

Management Plan for Majjiesa Area
- compiled for The Gaia Foundation

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July, 2000

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1.0 Executive Summary

This document is an overview of the actions that will be administered by the Gaia Foundation in order to preserve and maintain areas of ecological importance in Majjiesa. Majjiesa is mapped out according to its ecological protection levels (1-4) as well as its designated land use.

These ecological protection levels dictate the amount of ecological attention allotted for the divided land. Along with this information the Majjiesa site is also divided into government-leased land and private land. It is imperative that the government-leased land be properly utilized as the government has issued in order to ensure ecological integrity. The blue clay slopes are also of ecological importance.

The Foundation's actions to these environmental concerns are listed in section 3 under the First-Intervention and Rights to Access. Some of the key steps are designing footpaths and constructing fences that will protect the areas of ecological importance by minimizing the exposure to humans. The goal of the Foundation is not to eliminate the human contact to these areas of ecological importance but to integrate environmental awareness and safety with the consideration to public use and appreciation.

The Gaia Foundation is presently managing the adjoining site at Ghajn Tuffieha following a management agreement in 1996 with the Environment Protection Department as part of a strategy for the integrated management of specially protected coastal areas. An upgrading of the project to include the area around Ramla Bay in Gozo was made possible when the Foundation teamed up with the Euro-Mediterranean Centre on Insular Coastal Dynamics (IcoD) of The Foundation for International Studies, to submit an project application for EU funding under the LIFE financial instrument. This had the support of the Ministry for Environment and was accepted by LIFE. This project commenced in February, 2000.

The LIFE Project has made it possible to extend the management of the Ghajn Tuffieha area to cover the area known as Rđum Majjiesa. This is bordering Ghajn Tuffieha, and could take advantage of the several projects that are already being carried out there by the Gaia Foundation, namely:

1. Project Olympus: Coastal conservation
2. Project Elysium: Biodiversity
3. Project Phoenix: Waste Management
4. Project Persephone: Sustainable Agriculture
5. Project Athene: Agroforestry
6. Project Odysseus: Nature Trails and Eco Tourism
7. Project Poseidon: Marine Conservation and Safety
8. Project Pegasus: Aerial Surveys and Monitoring.
9. Project Dyonisius: Beach Management.
- 10 Project Hermes: Education, Information and Awareness.
- 11.Project Apollo: Visitor Centres.
- 12.Project Galatea: Restoration.

Although not all projects might be applicable to Majjiesa, an integrated approach to coastal management requires and interconnection and interrelation between each and every one. The economy of scales also permits the use of the Foundation's resources for the subject area. These include trained and experienced environmental wardens, equipment and trees and shrubs propagated at the Foundation's Elysium Nursery at Ghajn Tuffieha.

A photogrammetric aerial survey has already been prepared for the site. This forms part of a larger project currently being carried out by IcoD, and will be to compare the progress of the Majjiesa site in years to come.

An Ecological Survey of the Blue Clay slopes and Boulder Scree of Majjiesa has also been completed. Details of this are set out below.

A Biodiversity is also being commissioned for the garrigue area around the Majjiesa Peninsula. This would form a basis for the first garrigue rehabilitation and nourishment on the Maltese Islands.

A Sustainable Agriculture (known as Permaculture) report has also been commissioned, as part of Project Persephone, for an area at Ghajn Tuffieha. Since the Majjiesa area is one of the only places left where the farmers adopt traditional farming techniques, this report could prove very helpful in augmenting these methods and maintaining the area as a showcase for Permaculture in Malta.

2.0 Mission Statement

The Rdum Il-Majjiesa Project is the third project manifesting the Gaia Foundation's main purpose. The main objective of the Foundation is this:

To promote and implement means through which human beings can meaningfully interact with their environment in an integrated and holistic manner

This management plan has built on the projects of Ghajn Tuffieha and Ramla Bay. Protection, understanding and integration denote the intention and underlying thrust behind the Foundation's work.

The intention of the Foundation is to protect and manage Majjiesa as a habitat. This is the only sure way of protecting the individual species while retaining the integrity of the bio community. This is in accordance with Environmental Protection Act of 1991, the Development Planning Act of 1992, and international regulations. It is clear that habitats have a greater value than simply the sum of their collective species.

3.0 Site Description and Plan Summary

3.1 Site Description

Rdum Il-Majjiesa is an area of particular beauty because it has remained relatively untouched by humans. Visitors do pass through the area, but luckily, heavy traffic, human and vehicular, is not a large problem here, so much of the natural beauty of the site has remained intact. The main goal of this management plan is to ensure that it remains whole. Agricultural land found on the site is completely organic and therefore beneficial to the environment at Majjiesa. Managers will work side by side with the farmers to continue a healthy propagation of the land and proper management of the rest of the site. In accordance with the integrative coastal management model, the priority here is to protect the site and therefore human activity must be channeled and controlled without being unnecessarily inhibited.

The vision that the Gaia Foundation has for Majjiesa is a place where one can enjoy the rugged beauty of Malta's coastal region while remaining aware of its fragile environmental balance. It is a perfect venue for outdoor walks. Such recreational activities provide an excellent opportunity for the general public to experience a location where persons can enjoy an outdoor activity with full respect for the environment. The natural beauty of Majjiesa attracts about fifty visitors a weekend during the high season. The Foundation in no way wishes to prohibit the public from the site, however it also does not plan on developing Majjiesa as a major coastal attraction. The ecological aspects that set Majjiesa apart from other Maltese shores include rare plant species and an uncommon example of organic farming and make it a perfect site for ecology-minded patrons. In order to take advantage of this opportunity, educational signs and interactive mapping routes are being designed for walks through the site. These exercises will continue to provide the Majjiesa visitor with recreation and an additional environmental lesson provided by the Gaia Foundation.

