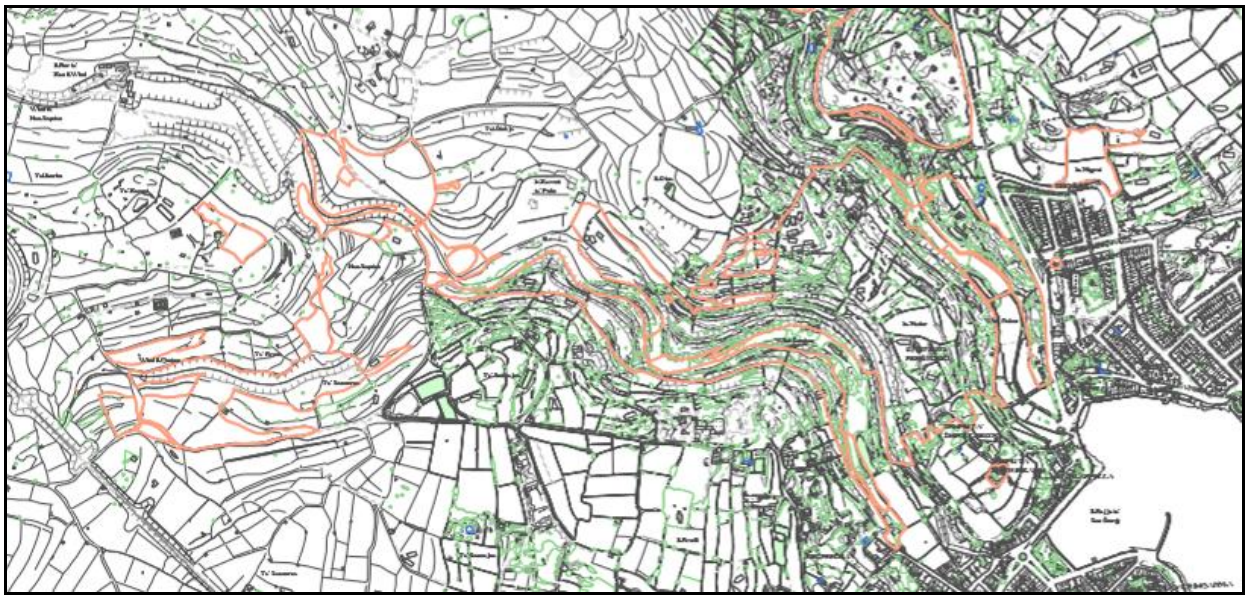


Figure 8. Areas declared as no trapping zones. Source: PA Mapserver 2016

2.2.2 Policy Framework

2.2.2.1 Legislation

The main legal instruments concerning the protection and sustainable use of natural and cultural resources are the following Acts, as amended:

- Environment Protection Act 2016
- Development Planning Act 2016
- Malta Resources Authority Act 2001
- Cultural Heritage Act 2002
- Fertile Soil (Preservation) Act 1973
- Disposal of Government Land Act 1977

Government departments and ad hoc entities are already entrusted with the implementation of these Acts of Parliament. Subsidiary legislation to these Acts is considerable; however the most significant to the management of the Park area are listed in Table 1. These include regulations for key activities known to occur within or in the vicinity of the Park namely agriculture, hunting and trapping. Protection of environmental quality including biodiversity is also regulated.

Table 1. List of Regulations applicable for the management of the Park

Reference	Title
Water Resources	
SL 423.12	Notification of Groundwater sources Regulations 2008 as amended
SL 423.32	Borehole drilling and excavation works within the saturated zone Regulations 2008 as amended
SL 432.40	Groundwater (metering) Regulations 2010 as amended
Environment Protection	
SL 504.02	Reptiles (Protection) Regulations 1992, as amended
SL 504.13	Rubble Walls and Rural Structures (Conservation and Management) Regulations 1998 as amended
SL 504.16	Trees and Woodlands Protection Regulations 2011
SL 504.37	Waste Regulations 2011 as amended
SL 504.43	Protection of waters against pollution caused by Nitrates from agriculture sources Regulations, 2003 as amended
SL 504.67	Abandonment, dumping and disposal of waste in streets, public places or areas Regulations 2005 as amended
SL 504.71	Conservation of Wild Birds Regulations 2006 as amended
SL 504.73	Flora, Fauna and Natural Habitats Protection Regulations 2006 as amended
SL 504.85	Prevention and Remedying of Environment Damage Regulations of 2015
SL 504.108	Nitrates Action Programme Regulations 2011 as amended
SL 504.129	Water Policy Framework Regulations 2004
SL 504.130	Protection of groundwater against pollution and deterioration Regulations, 2009 as amended
Development Control	
LN 162.2016	Development Planning (Procedure for Applications and their Determination) Regulations, 2016
LN 211.2016	Development Notification Order 2016

2.2.2.2 National Strategy for the Cultural Heritage

Although the National Strategy for the Cultural Heritage is currently being revised, the last available document of such policy was a draft document issued for public consultation in May 2012.

Unlike the creative industries which they complement, cultural heritage resources contribute to the socio-economic development of the Maltese islands in different ways. The complex issues of cultural heritage resource management are clearly reflected in the range of values of these resources: aesthetics, historic, science, social, spiritual, religious and economic values. The document recognises the growth in the heritage sector in particular as an economic and leisure sector. Sustained foreign and local visitors to museums and sites of heritage importance have enabled a revenue stream that compliments public expense in restoration projects. Employment in this sector has also increased and thus recognised as an important service industry.

The Strategy of 2012 encourages the cultural heritage sector to explore ways of becoming more creative and to respond in a positive manner to public needs of cultural end users coming from all walks of life. The National Strategy document recognises that as end users of a resource that is a public good, we must share not only the common benefits of this resource but also in its wellbeing and care. The strategy document also highlights the need of sustainable use of heritage resources. In fact it lists thee strategic objectives to achieve this:

- Develop sustainability policy framework for the use of cultural heritage resources. (5.1)
- Identify and establish cultural heritage reserves comprising extractable deposits, buildings and monuments, cultural landscapes, and archaeological sites on land and at sea. (5.2)
- Develop management and conservation plans for cultural properties of outstanding national importance. (5.3)

Objective 5.2 promotes the notion of cultural heritage reserves as required by the European Convention on the Protection of the Archaeological Heritage (Revised) (Valletta, 1992) with the aim of protecting the national collective memory for future generations. It is also a resource from which Malta derives substantial economic and non-economic benefits.

Objective 5.3 encourages the need of preparing appropriate Management and Conservation Plans for cultural properties.

2.2.2.3 National Cultural Policy

This National Cultural Policy (2011) was the result of a long consultation process aimed at the improvement of the organisation and quality of cultural expression and identity. To this effect, the National Cultural Policy focuses on the sector's holistic development, particularly on governance, education, inclusivity and participation on an international level.

In the cultural governance framework, the Ministry responsible for Culture shall lead, amongst other issues, in overseeing all aspects relating to tangible and intangible cultural heritage management; regulating issues pertaining to protection, conservation, exhibition and appreciation of heritage, including its accessibility through traditional, innovative and online means. It should also ensure the liaising with the relevant entities to ensure optimal communication, promotion, and dissemination of information and awareness about Malta's culture.

This Policy aims at strengthening the structures that administer and manage cultural heritage. Heritage Malta is considered as one of the key stakeholders in the management and conservation of Malta's

heritage assets. This Policy also encourages strategic partnerships such as public-private ones which respect the core of cultural initiatives, while supporting their long-term sustainability in the broadest and most comprehensive manner.

Maximising investments in culture with a view to:

- improving the education and training facilities related to cultural management and heritage conservation
- synergising efforts with the tourism authorities in areas of common interest and mutual benefit
- improving and extending the use of IT tools in cultural management and in the dissemination of knowledge, including the digitisation and online accessibility of cultural material, through synergies with IT stakeholders

A forward-looking vision for the heritage sector is needed in order to ensure the adoption of the latest techniques and the most updated knowledge in heritage conservation, while providing a fresh outlook on the past which appeals to all sections of the population, especially children and young people, and international visitors to the Islands. Operational structures managing museums and heritage sites are to provide appropriate interpretation and ancillary facilities, centred on the core historical dimension of the asset. Interpretation should be historically sensitive, but should also take into account 21st century visions for and expectations of presentation and appreciation of heritage.

Special attention to the value of these sites in sustaining a dynamic and open discussion on aspects of a historically-rooted national identity shall be given. Particular attention shall be paid to visitor centre layout with the aim of making people's visits more appealing and rewarding. The strength of cultural tourism in Malta has provided our heritage sites with an international audience, whose needs must be catered for. However, this should not detract from the continuous importance these sites have for Maltese people and their identity.

The National Cultural Policy recognises that the function of museums goes beyond that of a tourist attraction; they are essentially a gateway to past ways of life of Malta's people, which should be physically and intellectually accessible to today's public. It is therefore understood that the word 'museums' should not be solely synonymous with depositories of the past. This Policy aims at encouraging the exploration of the different and stimulating ways in which museums can become more appealing to the public. It is committed to investing further in order to facilitate contemporary forms of exhibiting which encourage an active involvement of individuals through technology, innovation and imagination.

2.2.2.4 National Tourism Policy

A draft of the National Tourism Policy 2015 – 2020 has been issued for consultation in March 2015 and this is based on a long-term vision up to 2030. This policy document recognises the shift in tourism from detached sightseeing into a hands-on lifestyle and indulgence experience. Destinations are gearing themselves up for increased demand for personalized deluxe experiences available with smaller budgets. This extends also to the concept of experiences in hotels where accommodation opportunities are being offered in all sorts of establishments ranging from unusual buildings converted to tourist accommodation. It is also acknowledged that travellers will invariably be seeking more cultural immersion into the destination in the coming years. The use of the fast advancing digital technology to provide immersive experiences to visitors has also been highlighted from the outset of this document.

The three main guiding principles of this document are:

A. Managing visitor numbers;
B. Raising the level of quality across the entire tourism value chain; and

C. Reducing seasonality

This Policy specifically outlines managing visitor numbers as the process for sustainable tourism development on the Maltese islands. One key factor is the multiple challenge of maximizing visitor satisfaction without diminishing the hospitable nature of the host community, and diminishing the natural and man-made attractions of the destination, which attract the visitors in the first place. Seasonality is acknowledged worldwide as one of the major scourges afflicting the profitability and sustainability of the tourism industry. The winter months present the greatest financial strain for tourism operators and the economy. Therefore, the development of existing and new market segments and the organization of activities and the staging of events, have the potential to lure more visitors. Slightly less than two thirds of inbound tourism to Maltese Islands occurs during the peak months of April to September (Figure 9). Malta's tourist profile has changed from one which was mainly focused on 'sun and sea' to a much more varied motivational portfolio. The policy aims at decreasing the country's dependency on the 'summer sun' segment and increasing the market share for trips having main motivations of 'winter sun', 'culture', 'sports' and 'conference and incentive' travel.

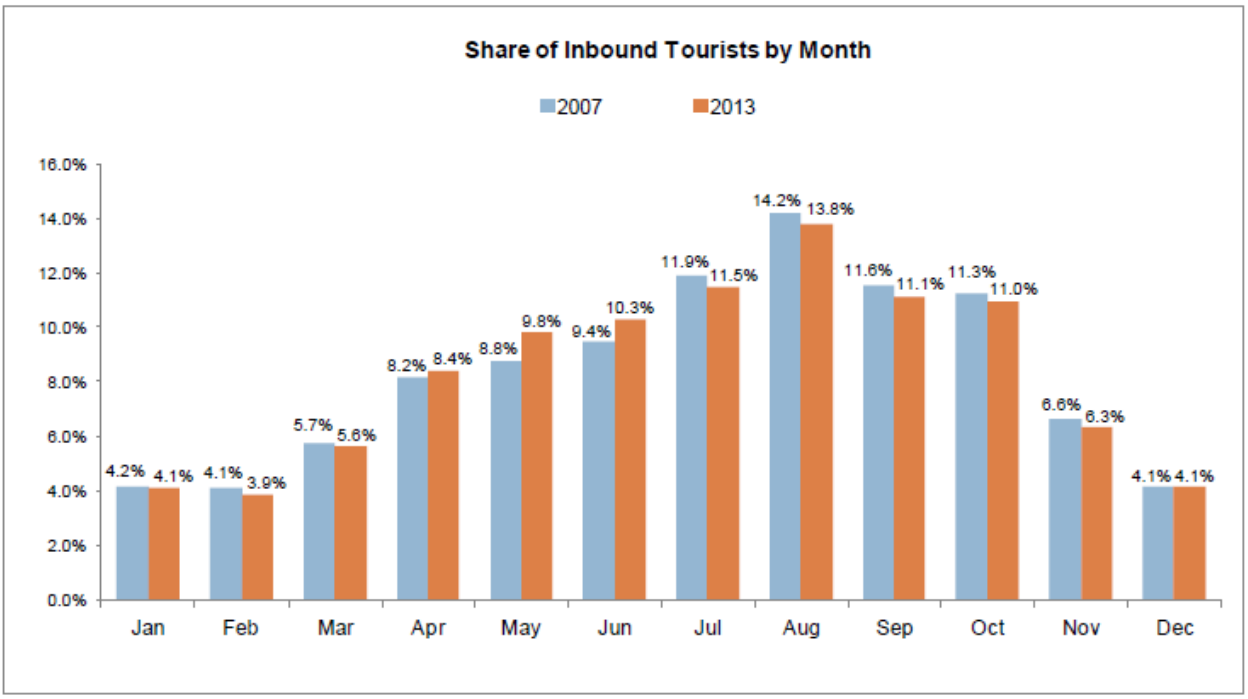


Figure 9. Inbound Tourists by Month. Source: Draft National Tourism Policy 2015-2020

While recognizing that Malta has been fairly successful in attracting a number of market segments that perform well during the lean months, there are other niche markets which, with the right planning and incentives, have the potential to grow, such as gastronomy, tourism for all, sports and adventure, nature, religious travel, yachting, film location tourism, crafts and others.

2.2.2.5 National Environment Policy

This overarching policy provides six key environmental objectives for environment protection in the Maltese Islands. The policy links environment protection with environmental health, efficient and sustainable use of resources and promotes innovative measures to ensure that economic growth does not result in harmful

effects on the environment. The relevant objectives need to be taken into consideration in formulating the vision for the Park as well as its management to ensure that implementation is in line with national policy.

NEP Objectives

1. **Greening the economy**: addressing environmental policy integration, the use of market-based instruments, environmental taxation, eco-innovation, green jobs, enabling the private sector to take a stronger role in environmental management, green public procurement and mobilising finance for the green economy
2. **Safeguarding environmental health**: addressing air quality, noise, chemicals, and radiation
3. **Using resources efficiently and sustainably**: addressing stone, fresh water, coastal and marine areas, soil, land and waste
4. **A pleasant place**: Improving the local environment by addressing urban and rural areas, and cultural heritage
5. **Greening Gozo**: addressing more sustainable forms of agriculture, transport and tourism, and improved resource management, within the framework of eco-Gozo
6. **Long-term sustainability issues**: addressing climate change, biodiversity and ecosystems, and environment-related emergencies.

The NEP recognises that the achievement of its objectives, policies and actions is based on good governance and dedicates a specific section on implementation. Key policies that are relevant to the successful management of the Park are the following:

- Steer significant resources towards environmental regulation and management, and ensure that maximum use is made of any EU and multilateral funds in this regard.
- Empower people to actively participate in environmental management and take action on environmental issues.

2.2.2.6 National Biodiversity Strategy and Action Plan

The National Biodiversity Strategy and Action Plan (NBSAP) provides a comprehensive policy framework for protecting biodiversity in the Maltese Islands and aims to improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity, as well as by reducing pressures on biodiversity and promoting sustainable use. It presents a set of 19 targets with various actions, to guide action by 2020 at a national scale. The targets that may be considered of direct relevance for the Park and its management are listed in Table 2.

Table 2. Relevant NBSAP Targets for the National Park

NBSAP National Targets	Relevance to the Park
Target 3: Positive incentives for conservation and sustainable use of biodiversity are increasingly promoted. Malta cooperates in efforts to address environmentally harmful subsidies.	Biodiversity is an integral component of the Park. Evaluate the success or otherwise of fiscal incentives related to legal activities already occurring in the Park.
Target 7: Areas under agriculture and aquaculture are managed sustainably, ensuring the conservation of biodiversity.	Some of the land area is used for agriculture. Management of this activity within the Park may enable greater opportunity to understand long term synergies between this economic activity and the Park's biodiversity objectives.
Target 9: Measures are in place to prevent, in so far as practical, the introduction and establishment of new invasive non-native species, while those that are	A managed Park should ensure periodic monitoring of the ecological communities in the area that would immediately raise the alert should new invasive non-native species be

established are identified and prioritised for eradication or control, where feasible.	identified.
Target 11: The risk of local extirpation of known threatened species has been reduced, with 30% of the species of European Community Importance in the Maltese territory having a favourable or improved conservation status	Species of European Community Interest are not known in the Park area however a number of endemic species are recorded. Management is likely to assist action towards the achievement of this national objective.
Target 14: The impacts of climate change on ecosystems have been reduced, in so far as feasible and, mitigation and adaptation responses to climate change that support and conserve biodiversity have been agreed and are being implemented.	Safeguarding biodiversity and allowing habitat restoration is key to enhancing resilience to climate change. Allowing space for local biodiversity to extend is an important component to reduce national biodiversity vulnerability. Scope for including monitoring indicators related to long term impacts of climate change on certain key indicator species, within the biodiversity monitoring programme for the Park's management.
Target 17: The contribution of local communities/entities to the sustainable management of biodiversity is recognised and enhanced	The farming community and nearby urban areas provide an opportunity for a more active role in the management of the Park.
Target 18: Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved and applied.	A managed Park is synonymous with data collection and improved awareness on biodiversity.

2.2.2.7 Climate Change and Adaptation Strategy

The Climate Change Adaptation Strategy of 2012 provides a set of recommended actions for the Maltese Islands to adapt to the predicted impacts of climate change. Whilst most of the recommended actions are of an administrative nature, there are a number of actions that can be considered to be directly relevant to the management of the Park. These are listed in Table 3 below.

