# Guidelines on

# Trees, Shrubs and Plants

# for

# Planting and Landscaping

# in the

# Maltese Islands

Environmental Management Unit
Planning Directorate

January 2002

# CONTENTS

# 1. INTRODUCTION

## 1.1 General overview

The Structure Plan for the Maltese Islands recognises trees and vegetation as *"a limited but very important feature of the Maltese landscape and a threatened resource"*, as aesthetic features which provide valuable opportunities for landscaping and screening, and (in many cases) as essential components of natural or semi-natural ecosystems. It therefore seeks to protect the existing greenery and to promote the additional planting of trees and shrubs in appropriate locations. The importance of planting and landscaping is spelt out in **Paragraph 7.16**, and in policies **BEN 17** and **RCO 6** of the Plan:

**Paragraph 7.16:**

*"The design, establishment and maintenance of hard and soft landscaping is an essential part of improving and enjoying both the urban and rural environment. The design of rural roads in particular should be landscape-led so that they blend into their surroundings."*

**Policy BEN 17:**

*"Development permit applications shall include proposals for hard and soft landscaping, and measures by which their maintenance will be undertaken."*

**Policy RCO 6:**

*"Following the adoption of Local Plans for Rural Conservation Areas, the Planning Authority will institute a programme of enhancement and management in conjunction with the Ministry of Agriculture and the Secretariat of the Environment comprising* (inter alia)*:*

1. *Afforestation and landscaping schemes*
2. *Rehabilitation of abandoned quarries*
3. *Reactivation of abandoned agricultural land, encouraging compatible methods of cultivation*
4. *Rehabilitation of degraded habitats"*

Planting and soft landscaping are considered as fundamental mitigatory inclusions in many development proposals, and as a statutory requirement for developments which would, without prejudice to other relevant policies and regulations, have to be located in sensitive areas (e.g. Outside Development Zones). The need to embellish both urban and rural areas by means of tree planting has long been recognised in principle. Indeed, extensive tree planting, afforestation and landscaping projects have been carried out since the beginning of the 20th century and before; the intended aim of expanding the Islands' tree cover was in many respects achieved.

However, several projects carried out in rural areas (in the past and, to a lesser extent, even to date) have been inappropriately sited and/or have often made use of inappropriate species, to the detriment of natural ecosystems and the countryside in general. For example, many hectares of ecologically valuable garrigue were utilized for afforestation and replaced (to a substantial extent) with alien trees such as *Acacia,* which are, in the local context, ecologically damaging. Other rural areas have likewise been planted with *Eucalyptus*, an exotic tree that secretes chemicals into the soil so as to inhibit the growth of other plants; this has been carried out both by public agencies and, in a piecemeal manner, by individual tenants. Moreover, many ornamental species used in rural gardens and landscaping projects in the countryside have escaped into, and invaded, many ecologically important valleys, displacing their characteristic vegetation. These concerns are less important in urban areas.

## 1.2 Principal objectives and scope of these guidelines

The Structure Plan provides outline guidelines about conservation, afforestation and landscaping, particularly in sites located Outside Development Zones (ODZ) and/or within Rural Conservation Areas (RCAs).However, the Structure Plan is limited primarily at providing strategic guidance rather than the actual details required for implementation. It is therefore necessary for Government Departments and Agencies, Local Councils, Non-Governmental Organisations, private nurseries, planners (including private sector consultant planners), developers, architects and the interested public to be provided with more detailed guidance concerning the suitability or otherwise of particular species and sources for the purpose. This document is intended as a proactive basis for assessing individual proposals presented to the Planning Authority, and as a means of guiding prospective initiatives in advance, spelling out the details expected by the Planning Authority for projects that consist of, or include, planting. The intention is to:

1. promote environmentally-sound planting and soft-landscaping by guiding genuine efforts made by interested agencies (e.g. Government Departments, Local Councils, voluntary organisations) and by the general public;

2. encourage incentives for environmentally-compatible improvements in planting and landscaping projects, and to deter unsustainable, or environmentally-damaging practice;

3. further promote the demand for the propagation of suitable indigenous vegetation, and encourage Governmental and private nurseries to satisfy such demand; and

4. enable clients/developers, as well as their architects and consultants, to produce appropriate landscaping layouts and drawings for specific development projects.