The Foundation has in the past months been primarily engaged in the establishing of contact, developing ideas and planning the work to be done with organisations and persons considered as the main players in this project. These include:

- Environment Protection Dept.
- Planning Authority
- Department of Agriculture
- Euro-Mediterranean Centre on Insular Coastal Dynamics
- Local Councils
- Farmers working the land

This management plan is a comprehensive document addressing the project from as many angles as possible. The reason for this is twofold: firstly, only a holistic approach could hope to provide a solution for a site such as Majjiesa with such a variety of factors affecting its environment; secondly, it is expected that this plan will form part of a guide for the protection of similar sites in the Maltese Islands.

It is imperative that the Majjiesa Management Plan retains a dynamic approach to preserving and conserving coastal areas. This particular site is of unquestionable value to the Maltese Islands. Majjiesa contains several rare species, including one species that was previously thought to be extinct. Like the environment, this management plan is constantly evolving to adapt to new site discoveries as well as government protection level adjustments. It provides a basic framework. It will be subject to amendments and enhancements as the site manager becomes more involved and experienced with the Majjiesa site.

Rdum il-Majjiesa extends along the cliff base, just behind the Golden Sands Hotel in the south (at il-Minzel ta-Majjiesa). Majjiesa is located inside the boundaries of Mellieha and to the west of Manikata. The entire site is between 1.5 and 2 kilometres in length. The height of the Majjiesa site ranges from sea level to 55 m.. The coastline is composed of boulder scree, a common occurrence on this part of the island. A layer of Upper Corraline Limestone overlies the Blue Clay. The movements of the blue clay cause the limestone to collapse, thus producing the massive boulder network found on the Mediterranean coastline.

An Ecological study of this site was conducted by Eman Calleja BSc, DSPU (Env. Rest.), MSc and Viktoria Gaydarova Calleja MSc (For.), DSPU (Env. Mangt.), MSc (Ecol. & Env. Prot.), in May of 2000. The study is entitled *A Vegetation Survey of the Rdum Il-Majjiesa Area Prepared for the Gaia Foundation* and was used extensively as a reference for this management plan. The Vegetation Survey divided the site into four sectors according to habitats, clay slopes, scree, human induced habitats and watercourses.

3.2 Plan Summary

The main objectives that the Foundation is looking to fulfill through the development of this management plan are the following:

- | | |
|--|--|
| □ Project Olympus – Coastal Conservation – | Blue clay Slopes
Garrigue
Beach Coves
Water Courses
Boulder Scree – Maquis |
| □ Project Persephone – Sustainable Agriculture | Guidelines & Expertise to
Farmers |

- Project Elysium – Providing indigenous plants to augment the coastal Conservation.
- Project Odysseus – maintain the site for controlled eco tourism.
- Project Hermes – An Educational Showpiece for School Trips.
- Project Gaia - A model to form part of a growing coastal area management exercise.

3.2.1 First Intervention Measures and Rights of Access

The urgent measures that need to be taken right away include access points, waste removal, blue clay slope restoration, exotic plant removal, encouragement of permaculture and apiculture and finally the prevention of boat and cave house use. All of these are the most pressing problems facing Majjiesa. Once these issues are dealt with, the management of Majjiesa will be a simpler task.

3.2.2 Wardens and Regulations

It is necessary to engage environmental wardens at Majjiesa so that the day to day tasks can be carried out. Their responsibilities will include patrolling the site, overseeing waste management, working on conservation of habitats, and acting as a liaison with the farmers. Another important job of the Wardens will be to act as an education medium for visitors to the site so that the public can gain a full appreciation of the rare ecological importance of Majjiesa.

3.2.3 Photogrammetric Survey

The Gaia Foundation purchased a copy of photogrammetric survey commissioned by the Euro Mediterranean Centre for Coastal Dynamics pertaining to digitally processed aerial photographs of the Majjiesa site. These photographs show all the major geological, agricultural, and ecological aspects of the site. They will be used as a tool for the monitoring of the site as well as a measure of progress made as more management goals are met. In keeping with the integrative coastal management model, a copy of these photos can be made available to the farmers working the land at Majjiesa to give them an appreciation of their important role in the protection of the site.

3.2.4 Existing Structures

There are few existing structures in the Majjiesa site, namely 4 boathouses in one of the coves, a cave houses, which is a hole hewn in the rock and covered by a door, situated just above the same cove that contains the boathouses, and hunting/trapping shelters on the ridge. A management presence on site will assist the monitoring to prevent any illegal development. The said cave dwelling is not covered by any permit. Another attempt to commence works on a second cave dwelling just next to the existing one was brought to a timely end in May, 1999, when the Gaia Foundation alerted the Planning Authority, who issued a stop notice.

3.2.5 Footpaths

There is a main road that will be used as the Majjiesa footpath. The road will be fenced off to automobiles, since this is not a public road. According to the offroading law, only service and agricultural vehicles are permitted. The path will remain accessible to trekkers and visitors who can enjoy the site without disturbing the natural habitat.

3.2.6 Education

Another primary objective in addition to protecting and preserving Majjiesa is to educate the general public on the importance of the site and spread ecological awareness. Informative unobtrusive ecological signs may be posted all along the site and its footpath. These signs serve a dual purpose: to direct the visitors and to educate them. Appendix II is a suggested format for the educational signs. Majjiesa will not have an information center in its site. However, it is recommended to reserve a place for a display about Majjiesa in the Ghajn Tuffieha information centre. The display should include aerial photography and a list of the flora and fauna, as well as a small map of the site.

The management plan, surveys and general information can be posted in the Foundation's website, gaiamalta.org. and designed in such a way to make it easily accessible to students and site visitors alike.