Table 3. Relevant Climate Change Adaptation recommended actions

Climate Change Adaptation Action		Relevance to the Park
Action 17	A core pillar of the adaptation strategy is the continued conservation of biodiversity and ecologically dependent ecosystems and, wherever possible, the restoration of habitats to a favourable conservation status.	Action towards biodiversity conservation and habitat restoration is linked with increased resilience.
Action 20	Malta will adopt a national strategy and appropriate contingency plans to deal with this threat posed by alien and invasive species, which could also have significant health and economic implications and beef up its border customs, veterinary, and phytosanitary controls with third countries.	Action towards eradication of alien and invasive species within the Park can contribute towards climate action
Action 26	The Government will continue to implement incentives schemes directed at the farming and livestock breeding sector to construct or rehabilitate existing reservoirs to capture rainwater for re-use for irrigation and other appropriate uses.	Potential of rehabilitating any existing reservoirs and wells is to be encouraged; however construction of new reservoirs within the Park boundaries should be properly assessed in view of the archaeological importance of the area.
Action 50	The Department of Agriculture will undertake the appropriate study and action to maintain Maltese agro-ecosystems through the management of agricultural landscapes given the central role they play in contributing to overall resilience to climate change.	Protection of agricultural landscape is considered to contribute towards climate action

Climate Change Adaptation Action		Relevance to the Park
Action 55	The Department of Agriculture will work with appropriate stakeholders to study and recommend how local breeds and crop varieties together with new species and hybrids could play an important role in agricultural adaptation.	Potential to assess scope of agriculture in the Park as a demonstration project for alternative crop varieties
Action 57	The Department of Agriculture will continue to work with the rural community to encourage them to adopt sound land management practices which are essential for soil conservation and which, together with flexibility regarding land use, will help minimise the impacts of climate change on agricultural soils. The Department should as well encourage them to embark on long-term management strategies that increase soil organic matter, resulting in a soil which has a high nutrient content and strong water-holding capacity, which renders the land better able to cope with future climatic changes.	Scope to identify what actions are being undertaken at national level to ensure that the management plan is in line with good soil conservation measures

2.2.2.8 Water Catchement Management Plan 2010

The EU Water Framework Directive requires that Member States prepare a River Basin Management Plan which deals with groundwater, coastal waters and protected inland surface water management issues with a view to achieving and maintaining good status. Malta has adopted its first Water Catchment Management Plan (WCMP) in March 2011, which spelt out the steps needed to protect, enhance and improve the water environment of the Maltese Islands.

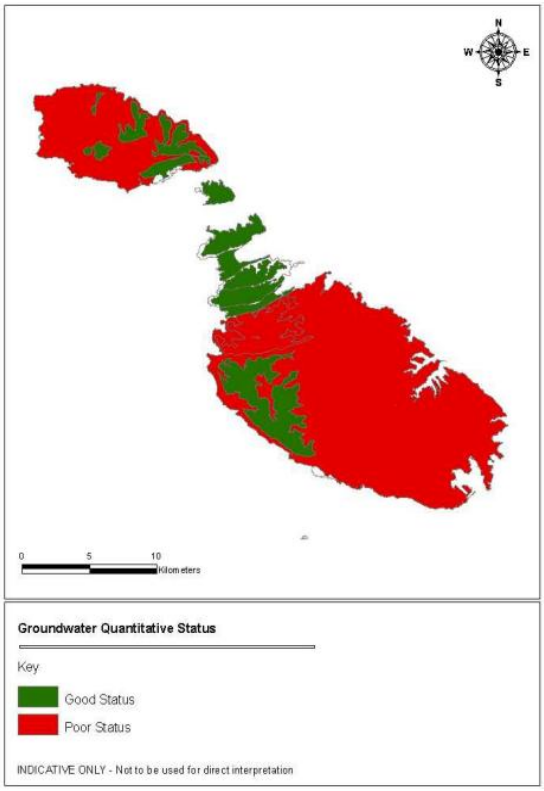
The Park area is found on the south eastern limits of the Mean Sea Level aquifer which spans across mainland Malta. This groundwater body presents widespread evidence of pollution caused by nitrates as well as signs of over extraction. Consequently the first Water Catchment Management Plan considered this groundwater body as having poor qualitative and quantitative status.

Within this plan, Marsaxlokk Harbour is identified as a distinct water body (MTC 107) and an Urban Waste Water Sensitive zone at risk of failing to achieve the environmental objectives of the Directive. The wide spectrum of wastewater streams from the power stations give rise to both chemical and thermal water pollution. The most significant discharge in terms of quantity is that of cooling waters. These waters contain antifouling agents such as chlorine and clam-trol. Heavy metals are of particular concern especially copper, nickel and organotins.

Bunkering activities are another source of diffuse pollution. Bunkering operations are carried out in the close by port. Vessels carrying petroleum products are bunkered within the port and the same port is frequented by large sea carriers for transhipment at the Malta Freeport. There exists a degree of risk of accidental oil pollution from fuel terminals and bunkering operations.

Marsaxlokk Bay is considered as a Heavily Modified Water Bodies (HMWB). The objective of the Directive in HMWBs is to achieve Good Ecological Potential (GEP) which can be thought of as a status that is less than the good status in natural water bodies given the pressures and economic activities. Nonetheless, this port was classified with moderate status for *Posidonia. oceanica*. This indicator was not assessed within Marsaxlokk Bay, however the qualitative assessment indicated significant risks to water quality and ecosystems associated with harbour and related industrial operations that are higher than in the Grand Harbour and Marsamxett Harbour; consequently this water body was classified at a lower status, that is in

poor status. The relationship of this classification to achieving GEP in these water bodies will be defined as scientific data is collected on hydromorphological, physico-chemical and biological quality elements.



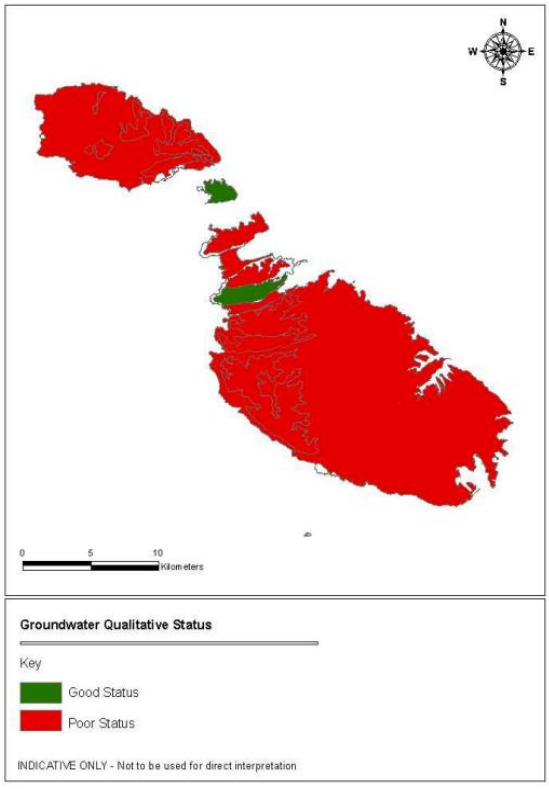


Figure 10 (a) Groundwater Quantitative and Figure 10 (b) Qualitative Status. Source: MEPA, MRA 2011

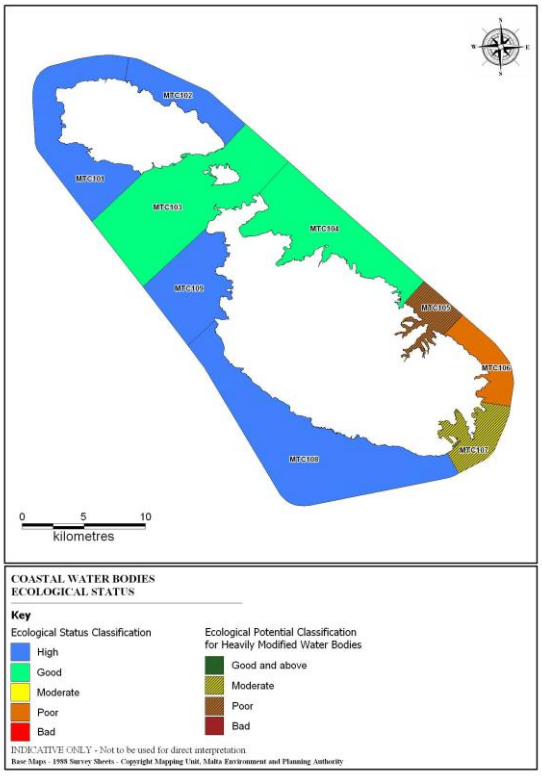


Figure 11. Coastal waters Ecological Status. Source: MEPA 2011

2.2.2.9 Strategic Plan for the Environment and Development (SPED)

The spatial framework adopted in the Strategic Plan for Environment and Development (SPED) in Map 2A identifies the area of the Park as an Area of High Landscape Protection (Figure 12).

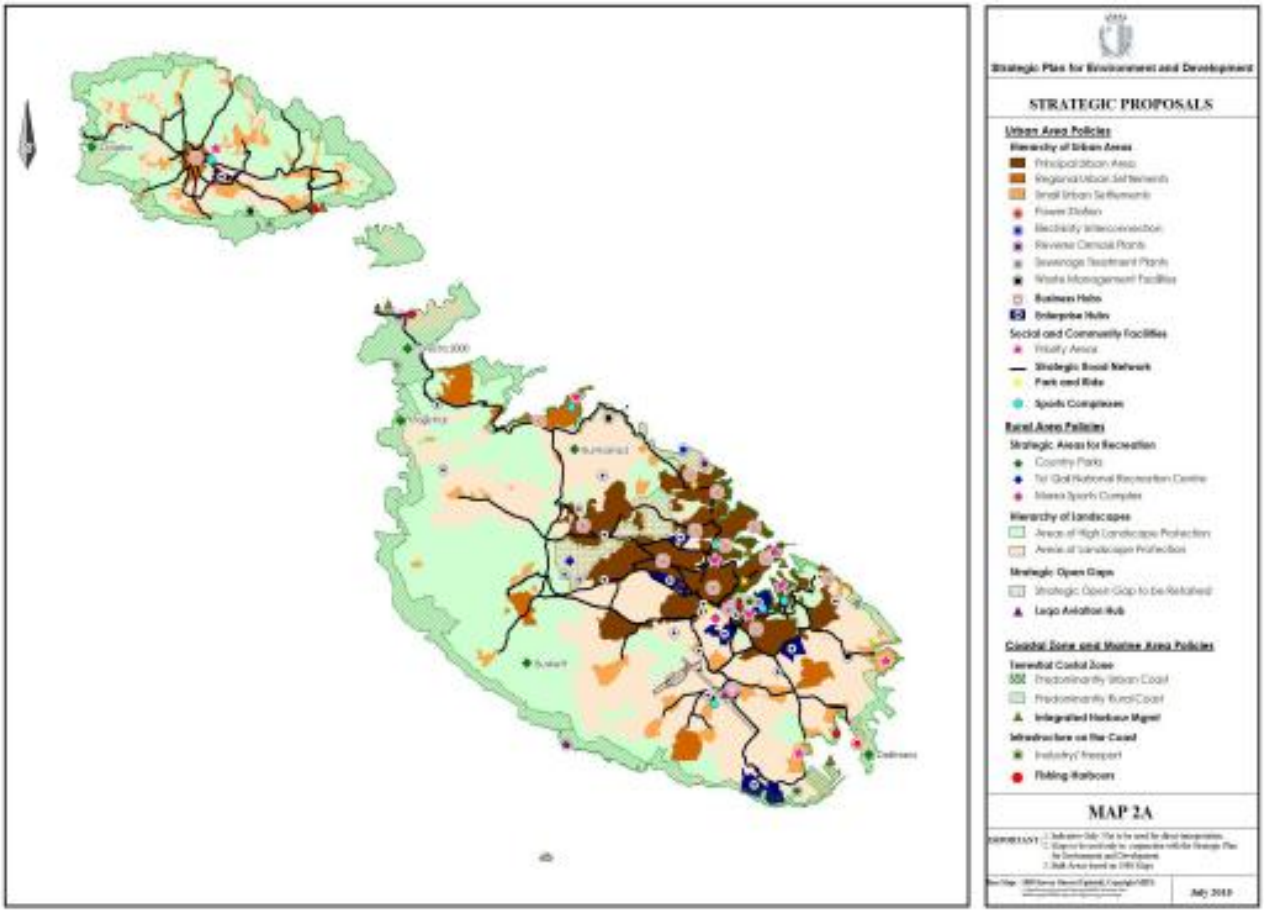


Figure 12. Strategic Plan for Environment and Development (SPED) Map 2A

The relevant development framework for the spatial characteristics of the area to be managed is guided by the respective thematic and spatial policies of the SPED which essentially call for the support of agriculture and the farming community through diversification, the enjoyment of informal recreation along the coast within the context of safeguarding the landscape and natural and cultural heritage with a long term view of enabling economic growth within the context of sustainability.

The policy direction of the SPED introduces a broad spectrum of inter-related aspects that need to be considered in the management of the Park. These can assist in the process of developing a vision for the Park. The relevant SPED policies that would guide decision making for development and environmental permitting for this area are listed in Table 4 below.

Table 4. SPED Policies guiding the development framework of the National Park

SPED Reference	Policy text	Relevance to the National Park
RO 1.1	To facilitate sustainable rural development and the diversification of activities within the Rural Area to sustain agriculture and safeguard its distinctiveness by Protecting good quality agricultural land from development.	Supports protection of agricultural land and the continuation of agricultural activities.
RO 1.7	To facilitate sustainable rural development and the diversification of activities within the Rural Area to sustain agriculture and safeguard its distinctiveness by Controlling the cumulative effect of rural development.	Focuses on the need to consider the carrying capacity of an area since cumulative impacts may degrade the distinctive quality of the rural area (in terms of landscape; openness and tranquillity; environmental quality e.g. noise).
RO 2.1	To ensure that existing rural recreational resources are protected, enhanced and accessible and to facilitate the provision of new recreational facilities which enhance the public's rural experience in a manner which does not have an unacceptable adverse impact on protected areas, species and areas of high landscape sensitivity by Identifying and managing key rural areas popular for informal recreation which enhances the rural experience, improving synergies between biodiversity and tourism, and protecting them from deleterious and incompatible uses.	Supports the appreciation of the rural environment through informal recreation for both locals and tourists.
RO 2.4	To ensure that existing rural recreational resources are protected, enhanced and accessible and to facilitate the provision of new recreational facilities which enhance the public's rural experience in a manner which does not have an unacceptable adverse impact on protected areas, species and areas of high landscape sensitivity by Ensuring public access to rural areas whilst minimising negative impacts, particularly from vehicular access on protected areas and areas of high landscape sensitivity.	Safeguards public access through appropriate visitor management.
RO 2.5	To ensure that existing rural recreational resources are protected, enhanced and accessible and to facilitate the provision of new recreational facilities which enhance the public's rural experience in a manner which does not have an unacceptable adverse impact on protected areas, species and areas of high landscape sensitivity by Ensuring compatibility between recreational activities and between these activities and other land uses.	Acknowledges the need to respect existing legitimate uses within the rural area and safeguards them against displacement and conflict from recreational activities, in this regard visitor access needs to be managed to avoid conflicts with agriculture.
RO 4.1	To protect and enhance the positive qualities of the landscape and the traditional components of the rural landscape by promoting integrated countryside management.	The management of the Park can act as a demonstration project for integrated countryside management with a broader spectrum of stakeholder involvement and in trying to implement the various existing regulations.
RO 4.5	To protect and enhance the positive qualities of the landscape and the traditional components of the rural landscape by encouraging the reuse of existing structures worthy of conservation, in a manner which is compatible with the rural character and prevents formalisation of the countryside.	Scope of enabling sustainable use of identified structures within the context of the Park.
TO 8.2	To safeguard and enhance biodiversity, cultural heritage, geology and geomorphology by Safeguarding protected areas including SACs, SPAs and MPAs, whilst enabling activities aimed at enhancing their management objectives.	Directing objective of acceptable activities to ensure compatibility with protection of natural and cultural heritage.
TO 8.3	To safeguard and enhance biodiversity, cultural heritage, geology and geomorphology by	To avoid showcase conservation and thus provide a national context and objective to

SPED Reference	Policy text	Relevance to the National Park
	Strengthening the links within the ecological network of the Maltese Islands.	the scope of protection.
TO 8.4	To safeguard and enhance biodiversity, cultural heritage, geology and geomorphology by facilitating restoration of damaged ecosystems.	Promotes the restoration of damaged ecosystems.
TO 8.7	To safeguard and enhance biodiversity, cultural heritage, geology and geomorphology by controlling activities which might have an impact on areas, buildings, structures, sites, spaces and species with a general presumption against the demolition of scheduled and vernacular buildings.	Safeguards against activities that are iincompatible with protected natural and cultural heritage.
TO 8.9	To safeguard and enhance biodiversity, cultural heritage, geology and geomorphology by controlling sources of light pollution which negatively affect the Rural Area.	Protection against light pollution.

2.2.2.10 Marsaxlokk Bay Local Plan

The Marsaxlokk Bay Local Plan issued in May 1995 has a number of policies which relate directly to the area under study and its surroundings (Figure 13). Although the implementation of this local plan, being the first in Malta, is long overdue, most of the policies which directly relate to this area are still valid. It is sad to note that although the potential of this area was identified more than twenty years ago, little to nothing has been done to try and implement some of the actions which were identified in this plan.

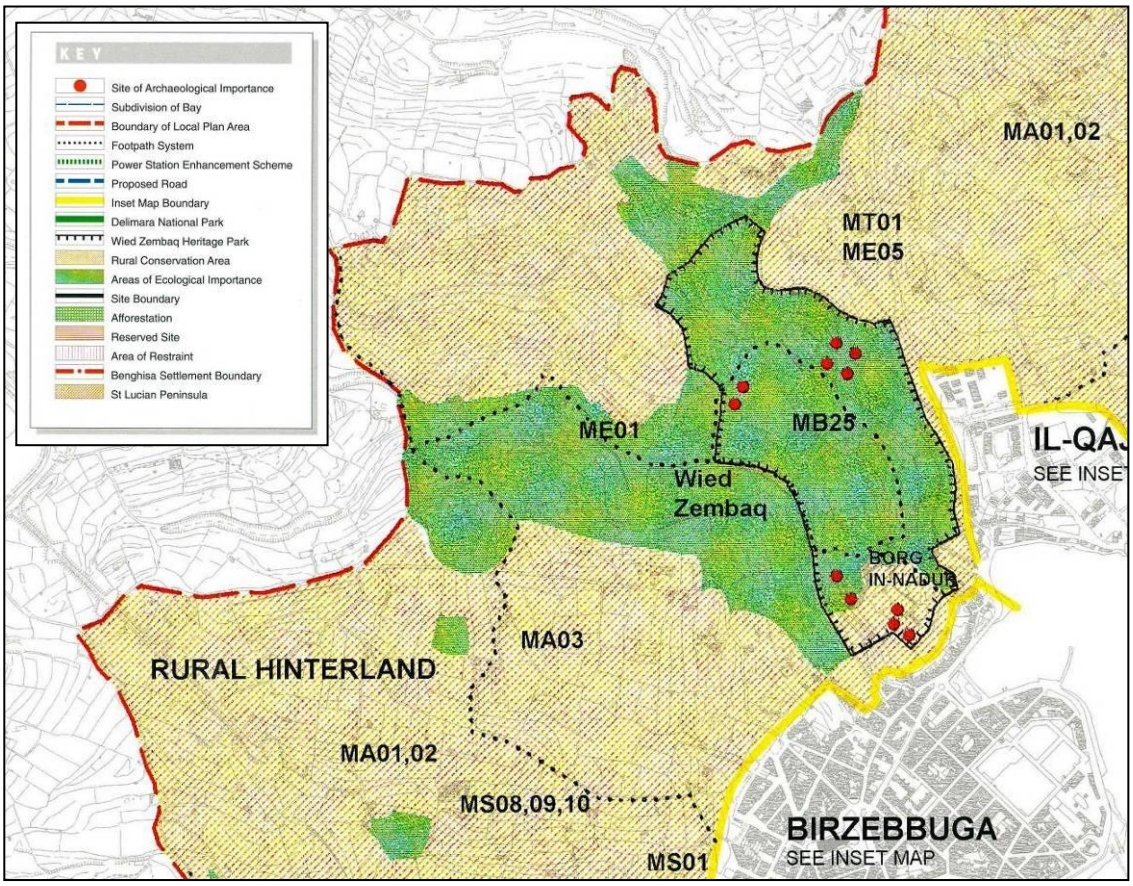


Figure 13. Part of Marsaxlokk Bay Local Plan Policy Map. Source: MBLP 1995

The strategy of the local plan aimed at taking positive steps to improve the environment and protect natural habitats. The approach which had to be adopted was the identification, protection and conservation of areas of ecological and archaeological interest. Through Policy ME01 the local plan had identified areas of ecological importance and sites of scientific importance. These have been marked on the Policy Map.