The report focuses primarily on environmental and planning issues, and its main thrust is to promote and ensure compatibility of interventions with their siting. Some guidance about requirements that are essential pre-requisites for successful planting are also given; however, exhaustive specifications are beyond the scope of these guidelines (especially in view of the numerous requirements of individual species) and additional technical advice in this regard should be sought from the Department of Agriculture, the Environment Protection Department, competent landscapers, specialised consultants (especially ecologists and/or botanists) and specialised nurseries wherever appropriate. In view of the objectives outlined above, this report is centred on a number of key issues and requirements, with ancillary species lists (for clarification purposes) wherever applicable. It first outlines a number of key general requirements, and then highlights the different specific provisions that are applicable in urban and rural areas. It should also be noted that, for practical reasons, the lists contained in this document are indicative rather than exhaustive; it is therefore expected that the finer details of individual projects would continue to be assessed on their own merits, within a framework of standard criteria as established herein.

# 2. SAFEGUARDING EXISTING TREES AND VEGETATION

## 2.1 Why protect existing trees and vegetation ?

Generally, existing trees and vegetation should be conserved and adequately looked after; they are to be considered as valuable for the following reasons:

1. Many trees and plants contribute towards a more **attractive environment**;

2. Indigenous and archaeophytic trees (and vegetation) growing in the wild (see examples in ***Appendix 2***) or in a semi-natural state (e.g. artificially afforested sites which are regenerating in a natural manner) are of **ecological value** and, in some cases, of **scientific importance** as well. For example, they provide important habitats for other forms of wildlife, including birds;

3. Trees and vegetation (depending on type and siting) may have **important properties** such as sediment stabilisation (e.g. soil binding), uptake of runoff water, reduction of wind velocities, etc.;

4. Several old trees (including old wild trees, trees forming part of old gardens/plantations, old cultivated trees and old grafting stocks) are valuable as **antiquities**; a non-exhaustive list is contained in Government Notice 269 of 1933 issued by virtue of the Antiquities (Protection) Act, 1925. Old (and/or large) trees or vegetation clumps may be valuable as established **landmarks**; and

5. Many trees and plants grown for their crop value (including grafting stocks) have evolved local adaptations or variations as a result of prolonged artificial selection; these local strains are valuable in terms of agricultural/horticultural **biodiversity**.

## 2.2 Legal and policy framework

### *2.2.1 The Structure Plan for the Maltese Islands*

In addition to the promotion and regulation of new planting, the Structure Plan seeks to protect existing trees and vegetation; the following policies are particularly relevant in this regard:

**Policy RCO 4:**

*"The Planning Authority will not permit the development of any structure or activity which in the view of the Authority would adversely affect scenic value because it would:*
*... adversely affect existing trees or shrubs"*

**Policy RCO 33**

*"Specified individual trees or groups of trees of aesthetic, historical, cultural, arboricultural, and/or scientific interest will be protected by means of Tree Preservation Orders which prohibit the uprooting, destruction, or damage to trees growing in the wild and in public parks, gardens, and other spaces, or on private land, and regulate any other activity which may cause harm or death of such trees."*

### *2.2.2 The Development Planning Act*

**Articles 46 and 48** of the Development Planning Act, 1992 [Act I of 1992] reinforce these policies by empowering the Planning Authority to protect existing trees and vegetation through their "scheduling" or by means of Tree Preservation Orders:

**Article 46:**

*"(1) The Authority shall prepare... a list of... areas of natural beauty, ecological or scientific value (hereinafter referred to as "scheduled property") which are to be scheduled for conservation and may in respect of all or any one or more of the scheduled property make conservation orders to regulate their conservation...*

*(1) The carrying on of any work in, and the demolition, alteration or extension of, any scheduled property is prohibited or restricted as provided in this section or in a conservation order.*

*(2) No works of any description shall be carried out in or on any scheduled property and no scheduled property shall be demolished, altered or extended except with the permission of the Authority granted on an application made to it and giving such details as the*

*Authority may require, or in accordance with the provisions of a conservation order: and for the purpose of this section, damage to or destruction of any part of a scheduled property shall be deemed to be a demolition thereof.*

*(3) A permission of the Authority and a conservation order granted or made under this section may contain such conditions and other provisions as the Authority may deem necessary or expedient; and a conservation order may regulate any matter affecting scheduled property.*