3.2.7 Geology and Geomorphology

A major aspect of the geology of Rđum il-Majjiesa consists of coastal boulder scree. This scree has an Upper Corraline Limestone layer overlying blue clay. The mobile blue clay shifting and causing the limestone layer to collapse creates the boulder network found beneath the cliff. Boulders are formed from the collapsed layer and create scree as they move down the cliff. Clay slopes are also a main geological feature of the site, composing 35% of Majjiesa's surface area. The Southeast corner of the site contains the

largest stretch of clay slope. Boulder scree covers a little less than half of the coastline. The scree is very narrow on the south side of the site, while on the west part of the peninsula the scree extends into the sea and forms one of the best preserved scree habitats in all the Maltese Islands. (Details taken from the ecological survey Calleja et al 1999 and personal consultation Dr. Saviour Scerri PhD. (Giol. Milano).

3.2.8 Hydrology

There are several springs forming watercourses throughout the site. The main source is a perched aquifer in the cliffs. The watercourses are relatively undisturbed and no human intervention is necessary besides the conservation and protection of these habitats.

3.2.9 Ecology

An ecological survey was commissioned by the Gaia Foundation for the Majjiesa site in May 2000. The authors of this survey are Eman Calleja MSc and Viktoria Gaydarova Calleja MSc. The survey describes the site area through a map of habitats and discussions on the various plant communities found. The survey also provides recommendations for the management of the site, recommendations for the protection of the area, and a list of species encountered.

The area consists mainly of clay slopes and screes. The clay slopes constitute approximately 35% of the area and are mainly dominated by steppic communities. Since parts of the clay slopes are relatively bare of vegetation and have a greater chance of erosion, recommendations have been made to preserve them. The scree on the southern slope consists mainly of high garigue and low maquis. The scree on the western slope is highly inaccessible and is the most preserved area on the site. Because it has been relatively undisturbed, vegetation is at its highest here. The screes on the northern slope were historically used as agricultural land and are still being used in some sections today. The cliffs have a perched aquifer forming semi-permanent springs supporting a variety of vegetation.

Ecological recommendations mainly include those for protection and conservation of the area. It is recommended that wattle fences and crib walls be integrated with the clay slopes to prevent erosion. The screes in the area do not need intervention except to restrict access to a few footpaths. The human induced habitats and farming are encouraged to continue organic methods and to further develop permaculture practices to treat the land as a whole, not only as a crop producing entity.

4.0 First Intervention Measures and Rights of Access

4.1 First Intervention Measures

The first intervention measures of the site include the control of access points, removal of rubbish, protection of clay slopes, exotic plant removal, and the encouragement of the use of permaculture and apiculture in agricultural land.

First Year Intervention Measures for Protection and Conservation of Majjiesa

Screens

- Restrict footpaths
- Place educational signs along footpaths and points of ecological importance.
- Maintain agriculture by introducing permaculture and apiculture practices into human induced habitats
- Remove rubbish, clean up dump sites, and place trash bins in easily accessible places to empty
- Restrict access to offroaders by placing a gate at the entrance of the road

Clay Slopes

- Build Live Wooden Cribwalls at the base of slopes that meet the sea¹
- Build Wattle Fences to keep the rest of the clay slopes together²

4.1.1 Access

One of the most urgent intervention measures is controlling access to the site. The persons and vehicles having access to the site today can be split between those who gain access to partake in activities that are not harmful to the ecosystem and those that have actively contributed to the degradation of Majjiesa. Examples of this are shown on the chart below.

Table 1. Examples of Acceptable and Unacceptable Access

Acceptable	Unacceptable
<input type="checkbox"/> Farmers (if no more encroachment occurs) <input type="checkbox"/> Maintenance of Site <input type="checkbox"/> Hikers (when remaining on designated paths) <input type="checkbox"/> Ambulance and Fire Brigade <input type="checkbox"/> Cleaning- removal of waste	<input type="checkbox"/> Motorcycles/ Cars- offroading <input type="checkbox"/> Mountain Bikes beyond the path – offroading <input type="checkbox"/> Four wheel drive vehicles- offroading <input type="checkbox"/> Hikers (when not on designated paths) <input type="checkbox"/> Visitors that partake in camping, barbeques and fires

¹ See page 15 in ecological survey for diagram and instructions

² See page 17 in ecological survey for diagram and instructions

4.1.2 Removal of Rubbish

Another means of intervention is the removal of rubbish from various areas in the site. The most disturbed area is located at the northern side of the peninsula near the boathouses where there are domestic dumpsites. The cleaning of these areas is essential for the proper maintenance of the site. Hunters in the area will also be advised to clean up their gun shells and deposit them in trash barrels set up around the hunting area.

4.1.3 Restoration of Blue Clay Slopes

There are several degraded blue clay slopes that are eroding at a fast rate. Erosion is caused by an increase of tension. An increase in tension can be caused by natural causes, such as the sea, wind and rain. The trampling of vehicles, people and animals can also cause the clay slope to degrade. In order to stabilize the clay slopes, it has been recommended by the Calleja and Calleja Vegetation Survey, to use a Live Wooden Cribwall to provide support at the base of the cliff, and a Wattle Fence that will hold the rest of the slope together (see Annex).

4.1.4 Exotic Plant Removal

Many exotic plants have a harmful effect on the native Maltese ecosystems. Any exotic plants located on site should be removed immediately. Plants such as *Acacia*, *Agave americana* and *Opuntia ficus-indick*, are examples of exotic plants on site that should be removed immediately. *Agave americana* and *Acacia* are two of the most problematic exotics on site because they grow and spread very quickly. The removal of these plants should be done slowly as to avoid erosion.

4.1.5 Encouraging the Use of Permaculture and Apiculture in Agricultural Land

The use of Permaculture and Apiculture should be recommended to the farmers. Permaculture is an ideology of sustainable agriculture treating the environment as a whole, not just as one crop producing entity. The bees aid in pollination of crops, which helps yield a larger crop. The bees produce honey that can be sold by the farmers, which increases products, while at the same time providing a habitat for bees.

4.1.6 Prohibited Use and Construction of Boat and Cave Houses

The boat and cave houses are located at the northern side of the peninsula. These houses were illegally built as temporary housing for vacations. It is recommended that any future construction be prevented. The owners of these building should also be educated on the value of the land that these houses are found on so that they have an increased appreciation of the efforts of the site managers.