> *ME01 Areas of Ecological Importance and Sites of Scientific Importance are defined as indicated on the Policy Map. The major areas are in the vicinities of Wied il-Qoton, Wied Żembaq, Għar il-Friefet, Wied Żnuber, Għar Ħasan, north of Marsaxlokk, Xrobb il-Għaġin and Delimara Point.*

A positive feature which was identified in the rural hinterland of this local plan area was the quality of its countryside and the considerable recreational potential which is yet barely appreciated. The local plan in fact had recommended the introduction and development of a properly managed footpath system, with picnic locations. This was seen as a way of providing simple leisure facilities appealing both to local residents and tourists. A management scheme was advocated in order to ensure proper upkeep of the footpath system, including the introduction of appropriate interpretive facilities.

> *MA03 The Planning Authority will promote the development of a recreational footpath system based on routes linking Ħal Far – Delimara and Birżebbuġa – Gudja localities. These routes will incorporate picnic areas and strategic planting. The proposed routes are shown on the Policy Map. They will also be the subject of a management scheme. Specific conditions regarding the development of the footpath system will be applied.*

Policy MB20 relates to Wied Żembaq and the opportunity of creating recreational footpaths within the area. This site offers excellent views of typical Maltese countryside. Its proximity to the town centre makes it ideal to access the countryside.

> *MB20 The open land north of Triq in-Noqra which marks the start of Wied Żembaq will be maintained. No development will be allowed in this area. A recreational footpath down Wied Żembaq is to start from this site.*

Policy MB25 relates directly to the designation of a heritage park on the outskirts of Birżebbuġa. Għar Dalam and Borġ in-Nadur are neighbouring locations in which a variety of interesting archaeological remains have been discovered.

> *MB25 The area around Għar Dalam and Borġ in-Nadur shown on the Policy Map will be designated as a "heritage park". A development brief will be prepared for the park in consultation with the Museums, Tourism and Environment Departments.*

The designation of Heritage Park is intended:

i) to indicate the importance the Planning Authority attaches to the site from an archaeological view point
ii) to help to reduce the abuse of historic and archaeological sites by providing better security arrangements
iii) to signal the intention to take positive measures to conserve and manage the sites located here
iv) to welcome visitors, encouraging them to spend time in the area with the benefit of better guidance, information and presentation related to the remains
v) to enable better facilities and assistance to be made available for serious archaeological studies and investigation
vi) to assist in the popular presentation of archaeological findings

vii) to offer improved access, car and coach parking and refreshment facilities, on the basis of "access for all", including wheelchair users where possible
viii) to provide opportunities for private sector involvement as an additional source of income

2.2.2.11 Għar Dalam Conservation Order

A conservation order has been issued for Għar Dalam in line with Regulation 17 of the Fauna, Flora and Natural Habitats Protection Regulations, 2006 (LN311 of 2006) after the site was designated as a Special Area of Conservation (SAC) of International Importance (MT0000011) in 2007 (GN 112/07) and included in the EU's Natura 2000 network.

Importance of the Site
Għar Dalam supports the following Annex I Habitats (Directive 92/43/EEC):

- **8310 Caves not open to the public**

The following Annex II species (Directive 92/43/EEC) are present at this site:
- ***Armadillidium ghardalamensis***
- ***Rhinolophus hipposideros*** (Lesser horseshoe bat)

Other important species known from the site include:
- ***Plecotus austriacus*** (Long-eared bat) - listed in Annex IV (Directive 92/43/EEC)

Vision for the Site by its multiple protective designations, including its inclusion in the list of Scheduled Properties in terms of Section 81 of the Environment and Development Planning Act 2010 as a Class A Site of Archaeological Importance located within an Area of Archaeological Importance (GN 358 of 1998). Conservation at Għar Dalam will be mainly achieved through education and effective management of the cave system.

The vision for Għar Dalam summarises the desired outcome for the site after a period of management of this protected area. The vision for the site is:

Għar Dalam is a natural karstic cave system of immense cultural, scientific and ecological value. The various heritage features of the cave will be protected and preserved to serve the site's cultural, scientific, educational, and recreational purposes. The Annex I habitat will remain closed to the public and maintained at a good conservation status. The populations of protected animal species known from this site will likewise be maintained through the control of the threats and pressures affecting the cave and its inhabitants. The site will continue to be promoted as an archaeological and palaeontological site and promoted for public education and recreation as long as such uses remain compatible with the conservation objectives for the site.

Management Objectives
The Management Objectives for the site are:

1. To ensure that the area, structure and function of cave habitat 8310 are maintained;
2. To ensure that the range of *Armadillidium ghardalamensis* at this site is extended and its population size is increased;
3. To ensure the long-term maintenance of the range and population size of *Rhinolophus hipposideros* within the site;

4. To maintain healthy populations of the Annex IV fauna species present at the site;
5. To raise visitor awareness about the ecological/scientific and cultural importance of the site and to create added value out of its conservation and management; and
6. To enhance the visitor experience at Għar Dalam, which extends to the museum, the gardens, and the surrounding area.

Whereas Għar Dalam is considered to be of considerable value from a palaeontological, archaeological, geomorphological, and ecological perspective, it receives up to 55,000 visitors annually and visitor impacts, in particular lighting inside the cave, impact its state of conservation. The main threats to the site revolve around the increased access to part of the habitat of the priority Annex II species allowed in the past and the limited potential for habitat expansion due to the site's social importance. The following approach to the site's conservation will be taken:

1. The area is to be conserved and maintained by means of a management and maintenance programme in accordance with the various levels of protection assigned to it and according to the management objectives and measures determined through the management planning process for the site's Natura 2000 designation.
2. The maintenance and management of Għar Dalam is the responsibility of the Government, namely Heritage Malta (hereinafter referred to as the "site manager").
3. The site manager shall consult the MEPA regarding any activities or interventions on the inner part of the cave system (the habitat of *Armadillidium ghardalamensis*) and no work of any kind shall be undertaken on site (including the gardens and museum) prior to the approval of the MEPA.

The following conditions and provisions linked to the Management Objectives are to be applied when managing/conserving the area:

A. Maintaining the cave habitat in a good conservation status

1) The site manager shall, within two years from the issue of this Order, commence a study to determine the sustainable carrying capacity of the cave in order to determine the number of visitors that the cave system can accommodate at any one time without jeopardising the cave's favourable conservation status as well as that of *Rhinolophus hipposideros* in particular.
2) The site manager shall, within two years from the issue of this Order, install equipment to monitor the environmental conditions within the cave. Measurements have to include light intensity, relative humidity oxygen, and temperature.
3) Within three years from the issue of this Conservation Order, the site manager shall commence a monitoring programme of the movements at the cave entrance over an extended period of time covering several seasonal cyclic changes. Monitoring is to take place at different points around the cave entrance and include monitoring of movements of the ceiling rock wedge, the supporting masonry columns and arches, and the viewing platform, as well as monitoring of temperature and precipitation inside and outside the cave entrance.
4) Within the first ten years from the issue of this Conservation Order, the site manager shall carry out a 3D survey of the entire cave system and investigate whether Għar Dalam includes any links with other caves / cave systems in the area, in particular whether any small fractures / fissures exist that link this cave to Għar il-Friefet, which may indicate that the population of A. *ghardalamensis* recently reported at the latter cave is part of that of Għar Dalam.
5) Within the first year from the issue of this Conservation Order, the site manager shall prepare:
   a. a monitoring plan for habitat 8310,
   b. a plan to monitor the use of the site by *Rhinolophus hipposideros* and *Plecotus austriacus*, including population size, range and roost composition of the two species.

The monitoring plans shall be submitted to MEPA for approval and they shall subsequently be implemented for a minimum period of two years, following which the frequency of the longer-term monitoring will be determined.

B. Extending the habitat of *Armadillidium ghardalamensis* and *Rhinolophus hipposideros*

1) The site manager shall reduce the amount of artificial light in Għar Dalam by:
   a. ensuring that no more lights are added inside the cave beyond the present location (c. 60m from the cave entrance),
   b. replacing the existing lights with ones that are more environmentally friendly and ideal for cave systems (including to prevent the growth of lamp flora),
   c. use directional lighting to focus attention on specific features rather than illuminate a whole area,
   d. use dimmable lights, and/or
   e. use motion sensors to only switch on the lighting system when people are inside the cave and then only in the part of the cave where they are found.

   These changes shall take place by the third year following the issue of this Conservation Order.
2) As a result of the changes in the lighting system described in B(1) above, and in particular the removal of lights from the inner part of the cave (already being implemented), the site manager shall ensure that the area of the cave system that is open to the public will remain restricted to the initial 60m.
3) The site manager shall monitor the response of *Armadillidium ghardalamensis* and *Rhinolophus hipposideros* to the reduction in light / extension of the dark area. This monitoring study shall follow a Method Statement, which shall be prepared by the site manager and submitted to MEPA for approval. The monitoring shall take place over a minimum period of one year following the implementation of the changes in the lighting system, following which any changes in the conservation measures at the site that may be required to address the findings of the monitoring report, will be implemented.

C. Raise visitor awareness on the cave system's importance

1) The site manager shall install signage promoting Għar Dalam as part of the Natura 2000 network of the Maltese Islands. This shall be done in accordance with the interpretation strategy for Natura 2000 that will be carried out nationwide.
2) Within one year of the issue of this Conservation Order, the site manager shall include information on the ecological importance of the cave system on the site's website and promote it also as a Natura 2000 site (apart from its cultural heritage significance).
3) Within seven years of the issue of this Order, the site manager will develop an application that will allow visitors to download digital data about the site and the surrounding area and provide a guided tour of the site, including its ecological features.

D. Enhance the visitor experience at Għar Dalam

1) Within seven years from the issue of this Order, the site manager shall liaise with the Superintendence of Cultural Heritage to develop a cultural heritage inventory of Għar Dalam, including mapping / digitising of the cave deposits and of historical data.
2) The site manager shall, within five years of the issue of this Order, promote Għar Dalam within the context of its landscape and promote a link with other cultural heritage sites in the vicinity.
3) The site manager will collaborate with the Birżebbuġa Local Council, the Superintendence of Cultural Heritage, MEPA, and the Malta Tourism Authority, to explore the possibility of developing a heritage Park linking Borġ in-Nadur, Għar Dalam, Ta' Kaċċatura, and ir-Razzett ta' Pultu (Casa Ippolito) in line with previous planning policy recommendations and the scheduling of parts of Wied Dalam and Wied Żembaq as an Area of Archaeological Importance (GN 358 of 1998). *The actual establishment of*

such a Park is outside the scope of the Conservation Order and will need to take other constraints into consideration, including the presence of the adjacent Wied Dalam installation (a Seveso site).

4) Within five years of the issue of this Conservation Order, the site manager shall prepare a plan to upgrade the museum and outdoor areas of the site and develop interactive media / technologies that encourage the visitor to spend more time in the museum and the outdoor area (including the gardens) rather than in the cave itself.

E. Regulation of activities

1) In principle, excavation works directly above the cave system and within 10m of its boundary shall be prohibited. In the case of essential interventions related to the repair of existing service utilities located directly above the cave, the site manager shall be contacted by the relevant utility provider, and the details of the works shall be agreed with the site manager, the Superintendence of Cultural Heritage, the Birżebbuġa Local Council, and MEPA. No heavy machinery shall be used in such interventions located above the cave system and up to 50m from the cave boundary (shown in Figure 15); any essential interventions will be undertaken using small hand held equipment to minimise vibrations and noise.
2) There shall be a presumption against works or activities that may lead to significant vibrations within the cave system.
3) Any works or activities proposed within the vicinity of the cave (up to 100m from the cave boundary as indicated in Figure 15 shall have to provide noise and vibration monitoring. Existing installations within the said buffer area shall, within two years of the issue of this Conservation Order, provide a noise and vibration survey of their activities that could affect the structural integrity of the cave or disturb its species and evidence of effective noise and vibration mitigation measures applied at their sites.
4) The use of strong lights at night at developments or during activities within a distance of 100m of the cave entrance (see Figure 16) shall be prohibited unless they can provide clear evidence that the lighting will not result in a light intensity greater than 1 Lux within 10m of the cave entrance (see Figure 16).
5) Smoking and the lighting of fires (including barbecues) is prohibited within the cave and anywhere within 50m of the cave entrance (see Figure 16).
6) Activities in the outdoor areas and gardens of the site that generate noise shall not be allowed.
7) Lighting in the gardens and the path leading to the cave shall be kept to a minimum and located at the level of the footpath and be downward pointing to minimise glare at the cave entrance.
8) In the interest of safeguarding the cave system and its habitats, group visits inside Għar Dalam shall be restricted to not more than 55 at any one time until such time that the results of the study referred to in A(1) above are available to establish a sustainable carrying capacity.
9) Access to the inner part of the cave (the Natura 2000 site not opened to the public) shall be expressly prohibited except for scientific monitoring including that of the populations of *A. ghardalamensis* and *R. hipposideros* and this following the issue of the relevant permits/licences by the site manager and MEPA. Such monitoring visits shall be restricted to not more than three visits annually (to be undertaken in February, April and September of each year) and the data from the study is to be deposited with the site manager and MEPA together with a report on the monitoring.
10) Any archaeological / palaeontological investigations that may need to be undertaken within Għar Dalam shall remain the responsibility of the Superintendence of Cultural Heritage; however, any interventions within the inner cave system (beyond the 60 metre mark) shall only take place following consultation with and approval by MEPA and in accordance with an approved method statement in order to safeguard the cave habitat and its inhabitants.
11) Permit applications for any activities or operations regulated by these regulations are to be received by the MEPA at least 30 working days prior to the activity or operation in question.

If the property subject of this Conservation Order is in any way damaged or altered in contravention of this Order or its status as a Special Area of Conservation / Natura 2000 site is in any way jeopardised or rescinded, or if any person undertakes activities or actions in breach of the provisions of this Conservation Order, the Authority shall exercise its powers of enforcement as set out in Article 49 of Legal Notice 311 of 2006, as may be applicable.