*(4) In respect of any scheduled property, the Authority shall also have power to require the owner, by notice in writing, to undertake such works generally, or as may be specified in the notice, as may be necessary to ensure that no further deterioration occurs. In default, the Authority may give a further notice to the owner to carry out and complete the works within a specified time, and if the owner is still in default it may itself carry out, or cause to be carried out, the necessary works and recover the cost thereof from the owner of the scheduled property.*

*(5) If any scheduled property is demolished in contravention of any of the provisions of this section then, in addition to any penalty or other effect under this Act, every person convicted of such offence shall be liable to pay compensation to the Authority calculated on the basis of whichever is the highest of the following:*

*(a) the value of the thing destroyed.*

*(b) the cost of restoration or repair.*

*(c) the financial benefit which could be achieved as a consequence of the demolition."*

**Article 48:**

*"(1) The Authority shall prepare, and from time to time review a list of individual trees, groups of trees or woodlands (hereinafter referred to as "scheduled trees") which it considers should be protected, and may in respect of all or any one or more of them make tree preservation orders regulating such protection.*

*(1) No scheduled tree shall be cut down, lopped, topped or wilfully damaged or destroyed except with the permission of the Authority on an application made to it or as may be allowed under a tree preservation order.*

*(2) A permission of the Authority and a tree preservation order granted or made under this section may contain such conditions and other provisions as the Authority may deem necessary or expedient: and a tree preservation order may regulate any matter affecting scheduled trees."*

## *2.2.3 Other regulations*

Other regulations also seek to protect certain species of trees and natural vegetation. Particular, attention is drawn to:

1. the Wild Thyme Protection Regulations, 1932 [Government Notice 85 of 1932] which prohibit the destruction or uprooting of Mediterranean thyme (*Thymus capitatus* -- sagħtar);

2. the Conifer Trees (Preservation) Regulations, 1949 [Government Notice 328 of 1949] which require authorisation from the Director of Agriculture prior to the destruction or removal of existing conifer trees; and

3. the Trees and Woodlands (Protection) Regulations, 2001 [Legal Notice 12 of 2001]

## 2.3 The Planning Authority's outlook

The Planning Authority's outlook towards existing trees and vegetation is generally aimed at their conservation. Therefore, unless removal would result in a net environmental improvement (*see other sections of these guidelines*), the continued retention of existing trees, groups of trees and/or clumps of vegetation is to be sought wherever possible; their **unjustified destruction** or mutilation (even if this is to make way for other plantations) will generally be objected to by the Planning Authority. Nonetheless, the removal of existing trees or vegetation may be unavoidable in other cases-- e.g. to make way for new permissible development within development zones, or for essential infrastructural upgrading. The Planning Authority will therefore:

1. not approve the removal of trees in the absence of a **valid justification**; or

2. in the event that the Planning Authority is satisfied that such justification exists, demand that the **extent of removal** be conservative and that undesirable "casualties" (including accidental casualties) entailed by the intervention in question be minimised by the adoption of **precautionary measures**.

To this effect, and in collaboration with the competent agencies-- particularly the Environment Protection Department, the Department of Agriculture, and the relevant Local Councils-- the Planning Authority may pursue one or more of the following options (subject to the nature of the location, the options indicated below can be considered as listed in decreasing order of preference):

1. The **incorporation of existing** trees and/or vegetation into the proposed development wherever the proposed development is indispensable and cannot be relocated; to this effect, modifications (even if substantial) to the proposal may be required. Where appropriate, the Planning Authority may also prohibit the mutilation or severe pruning of such trees/vegetation, through appropriate **permit conditions**. In particular, the removal or mutilation of trees that are older than approximately 20 years (excluding invasive species) should only be considered as a

very last resort; the Planning Authority would also need to be satisfied that no other options exist and may require the commissioning of expert advice in this regard.

2. **Transplanting** of trees/vegetation, which would otherwise be affected by the proposed development/interventions, although this option is often limited by the species and age of the trees/vegetation in question. For example,

   - palms (*Phoenix* spp.), olive trees (*Olea* spp.), deciduous legumes such as Judas trees (*Cercis siliquastrum*), almond trees (*Prunus* spp.), citrus trees (*Citrus* spp.), and *Ficus* spp. are readily transplantable if adequate precautions (including seasonal factors, methods used for uprooting, transportation and replanting, and minimisation of damage to root and stem systems) are taken **in advance of uprooting**. Generally, deciduous trees with a defined rest period should only be transplanted during such period.

