

The Natural Environment of Gozo

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Preamble

The word "Environment" is a frequently abused one. Several different definitions, encompassing all that is found on and around this globe, and affecting man's life, are attributed to it. For the purpose of this presentation, the term "*the natural environment of Gozo*" addresses, albeit in a general way, the biodiversity of the Island: the variety of plant and animal species together with their various habitats found in some of the ecologically important localities in Gozo.

Some species need a particularly special habitat, others have adapted to live and grow in a diversity of habitats. The Giant Fennel *Ferula communis* grows profusely in rocky areas as well as in disturbed ground. But the Sea Daffodil *Pancreatum maritimum* is found growing only on sand dunes. The latter is a very scarce habitat and the species, which are only adapted to grow in it, are consequently localised, restricted and rare. Habitats provide an adequate place for one or a group of living organisms, to multiply, and to find food and shelter. The status of a habitat is always a decisive factor for the health or otherwise of the population of a species which is adapted to it. A special habitat is usually considered as an ecological site and a site of special scientific importance.

An ecological site is a place which provides a good habitat, or better still a diversity of habitats. These in turn provide food and shelter to a species or a number of species. Ta' Ċenc' area and its surroundings is a fine example of an ecological site. Here one finds garigue and steppe areas, rocky rain-water pools, and cliffs. Such a healthy diversity of adequate habitats, which provide food, shelter, protection, nesting sites and other necessities, is synonymous with a biodiversity enriched with a healthy number species.

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Topography

Gozo has a surface area of about 67 sq.km and a coastline of about 40km. Its highest point at Ta' Dbiegi has an altitude of 191m. The formation of the Maltese Islands is mainly the result of geotectonic movements, which started to occur millions of years ago. Tracts of land collapsed or subsided; others were raised from the bottom of the sea, and what are known as faults, in geological terminology, were created throughout the islands. The principal fault in Gozo crosses from Ras il-Qala to Mgarr ix-Xini. The topography of Gozo is more complex than that of the Island of Malta and is characteristically marked by a number of hilly plateaux, such as Id-Dabrani, In-Nuffara, and Ta' Kuljat, amongst others, formed from upper Coralline limestone, between which are plains where erosion has exposed the Globigerina limestone. The hillsides are covered with clay slopes, whilst the plains slope down into several valleys such as Wied il-Qleghja, Wied il-anaq and Marsalforn Valley.

Gozo's coastline is less spoilt than that of mainland Malta. 14.5% of the coastline is composed of scree and 62.0% of cliffs. Less than 7.5% of the coastline is obscured by development such as Marsalforn Bay and Mgarr Harbour, while 74% is inaccessible from land. This inaccessible part provides good habitat, as well as some protection, to a variety of flora and fauna species. Here one finds sites of ecological importance, supporting habitat types, which are rare in the Maltese Islands, and where endemic and/or rare species are found.

The Flora

Coastal cliff communities are mainly located on the south, southwest and west coasts of Gozo. There are many plant taxa here including two, the Maltese Cliff-Orache *Cremnophyton lanfrancoi* and the Maltese Rock Centuary *Palaeocyanus crassifolius*, which belong to monotypic genera, both of which are

endemic to the Maltese Islands. The recently described Maltese Cliff-Orache is restricted to sheer sea-cliffs in the western part. It is a dense shrub with whitish, elongate leaves and is the only species found in the genus *Cremnophyton*. The same can be said for the Maltese Rock Centuary, Malta's national plant, which, in Gozo, is restricted to the southern cliffs. The Maltese Everlasting *Helichrysum melitense* is another coastal species. Known in Maltese as *Sempreviva ta' Ghawdex* this is one of Gozo's endemic plants found only in the Dwejra area and on Fungus Rock.

The flora of Gozo is essentially similar to that of the rest of the Maltese Islands but there are several species, which have been recorded only from the Island. The Shrubby Campion *Silene fruticosa* is one of them. A very small population of this eastern Mediterranean species still grows in the valleys of Mgarr ix-Xini and Xlendi. A number of typical dune species persist on the sand-dunes at Ramla, which are the least spoilt dunes in the Maltese Islands. The Prickly Parsnip *Echinophora spinosa* and the Sea Spurge *Euphorbia paralias* are two dune species, which are confined to Ramla. One cannot omit mentioning the famed Malta Fungus *Cynomorium coccineum*, which in the Islands is known mainly to grow on Fungus Rock. This strange looking plant was formerly only known from this islet and it was believed to have medicinal and magical powers. In time



The rocky valley of Wied HanWra supports a large number of flora species

it was found growing in other parts of the Mediterranean. Whilst few indigenous tree species exist on Gozo, the African Tamarisk *Tamarix africana* and the Chaste-tree *Vitex agnus-castus*, two large shrubs, locally considered as small trees, are quite widespread in Gozo, while they are very rare on the main Island.