4.2 Access Points

There are two means of access to the site. The main entrance is a small cement road located on the South side at il Minzel tal-Majjiesa. The other access point is a stone

staircase located on the North side. The farmers prohibit entry of vehicles and pedestrians to control access to the South side. There are currently no restraints on access at the North side.

4.3 Access Control

Access of unauthorized vehicles to the South side will be inhibited by the installation of a gate. The gate will have an open area that will allow access to pedestrians and bicycles. There is government land that is under an agricultural lease directly North of the entrance. The farmers working on the land, the warden, and any other persons granted access to the land would receive a key to the gate. If this gate is left open continuously, or proper responsibility is not used with regards to gate access, then the site manager withholds the option to deny rights of access through the direction of the warden posted at Majjiesa.

4.4 Property Rights

The land, buildings, and agricultural leases are as following:

Land or Building

- Small hut- located near the South entrance
- Cave houses- located at far North side
- Boat houses- located at far North side

Agricultural Leases

- Agricultural Land- area north of entrance

The employment of Wardens and the establishment of site regulations are crucial for the success of the management plan. There is no way the site managers can be successful in their endeavors unless the Planning Authority issues a conservation order with site specific regulations. The site manager will keep the landowners informed of the management of the public site and any pertaining regulations.

5.0 Wardens and Regulations

The presence of Environmental Wardens is essential to enforce the regulations through government law enforcement agencies.

5.1 Wardens

The Wardens that will patrol Majjiesa will be the same as those employed at Ghajn Tuffieha because of the close proximity of the two sites. The Wardens shall wear a uniform in summer that consists of a cap, shorts, a polo shirt and joggers. The polo shirt and cap carry the Gaia Foundation logo. The winter uniform consists of a cap, jeans, sweatshirt, an anorak and joggers. The cap, sweatshirt and anorak will also carry the Gaia Foundation logo. The Wardens are to attend first aid, rescue, and life saving courses as well as environment related courses.

The tasks to be carried out during the shift are:

- ❑ Patrol the entire site regularly to enforce regulations
 - ❑ Prevent vandalism, stealing of crops, offroading and bar-b-cues
 - ❑ Oversee proper waste management
- ❑ Act as a liaison with farmers accessing the cultivated land
- ❑ Guide the flow of human activity along footpaths and away from sensitive areas
- ❑ Act as a medium of education to the general public about the effort being carried out at Majjiesa and on environmental matters generally.
- ❑ Control access into the site by motorized boats and jet skis
- ❑ Assist in clean-up activities
- ❑ Prevent further encroachment on government leased land
- ❑ Ensure proper use, defined by the government, of the government leased land
- ❑ Carry out maintenance work

Special attention should be given to the following:

1. Prevention of the picking of flora and the removal of sand or clay
2. Preventing pilfering and stealing of trees and crops from the agricultural land
3. Prosecution of vandalism of the site
4. Enforcement of fire safety measures
5. Elimination of offroading, camping and bar-b-cues
6. Ensuring traffic stays on designated paths

In order to ensure the best protection for the site, a site specific conservation order should be set in place by the Planning Authority.

5.2 Site Regulations

Site regulations are imperative to the management of Majjiesa. These are the regulations that justify the management plan's actions and scheduling of the site.

5.2.1 Structure Plan Policy RCO 10

Majjiesa is defined as an Area of Ecological Importance. This is defined by Policy RCO 10 because of the presence of permanent springs, natural freshwater pools, coastal cliffs and the garigue, maquis and watercourse habitats found there. An essential part of the management of the site is to be devoted to preserving and conserving the coastline in accordance with this law.

5.2.2 Structure Plan Policy RCO 12

The Foundation is recommending detailed site regulations that stem from its interpretation of the Structure Plan Policy RCO 12. Clause 9.3 in the section on conservation profiles adequately divides the protected zone between levels 1 to 4.

RCO 12 states that in local plans, the Planning Authority will give protection ratings to Areas of Ecological Importance (AEI) and Sites of Scientific Importance (SSI) as follows:

Under this policy there is a general presumption against the following:

- Development
- Activities likely to be a fire risk
- Noxious emissions nearby AEI and SSI

Also

- Intrusive elements should be removed
- Buffer zones should be included to further protection

RCO 12 provides for 4 levels of protection and the following is a brief explanation of each and the recommended regulations for the areas falling under each level.

5.2.3 Structure Plan Policies

Policy RCO 8 states in Rural Conservation Areas, individual cultivators will be required to illustrate to the Planning Authority how any planned agricultural development will not harm the ecological, archeological, and scenic value of the Area.

This two law is applied to any further and current standing agriculture developments that will hinder the ecological value of the rare plant life, clay slopes, boulder screes and the scenic value of the Majjiesa waterfront.

Policy RCO 20 states that positive action will be taken to rehabilitate identified areas of degraded habitat and landscape, and proposals from Government agencies and non-government bodies for rehabilitation schemes for these areas, provided that such schemes

do not conflict with other policies and/or regulations concerning these, will be supported subject to scrutiny and approval by competent experts.

Policy RCO 20 is specific to the areas of the blue clay slopes where degradation has occurred. In these areas the Foundation plans to concentrate in regeneration of natural plants and shrubs from the foundation nursery in accordance with the recommended list of the Vegetation Survey dated May 2000.

Policy RCO 39 states educational programs aimed at creating positive patterns of behavior of individuals, groups, and of society as a whole, towards the environment will be promoted.

Policy RCO 40 states that in conjunction with the Department of Education and the Government's environment agency, the Planning Authority will establish a resource centre for the environmental education whose functions will be:

1. Keep the Maltese public adequately informed about environmental matters
2. Increase awareness of the necessity for environmental protection and the wise management of natural resources
3. Provide the mass media with good quality information and educational material on the environment

Policy RCO 39 and Policy RCO 40 explain in detail the importance of the Foundation's environmental education and awareness information signs. These informative signs will be posted at the main entrance to Majjiesa to direct and educate the general public.