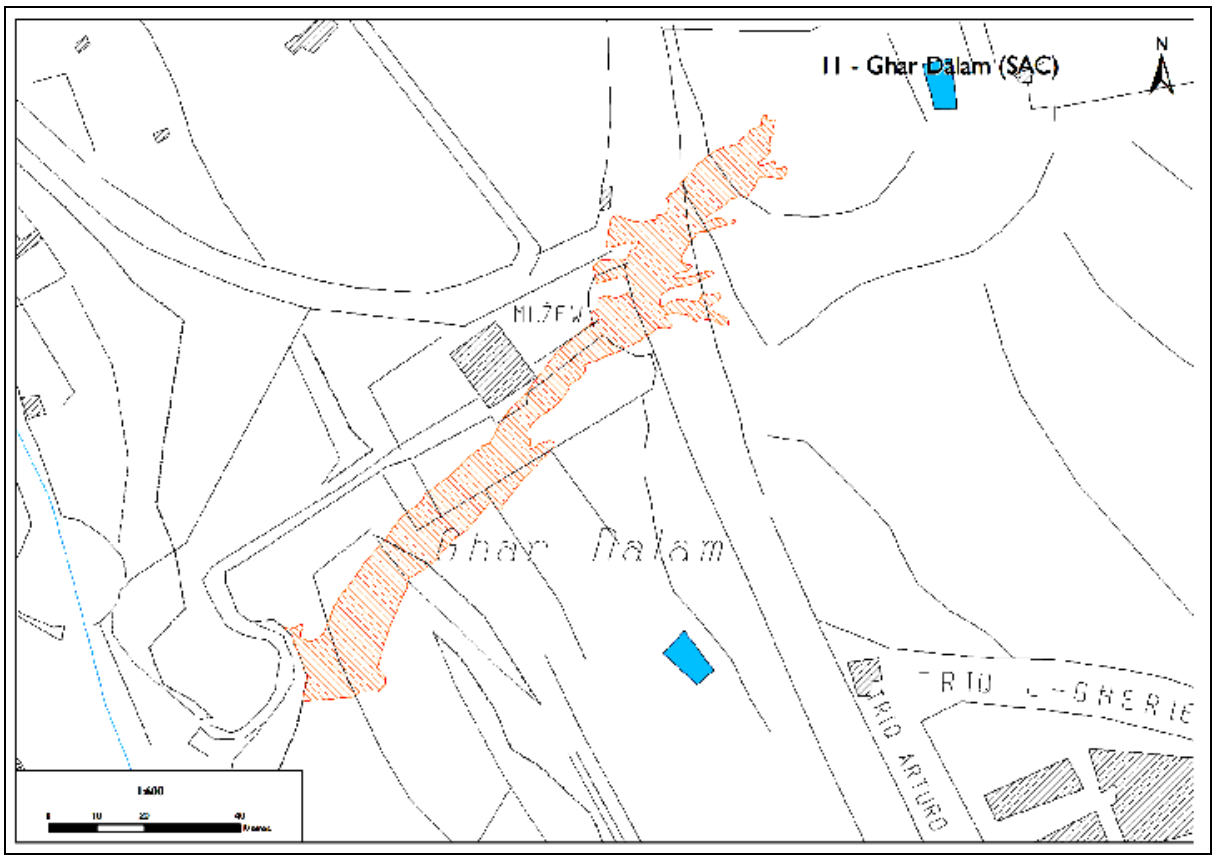


Figure 14. Location of Għar Dalam

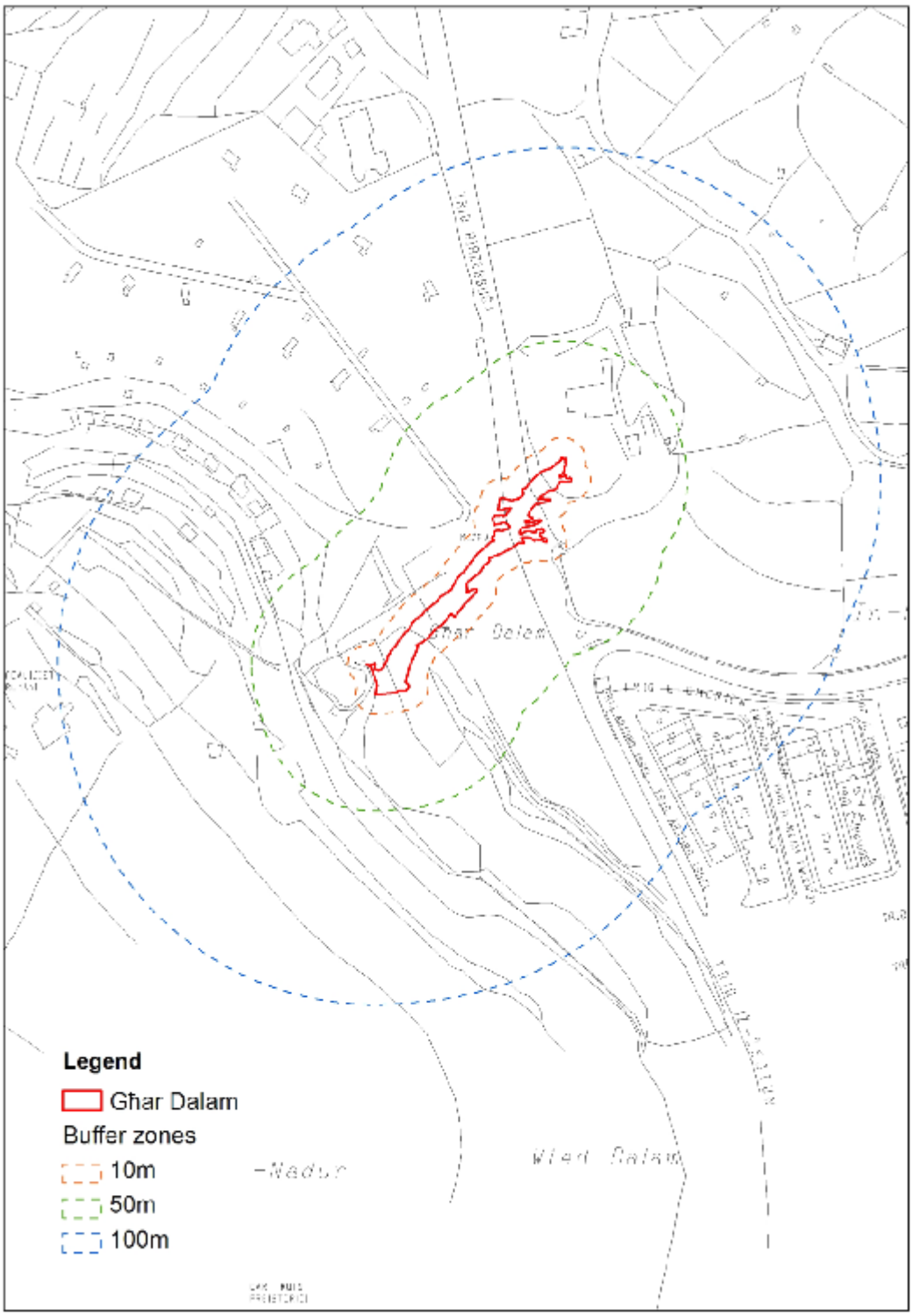


Figure 15. Buffer areas around Għar Dalam Special Area of Conservations (SAC)

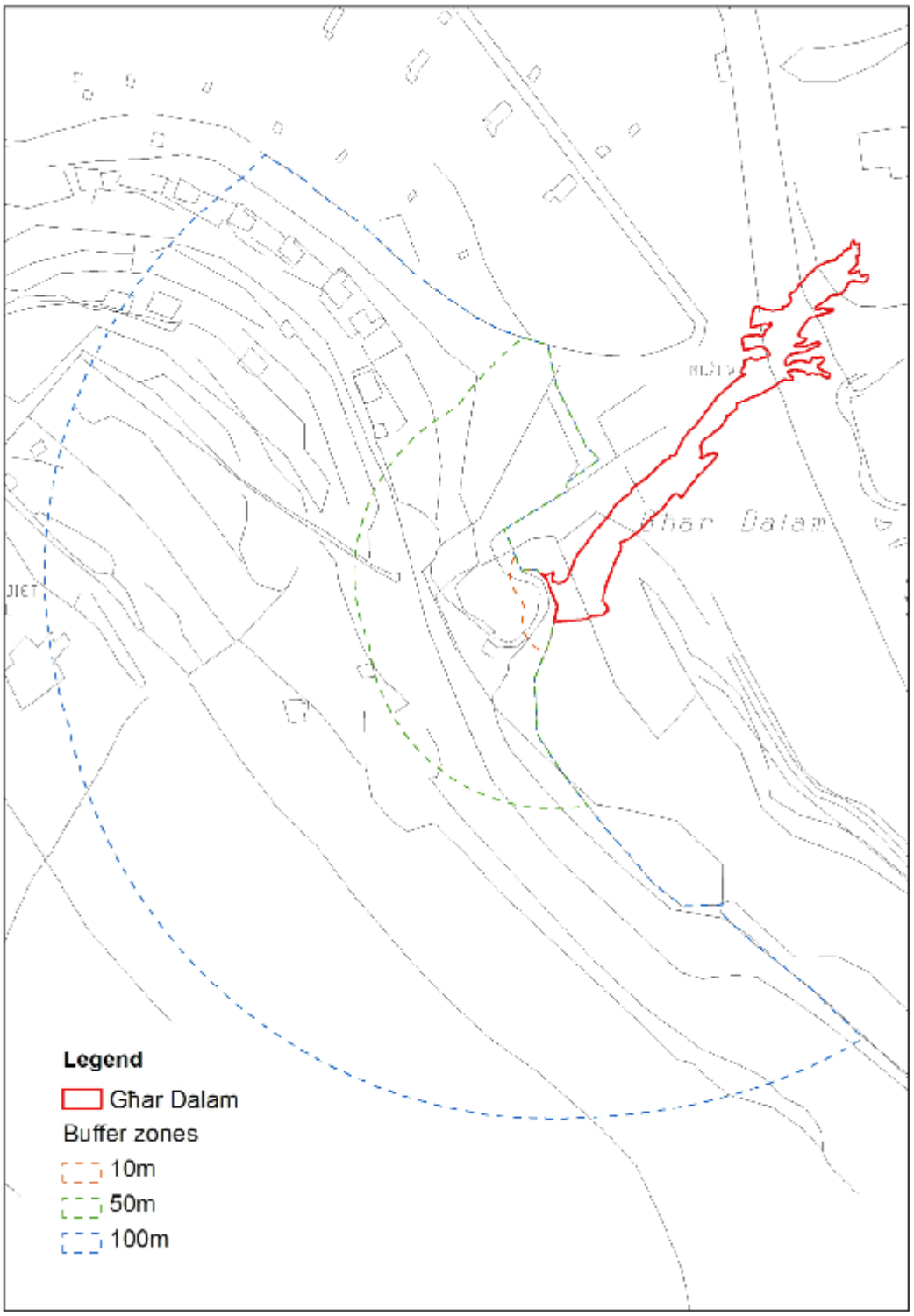


Figure 16. Buffer areas around cave entrance

2.3 Management Infrastructure

2.3.1 Facilities and Services

Għar Dalam Cave and Museum is the only site managed by Heritage Malta within the area which is open to the public. It is opened daily between 09.00 and 17.00 hrs.

In 1933 a museum was built. This consisted of one entrance corridor flanked on one side by a small hall which housed a number of display cases placed along its walls. At the time there was no need to cater for large numbers of visitors. The original display and cabinets are still kept in place and although having lost some of its authenticity due some modifications which have been carried, it is still considered as a heritage item on its own as it portrays the Victorian style of museum settings.

In the early 1990s the Department of Museums enlarged the museum to include a modern display on the other side of the entrance way. The works included also the addition of a terrace at the back of the visitor centre and a lecture room and an office at a lower level.

The open areas surrounding the cave and museum consist mostly of badly maintained patches of soil, an area with a number of olive trees, a field which was being used as a dump site, areas of garigue with several non-indigenous plants including ruderal and highly invasive species. The fields above the cave were bought by the Museum Department in the 1930s to protect the cave. They are presently being used by a third party for agricultural purposes.

In the past fifteen years there has been a steady decline in the number of paid visitors. Between 1999 and 2014 the number of visitors at Għar Dalam decreased from a total of 86,332 to 36,408, a decrease of 57.8 %. The decrease was mainly due to a decrease in the number of group visits (55,543 to 13,850). On the other hand the number of individual visitors increased from 14,114 to 22,558. Since 2013 the number of individual visitors started to exceed the number of group visitors (Table 5).

If this trend continues it is envisaged that by 2018 the number of group visitors would fall to 10,000 while the number of individual visitors will increase to 24,000, resulting in a total of 34,000 visitors, a decrease of about 2,500 over 2014 figures.

The other site within the area which is directly managed by Heritage Malta and is under surveillance on a 24x7 basis by a security guard is the Borġ in-Nadur Neolithic Temple. The access to the site is fenced and visits to it are by appointment.

All the other archaeological sites within the area under study are accessible to the public and are not cordoned-off. In fact the Borġ in-Nadur Bronze Age wall, up to some months ago was frequented by “pilgrims” led by Angelik Caruana, who adapted the site as a sanctuary for his activities.

YEAR	Individuals	Groups	TOTAL
1989			16,890
1990			15940
1991			14,552
1992			14,721
1993			65,619
1994			71592
1995			48,044
1996			79,201
1997			74,572
1998			80,896
1999			86,332
2000			81,543
2001	14,114	55,543	69,657
2002	12,555	46,766	59,321
2003	17,632	46,194	63,826
2004	20,695	51,125	71,820
2005	19,408	47,265	66,673
2006	18,501	35,212	53,713
2007	17,363	34,754	52,117
2008	23,613	33,141	56,754
2009	17,864	27,693	45,557
2010	17,824	23,355	41,179
2011	16,540	19,407	35,947
2012	17,603	18,211	35,814
2013	20,946	16,438	37,384
2014	22,558	13,850	36,408

Table 5: Number of visitors to Għar Dalam by year. Source: Heritage Malta

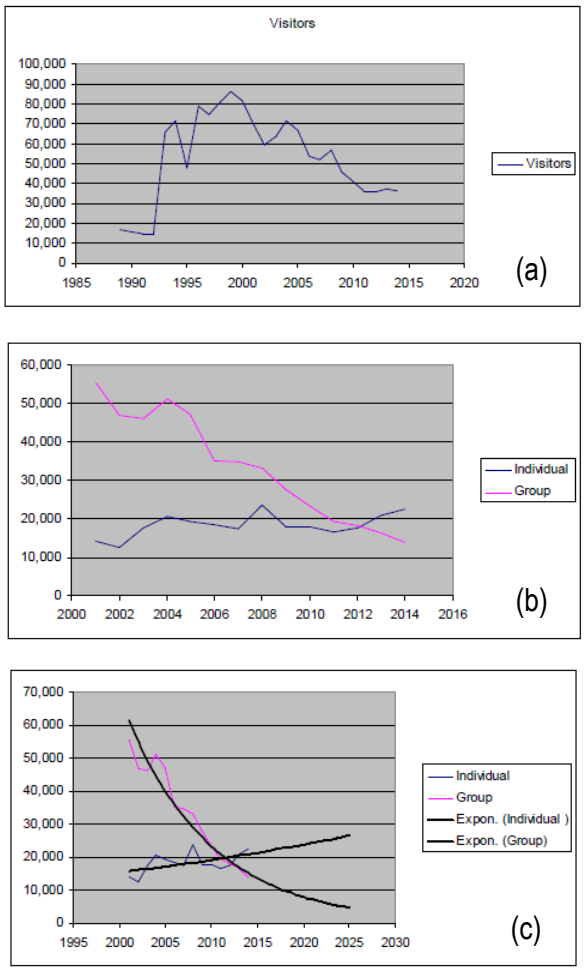


Figure 17 (a) Total Visitors 1989 - 2014; (b) Group and Individual Visitors 2001 - 2014; (c) Extrapolation of Group and Individual Visitors. Source: Heritage Malta

2.3.2 Health and Safety

Although the site has not been surveyed thoroughly and no risk assessments have been done at such a preliminary stage of this study, one can easily identify a number of health and safety issues which are of concern to visitors and users of the area with the site in its current condition. Therefore any management plan for the area should include a health and safety risk assessment, to seek to address and minimise such risks.

The following is a non-exhaustive list of health and safety issues (not in order of priority) which have been noted through this study:

1. Dangerous structural condition of some of the cultural assets within the site
2. Exposure to Volatile Organic Compounds (VOCs) from nearby fuel depots
3. Risk of fire and/or explosions from nearby fuel depots
4. Major vehicular traffic passing through the arterial road along the site
5. Uneven surfaces of pathways and country roads
6. Uneven walking paths within the archaeological sites
7. Unprotected reservoirs, wells and boreholes

8. Partly collapsed and unsteady rubble walls
9. Gunshots during the hunting season
10. Rodents and insect bites
11. Unsecured watch-dogs
12. Potential hazardous waste dumped in the area

2.3.3 Accessibility

Most of the area under study is inaccessible to vehicles and therefore any restoration and conservation works which have to be carried out on the archaeological areas and historical structures have to take this issue into consideration. Although this applies also to the restoration of rubble walls and country paths, this matter might be slightly less of a problem as one can re-use dumped or loose rubble found in different areas of the site, although one has to ensure that the rubble used is not of archaeological importance.

Although most areas and important sites within the area under study are accessible on foot, it was found that a number of old access paths and country paths or lanes have either been blocked or taken over naturally by vegetation, including some, also by protected trees.

Most of the country roads and paths which are still in use have uneven and rough surfaces, besides the fact that due to the topography of the site, some of them are quite steep. This renders most of the site completely inaccessible to wheelchair users and families using pushchairs. This is also a major problem even at Għar Dalam Cave and Museum which is completely inaccessible to such users.

2.4 Geology

Malta's formation is the result of marine sedimentation that was deposited layer upon layer over millions of years. This particular geological formation of the Maltese Islands must be regarded as a key factor that contributed towards the evolution of a unique cultural heritage.

Malta can be stratified into five main layers: Upper Coralline Limestone, Greensand, Blue Clay, Globigerina Limestone, and Lower Coralline Limestone, the sequence of which is seen to be kept throughout the archipelago. A geological map, seen in Figure 18, depicts these layers in the various areas of the Maltese Islands. Even though the sequence of this stratification is constant, some parts of the islands lack the topmost layers, causing exposure of the layers beneath (Azzopardi, 1995, p. 36).

The geological map of the Maltese Islands[11] (Figure 19) indicates that the area under study consists of Lower Globigerina Limestone, underlain by Lower Coralline Limestone. The valley beds and sides form an outcrop of this course-grained limestone known as Il-Mara Member. Along the sides of the valleys some caves have formed, one of which is Għar Dalam itself. These have formed by flowing groundwater that eroded the soft Lower Coralline Limestone along discontinuities within the rock mass.[12]

Promontories such as the one between Wied Żembaq and Wied Dalam, illustrate exposed layers of rock which are best for quarrying and building. Such areas were thus earmarked as ideal for habitation, and signs of such activity throughout the ages can still be found.

[11] Geological Map of the Maltese Islands – Sheet 2, Gozo & Comino (1993)

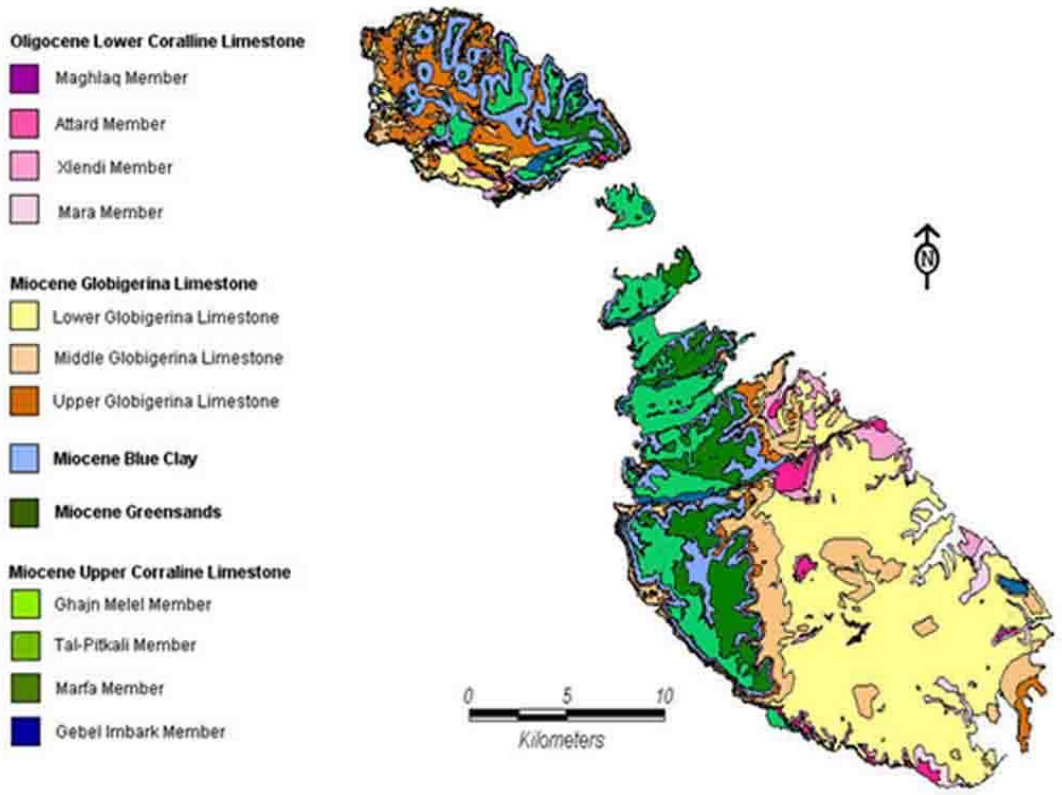


Figure 18. Geological map of Malta. Source: Various, Malta Focal Point, 2007

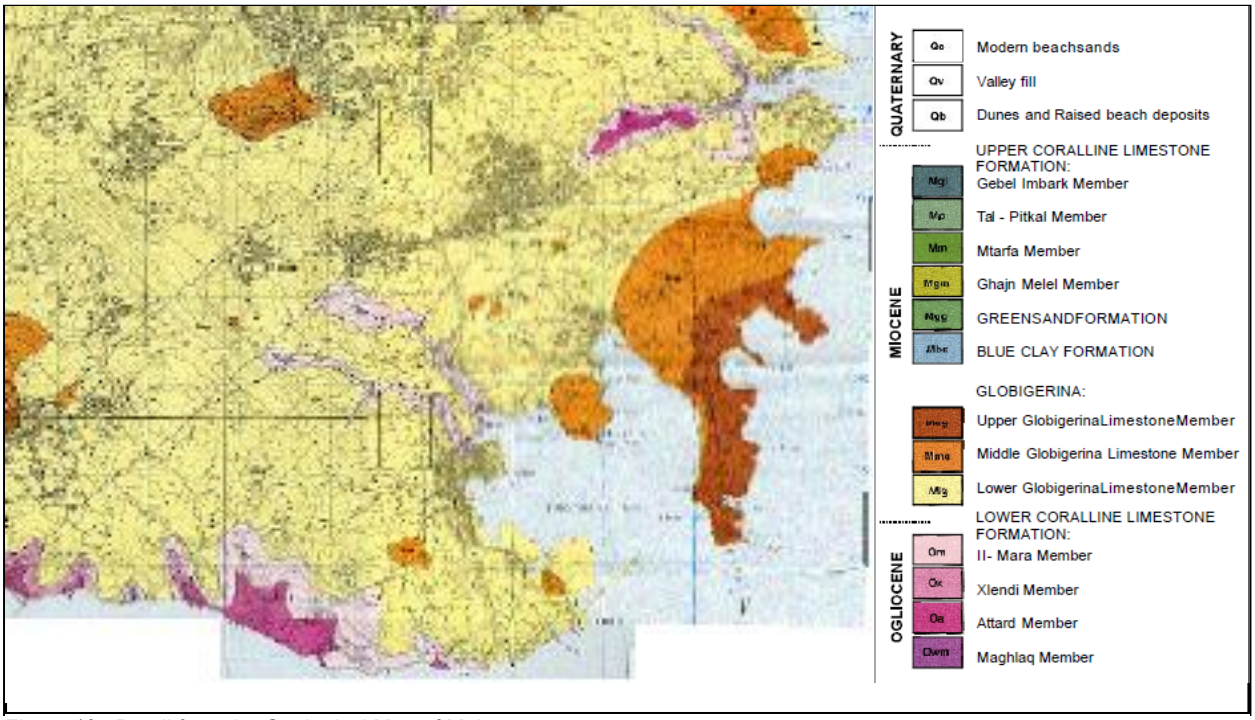


Figure 19. Detail from the Geological Map of Malta

It is easy to notice that the rock on this promontory has a particular 'stepped' formation. Geologists highlighted the fact that the 'stepping' in the rock is caused by the presence of a bedding plane which is formed at the interface between globigerina and lower coralline limestone. The height of each 'step' is the height of the lower globigerina present above the bed and it is possible that some of the deep pits found

around the area were purposely dug in order to find this interface (Figures 20 - 22)). Such natural formations facilitated the extraction of stone for building purposes. It was therefore possible to excavate large slabs by simply cutting trenches and levering up the parcelled rock. This activity gave rise to the relatively flat surface that is still visible around the area (Scerri, 2012)