The Fauna

The land fauna of Gozo, apart from a few mammals and reptiles, and several birds, is largely made up of invertebrates, with insect, arachnid and mollusc species being the most dominant. Migrant bird species are quite in evidence during spring and autumn, but only about 15 species breed regularly on the island. Amongst these one finds fine colonies of the pelagic Cory's Shearwater *Calonectris diomedea*. The breeding population of the Short-toed Lark *Calandrella brachydactyla*, which in recent years decreased drastically on the Island of Malta, is still widespread on Gozo during the summer months. The most interesting mammal species is the Sicilian Shrew *Crocidura sicula*, which has been recorded only in Sicily and Gozo. Its subspecies *calypso* occurs only on Gozo. On the other hand mammal species which are found on the Island of Malta, such as the Weasel *Mustela nivalis* and the Pygmy White-toothed Shrew *Suncus etruscus* are not recorded from Gozo. The same can be said for snakes. Out of four species recorded from Malta, only the Western Whip Snake *Coluber viridiflavus* is found on Gozo.

One of the most remarkable invertebrates found in Gozo is the Ramla Sand Cricket *Brachytripes megacephalus*. This rare, nocturnal, relatively large-sized sand-burrowing cricket is restricted to the sand-dunes at Ramla. There are several endemic invertebrates in Gozo. A recently described species of False Scorpion *Chthonius (Epphippochthonius) maltensis* is restricted to Dwejra.

Ecological Sites

Dwejra is a geological complex, which is on top of the list of Gozo's ecological sites. Here one can find geological formations, slickensides, collapse structures, quaternary deposits, a unique topography, and a diversity of habitats including a freshwater pool. Fungus Rock is found here too, standing in front of one of the collapse depressions. This islet is not only the home of the famed Malta Fungus but also of the endemic subspecies *Podarcis filfolensis generalensis* of the Maltese Wall Lizard. This massive stack is known locally as Haġret il-Ġeneral or il-Ġebbla tal-Ġeneral and is a strict Nature Reserve by virtue of L.N. 22 of 1992.

The Maltese Wall Lizard *Podarcis filfolensis*, the well known slender lizard with the long tail, is endemic to the Maltese Islands and to the islands of Linosa and Lampione. Five subspecies are known to occur, four of which are found in the Maltese islands. The subspecies *maltensis* is found on the islands of Malta, Gozo and Comino and of course is present at Dwejra area. But one of the other subspecies, the *generalensis*, is restricted only to Haġret il-Ġeneral and nowhere else. The *generalensis* is different in appearance by having reddish underparts with bluish flanks. It was first described by the Maltese Naturalist Giovanni Gulia in 1914.

Il-Qawra is also a subcircular collapse depression, which includes what is popularly known as the 'inland sea', surrounded by a couple of valley mouths, cliff sides, a steep sided ridge, clayey slopes and long uncultivated fields. The endemic Maltese Sea-chamomile *Anthemis urvilleana*, a low-growing plant, which is frequent in sea-side habitats is one of the interesting flora species which grow in the area. Il-Qattara, a permanent freshwater pool fed by a perennial trickling spring, is also found in this depression. This permanent freshwater provides a habitat, which is quite rare, and in spite of its small size its ecological importance is great. It abounds with water life particularly in summer, when the surrounding area is parched dry.



Il-Qattara at Dwejra is a unique permanent freshwater pool

Several species of insects, including diving water beetles and water boatman, dragonflies, and wasps, amongst others, are common here. The richness of the pool's fauna includes a number of freshwater snails, which are found in the spring trickling into the pool. Amongst these one finds the Freshwater Spire-snail *Mercuria similis* and the Dwarf Pond-snail *Lymnaea truncatula*

The Corn Bunting *Miliaria calandra*, which has almost disappeared from the island of Malta and has decreased drastically in Gozo, still visits the pool during the summer months. The whole area of Dwejra is, in fact, also very important from an ornithological point of view. It is one of the few areas where one or two pairs of Corn Bunting still breed. This species, which prefers open country with a few or no trees, builds the nest on the ground among herbage. Dwejra is also one of the remaining posts where another declining species, the Spectacled Warbler *Sylvia conspicillata*, is still found breeding. It is a shy, resident species, frequenting open countryside, preferring low-growing shrubs as a nesting site.

Next on the list as a site of ecological importance is Ta' Ċenċ extensive rocky area. Apart from the beautiful landscape provided by the massive lower coralline limestone cliffs, the area is famous for its garigue vegetation, parts of which are dominated by the Tree Spurge *Euphorbia dendroides* or the Mediterranean Thyme *Thymbra capitata*. The Common Pyramidal Orchid *Anacamptis*

pyramidalis, the French Daffodil *Narcissus tazetta*, the Large Star of Bethlehem *Ornithogalum arabicum* and the Blue Stonecrop *Sedum caeruleum* are few of several common flowering plants that grow here, providing an extensive natural rock garden.