6.0 Photogrammetric Survey

The EuroMed Centre on Insular Coastal Dynamics has commissioned a series of digitally processed aerial photographs. These photographs will serve as a visual record of the existing site. In the future, they will be used to evaluate the progress of rehabilitation and maintenance of the site.

The aerial photograph taken includes parts of the Ramla Bay site including:

- ❑ Agricultural lands
- ❑ Boulder Screens
- ❑ Rocky beaches
- ❑ Blue Clay Slopes
- ❑ Sites of High Landscape Value

Photographs may be given to the farmers in Majjiesa in order to inform them about the project and to give them a sense of participation with the project thus in the protection of the environment that supports their livelihood. Such an action is staying with the integrative coastal management model, where all those individuals who are previously involved with the site are still given an opportunity to play a role in its management. By including the farmers in this management plan, they will be far more likely to cooperate with the new implementations of the site managers, as well as benefiting the surroundings off which they make their living.

7.0 Existing Structures

The Foundation recommends ceasing all future and current construction plans. The priority of the Majjiesa site is to preserve and restore the present ecosystem without fostering any other new developments. However, there are few existing structures that are in Majjiesa, as listed below:

The Existing Sites include:

- Boathouses
- Cave houses
- Hunting shelters

The boathouses are located by the northern scree shore. The cave houses are located an estimated 30 meters from the boathouses. These structures are currently used as summerhouses. There has been no authority granting the right to build there. For this reason, it is recommended that the use of these secondary cave houses be terminated.

It is advised that a booth space be reserved for the Majjiesa site in the Ecological Information Centre in the neighboring Ghajn Tuffieha Bay site. The centre is planned to introduce the mission of the Foundation to the general public as well as educate the visitors on the importance of Majjiesa and its vegetation. Majjiesa is the home for several endangered and rare species. The information booth will provide facts about the surviving species and a general history of flora and fauna in the Majjiesa site. Some of the rare species are:

Species name	Index number ³
Coronilla valenting	42
Fagonia cretica	48
Parietaria lustamaia	40, 41
Sedum caesitosom	36, 37
Senecio pygmaeus	50
Tammius commonius	39
Trifolium lappaceum	45
Vitex agus chastus	--

Educational signs also will be placed by the sites which will contain valuable information pertaining to the sites to give the public a greater understanding and appreciation of Majjiesa. The signs will be posted along the site's footpath as well as the access points. A suggested format of the educational signs can be found as an annex to this management plan packet.

7.2 Hunting and Trapping Shelters

³ See appendix I

The hunting shelters are found on top of the cliff of Majjiesa along the Northern disturbed areas. Currently bird hunters and trappers use these shelters, when they are hunting, for shade from the sun and to store their equipment. There are going to be more signs that ask the hunter to be responsible for his or her own trash, especially shot gun shells. This is a current problem because the footpath on top of the cliff is replete with discarded used shotgun shells.

If the problem persist and/or the shelters begin to disturb the areas of ecological importance then it suggested the removal of all the she lters or the enforcement of stricter laws pertaining to litter. This will be a clear deterrent to further hunting activities in the site.

8.0 Footpaths and Waste Management

8.1 Footpaths

There is only an estimated 50 people per weekend that explore and walk through the site. It is still very important to establish a main footpath that can be utilized by walkers. However, the implication of the footpath is not to encourage an increased volume of visitors, but rather to minimize the exposure of visitors from the entire site so there remains some parts that sustain complete separation from trampling. It is hoped that curious and respectful visitors whom find the footpath will create the delicate avenue of ecological education while maintaining preservation. This is imperative to the survival of the rare plants that are regenerating in Majjiesa. Currently there is a road that serves as an excellent footpath for visitors. In addition to this road, there will also be smaller paths carefully laid out for those trekkers interested in the unique vegetation of Majjiesa. The road is being fenced off (as stated in the Rights to Access Section 4) as well as labeled with an entrance sign. It is suggested that informative signs about the flora and fauna found in Majjiesa be added. These signs will be placed along the footpaths.

8.2 Waste Management

It is recommended that the footpath also be equipped with trashcans along the side. This will provide an organised disposal area for visitors to discard their trash without littering on the site. The trashcans will be emptied as needed by the wardens.

9.0 Conservation Profiles

The surveys carried out contain a large quantity of detailed information and recommendations. This section will outline the general plan of action that will be guided by the information found in the scientific surveys and the manager's own observations. This plan is intended to set strict parameters by recommendations and is not definitive. Technical knowledge, experience, and observation will further define the action to conserve and protect the Majjiesa site.

9.1 Geology and Geomorphology

Policy RCO 12 states the following for general protection of designated Areas of Ecological Importance (AEI) and Sites of Scientific Importance (SSI):

- 1) A general presumption against development, including roads and public utility services, and particularly on crests of ridges and the edges of coastal and inland cliffs
- 2) A general presumption against activities likely to be a fire risk to a significant wooded area
- 3) A general presumption against development where noxious emissions are likely to create problems in nearby AEI and SSI
- 4) The removal of intrusive elements

Level 1 – AEI's and SSI's

- Human intervention kept to the barest minimum
- No physical development
- All efforts made to protect the identified features of scientific interest
- Management by the competent Government agency in an appropriate manner

Level 2 – AEI's and SSI's

- Human intervention strictly controlled
- Physical development limited to the maintenance of already existing structures and construction of minor amenities designed to enhance the educational and recreational use of the area. Any such developments to be carried out with the least possible damage to the environment
- Traditional activities can continue, unless in conflict with other policies, but no new land diverted to these uses except for the suitable re-establishment of abandoned fields for agriculture

Level 3 – AEI's and SSI's

- No residential, industrial, commercial, or tourism development
- No infrastructure or public utility works
- Small scale physical development can be considered providing the adjacent AEI's and SSI's are protected, and this is demonstrated by a suitable environmental impact assessment, and is consistent with other policies

The recommendations of the Vegetation Survey carried out for Majjiesa as well as the recommendations of the site managers indicate that intervention, where it is necessary, should be non-invasive, as much as possible, using novel application of traditional structures. The most important measure is for the site to be protected from further abuse, which mainly stems from human activity and therefore should be channeled and controlled. No further development should be allowed in the entire area covered by the plan. The goal for the management of the entire site is to Majjiesa as undisturbed as possible and only bringing in additional visitors who have a keen interest in the superb ecological aspects of the site such as the permaculture capabilities it holds.