Figure 20. The lower globigerina present above the bedding plane (Photo credit Daphne Fenech)

Figure 21. Possible excavation pit to find bedding plane (Photo credit Daphne Fenech)

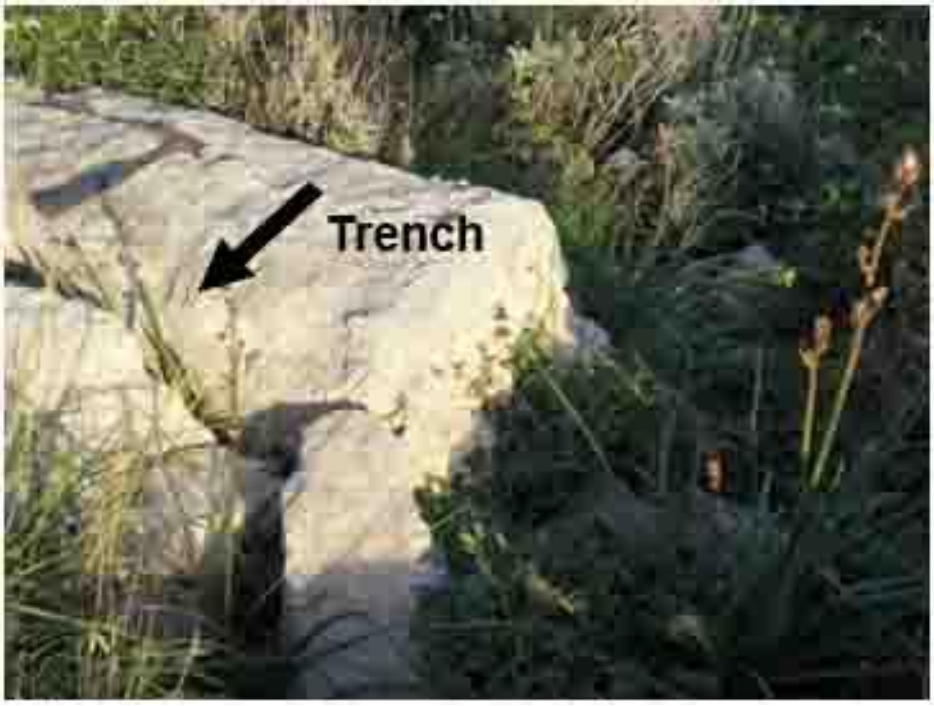


Figure 22. Trench excavated at the top of the 'step' in order to parcel off the stone before lifting (Photo credit Daphne Fenech)

Further detailed study into the type of stone used for the construction of the Roman Domus known as Ta' Kaċċatura and that used to build the much later Casa Ippolito may further reinforce the hypothesis that local quarrying was resorted to on the peninsula.

The geological formation of this tongue of land also made the creation of the cistern at Ta' Kaċċatura possible, as the type of stone that the cistern is quarried into, that is the lower member of globigerina limestone, is naturally impermeable and thus renders itself well for such a use.

Other quarries are found along Triq Għar Dalam overlooking Wied Dalam, namely in the stretch further down from the Għar Dalam visitor centre up to St George's Bay. It is thought that these were used to supply stone for the building of the 19th Century villas overlooking the bay.

2.5 Geomorphology and Landscape

The Maltese archipelago is situated on a shallow shelf called the 'Malta-Ragusa Rise', which forms part of the African Continental Plate[13].

The area of interest for this project lies at the south-eastern most extent of the island of Malta and has the best harbour in the region. Wied Żembaq to the south west and Wied Dalam to the north east run past the Borġ in-Nadur ridge on each side. Thus, Borġ in-Nadur is found on a ridge that links the sea and the interior. Ta' Kaċċatura is 400m further inland at the point where the narrow ridge between the two valleys broadens out[14], whilst the Għar Dalam site is situated on the other side of Wied Dalam. The area ranges from 0 to 75m above sea level[15]. The coast of this area has long been exploited by humans, as can be seen by the silo pits and cart ruts present on the shoreline. The cart rut trail running into the sea also

[13] Magri 2006: 10
[14] Grima in Tanasi & Vella 2011: 229
[15] Pedley 2002:21

indicates that the shoreline of the area has changed in the last millennia, and that previously the coastline was more retreated.

The geology of the area is composed of Globigerina Limestone and Lower Coralline limestone forming the gorge of the valleys found in the area[16]. The lower Coralline Limestone deposit is the oldest visible in the area, and is limited to coastal sections of the Western side of Malta and Gozo[17].

The features of the karst landscape include the Għar Dalam cave, fissures and other typical features of limestone regions. The Lower Corraline Limestone aquifer is the only aquifer present in the area. According to the Kubiena classification system, the Borġ in Nadur promontory contains Xerorendizas Soil, whilst the two valleys of Wied Dalam and Wied Żembaq contain Carbonate Raw Soil (Azzopardi 1995) deposited naturally, this contrasts with the 2005 state of environment report, which indicates that the soil in the area is made of Luvisols[18]. Soils in the area contains low (10g-20g/Kg) to medium (20-60g/Kg) organic carbon content[19], and are below the legal threshold for concentrations of heavy metals exceeding the limits of the Sewage Sludge Regulations[20].

The soil landscape of this area is a mixture of moderate and steep terracing on Globigerina Limestone[21], this is interspaced with areas where the bedrock is exposed due to severe weathering, or due to a lack of terracing. Thus it is the actions of humans which are keeping the landscape as is at present, and it is human activity which is reducing the amount of erosion the area would suffer. A diversity of crops is cultivated in the area, including cereals between November and May.

Figure 23. Moderate terracing in the Borġ in-Nadur promontory. (Photo credit Josef Caruana)

[16] Pedley 2002: 20
[17] Magri 2006: 14
[18] State of Environment report 2005: 56, MALSIS 2004
[19] Vella 2005:240
[20] State of Environment report 2005: 59
[21] State of Environment report 2005: 56

2.6 Hydrology

Although two relatively deep valleys pass through the area under study, the tributaries of these valley systems are not very long as is with other valleys found in the south of Malta. Moreover the upper part of the watercourses of Wied Żembaq and Wied Dalam have been changed by the construction of Runway 32 and the extension of the urban area of Ħal Għaxaq at Tal-Qattus area respectively. A large open reservoir was built at Ħas-Saptan in the area known as Ta' Ras il-Wied, in order to gather as much as possible the rain water run-off from the airfield (Figure 24). Notwithstanding this, according to the farmers cultivating the few parcels of land at Wied Dalam and Wied Żembaq, there have been instances of rain water flooding at the end of both valleys.

Figure 24. Large open reservoirs at Ħas-Saptan. Source Planning Authority Orthophoto 1998

The only groundwater safeguard constraints identified through the Planning Authority data available to the public on Mapserver are located at Ħas-Saptan as shown in Figure 25.

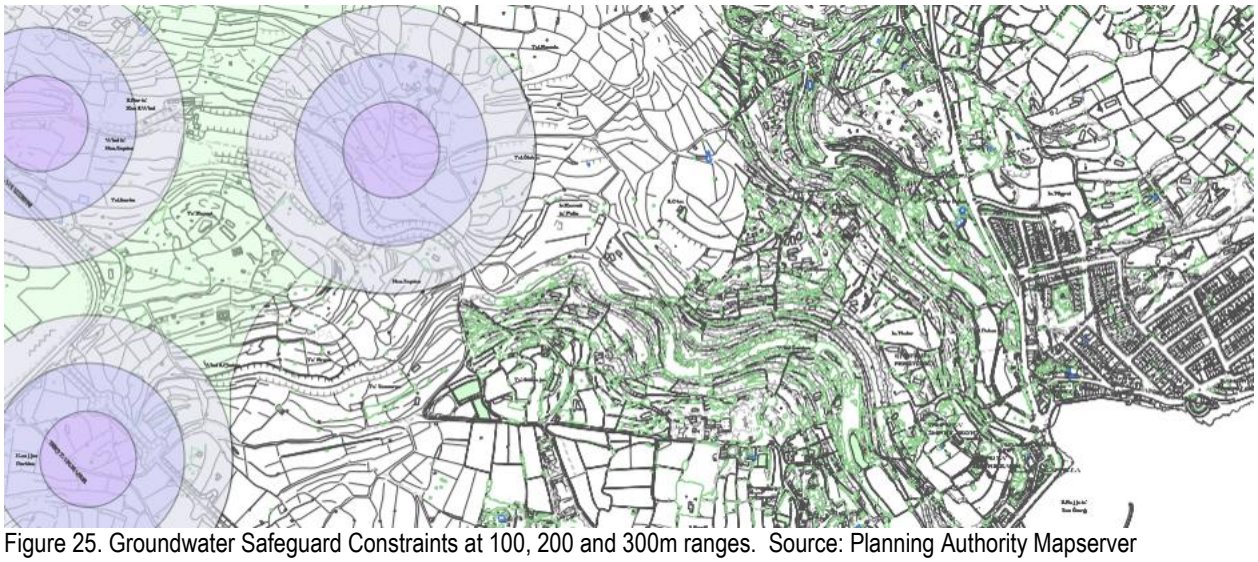


Figure 25. Groundwater Safeguard Constraints at 100, 200 and 300m ranges. Source: Planning Authority Mapserver

2.7 Cultural Heritage

2.7.1 Archaeological Sites

2.7.1.1 Borġ in-Nadur Temple

During the 16th and 17th Century, the Borġ in-Nadur temple period remains were thought to have formed part of a Roman sanctuary encompassing the whole harbour, with other sites such as Ta' Kaċċatura and Tas-Silg being counted as part of the same structure. This view gradually changed with time, and the Borġ in-Nadur temple started being identified as a unique site in its own right. Margaret Murray excavated the site in the 1920s, and recognized that it formed part of the megalithic temples of Malta, as had previously been discovered in sites such as Ħaġar Qim, Tarxien and Mnajdra. Murray also recognized that the Borġ in-Nadur promontory contained both Bronze Age and Temple period features.

The temple complex is composed of a four-apse temple with a niche, a main enclosure, a double chapel and field stones. These are the main features which were excavated by Murray and which comprise what is now known as the Borġ in-Nadur Temple. Near the incomplete remains which were termed as a double chapel by Murray, the remains of a Bronze Age wall are also visible.

The four-apse temple was well preserved with a torba floor, whilst the niche at the end of it had a rock floor.[22] A threshold slab that separates the two sets of apses was discovered when the torba floor was removed during the excavations.[23]

An interesting feature of the site is the forecourt, which whilst not observed in other temple sites such as Tarxien and Ħaġar Qim, seems to have been present also in Ġgantija, judging from old paintings of the site. The artefacts retrieved during the excavation also suggest that the temple site was also used during the Bronze Age, a reutilisation not new to Maltese prehistory, where sites such as Tarxien and Skorba were also used during the Bronze Age according to their needs at the time. Thus finds found on the torba floor such as 'betyls' probably date to this period, due to the Tarxien Cemetery pottery which was found during the excavations.[24]

The 'field stones' feature remained unexplained by the excavations, and were either reburied or destroyed by 1958.

The Borġ in-Nadur temple suffers from several factors which effects its stability. These include sea spray, the large variations in temperature between daytime and night-time which leads to deterioration and weathering, the mechanical erosion by means of rain and wind, and the effect the sun has on the megaliths themselves, which can be observed by how different types of biological organisms grow on different parts of the same megalith.

The temple is also running the risk of parts of it collapsing due to previous restoration interventions not having been done in the best way possible. Agricultural activity in the vicinity of the temple is also a cause for concern, with parts of the complex that have been reburied since the original excavation having crops grown above them.

[22] Vella *et al*. In Tanasi & Vella 2011:51
[23] *Ibid.*
[24] Vella *et al*. In Tanasi & Vella 2011:53

Figure 26.The Borġ in-Nadur Temple remains (Photo credit Josef Caruana)

Figure 27. The remains of the forecourt and the entrance to the enclosure (Photo credit Josef Caruana)

Figure 28. Photograph showing how the trilithon is resting precariously on a pillar made of modern stone blocks. Evidence of biological growth can be seen in the foreground, with weathering in the form of pitting being evident on the megalith in the left side of the photo. In the background one can observe the proximity of agricultural fields to the temple (Photo credit Josef Caruana)

2.7.1.2 Borġ in-Nadur Bronze Age fortified village

The site was cleared between 1881 and 1882 by the Permanent Archaeological Commission. The D-shaped enclosure which was subsequently uncovered was interpreted by Caruana as being one of the apses of the temple to Melqart, thought at the time to be in the area. A partial reconstruction of the megalithic wall was also undertaken during this period. This wall is built without mortar, using irregular blocks laid down in rough courses.[25] By the 1890s Mayer recognised the D-shaped structure as being a wall which had a defensive purpose, and also identified two dwellings which had been discovered in the previous clearing operation. David Trump excavated six trenches behind the fortification wall, from which he confirmed the presence of a Bronze Age settlement by identifying two huts, both with a mortar, quern and a hearth in them.[26] Trump identified different phases in the stratigraphy, showing that the area was used during different periods of the Bronze Age, and that the two huts were constructed during different phases.[27] Trump also identified that the Romans also used the site as a field.[28]

[25] Zammit 2008
[26] Vella *et al*. In Tanasi & Vella 2011:56
[27] Vella *et al*. In Tanasi & Vella 2011:59
[28] *Ibid.*

Later emergency excavation in 1998 by the Museum department revealed that the defensive wall had once encircled the whole hilltop. Three silo pits were also observed within the wall perimeter, further adding strength to the theory that the wall served a defensive purpose.[29]

Whilst part of the wall is in a state of disrepair, with parts of it having collapsed, other parts of the wall are holding well as a result of the conservation intervention done at the turn of the century. The greatest danger posed to this site, apart from the threat of rain causing collapses and the sun, wind and sea spray, is human activity: people walking on the wall and around it increase the rate of deterioration of the wall, especially when these are in large groups. Vegetation growing in cracks in the wall, such as *Capparis orientalis* also poses a long term risk to the site. A detailed study determining the structural stability of the construction, and ways in order to ensure its long term preservation needs to be conducted.

Figure 29. Part of the original wall together with signs of the restoration conducted at the turn of the century. On the left side of the photograph an area where a collapse has occurred is also visible (Photograph credit Josef Caruana)

2.7.1.3 Rock-cut pits

These rock-cut, bell-shaped cavities of a depth of up to four metres[30] were more numerous a century ago, but the construction of the existent road leading from Zejtun to Birzebbuga unfortunately meant the destruction of most of them, with only a few examples being left on a small spur of land along the promenade. The large number of original pits present indicates that these were an important element of the

[29] Zammit 20
[30] Trump 2008:268

life of the people who utilised them. Whilst dating these pits is not possible, such pits are known to be associated with the Borġ in-Nadur kind of settlements, as found in this type-site.[31]

Figure 30. The rise in sea levels means that the rock-cut pits are partially submerged. (Photo credit Josef Caruana)

A 1960s excavation of such a pit in Luqa yielded Borġ in-Nadur pottery and animal bones. The explanations for the presence of these pits have ranged from storage areas, rubbish pits, to even commercial uses[32], but the reason for their presence remains elusive. Unfortunately most of the pits situated on the shoreline are now flooded with seawater due to the rise in the sea level.

The pits are in a bad state of conservation due to their proximity to the shoreline. Some of them are continuously or periodically submerged. This means that the sea erodes the features just like it erodes the rest of the coastline. Different situations are also visible between the permanently submerged pits and those that are only occasionally filled with sea, as the latter cycle, apart from causing mechanical damage like cracking and faulting, increase the rate of deterioration through chemical imbalance. The pits have also been used as a dumping ground for rubbish, with evidence of burning also found in some of them. Sedimentation from the sea filling the pits is also a problem. Protecting these features is problematic due to their location.