   - carobs (*Ceratonia siliqua*), *Eucalyptus* spp., and most conifers-- including alerces (*Tetraclinis articulata*), cypresses (*Cupressus* spp.), pines (*Pinus* spp.), *Thuya* spp., and *Araucaria* spp.-- are not readily transplantable.

   - Young trees also generally lend themelves better to successful transplanting than do older specimens of the same species.

3. Where none of the foregoing options are possible, destruction and damage to existing trees and vegetation is to be compensated for by the planting of trees/plants of the same species according to the "formula" established in ***Appendix 1*** Where replacement of the original species is actually desirable, or in other exceptional circumstances, the Planning Authority may consent to the planting of other species in the place of the trees/vegetation damaged or destroyed. In rural areas, the replacement of exotic trees and vegetation with indigenous and/or archaeophytic species of native stock will be pursued. Moreover, the Planning Authority may require that **compensatory/replacement planting** is effected in the same area or on a different site approved by it in advance; the Planning Authority may also require agreement with the respective Local Council on such planting.

4. The pruning, transplanting or removal of shrubs and trees in public soft areas, public gardens and other public areas must be carried out solely by a professional arboriculturist subject to authorisation from the Department of Agriculture. In other cases, the Trees and Woodlands (Protection) Regulations 2001 shall apply.

Notwithstanding the options indicated above, the Planning Authority will (especially in sites that are not zoned for development, green areas, sites located Outside Development Zones, scheduled / protected areas, and sites of conservation value):

- retain the right to refuse permits for developments which would damage existing trees or vegetation that are of conservation value. The provisions of Structure Plan policy RCO 4 (see ***Section 1***) are also particularly relevant; and

- not favourably consider development proposals that are unacceptable in principle, even if they include planting schemes.

- enforce procedures for safeguarding of existing trees during construction, unless declared invasive trees

In certain instances, site and tree assessment surveys should be carried out at the pre-development stage, in order that adequate treatments can be recommended to minimise potential damage and maximise positive tree reactions to change. Preferably this should take place one full growing season in advance of any development activity on the site. Such evaluations and treatments should be undertaken by qualified arboriculturalists and could include measures such as setting up protection barriers, pruning, mulching, establishing irrigation needs and marking access sites.

# 3. GENERAL GUIDELINES FOR NEW PLANTING

## 3.1 Ensuring successful planting projects

A number of factors (including environmental factors) must be taken into account to ensure that planting schemes are successful. Far from fulfilling the intended environmental improvement/embellishment, abortive projects are generally conducive to a net deterioration of the site chosen for their implementation. In order to minimise such eventualities, the Planning Authority will only approve planting schemes that require its authorisation if it is satisfied that the relevant precautions (including those outlined below) have been taken:

1. The trees and vegetation used should be **well adapted** to growing in the conditions that prevail in the Maltese Islands and specifically in the site to be used for planting; important factors include exposure, shade, climate/temperature, water availability/drought, soil conditions (including soil texture, compaction, soil moisture, salinity, soil pH / alkalinity, nutrient availability, contamination), soil cover / depth of usable soil, and pollutant levels. For example, plants with silvery, thick or waxy leaves, as well as plants bearing leaves that are lighter on their underside than on the upper side, are generally suitable for open sites and will not thrive fully in shaded situations. Conversely, plants with thin, soft or deep green foliage, as well as plants with very broad leaves, are often suitable only for shaded situations and would need constant watering if planted in exposed sites.

2. The **planting density** should also allow for sufficient space around the plants/trees so that specimens will not be stunted; space requirements vary from one species to the other. In some cases over-planting is acceptable, as are thinning practices. On the other hand, planting arrangements that are too sparse (this depends on the siting as well as on the intended use) generally fall short of satisfying the ultimate aim of environmental improvement.

3. It is important to make due allowance for the **increased size of the trees at maturity** (which is often considerable when compared to the initial size when first planted) and to allow sufficient room (and depth) for root growth. This aspect is particularly, though not exclusively, crucial in road construction and urban design.