Table 1. Measures of Yearly Intervention- Degraded Area

SSI	Year 1	Years 2 to 4	Years 5 to 7	Years 8 to 10
Blue Clay Slopes (degraded area)	1) Prohibit Unauthorized entry of vehicles, camping, bar-b-ques, open fires, hunters, littering and removal of clay 2) Posting of informational signs 3) Establish main features of this SSI and the conservation profile 4) Build Live Wooden Cribwalls ⁴ at the base of slopes that meet the sea 5) Build Wattle Fences ⁵ to keep the rest of the clay slopes together	1) Control access to slopes through education by Wardens and signs 2) Plant trees and shrubs at selected sites	1) On going study and monitoring of blue clay slopes.	1) On going study and monitoring of blue clay slopes.

⁴ See page 15 in ecological survey for diagram and instructions

⁵ See page 17 in ecological survey for diagram and instructions

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Table 2. Measures of Yearly Intervention- Permaculture and Apiculture

	Year 1	Years 2 to 4	Years 5 to 7	Years 8 to 10
Permaculture and Apiculture	1) Research sites within Majjiesa suitable for permaculture. 2) Build relationship with farmers and educate them on the subject. 3) Designate What crops will be planted on site. 4) Speak with an expert on apiculture and research its feasibility at Majjiesa.	1) Continue working with farmers and educating them. 2) Begin planting crops. 3) Explore utilization of native medicinal plants on site.	1) Continue working with farmers. 2) Proceed with permaculture crops.	1) Continue working with farmers. 2) Proceed with permaculture crops.

Table 3. Measures of Yearly Intervention- Garigue

Recommended SSI	Year 1	Years 2 to 4	Years 5 to 7	Years 8 to 10
Western Coastal Garigue	1) Prohibit unauthorized entry of vehicles, littering, and removal of vegetation 2) Protection of endangered species	1) Planting of endangered and other indigenous species to help in the recovery of the site.	1) On going study and monitoring of site.	1) On going study and monitoring of site

Table 4. Measures of Yearly Intervention- Endangered Species

SSI	Year 1	Years 2 to 4	Years 5 to 7	Years 8 to 10
Southern sites of <i>Senecio</i>	1) Prohibit unauthorized	1) On going study and	1) On going study and	1) On going Study and

<i>pygmaeus</i> and <i>Fagonia cretica</i>	entry of vehicles, bathers, camping, littering, and removal of vegetation. 2) Species should be left undisturbed in southern area.	monitoring of site. 2) Continue to strictly prohibit unnecessary human contact with species.	monitoring of site. 2) Continue to strictly prohibit unnecessary human contact with species.	monitoring of site. 2) Continue to strictly prohibit unnecessary human contact with species.
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Table 5. Measures of Yearly Intervention- Endangered Species

SSI	Year 1	Years 2 to 4	Years 5 to 7	Years 8 to 10
Northern site of <i>Trifolium lappaceum</i> , <i>Parietaria lusitanica</i> and <i>Vitex agnus-chastus</i>	1) Human intervention should be strictly controlled. 2) Prohibit the unauthorized entry of vehicles. 3) Strictly prohibit unnecessary human contact with species.	1) Slow removal of exotic plants. 2) Planting of native plants to guide in the recovery of site. 3) Continue to strictly prohibit unnecessary human contact with species.	1) On going study and monitoring of site. 2) Continue to strictly prohibit unnecessary human contact with species.	1) On going Study and monitoring of site. 2) Continue to strictly prohibit unnecessary human contact with species.

9.2 Ecology

9.2.1 Current Ecological Conditions

The clay slopes are almost entirely dominated by steppic communities. Areas of the slopes with little protection are mostly bare in vegetation. Slopes with boulders acting as windbreakers usually have thick vegetation cover and are often supported by shrubs and trees, including the *Tamarix africana*.

The screes are the most inaccessible parts of the managed site and have therefore undergone little human intervention. As a result, rare and endangered species have been undisturbed and ecosystems remain ecologically intact. There is evidence of some past agricultural lands divided by rubble walls and remaining fruit trees. The main vegetation consists of high garigue to low maquis. The greatest amount of vegetation is found at the bottom of the cliffs between boulders since it is protected from wind. Footpaths have been made through parts of the screes with evidence of disturbed habitats.

The watercourses in Majjiesa include a series of springs. Watercourse vegetation exists in the clay sediment along the semi-permanent springs. The springs create pools along the southern side of the area and support populations of frogs and other fresh-water fauna.

Important Species of Rđum Il-Majjiesa

Rare, Restricted (MI)	<i>Parietaria lusitanica</i> , <i>Laurus nobilis</i> , <i>Vitex agnus-chasus</i> , <i>Tamarix africana</i> (and MED), <i>Tamis communis</i> , <i>Anacamptis urvilleana</i>
Very Rare, Restricted (MI)	<i>Sedum caespitosum</i> , <i>Trifolium lappaceum</i> ⁶ , <i>Senecio pygmaeus</i>
Endemic	<i>Euphorbia melitensis</i> , <i>Limonium melitense</i> , <i>Orobanche muteli ssp. nana forma melitensis</i> , <i>Alium melitense</i> , <i>Anacamptis urvilleana</i>
Restricted (MED)	<i>Daucus lopadusanus</i> , <i>Periploca la evigata ssp. angustifolia</i> , <i>Crucianella rupestris</i> , <i>Satureja microphylla</i> , <i>Phagnalon graecum</i> , <i>Carlina involucrata</i> , <i>Urginea pancration</i>
Vulnerable, Restricted (MED & MI)	<i>Fagonia cretica</i> ⁷

MI- taxon has a restricted distribution in Maltese Islands

MED- taxon has a restricted distribution in the Mediterranean

⁶ Previously thought to be extinct, This is the only known locality.