[31] Zammit 2008
[32] ibid

Figure 31. Detail of a rock-cut pit, showing the traces of burning at the opening (Photo credit Josef Caruana)

Figure 32. Photograph showing cracking in one of the pits, with evidence of burning and sedimentation in it (Photo credit Josef Caruana)

2.7.1.4 Cart Ruts

These mysterious markings on bedrock can be found in various places around the Maltese islands. Whilst attempts have been made to explain their function and to date them, these answers are proving to be as elusive to current researchers as to those who tried to understand them since the 17th century. The current prevalent theory is that the cart ruts were a means of transportation,[33] but what was transported is highly speculative, with possibilities range from stone or water to grain.[34] Some scholars believe that cart ruts are associated with quarrying activity, but no sign of this is identifiable in our area of interest. Of interest in the proposed area is the single pair of cart ruts which can be found adjacent to the rock-cut pits in the San Ġorg Bay. These cart ruts are interesting as they lead directly to the sea. This feature used to re-emerge on the opposite side of the bay, thus showing that in ancient times the sea level was lower, with the result that parts of the bay which are now submerged could be previously traversed.

This is, however, not an isolated pair. A set of ruts seems to be leading the way towards the D-shaped Bronze Age wall, while another, longer pair runs along the existing access road for Ta' Kaċċatura. This pair is particularly interesting as it seems to go around the Roman villa site.

Figure 33. The pair of cart ruts which in modern times lead to the sea, due to the rise in sea levels (Photo credit Josef Caruana)

The state of the submerged part of the cart ruts could not be ascertained.

[33] Magro Conti & Saliba 1998
[34] Trump 2008:268

2.7.1.5 Other Bronze Age remains

Other Bronze Age features are also visible in the area. Traces of a wall similar to the Bronze Age wall mentioned above were found a few years ago on top of a vertical ridge after the demolition of a house. Its location along the same promontory of the Bronze Age village of Borġ in-Nadur, close to the site of the Knights' redoubt, seems to indicate that the entire Bronze Age Village was surrounded by a wall.

Figure 34. Detail showing the remains of a megalithic wall dating to the Bronze Age (Photo credit Josef Caruana)

Another site possibly dating to the Bronze Age is what looks like a dolmen with two 'vine trenches', situated close to Ta' Kaċċatura. Unfortunately as with the other dolmens around the island, very little is known about it.

The main conservation issues affected the dolmen located half way between Ta' Kaċċatura and Wied Żembaq are mainly connected with natural processes of deterioration. Although the structure looks quite stable, the lower blocks seems to be slowly deteriorating making the possibility of collapse in the near future a considerably high one.


Figure 35. A dolmen is found on the promontory close to the Ta' Kaċċatura Roman complex (Photo credit Josef Caruana)

2.7.1.6 The Roman Villa of Ta' Kaċċatura

Clearing of this *villa rustica* or *agraria* was completed in May 1915 by Thomas Ashby, who published his findings in an article in the *Journal of Roman Studies.*[35] The site seems to have already been partially investigated a few decades earlier and Caruana's reference to column shafts and tiles uncovered close to the Bronze Age site of Borġ in-Nadur in April (1881) probably refers to these clearing works.[36] Nothing remains of these early works except for the mentioned reference and a plan by Dr. F. Vassallo which was apparently discovered by Zammit.[37] These earlier references might have been the reason that prompted Ashby to investigate this site but a more plausible indication might be the large cistern that was part of the site. This large cistern seems to have remained accessible as indicated by an 1893 plan marking the boundary to be constructed around it.[38]

The final phase of the villa consisted of a small peristyle around which lay a number of small rooms, including a small olive oil production area. Among the most important aspects of this house is the well-known rock-cut cistern that still retains its original roof propped up by a number of square-sectioned pillars. Another important feature of the house is what remains of a staircase accessible from the peristyle and leading to a now-lost upper floor. According to Ashby, the small peristyle around which the house is built was one of the areas that suffered most from stone pilfering.[39] However, enough evidence was gathered during the 1915 excavations to allow a partial reconstruction of the colonnaded peristyle. Twelve columns

[35] Ashby 1915: 52-66
[36] Caruana 1882: 18-19
[37] Ashby 1915: 52
[38] Project House plans 100/5a, 100/5b, 100/39, 100/41, 100/47, 100/51 and 100/164
[39] Ashby 1915: 54

(four on each side) of Coralline Limestone originally adorned the area. They seem to have had no base but rested on the shallow step between the portico and the impluvium which served as a plinth.

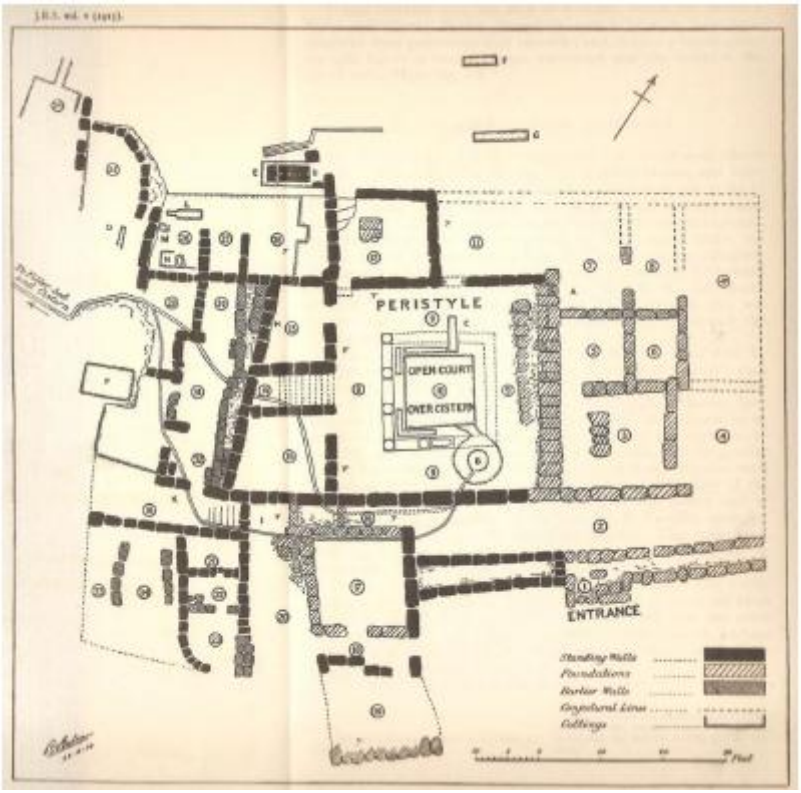


Figure 36. Ashby's plan of the villa at Ta' Kaċċatura (after Ashby 1915: 52)

Also of great importance for the local context is a small cistern cut below the peristyle. The importance of this cistern lies in the fact that it offers the only surviving roman concrete roof on the Island. This roof survives to such an extent that it still preserves the imprint of the reeds used as a shutter during the laying of this concrete.

Also visible around the site and possibly connected with it are a number of vine trenches as well as a classical tomb with two chambers. Unfortunately the latter seems to have been cleared decades ago and was already marked in the 1893 plans mentioned above.

The Roman villa site and tomb of Ta' Kaċċatura offers significantly different scenarios of deterioration due it its diverse and varied types of features and materials. All areas are currently suffering from different types of conservation issues most of which apparently connected with:
1 – large variations of temperatures between night and day
2 – natural processes of erosion through wetting and drying, winds and rain
3 – uncontrolled vegetation
4 – human interventions like rambling and goat rearing
All these have contributed to the bad state of preservation the site is at the moment. Apart from the same processes of deterioration mentioned above, the subterranean cisterns present on the site are also suffering from structural deterioration which is making these important features, highly unstable and in danger of collapsing.

2.7.1.7 Possible Tomb

Another possible tomb may be seen along the valley side half way between Ta' Kaċċatura and Borġ in-Nadur. Its original date of discovery is unknown, as is the number and shape of the chambers which are currently inaccessible do to rubble.

The tomb located between the Roman site of Ta' Kaċċatura and the Bronze Age site of Borġ in-Nadur is currently partially filled in with debris. An assessment of the tomb was thus made impossible.

2.7.1.1 Għar Dalam

A disturbed deposit in the site yielded archaeological material dating from the Early Neolithic, up to the modern day.[40] The earliest phase of human habitation in Malta has also been named after this period, with the Għar Dalam phase.[41]

2.7.2 Domestic Architectural Heritage

2.7.2.1 Id-Dar ta' Pultu

'Id-dar ta' Pultu', built by the Baron Ippolito Novantieri of Syracuse in 1664 (Buhagiar, p. 258) is often referred to as a 17th century country house. It lies to the west of the Roman ruins and is currently listed as a scheduled building. It is a two storey house with a cistern underneath its yard that was roofed by the use of six arches covered over with stone slabs 'xorok'. An archway forms the main door of the house. This leads into a wide corridor with two rooms on the right hand side and one room on the left, together with the main staircase leading to the roof of the first floor. Two further rooms are found on the second floor (D'Amato, 1998). The house has quite a simple street elevation yet it still has a noble characteristic thanks to its architectural composition, the arched doorway and the relatively plain rectangular windows situated at the ground floor and first floor (Buhagiar, p. 259). It is said that the house used to carry an inscription above the front door, which indicated that the house was built by the Baron Ippolito Novantieri in 1664. The inscription also read:

"Questa e la casa
Di Ippolito Novantieri
Che Fece Oggi Quel
Che Dovea Far Ieri"

Which in English translates to "This is the house of Ippolito Novanteri, who did today that which he should have done yesterday".

Upon the death of the Baron, his wife Cassandra Novantieri, left the house to their son Giovanni Battista. This house later passed under the ownership of various other family members but was subsequently sold to Luigi Mifsud in 1899 (Buhagiar, p. 260) until it ended up in the hands of Emanuel Mifsud who died in 1919. This house was left abandoned ever since (D'Amato, 1998).

The building is currently in a state of ruins. Most of its roofs have collapsed and if not taken care of imminently, a large percentage of the fabric shall be completely lost to the elements. This property is privately owned and it is very important to trace who the owners are and initiate discussions with them on the Park proposal.

[40] Trump 2008:57
[41] Trump 2008:10

Figure 37. Id-Dar ta' Pultu (Photo credit Ruben Abela)

Figure 38. Id-Dar ta' Pultu internal collapsed ceilings (Photo credit Ruben Abela)

2.7.2.2 Villas in St George's Bay

The inner part of St George's Bay is characterised by a number of sea-side villas dating back to the mid-19th Century, two of these also having their private chapel within their grounds. 'Palm Lodge', 'Pegasus' and 'Kalmera', include the built cluster between Triq iż-Żejtun and Triq Għar Dalam right behind the small sandy beach and including within their precinct the Chapel of St Joseph.

Another cluster made up of four villas is located on the opposite side of the road with Triq A. Maria Galea passing behind them, and behind the St George's Chapel there are three other villas which are also scheduled for their architectural value.

> These villas are privately owned and most of them are in a relatively good condition as they are inhabited. The proposal of a National Park can lead to the 'commercialisation' of these properties. If this is done care should be taken to respect their historic and architectural fabric.

2.7.3 Religious Architectural Heritage

2.7.3.1 Chapel of St Joseph

The chapel of St. Joseph is built in Neo-Gothic style and is located within the grounds of one of the private villas of the mid-19th Century found at St George's Bay.

Figure 39. Chapel of St Joseph and adjacent mid-19th Century villa (Photo credit Ruben Abela)

2.7.3.2 Chapel of St George

The Chapel dedicated to St. George which lies within the redoubt is found in close proximity to the Chapel of St Joseph, just across the road at the inner part of St. George's bay. St George's chapel has a long history, and is known to have been built in 1683 on the site of a previous chapel which was deconsecrated in 1659.

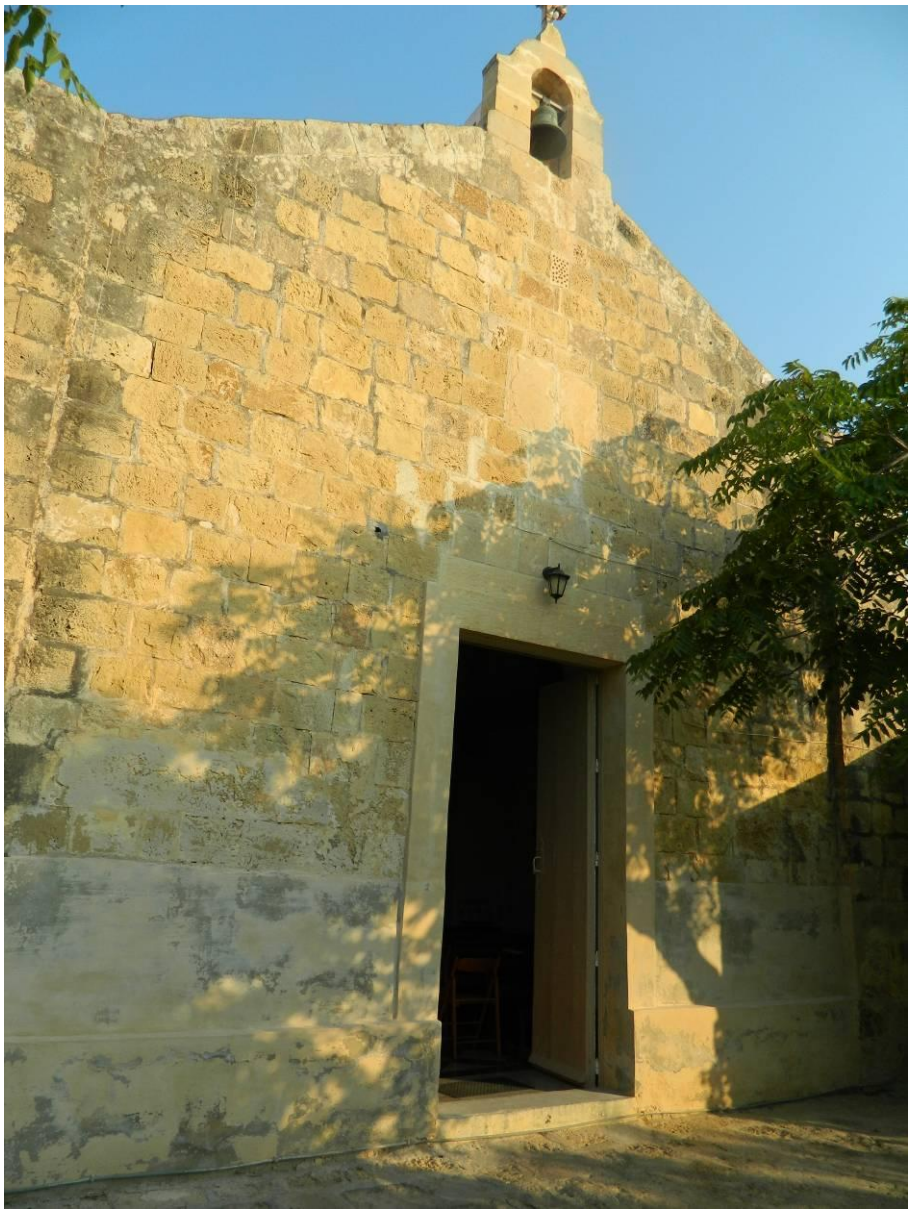


Figure 40. Main facade of St George's Chapel. (Photo credit Ruben Abela)

While St George's Chapel has been recently restored and is relatively in a very good condition, St Joseph Chapel needs urgent attention as its fabric is in a very bad condition.

2.7.4 Military Architectural Heritage

2.7.4.1 British military gun posts

The twentieth century saw the construction of a number of concrete field and coastal defences. Often referred to as pillboxes or gun posts, these took various shapes and sizes depending on their location. Some of these structures were also camouflaged to blend into their surroundings. A number of such

structures are present in the area. Unfortunately these have been vandalised and are in a general state of neglect.

The main issue with these structures is that although they are all government owned, the legal title of their occupants is not known, apart from the fact that they require urgent conservation.

2.7.4.2 Tower

A small tower is found right opposite Għar Dalam. Although this structure probably had a military purpose, it could also have been used as a private watch tower to guard property or crops.

Figure 41. The Military gunpost and tower across Wied Dalam (Photo credit Ruben Abela)

This tower lies on Government Property and requires conservation and restoration.

2.7.4.3 Redoubt

The Knights' system of coastal defences in the eighteenth century included the redoubt. These were intended to serve as infantry strongholds in the case of enemy troops landing on the coast. They were also meant to stop the enemy from establishing beach heads (Spiteri, 2001). St George's redoubt in Birzebbuga is inconspicuous and easily missed as it is surrounded by low walls and a landscaped area. It is in need of restoration and should be treated as an important link in the fortifications chain surrounding this part of the coast.

Figure 42. Coastal redoubt at St George's Bay (Photo credit Ruben Abela)

Although the redoubt was recently restored, it needs to be restored again. The public convenience which was built on the other side of the redoubt, and is now used as a bar/club, constitutes a visual eyesore in front of this military historic structure.

2.7.4.4 Fougasse

The fougasse can be described as a rock hewn stone firing cannon, introduced to Malta in the mid-1700s. These are found adjacent to other coastal defences such as the two found in Birżebbuġa.

Knowledge about such hidden features is scant, especially due to the fact that the two known fougasses in this area lie under private property and are thus not accessible.

2.7.5 Industrial Heritage

2.7.5.1 Wied Dalam Fuel Depot

Next to Għar Dalam one finds a large fuel depot which was built in the early 1950s and known as Wied Dalam Fuel Depot. This underground fuel depot forms part of a network of underground fuel storage which links the bunkering facilities found in Marsaxlokk Bay to Ħas-Saptan underground fuel tunnels and the airfield at Luqa. The system is also linked by means of a tunnel to Corradino.

This particular industrial heritage is linked to the Cold War era when the Western forces were preparing for an attack from the Eastern Block.

This is an important historical asset within the Park and measures should be taken to seek how best to integrate it within the visitor experience.

2.7.5.2 Pumping Station

Next to the entrance of the fuel depot, one finds an early 20th century building which was used as a pumping station. Although access to the building was not possible as it is in private hands. The pumping mechanisms are no longer present.

Figure 43. Pumping station at Wied Dalam (Photo credit Ruben Abela)

This could serve as another visitor attraction portraying the industrial heritage of the area.

2.7.6 Vernacular and Rural Heritage

2.7.6.1 Rural farm buildings

A number of vernacular buildings have been noticed within the area under study, some of which might even date to the 18th century and could have been used as small farmhouses or rural stores.

Figure 44. A recently restored and rehabilitated rural building (Photo credit Ruben Abela)

Within the rural landscape of the park one can notice a number of rural structures some of which are in ruins and others in dire need of restoration. These represent an important element of the rural heritage of the Park.

2.7.6.2 Apiary

A hut apiary, an uncommon vernacular structure is located to the north of Ta' Kaċċatura. Such apiaries were possibly introduced in the medieval period and remained in use until fairly recent times. This apiary consists of a rectangular room built of roughly squared stones and roofed with typical Maltese stone slabs (*xorok*). Its doorway originally stood in the south-eastern wall of the structure which is now partly collapsed. Two rows of two low, flat niches are built within the thickness of the south-western wall. These were meant to hold the beehives which were accessed by the bees through holes in the same wall.

The structure needs urgent conservation however one should decide whether it is best to preserve it as a ruin or perhaps restore the collapsed area, if enough information exists which could lead to its restoration.