Ta' Ċenċ area also qualifies as an international important bird area. The cliffs support the largest colony of Cory's Shearwaters *Calonectris diomedea* in the Maltese Islands, and are a stronghold of the national bird, the Blue Rock Thrush *Monticola solitarius*. The cliff-top rocky area is a good breeding site for the Short-toed Lark *Calandrella brachydactyla* and the Spectacled Warbler *Sylvia conspicillata*, while the Peregrine Falcon *Falco peregrinus* and the Barn Owl *Tyto alba* used to breed in the cliffs. Quite recently a small colony of the European Storm-petrel *Hydrobates pelagicus* has been rediscovered in one of the numerous sea caves below the cliffs.



Ta' Ċenċ cliffs are the home of a large colony of about 1000 pairs of Cory's Shearwaters

In this whole complex of natural habitats, small ecological niches, such as the rocky rainwater pools, are also found, albeit for a short period during the rainy season. This scarce habitat is important for the survival of small living organisms such as the Fairy Shrimp *Branchipus schaefferi* and the Pool Flea *Ceriodaphnia quadrangula*. Some tiny species living here lay hard-shelled fertilised eggs, which sink to the bottom sediment and can withstand the intense summer heat when the pool dries up. The eggs will hatch when the pool fills up again with the autumn rains.

The valleys in Gozo harbour very interesting vegetation and support a wide variety of fauna species. Mgarr ix-Xini and Xlendi valleys are amongst the most remarkable ones providing adequate habitat for a variety of species. But even other valleys, such as Lunzjata, are of ecological significance, in spite of human interference. Lunzjata valley, which carries a permanent spring, is the only place in Gozo, which supports the rare Fresh Water Crab, the Maltese endemic subspecies *Potamon fluviatile lanfroncoi*. The rare Dwarf Elder *Sambucus nebulus* together with other interesting flora can be found growing here. This is the only place in the Maltese Islands for the predatory leech *Haemopsis sanguisuga* and the freshwater amphipod *Echinogammarus ebusitanus* as well as the breeding ground for the semi-aquatic grasshopper *Paratettix meridionalis*. Further down the valley as it starts running towards Xlendi, two snail species found on the rocky sides are endemic to Gozo. Here too grows the rare Sicilian Iris *Iris sicula*, an endemic plant to Sicily and Malta. It was in the thick vegetation along this valley that the Cetti's Warbler *Cettia cetti* first established itself some twenty-five years ago as a new breeding bird in Gozo. In fact the whole length of the valley from Lunzjata down to Xlendi is one of the most attractive sites for spring and autumn migrant bird species as well as for winter visitors.

No garigue area in the Maltese Islands is as rich as the area known as Tal-Maġun, a rocky limestone plateau protruding eastwards and flanked by the valleys of Dahlet Qorrot and Wied ir-Riħan. Here the garigue has developed into a dense covering of low-growing shrubs of a large variety of species, dominated by Narrow-leaved Rock-rose *Cistus monspeliensis*, Tree Spurge *Euphorbia dendroides*, Wolfbane *Periploca angustifolia*, Mediterranean Heath *Erica multiflora*, Olive-leaved Germander *Teucrium fruticans*, and White Hedge-nettle *Prasium majus*, with scattered Sea Squill *Uriginea maritima* and Branched Asphodel *Asphodelus aestivus*. Patches of the yellow and purple forms of the rare Southern Dwarf Iris *Iris pseudomila*, amongst several other scarce species, are also found here.

Human Intervention

For the last 7000 years man has been tampering with his natural environment and no doubt has changed the face of these islands. Since man arrived Gozo too has seen great changes. There is not one single square metre on the face of the whole island where man's footprint is not in evidence. Man started using land to yield his sustenance and by time changed the landscape. The terraced fields supported by many kilometres of rubble walls together with natural valleys and watercourses, cliffs and a unique coastline carved through millennia of years, harmonise together to present us with a pleasant natural environment, quite rich in biodiversity. However, the negative effects of human activity have never been as devastating as in the last forty years.

The human population of Gozo now stands approximately at 28,000, which gives a density of over 400 persons per square kilometre. No wonder human pressure on the natural environment is quite evident everywhere. In spite of an increase in population, the terraced slopes of valleys and hillsides, where fodder crops were previously grown, now lie abandoned. The characteristic dry-stone walls are gradually collapsing, leading to the loss of whole tracts of soil through rain-induced erosion. Re-building of rubble walls needs time and skills, and these are both lacking. So we end up again with a degraded changing landscape.