⁷ Only known in Gnejna/Ghajjn Tuffieha area in Rđum il-Majjiesa

Species List

Clay Slopes	Screes	Watercourses
<i>Atractylis gummifera</i>	<i>Adiantum capillus-veneris</i>	<i>Arundo donax</i>
<i>Avena sterilis</i>	<i>Anacamptis urvilleana</i>	<i>Holoschoenus vulgaris</i>
<i>Esparto Gras</i>	<i>Anogramma leptophylla</i>	<i>Polypogon</i>
<i>Carlina involucrata</i>	<i>Anthyliss hermaniae</i>	<i>monspeliensis</i>
<i>Cyanara cardunculus</i>	<i>Arisarum vulgare</i>	<i>Arundo donax</i>
<i>Coronilla scorpioides</i>	<i>Asphodelus aestivus</i>	<i>Holschoenus vulgaris</i>
<i>Fagonia cretica</i> (very rare in Malta)	<i>Capparis orientalis</i>	<i>Juncus acutus</i>
<i>Lygeum spartum</i>	<i>Catapodium rigidum</i>	<i>Vitex agnus-chastus</i>
<i>Mesembryanthemum</i>	<i>Ceratonia siliqua</i>	
<i>nodiflorum</i>	<i>Coronilla valentina</i>	
<i>Tamarix africana</i>	<i>Crithmum maritimum</i>	
	<i>Cydonia oblonga</i>	
	<i>Daucus carota</i>	
	<i>Erica multiflora</i>	
	<i>Euphorbia melitensis</i>	
	<i>Fagonia cretica</i>	
	<i>Ferula communis</i>	
	<i>Ficus carica</i>	
	<i>Foeniculum vulgare</i>	
	<i>Geranium purpureum</i>	
	<i>Geranium molle</i>	
	<i>Hypericum aegyptiacum</i>	
	<i>Inula crithmoides</i>	
	<i>Limonium melitense</i>	
	<i>Lonicera implexa</i>	
	<i>Medicago polymorpha</i>	
	<i>Olea europaea</i>	
	<i>Parietaria judaica</i>	
	<i>Parietaria lusitanica</i>	
	<i>Periploca angustifolia</i>	
	<i>Periploca laevigata angustifolia</i>	
	<i>Psoralea bituminosa</i>	
	<i>Sedum caespitosum</i>	
	<i>Sedum sediforme</i>	
	<i>Sherardia arvensis</i>	
	<i>Smilax aspera</i>	
	<i>Tamas communis</i>	
	<i>Teucrium flavum</i>	
	<i>Teucrium fruticans</i>	
	<i>Thymbra capitata</i>	
	<i>Trachynia distachya</i>	
	<i>Trifolium scabrum</i>	
	<i>Trifolium campestre</i>	
	<i>Trifolium lappaceum</i> (previously thought to be extinct)	
	<i>Urginea pancration</i>	
	<i>Vitis vinifera</i>	

9.2.2 Agricultural Land Use

The area surrounding the agricultural land, boat houses, and the cement road contains many of the common species of disturbed habitats. These include *Oxalis pes-caprae*, *Psoralea bituminosa*, *Sonchus tenerrhimus*, *Dittrichia viscosa*, *Avena barbata*, and *Galactites tomentosa*. Introduced alien species are *Acacia cyanophylla* and *Agave americana*. The dirt road going down into the *rdum* includes rare species of *Senecio pybmaeus* and *Fagonia cretica*.

The farmers in Majjiesa generally do not affect the area negatively. The agriculture is of cultural importance and the farmers are known as Tal-Majjiesa for generations. They actually help the site by restricting entry of people into the *rdum* and practice organic agriculture. They use no pesticides or artificial fertilizers. They also have no pest control against rabbits. Composting is also practiced on site and consists of leaves, trees, sulfur (not annually), and agricultural by products. This information is encouraging in hopes that Majjiesa may become a site involving the farmers in permaculture since it is already on its way to sustainable agriculture.

The following is a list of fruit trees, vegetable crops, and shrubs the Majjiesa farmers are propagating. This information was obtained from speaking with one of the farmers, Joey. The yield from crops is sold to the National Clearinghouse Market.

<u>Trees</u>	<u>Crops</u>	<u>Shrubs & Grasses</u>
Apples	Grapes	Agave
Figs	Beans	Capers
Pomegranate	Onions	
Olive	Potatoes	
Plumb	Pumpkins	
Blackberry		
Date Palm (no produce)		
Sweet Almond		
Bitter Almond		
Bamboo (not cropped)		

9.2.3 Permaculture and Recommendations

Permaculture was developed by an Australian Ecologist, Bill Mollison, to create sustainable agricultural systems. Sejo Jackson, a farmer and permaculture designer describes the overall goal of permaculture design. “To establish resource and energy conserving (including human energy) landscapes that are agriculturally productive, that take into account and mimic, as much as possible, relationships and processes found in the natural environment, and that approach the diversity, stability and resilience found in natural ecosystems. The underlying philosophy is that we are a part of the natural environment and not separate from it, and that we must work with nature and its processes, rather than against it.”

Integrating permaculture into the current management and farming of agricultural lands will help to keep Majjiesa as a holistically natural environment with no destruction or development. It is recommended that permaculture be practiced and supported by both the farmers and the site managers.

There are many options and designs that could be implemented for permaculture. An example would be to introduce beehives in Majjiesa. Not only would this practice of apiculture encourage pollination but also the honey produced by the bees could be a source of income, and pay for the initial set up costs of introducing the beehives. Further research is to be conducted to find the most feasible plan of action for the education and implementation of permaculture in the Majjiesa area.