Figure 45. General view of the apiary structure (Photo credit David Cardona)

Figure 46. Internal view of the partly collapsed apiary (Photo credit David Cadona)

2.7.6.3 Dry stone walls and other architectural features

The Park area proposed encompasses a number of parcelled fields. Some are still used for agriculture, while others have been abandoned. The rubble walls and *giren* dotting the landscape are mostly in a good state of preservation. It is interesting to note the planimetry and construction of some of these rubble 'huts' which differ from the typical *girna* found in the northern parts of Malta, as in they are more angular in shape and most often attached to one of the surrounding rubble boundary walls.

A plan of action should be formalised in order to restore the rubble walls and the *giren* within the Park.

Figure 47. The boundary wall surrounding the fields of ta' Pultu rural holding (Photo credit Ruben Abela)

Figure 48. One of the few structures similar to the traditional *girna* found within the Park (Photo credit Ruben Abela)

2.8 Natural Heritage

2.8.1 Ecological Processes

The area under study is considered to be one of the richest ecological systems in the Marsaxlokk Harbour Area. Figure 49 shows the terrestrial habitats around the two valleys of Wied Dalam and Wied Żembaq. However the ecology of the area is mainly dominated by rocky surfaces which in the past were covered with soil, but following the abandonment of agricultural activity, the area became desertified due to soil erosion. Thus the habitat of the garigue areas is still not as rich as in other garigue areas in the north-west of Malta.

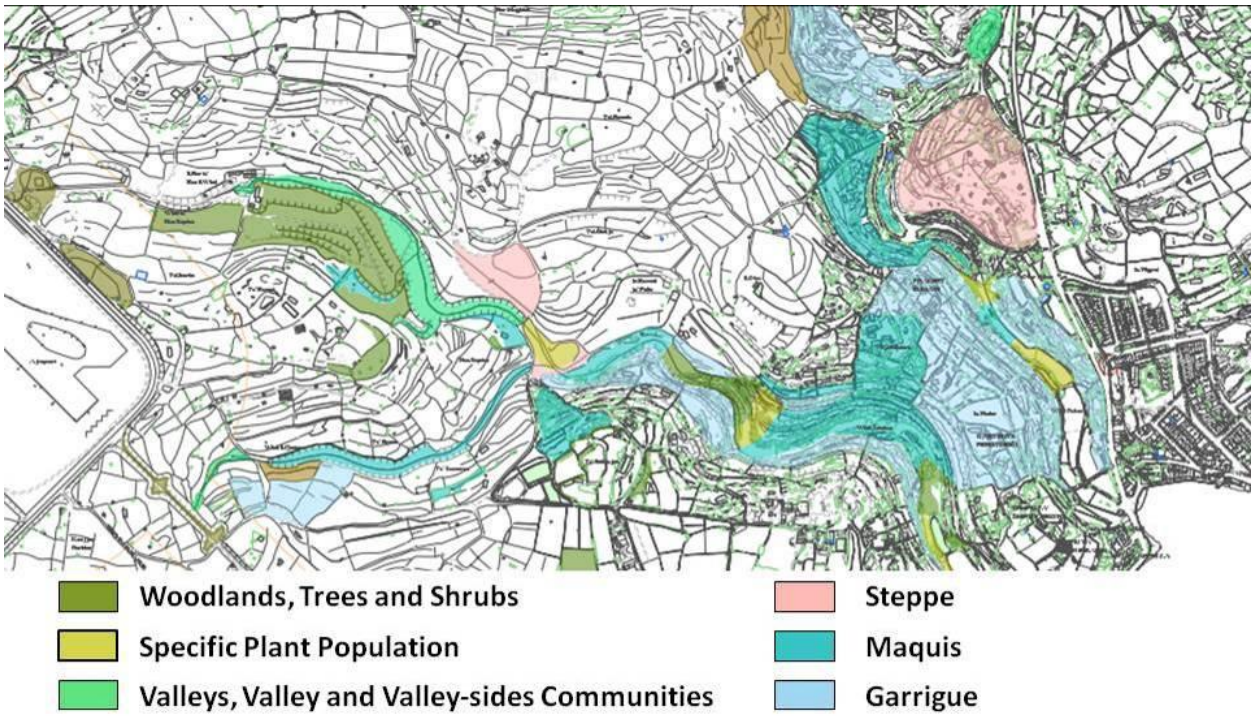


Figure 49. Terrestrial Habitat Map. Source: Planning Authority Mapserver 2016

2.8.1.1 Għar Dalam Garden

The area surrounding the cave has been planted as a garden consisting mostly of alien garden species. About ten years ago some indigenous trees were planted but none of the aliens were removed. There is now an ongoing project to replace the alien species with indigenous ones to create a Mediterranean habitat consisting mostly of maquis and garigue.

2.8.1.2 Agricultural Land

Several areas around the site consist of agricultural land that is still in production. Vegetation in these areas consists of plants typical of disturbed habitats as well as trees planted around the perimeter including prickly pear, carob, almond and fig trees.

2.8.1.3 Abandoned Fields

A large portion of the land consists of abandoned fields in various stages of succession. In some areas dumping has taken place in the abandoned fields, which have become ideal for opportunistic species, the most common being the tree mallow and the fennel.

2.8.1.4 Valley system

The area is dominated by two nearly parallel valleys: Wied Dalam and Wied Żembaq, with a strip of land in between. Much of the valley bottom is devoted to agriculture and most of the rest consists of abandoned fields dominated by stands of eucalyptus trees and vegetation typical of steppe or disturbed habitats.
Water flows through Għar Dalam Valley only after heavy rains. The flow is minimal as the catchment area has been reduced because of human interventions. Wied Żembaq is made up of a mixture of agricultural land, abandoned fields and eucalyptus groves. In the upper part of the valley one finds a fairly large grove of Syrian pear trees. Further north the valley is filled with rocks and debris dumped in the valley during the building of the Has Saptan fuel depot. Hundreds of olive trees were planted in the dumped material in the 1970s. The olive grove is popular with bird hunters and for recreation activities on weekends.

The part of Wied Dalam opposite Għar Dalam Cave is dominated by giant reed and bear's breach. Further down the valley the valley bottom consists of agricultural land. A boat yard, a car park and a road block the final part of the valley where it used to join the sea.

2.8.1.5 Flora

List of flora observed in May 2016 *

Scientific name	Maltese name	English	Comments
Cupressus sempervirens	Ċipress	Italian cypress	Alien – a few specimens in Għar Dalam Garden
Pinus halepensis	Siġra taż-żnuber	Aleppo pine	Indigenous – Several trees planted in Għar Dalam Garden
Tetraclinis articulata	Għargħar	Sandarac	Indigenous – Two trees planted in Għar Dalam Garden
Quercus ilex	Ballut	Evergreen oak	Indigenous – One tree planted in Għar Dalam Garden
Ficus carica	Siġra tat-tin	Fig tree	Indigenous – Growing in various parts of site
Nigella damascena	Sieq il-brimba	Love in a mist	Indigenous – Found growing in a trapping site
Laurus nobilis	Randa	Bay laurel	Indigenous – One tree planted in garden
Pyrus syriaca	Langasa tal-Lvant	Syrian pear	Probably archaeophyte – Rare. Several trees in the upper part of Wied Żembaq
Sedum sediformes	Sedum	Mediterranean stonecrop	Indigenous – frequent in rocky areas
Sedum caeruleum	Beżżul il-baqra	Blue stonecrop	Indigenous – grows in rocky areas
Ceratonia siliqua	Ħarruba	Carob tree	Archaeophyte – Very common throughout site
Cercis siliquastrum	Siġra ta' Ġuda	Juda's tree	Indigenous – two trees planted in Għar Dalam Garden
Agave americana	Sabbara tal-Amerika	American agave	Alien – Dense thicket in Għar Dalam garden
Agave sisalana	Sabbara ta' sisal	Blue agave	Alien – Growing in Għar Dalam garden
Oxalis pes-caprae	Ħaxixa Ngliża	Cape sorrel	Alien – Usually grows in profusion everywhere

Ruta chalepensis	Fejġel	Fringed rue	Indigenous – Single specimen planted in Għar Dalam Garden
Euphorbia dendroides	Tengħud tas-siġra	Tree spurge	Indigenous – Single specimen planted in Għar Dalam Garden
Euphorbia melitensis	Tengħud tax-xagħri	Maltese spurge	Indigenous – Single specimen planted in Għar Dalam Garden
Pistacia lentiscus	Deru	Lentisk	Indigenous – Planted in Għar Dalam Garden.
Rhamnus oleiodes	Żijju	Olive-leaved buckthorn	Indigenous – Frequent in maquis areas.
Rhamnus alaternus	Alaternu	Mediterranean buckthorn	Indigenous – Planted in Għar Dalam Garden
Lavatera arborea	Ħobbejża tas-siġra	Tree mallow	Indigenous – Common in abandoned fields.
Tamarisk sp.	Bruka	Tamarisk	One tree planted in Għar Dalam Garden
Myrtus comunis	Riħan	Myrtle	Indigenous – Three trees planted in Għar Dalam Garden
Punica granatum	Rummien	Pomegranate	Archaeophyte – Grows in several areas including Għar Dalam Garden
Opuntia ficus-indica	Bajtar tax-xewk	Prickly pear	Alien – Thick groves in fields and in the vicinity of cave
Prunus dulcis	Lewza	Almond	Archaeophyte – Small numbers found throughout site
Daucus carota subsp. carota	Zunnarija salvaġġa	Wild carrot	Indigenous – Grows throughout site
Acanthus mollis	Ħanewija	Bear's breach	Indigenous – Common in bottom of Wied Dalam
Capparis orientalis	Kappar	Caper bush	Indigenous – Common everywhere
Foeniculum vulgare	Bużbież	Fennel	Indigenous – Common in many areas
Smyrnium olusatrum	Karfus il-ħmir	Alexanders	Indigenous – Very common especially on disturbed habitats
Ecballium elaterium	Faqqus il-ħmir	Squirting cucumber	Indigenous – Common in disturbed habitats
Prasium majus	Te' Sqalli	White hedge nettle	Indigenous – Common on walls

Teucrium fruticans	Żebbuġija	Olive-leaved germander	Indigenous – Common in abandoned fields.
Antirrhinum siculum	Papoċċi bojod	Sicilian snapdragon	Indigenous – Very common
Antirrhinum tortuosum	Papoċċi roża	Greater snapdragon	Indigenous – Frequent in many places
Asphodelus aestivus	Berwieq	Summer asphodel	Indigenous – Main vegetation in areas grazed by goats.
Asparagus aphyllus	Spraġġ xewwieki	Mediterranean asparagus	Indigenous – Very common in rocky areas.
Erica multiflora	Erika	Mediterranean heath	Indigenous – Found mostly on one side of Wied Dalam
Anagallis arvensis	Ħarira kaħla/ħamra	Blue/Scarlet pimpernel	Indigenous – Found in Għar Dalam garden
Olea europea	Siġra taż-żebbug	Olive	Cultivated – In fields and Għar Dalam garden
Rosemarinus officinalis	Klin	Rosemary	Indigenous – Growing wild on sides of Wied Dalam and planted in Għar Dalam garden
Glebionis coronaria	Lellux	Crown daisy	Indigenous – few small plants noted in disturbed habitats
Smilax aspersa	Pajzana	Common smilax	Indigenous – Found climbing on carob trees in various areas.
Gynandriris sisyrinchium	Fjurdulis salvaġġa	Barbary nut iris	Indigenous – Growing along paths
Inula crithmoides	Xorbett	Golden samphire	Indigenous – grows in small numbers in abandoned fields
Jacobaea maritima	Kromb il-baħar isfar	Silvery ragwort	Sub-endemic – Found in various areas.
Atriplex halimus	Bjanka	Shrubby oracle	Indigenous – Probably planted in Għar Dalam Garden
Borago officinalis	Fidloqqom	Common borage	Indigenous – Grows in several parts of site
Bituminaria bituminosa	Silla tal-mogħoż	Pitch trefoil	Indigenous – Common in rocky areas.
Cheirolophus crassifolius	Widnet il-baħar	Maltese rock centaury	Indigenous – Two large specimens in Għar Dalam Garden
Cistus creticus	Ċistu roża	Hoary rock rose	Indigenous – Recently planted in Għar Dalam

			Garden
Cistus monspeliensis	Ċistu abjad	White rockrose	Indigenous – Recently planted in Għar Dalam Garden
Arundo donax	Qasab	Giant reed	Alien – Grows densely in parts of Wied Dalam
Eucalyptus sp	Ewkaliptu	Eucalyptus	Alien – Planted by hunters in many areas

* Winter 2015 – 2016 was the driest on record and many annual plants were not present.

Figure 50. Syrian Pear - *Pyrus syriaca* (Photo credit Ruben Abela)

Figure 51. Caper picking within the Park (Photo credit Ruben Abela)

2.8.2 Fauna

2.8.2.1 Arthropods

The arthropod fauna has been little studied and no list has been compiled of the species occurring in the area. The most notable species found on site is the Għar Dalam woodlouse (*Armadillidium ghardalamensis*) which is endemic to the cave. Għar Dalam cave has been designated as a Special Are of Conservation (SAC) within the European Union Natura 2000 Framework primarily because of the presence of this endemic species. The outer part of the cave hosts what is probably the largest breeding site in the Maltese islands of the hairy-footed flower bee (*Anthophora plumipes*).

The area surrounding Għar Dalam provides habitats for numerous species of insects. The most notable are the Swallowtail butterfly (*Papilio machaon melitensis*) which is an endemic subspecies and the Cleopatra (*Gonepteryx cleopatra*) which is restricted to areas with buckthorn shrubs.

Figure 52 - The Cleopatra - *Gonepteryx cleopatra* (Photo credit Paul Portelli)

2.8.2.2 Amphibian

The painted frog, which is the only amphibian indigenous to the Maltese islands, is regularly seen in various parts of the site.

Painted frog	Żrinġ	*Discoglossus pictus*

2.8.2.3 Reptiles

The area around Għar Dalam is rich in reptiles. The following species are present:

Moorish gecko	Wiżgħa tal-kampanja	*Tarentola mauritanica*
Mediterranean chameleon	Kamaleont	*Chamaeleo chamaleon*
Maltese wall lizard	Gremxula ta' Malta	*Podarcis filfolensis*
Ocellated skink	Xaħmet l-art	*Chalcides ocellatus*
Western whip snake	Serp iswed	*Coluber viridiflavus*
Leopard snake	Lifgħa	*Elaphe situla*

2.8.2.4 The avifauna

Four birds are regular breeders in the area. The spanish sparrow breeds in holes in buildings and in large bulky nests in trees. A small number breed in holes in the walls and ceiling of the first part of the cave. The sardinian warbler (*Sylvia melanocephala*) breeds in small bushes, the zitting cisticola (*Cisticola juncidis*) breeds in clumps of grasses, and the cetti's warbler (*Cettia cetti*) probably breeds in dense vegetation in Għar Dalam valley. The blue rock thrush (*Monticola solitarius)* is observed throughout autumn and winter. Although it has not been recorded breeding in the area, it would undoubtedly do so in one of the several abandoned buildings if it is not molested. The open rocky areas of the site are suitable breeding habitat for the spectacled warbler (*Sylvia conspicillata*), the short-toed lark (*Calandrella brachydactyla*) and the corn

bunting (*Emebriza calandra*), while areas with large trees can provide nesting sites for the collared dove (*Streptopelia decaocto*). The short eared owl (*Asio flammeus*), which in 2016 successfully bred on the island of Comino, is a potential breeder while the stone curlew (*Burhinus oedicnemus*) in the past used to breed in similar habitat as that found in the area.

The area is suitable for many of the wintering birds and many of them are regularly recorded. These include the white wagtail (*Motacilla alba*), skylark (*Alauda arvensis*), black redstart (*Phoenicurus ochruros*), stonechat (*Saxicola torquata*), robin (*Erithacus rubecula*), chiffchaff (*Phylloscopus collybita*) and starling (*Sturnus vulgaris*). The Kestrel (*Falco tinnunculus*) is occasionally seen hunting along the sides of Wied Dalam.

On migration any bird can be recorded. Of particular note is the fact that throughout the migration season birds of prey including honey buzzards (*Pernis apivorus)* and marsh harriers (*Circus aeruginosus*) are observed roosting on site.

Figure 53 - The Robin - *Erithacus rubecula* (Photo credit Paul Portelli)

2.8.2.5 Mammals

Vagrant hedgehog	Qanfud	*Erinaceus algirus*
Pygmy white-toothed shrew	Ġurdien geddumu twil	*Suncus etruscus*
Grey long-eared bat	Farfett il-lejl widnejh kbar	*Plecotus austriacus*
Lesser horseshoe bat		*Rhinolophus hipposideros*
Soprano pipistrelle		*Pipistrellus pygmaeus*
Kuhl's pipistrelle		*Pipistrellus kuhlii*
Maghrebian mouse-eared bat		*Myotis punicus*
Weasel	Ballottra	*Mustella nivalis*
Brown rat	Far tal-kampanja	*Rattus norvegicus*
Wild rabbit	Fenek Salvaġġ	*Oryclolagus cuniculus*

The lesser horseshoe bat is recorded as living in the dark parts of the cave. This is an Annex II species (Directive 92/43/EEC). The long-eared bat, which is an Annex IV species, is also present in small numbers in the cave. Three other species of bat are regular visitors to the area around the cave and observed feeding in the valley. The vagrant hedgehog, the pygmy white-toothed shrew, the weasel, brown rat and the wild rabbit are also present.

Figure 54 – The vagrant hedgehog - *Erinaceus algirus* (Photo credit Paul Portelli)

2.9 Land ownership and Management

2.9.1 Land Ownership

Figure 55 shows that most of the area under study is government property, with more than half of it administered by the Joint Office (hatched in green). A large area in the north of the site (hatched in red) is on a temporary emphyteusis up to 2069 and is currently being managed by ENEMED Company Ltd.

The grounds, museum and Għar Dalam cave (hatched in blue) were entrusted to Heritage Malta. The same agency is responsible for the management of Borġ in-Nadur temple. However the Roman Villa at Ta' Kaċċatura Villa and the Borġ in-Nadur Bronze Age village are yet not managed by Heritage Malta. The agency is interested in managing these sites and will act accordingly to present them as one consolidated attraction within the Park.

The areas hatched in yellow are Government owned properties which are not leased to third parties. The remaining land is under private ownership.