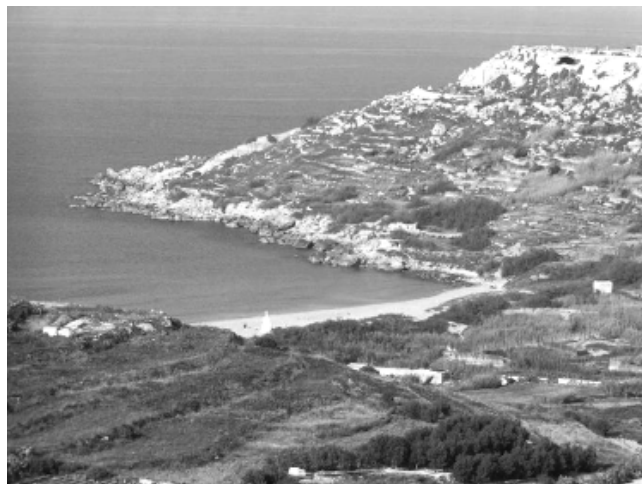
The increase in built-up areas, together with the large number of new roads, some of which have been constructed along valley beds, have lead to an increased volume and rate of flow of water run-off. Apart from eating up chunks from the Gozitan countryside and ruining natural watercourses, this development also results in less water percolating into the ground, while the run-off rainwater carries tons of soil down into the valleys and subsequently into the sea

The topography of Gozo, having a proportionally high ratio of hills, is more prone to run-off soil erosion. The end product of this

erosion-induced desertification can be easily seen by the turbidity off valley mouths at sea after heavy rains, which often give rise to flash floods.

The construction of roads and the booming building development of the past thirty years resulted in a flourishing quarrying industry to the detriment of large stretches of land, both garigue and agricultural, and in many cases ruining the natural environment. Disused and derelict quarries are not all restored into agricultural land, and when restoration takes place this is carried out in a slipshod and haphazard way.

Apart from the building development there are several other activities harming the Gozitan Natural Environment. Illegal off-roading activities along valley beds, on hillsides, and not infrequently on Ramla Bay's precious sand dunes, lead to the opening of new tracks, degradation of land, compaction of terrain and the destruction of flora and fauna. Illegal dumping in valleys of household wastes as well as inert material from quarries and building development only block natural watercourses, and also damages the natural environment in many ways.



The sand dunes at Ramla support an interesting variety of flora and fauna.

Bird trapping and hunting, which is widespread in Gozo, also has a negative impact on the environment. They do not only harm the environment by taking away large number of birds but also contribute towards the degradation of the landscape. Bird shooters plant groves of the fast-growing eucalyptus

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and a key element in the professional development of banks' employees in order to achieve their business objectives and ensure quality standards.

Conclusion

Local commercial banks play an important role in the social and economic development of Gozo. With their achievements local banks prove that they are the banks with whom one can plan his or her financial future. But it is not just the financial strength that Gozitans can take comfort in. Gozitans believe that a sense of commitment, quality and service must be at the core of their business. The future of local banks in Gozo lies in offering customers an increasingly personalized and professional service. A subsequent challenge is to ensure that the service delivered meets the specification set.

This is essential since during the last ten years Gozitans have played a major role in the expansion of banking deposits. However, local

banks need to nurture their loan portfolio by tapping related marked segments in Gozo. The Gozitan economy will benefit from the introduction of a strategically defined service quality programme; in order to monitor the changing environment with respect to Gozitan customer needs and expectations; technology and product development; business and economic conditions; and competitor activities. This is a must for the Gozitan community which is becoming increasingly demanding, better informed and ready to play a more active role in their relationship with a bank.

Better data to assess the real role of financial institutions in the island of Gozo is essential. This will help promote Gozo's own interests, and render the demand for disparity reductions more credible. Moreover there is the need of further studies in order to come up with proposals to support and encourage the Gozitan economy, in order to be able to exploit the strengths and opportunities that Gozo offers.

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trees to attract birds for hunting. These groves are sprouting everywhere, not only preventing the establishment of any undergrowth, but consist of alien species incompatible with our indigenous vegetation and landscape. Gozo also has to endure widespread illegal hunting of protected birds. The Peregrine and the Barn Owl, to mention just two species, have been lost due to illegal hunting. Illegal shooting of protected birds also prevents other species such as the Kestrel to settle and breed here.

Bird trappers, too, should share the blame of the degradation of Gozo's landscape. They transform rich garigue areas and agricultural land into bird trapping sites, not infrequently spraying herbicides on these sites to prevent vegetation growth. They set up netting sites in ecological areas, along cliff edges and hillsides, turning a beautiful landscape into one big eyesore. Tal- Maġun, Ta' Ċenċ, Wardija Point and several other places are evidence of these atrocities against Gozo's natural environment.

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