The ecological survey recommends the following intervention measures to protect the ecosystems in Majjiesa:

- ❑ Removal of rubbish that has occurred in a few areas.
- ❑ Encourage apiculture and construct apiaries, including the planting of sulla and thyme to encourage bees.
- ❑ Fruit trees grafted on native species should be encouraged, particularly the wild pear *Pyrus syriaca* and *Pyrus communis*.
- ❑ Convert a few fields into traditional Maltese vineyards.
- ❑ Native fruit trees should be encouraged, such as the extinct *Mespilus germanica*.
- ❑ Alien species of Acacia and Agave should be removed (slowly to prevent erosion) because they regenerate and spread easily taking over the area.
- ❑ The dirt road leading into the *rdum* should not be surfaced due to the rare *Senecio pygmaeus*.
- ❑ Use of boathouses should be discouraged. They should not be demolished due to ecological impacts such activities would have.
- ❑ Planting should be restricted to land that has already been disturbed. Only native species typical of surrounding habitats should be used, possibly including *Tetraclinis articulata*, *Chamaerops humilis*
- ❑ Propagation of medicinal plants.

9.3 Hydrology

The cliffs in the area contain a perched aquifer in the permeable Coralline limestone. This aquifer seeps out water at the foot of the cliffs creating springs. These springs form semi-permanent watercourses throughout the site. There are no watercourses on the Western tip, but there are many on the North slopes. There are three springs on the southern side supporting reed beds of *Arundo donax* and *Holoschoenus vulgaris*. Vegetation found near the watercourses consists of *Polypogon monspeliensis*, *Arundo donax* and *Holoschoenus vulgaris*. The springs on the North slope form pools in various areas maintaining populations of frogs and other fresh-water fauna. *Juncus acutus* and *Vitex agnus-chastus* were also found around the pools.

9.4 Protection Levels, AEI's and SSI's

Currently there are no Level 1 protection areas designated at Majjiesa. The Vegetation Survey strongly recommends that several areas on-site be upgraded to this level of protection. Overall the entire site is under the second tier of protection, at Level 2. Certain species and communities present at Majjiesa are precious to Malta and therefore should be given the proper protection.

A valuable example of coastal garigue is found on the Western part of the peninsula. This community is dominated by *Periploca laevigata* ssp. *Angustifolia* and *Coronilla valentina*. This area is difficult to reach and that factor has helped the habitat to grow into on the highest and thickest maquis communities of its kind in Malta. The Vegetation Survey suggests that this be upgraded to level one protection as an Area of Ecological Importance. The same protection could be given to the scree on the Northern and Southern slopes because it also extends along the maquis area.

Two localised sections of the site found on the Northern and Southern sides of the peninsula should also be upgraded to level 1 protection. There is a very rare species (according to the red Data Book) called *Senecio pygmaeus* growing in the south along with *Fagonia cretica*. The latter plant is only known to grow at Gnenja/Ghajj Tuffieha and in Rdum il-Majjiesa. The species *Trifolium lappaceum*, *Parietaria lusitanica* and *Vitex agnus-chastus* were all recorded in the North. *Trifolium lappaceum* was only recently discovered at Majjiesa, and is an extremely important find since it was previously thought to be an extinct species. The other two plants are very rare as well. Because of the scarcity of all of these plants, it is highly recommended that they be scheduled as level 1 protection under Sites of Scientific Importance.

Majjiesa is also home to permanent freshwater springs, an increasingly rare habitat in Malta. These can also be upgraded to Level 1 under an Area of Ecological Importance. Majjiesa has three freshwater springs on its peninsula, and therefore a special effort must be made to protect these watercourses.

Although none of these sites are currently under Level 1 protection, it is the hope of the site managers that they will be soon. Until then, efforts should continue to be made to protect these rare areas.

Appendix 1 – Majjiesa Plant Index

Pict #	Latin Name	Plant Family	Very Common, Common, Frequent, Rare, or Very Rare
14	Hypericum triquetrifolium	Hypericace	VC
15	Centurea nicaeensis	Asteraceae	VC
16	Pallenis spinosa	Asteraceae	VC
17	Salvia verbenaca	Lamiaceae	VC
18	Dittrichia viscosa	Asteraceae	VC
19	Ecballium elaterium	Cucurbitaceae	VC
20	Senecio bicolor	Asteraceae	VC
21	Parietaria officinalis	Urticaceae	VC
22	Cichorium spinosum	Asteraceae	F
23	Thymbra capitata	Lamiaceae	F
24	Lagurus ovatus	Poaceae	VC
25	Majjiesa site picture	----	----
26	Limonium melitensis	Plumbaginaceae	C
27	Valantia muralis	Rubiaceae	VC
28	Convoluolus oleiofolius	Convoluulaceae	F
29	Asperula cristata	Rubiaceae	VC
30	Satureja Microphylla	Lamiaceae	VC
31	Euphorbia pycnophylla	Euphorbiaceae	F
32	Prasium majus	Lamiaceae	C
33	Allium melitensis	Allianceae	VC
34 grey	Crucianella Rupestris	----	F
34 green	Hypericum aegypticum	Hypericaceae	F
35	Ruta chalepensis	Rutaceae	C
36 + 37	Sedum caespitosum	Crassulaceae	VR
38	Euphorbia pinea	Euphorbiaceae	VC
39	Tamus communis	----	R
40 +41	Parietaria lustanica	Vrticaceae	R
42	Coronilla valentina	Fabaceae	R
43	Hedysarum caronarium	Fabaceae	VC
44	Cydonia oblonga	Rosaceae	R
45	Trifolium lappaceum	Fabaceae	VR
48	Fagonia cretica	----	VR
49	Lotus cytisoides	Fabaceae	F
50	Senecio pygmaeus	Asteraceae	R
51	Fagonia cretica	----	----