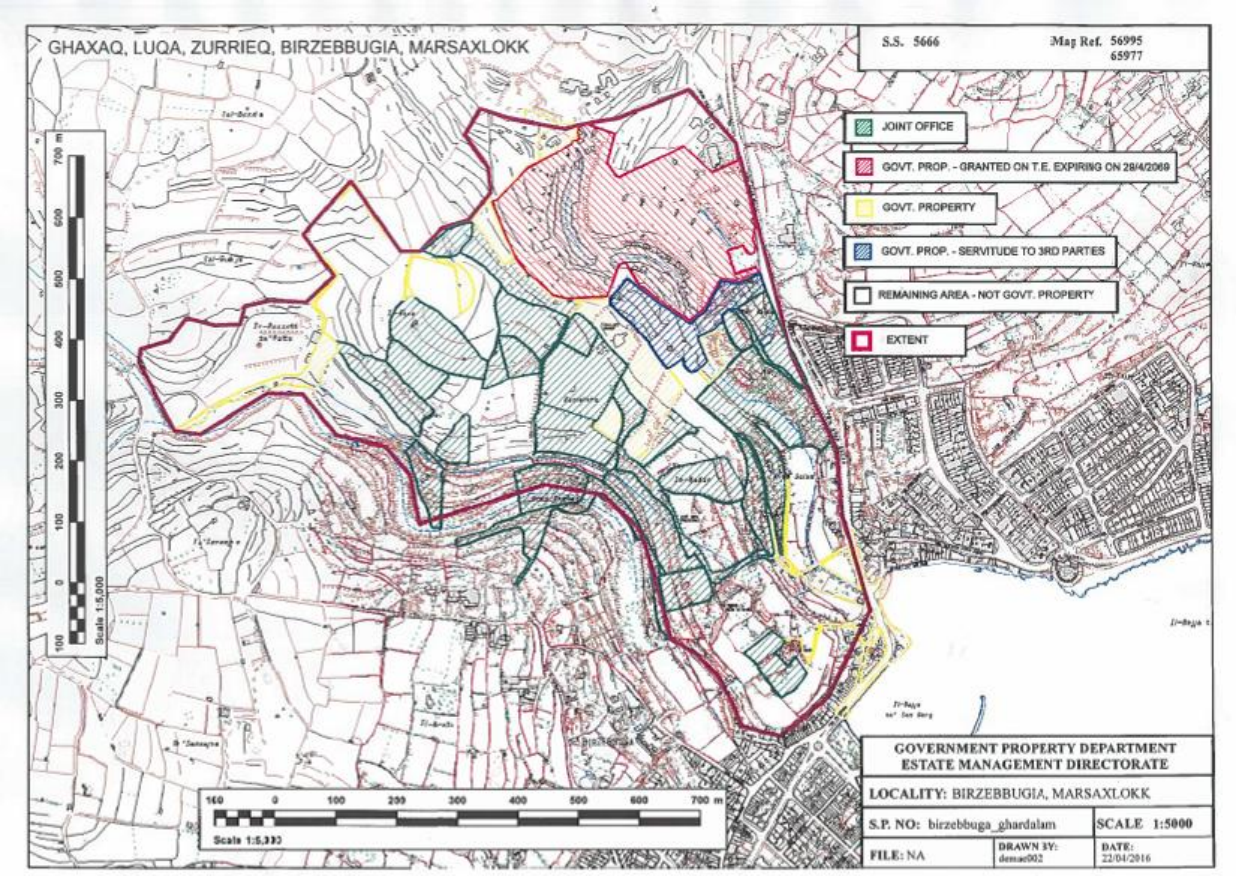


Figure 55 Government owned land. Source: Government Property Department, 2016.

2.9.2 Legal Rights

There are fuel pipelines passing through the valley bed of Wied Dalam which are used to transport aviation fuel from the fuel bunkering facilities in Marsaxlokk Harbour to the fuel storage facilities located at the northern end of the site. These are then connected to the airport fuel storage facilities through underground tunnels. The details on the legal rights or servitudes acquired through these passing pipelines are not known and fall beyond the remit of this study. It is being assumed that these will remain in their present location.

There are other legal rights which merit further investigation. These include a number of passage ways and country paths which connect a number of strategic sites within the area under study. Although some of these are shown as government owned in Figure 55, there are several others which are not included in this map. There are other paths which are physically clearly visible and identifiable on site, such as one leading to Ta' Kaċċatura, but seem to have been abandoned. Lack of use has resulted in their being blocked by trees and collapsed rubble walls.

2.9.3 Land Use

A basic land-use survey was carried out for the area under study. The area, particularly on the outcrop between the two valleys around ta' Kaċċatura, is mainly characterised by rocky land. A number of bird trapping sites were also noticed in this area.

An area of old quarrying has been noticed on the side of Wied Dalam along Triq Għar Dalam right opposite Triq iż-Żejtun. It is thought that these quarries were used to supply stone for the building of the 19th century villas across the road.

Agricultural land is mainly found on the north-west area of the site namely at il-Gisa and around ir-Razzett ta' Pultu. However there are some fields which are still being cultivated in the valley beds of both Wied Dalam and Wied Żembaq and in the south tip of the area around Borġ in-Nadur temple and Bronze Age Village.

Figure 56. Cultivation of agricultural land on archaeological sensitive areas (Photo credit Ruben Abela)

The only sites which are managed by Heritage Malta in the area are Għar Dalam cave and museum and the Borġ in-Nadur temple. All other archaeological sites and cultural assets are unmanaged. Although ir-Razzett ta' Pultu is abandoned and disused, its surrounding fields are cultivated and appear to be properly managed.

An important use within the area which takes up over 15% of the area under study, is the Wied Dalam Aviation Fuel depot managed by ENEMED and located on the northern side of Għar Dalam. This is an important fuel depot which connects to the fuel tanker bunkering facilities in Marsaxlokk Bay on one side and the other fuel depot also managed by ENEMED located at Ħas-Saptan, just outside the western boundary of the area under study. All the pipelines connecting these depots and the bunkering facilities pass through the area under study, most of which are surface-laid. Linked to the same use is a parking area at the lower part of Wied Dalam right opposite the small sandy beach of St George's Bay. Although this was intended for the parking of fuel bowsers, the area is currently being used as a land facility for boat storage and a public parking area.

A pumping station, leased to a private individual, is found at Triq Wied Ħas-Saptan adjacent to the entrance gate to the ENEMED Wied Dalam fuel depot.

A cluster of four villas are found at the northern tip of the study area, but the main residential uses are found along Triq Birżebbuġa at St George's Bay and on the opposite side of Triq Wied Dalam, the latter not falling within the area under study. Just opposite Għar Dalam Museum, there is a villa which is used as a wedding hall with its adjacent private car park.

A public parking area is located along Triq Wied Dalam, next to Għar Dalam museum. Triq Wied Dalam forms part of the arterial road system and passes along the eastern boundary of the study area.

Other land uses which are located beyond the area under study but which could have impact on the proposed Park include the Freeport, the Runway, a scrap-yard at Tal-Brolli overlooking Wied Żembaq, a fire-works factory just off Triq Ħas-Saptan, 31st March Fuel Depot and the commercial area along Triq Żarenu Dalli. One cannot ignore the active use of St George's Bay by small boat owners and the use of the small sandy beach for bathing during summer.

2.9.4 Land use permits and enforcements

2.9.4.1 Development permit applications

Since 1992, if one had to exclude development applications submitted on the residential buildings in the area, less than 40 development applications have been submitted in the area under study and its immediate vicinity. This data was gathered from the online information available on the Planning Authority website. Some of these were related to agriculture in terms of crop production and livestock farming, mainly for land reclamation, the development of reservoirs, storage rooms or building of dry stone walls. Other proposals were linked to the embellishment and road improvement works carried out in St George's Bay and along Triq Wied Dalam. There have been also a number of applications submitted on Għar Dalam Museum area and also on the adjacent fuel depot by the site operators, and an application for a fixed ice-cream kiosk and two other applications for bill-boards in front of the Għar Dalam Museum submitted by private operators.

There were no applications submitted or permits issued for major development proposals within the area under study; however a recent application was submitted by ENEMED at Ħas-Saptan just outside the boundary of the area under study, aimed at relocating the 31st March fuel depot.

2.9.4.2 Enforcement

According to information available on the Planning Authority website, there are a number of enforcement cases recorded within the area under study. One of largest areas affected by enforcement notices is the area around and incorporating Borġ in-Nadur. These include an enforcement notice which was issued in 1995 to stop the letting up of festa fireworks from the area, such practice has stopped and shifted outside the area under study. Another enforcement notice in this area was issued against illegal works carried out in relation to the past activities organized by Angelik Caruana at Borġ in-Nadur. Other enforcement notices issued in the Borġ in-Nadur area relate to illegal excavation works and structures.

Another major illegal development, which although located outside the Park area has a significant impact on the proposal, is a scrapyard located on the side of Wied Żembaq at tal-Brolli. Another illegal scrapyard on the other side of the study area, at Ix-Xerriek, has been recently removed following a direct action by the Planning Authority.

There are also a number of enforcement notices which have been issued against illegal reclamation of agricultural land on what used to be garigue land and also illegal dumping. These areas are concentrated at the upper parts of Wied Żembaq and Wied Dalam.

Figure 57. Illegal scrapyard seen from the Park (Photo credit Ruben Abela)

Figure 58. Illegal tipping on the western part of the Park (Photo credit Ruben Abela)

3 SWOT ANALYSIS

After gathering substantial knowledge about the Park and its surroundings, an analysis of strengths, weaknesses, opportunities and threats (SWOT) for the management of the site was carried out. The SWOT analysis was an appropriate guidance to develop the vision and identify the main objectives of the Park.

Table 6. SWOT analysis

STRENGHTS	WEAKNESSES
• Local plan identifies potential for Għar Dalam Park • Archaeological diversity • Għar Dalam Cave recognised as a Natura 2000 site • Substantial parts of the site are owned by the Government or Joint office • Limited agricultural activity • Site connectivity through transportation • Landscape value • Presence of interesting species • Concentration of scheduled sites • Proximity to commercial activity • Proximity to the sea • Military architecture features • Proximity to Marsaxlokk fishing village as a tourist attraction	• Environmental degradation and general neglect • Illegal development (structures, dumping, litter) • Lack of interest and appreciation by the community and users • Wide extent of site • Visual impact when looking outwards from the site (Freeport, scrap yards, fuel tankers) • Pockets of areas within the proposed boundary are privately owned • Squatters • ENEMED Station and Fuel pipelines • Site accessibility • Noise pollution due to proximity to arterial road and airport • Conservation condition of the sites and features • Need for a new infrastructure • Amount of resources required to manage site • Bird hunting and trapping • Years of neglect
OPPORTUNITIES	**THREATS**
• Improve sense of identity for local communities • Archaeological diversity • Għar Dalam Cave Natura 2000 site recognition • Għar Dalam Museum and visitors centre • Site location • Landscape value • Provide an edutainment opportunity to surrounding communities • Proximity to the sea • Rehabilitation of degraded site • Wied Dalam ENEMED fuel depot in the process of being decommissioned • Research opportunities • Education • Wide extent of site • Rambling • Cycling tracks • Abandoned fields • Niche tourism • Can form part of a network of attractions in south-east Malta • EU funding	• Illegal dumping and litter • Weak enforcement of legislation • Off-roading and scrambling • Squatters • Fireworks factories • ENEMED fuel depot and pipelines • Litter management attracting pests • Uncontrolled access • Invasive alien species • Negative public perceptions • Need for substantial financial and human resources

4 VISION

Although there are a number of protected areas in the Maltese Islands, these are protected for various reasons. Most of these have been legally protected for the importance of their habitats at a national level and some even for their importance at European or global level. Being a small island, human influence on the development of the natural landscape goes back even to pre-historic times. The Għar Dalam National Park incorporates one of the best examples in Malta where the topography and geology of the area itself lead to the area being used and developed since pre-history up to the post WWII period.

The Park is endowed with an array of cultural assets within a landscape which has been transformed through time due to its change in uses. The conglomeration of archaeological sites and features pertaining to different periods mellowed with military and vernacular structures pertaining to closer eras all gathered in such a relatively small area, makes this Park a unique attraction in south-east Malta.

A vision for the Park is being outlined. This takes into account national objectives and policy direction mainly evolving around the need for public enjoyment in rural open areas as an alternative to urban recreational areas and the need to increase continuous community involvement in appreciating natural and cultural heritage for our well being and long term sustainable development. This is the vision:

To promote and conserve the heritage value, to facilitate visitor access, education and interpretation and to facilitate the sustainable use of resources while encouraging research and maintaining the sense of peace and tranquillity of Għar Dalam National Park

The establishment of Għar Dalam National Park will provide another node attracting visitors to appreciate the cultural and natural assets found in south-east Malta in contrast to the impression and stigma on the region due to its association with industrial and polluted environment. The Park will also serve as an economic motivator for the region and it will create a positive social impact on the surrounding communities.

5 OBJECTIVES AND PRIORITY ACTIONS

5.1 Objectives of the Park

The following set of objectives has been drawn up for establishing and implementing the vision of the Park. These were based on the stock take and the SWOT analysis carried out in the first part of the process. The proposed objectives have been divided into five key sectors which are considered to be the fundamental aspects which are to be considered if the proposed Park is to succeed.

Recreation Objective: to provide opportunities for appropriate recreation and edutainment by capitalizing on the use of the existing cultural and natural heritage of the area.

Cultural and Natural Heritage Objective: to identify, document, protect and conserve the cultural and natural heritage assets within their landscape for their valuable reflection of the historical use and development of the area.

Interpretation Objective: to provide educational opportunities that promote knowledge, understanding and appreciation of natural and cultural values, environmental sensitivity and significance, and the associated conservation needs and how these are interlinked throughout space and time.

Management Objectives: to manage the public and private lands in the Park through partner collaboration and ongoing stakeholder and community involvement.

Economic Objective: to promote the Park as a node in south-east Malta as an affordable Eco-tourism destination acting as a catalyst to boost local existing businesses and initiatives

5.2 Priority Actions

			ST	MT	LT
1	1	Identify old tracks and paths within the Park to provide a link between cultural and natural assets		X	
	2	Study, design and implement a physical link across Wied Dalam	X		
	3	Promote country walking and cycling			X
	4	Identify spaces which can be used as rest areas		X	
	5	Identify ecological and cultural recreational activities and programmes		X	
	6	Liaise with relevant authorities for the monitored introduction of the concept of community archaeology in Malta through a pilot project within the Park.	X		
2	1	Carry out a full area topographic and archaeological field survey	X		
	2	Conduct remote sensing survey in selected areas	X		
	3	Plan and conduct archaeological investigations in selected areas	X		
	4	Carry out 3D modelling of all cultural and geological assets		X	
	5	Carry out condition assessment and conservation mapping of cultural assets	X		
	6	Geological analysis and surveys of the site	X		
	7	Hydrological studies of the area	X		
	8	Prepare a conservation management plan		X	
	9	Follow up the conservation order issued on Għar Dalam as a Natura 2000 site	X		
	10	Restore and conserve cultural assets		X	

	11	Create a controlled access to selected sites		X	
	12	Acquire selected privately owned cultural assets	X		
	13	Identify feasible uses to abandoned cultural assets		X	
	14	Restore rubble walls and historic paths			X
	16	Promote the conservation and restoration of scheduled private properties within the confines and in the vicinity of the Park			X
	17	Carry out thorough ecological studies for the area	X		
	18	Implement restoration of habitats as identified in the ecological studies		X	
	19	Schedule and protect any identified natural habitats and features	X		
	20	Promote traditional sustainable agricultural practices in existing cultivated land			X
	21	Promote the improvement and restoration of degraded landscapes			X
	22	Manage and possibly remove illegal tipping			X
3	1	Design and implement heritage trails		X	
	2	Introduce directional signage and interpretation facilities		X	
	3	Make use of multimedia tools to increase accessibility		X	
	4	Provide access to all, where physically possible		X	
	5	Create multiple information platforms to promote educational and intellectual accessibility		X	
	6	Co-operate with local and national NGOs	X		
	7	Investigate how young people could be trained in skills required for the Park	X		
	8	Promote research and educational programmes for diverse audiences	X		
4	1	Identify funding programmes	X		
	2	Create co-operation platforms and programmes with all stakeholders	X		
	3	Identify management partners	X		
	4	Prepare management plan	X		
	5	Provide the required personnel for management and guardianship		X	
5	1	Promote public-private partnership programmes which are in line with the aims of the Park		X	
	2	Enhance complimentary economic activities within and around the Park			X
	3	Assist farmers in promoting their products cultivated within the Park			X
	4	Promote the ecotourism niche to complement initiatives within the Park and its environs		X	
	5	Encourage the formation of community enterprises and co-operatives within the local community		X	
	6	Encourage the use of green infrastructure		X	
	7	Develop a scheme for potential corporate social responsibility projects to be implemented by the wider business community.	X		
	8	Support pilot projects that encourage eco-effective entrepreneurship		X	

6 RECOMMENDATIONS AND WAY FORWARD

This final section presents the next steps towards establishing Għar Dalam National Park and its management. In order of priority, the sequence enables a course of action that will see successive tangible results.

6.1 Recommendations

6.1.1 Park Boundary

The boundary proposed in the Marsaxlokk Bay Local Plan was taken as a study baseline but after carrying out the above desk-studies and surveying the area, it was considered important to encompass highly important cultural and natural assets which were not included in the boundary proposed through the local plan. Moreover, the original idea of the Park was that of a Heritage Park. Following these studies, it was found that most of the sites included in the Park are of national importance and that it was more appropriate to designate the Park with a national status.

The proposed Park will have an area of approximately 0.62km^2 / 620,000m^2. This will include the stretch of buildings along the coastline of St George's Bay just beneath Borġ in-Nadur, the chapel and redoubt of St George, the villa and its neo-gothic chapel and Għar il-Friefet further up Triq Għar Dalam. The western boundary will end just next to Ħas-Saptan Fuel Depot.

Figure 59. Għar Dalam National Park proposed boundary

6.1.2 Management of the Park

Heritage Malta cannot take the full management of the proposed Park as there are actions identified which are beyond its legal remit but which could however be followed up through a special management system which could include other national agencies. The setup of a national agency responsible for the management of this Park and others could be a plausible solution. Heritage Malta, while taking responsibility of the sites already entrusted to it (Għar Dalam and Borġ in-Nadur Temple) and others which it will seek to be entrusted with (Ta' Kaċċatura, the Bronze Age Village of Borġ in-Nadur, and the pathways linking them directly), would be ready to collaborate fully with the agency responsible for the management of the Park and be an active part of the Għar Dalam National Park Governance Body. It is also considered very important that the surrounding communities will be engaged in the development of this Park.

6.1.3 Legal notice

The declaration of the Għar Dalam National Park requires legal backing. It is recommended that a Legal Notice is issued under the relevant Act that declares the status of the Park and defines its boundary, vision, objectives and governance.

6.1.4 The preparation of the management plan and its funding

The next action being recommended is the drawing up of a Management Plan, guided by the Vision, Objectives and Priority Actions outlined in this Brief. It will determine timelines and propose a business plan for at least 3 years, highlighting the resources required, particularly funding. The Management Plan shall be reviewed periodically.

While it should be the remit of the agency responsible for the management of the Park to seek potential external funding to finance the preparation of the Management Plan for the Park, Heritage Malta can start planning and eventually implementing the short-term actions identified which specifically relate directly to cultural sites which already fall within its responsibility. However the latter should be done in line with this Management Plan Brief.

6.2 Conclusion

Once this Management Plan Brief is finalised internally and endorsed by Heritage Malta Board, it should be presented to the government through the Ministry of Justice, Culture and Local Government. It is recommended that the final brief be concluded after a public consultation process.

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