4. The **time taken by tree species to reach maturity** is a primary consideration wherever the screening of buildings or structures (and/or the visual upgrading of urban areas) is being

sought, since the planting of saplings of slow-growing species would inevitably leave the area almost bare of vegetation for a relatively long time. The same issue also arises in sites which are prone to continual trampling or to similarly hostile conditions, since saplings are much more vulnerable to physical (and other) damage and therefore have a lower chance of survival. The use of faster-growing species or the planting of mature specimens of slow-growers may need to be resorted to in such cases, provided that the provisions of ***Section 4*** or ***Section 5*** (as applicable, according to the planting location) are adhered to.

5. It may, in addition to (3) above, also be important to ensure that the trees used have an adequately long **lifespan**, as otherwise costly efforts made at embellishment would themselves be short-lived; slow-growing trees generally tend to live longer-- e.g. olive, pine, carob and oak trees grow rather slowly but then live on for whole centuries; in contrast, *Acacia saligna* is a fast grower which only lives for about 30 years.

6. Adequate provision often needs to be made for **watering** of the trees and/or plants planted, at least during their initial phases of growth. In urban sites such as gardens, this can be achieved by the incorporation of water retention facilities into, or close to, the area earmarked for planting (e.g. underground reservoirs beneath paved areas) or utilising permeable surfaces. Requirements in rural areas are different, particularly since the construction of such structures in the countryside is not *per se* desirable from an environmental perspective.

7. A **maintenance plan** for the planted site (insofar as this would be compatible with the surrounding environment) is also required to ensure the continued existence of the planted area, thereby avoiding localised environmental degeneration as well as the squandering of finances on unsuccessful projects. The Planning Authority may ask for the submission of such plans as a pre-requisite for the approval of planting schemes, and may also attach permit conditions to this effect.

## 3.2 Ensuring compatibility with the environment

Since the overall aim of planting is to contribute positively towards enhancement of the urban and rural environment, planting schemes should be fully compatible with their surrounding environment; visual, ecological, safety-related, amenity-related and structural considerations are of paramount importance in this regard. Without prejudice to the provisions of other sections in this document, the following general issues are also to be taken into account whenever planting and/or landscaping are to be considered:

1. Planting **should not adversely affect** already-existing habitats, features or artefacts of conservation value and **should not unduly interfere** with natural processes. Thus, hydrological considerations (e.g. blockage of watercourses, damage to wells, adverse impacts on drainage patterns) and the avoidance of possible impacts on geological, ecological or archaeological features (e.g. occlusion of exposed features, damage caused by roots, blasting of rock for planting on karstland, obliteration of existing habitats etc.) are considered as fundamental pre-requisites. The provisions of Structure Plan policy RCO 30 (see ***Section 4.1***) are also relevant in this regard.

2. It is important to ensure that the **methods used** for planting, transportation, maintenanace and irrigation are environmentally-friendly; the creation of new roads and tracks in the countryside to provide access to bowsers and unnecessary removal of undergrowth (which incorrectly treats the countryside as an urban garden) is not in line with this requirement. Methods should not be unduly wasteful in terms of water and soil use (e.g. careful drip irrigation should be resorted to where appropriate). Attention is also drawn to existing regulations prohibiting the use of potable water or untreated sewage for irrigation purposes, and to the Soil (Preservation) Act, 1973 [Act XXIX of 1973] and Preservation of Fertile Soil Regulations, 1973 [Legal Notice 104 of 1973]; clearance from the Department of Agriculture and the Water Services Corporation may therefore be required.

3. Wherever the **importation of plants** or trees is involved (subject also to the provisions of ***Section 4***), this must be in line with international conventions to which Malta is a party as well as with the Agriculture (Plant Quarantine) Act, 2001 [Act XVIII of 2001] and is therefore subject to approval by the Environment Protection Department and the Department of Agriculture.

4. Considerations related to **site design** and landscape/townscape architecture are essential in the selection of species and arrangements for landscaping purposes. These include:

    - **aesthetic compatibility with the surrounding design/landscape**-- e.g. colourful species/varieties may help to enliven certain areas but may jar with other settings, rendering them artificial. On a more general level, planting should respect the Mediterranean character of the Maltese Islands, particularly of the countryside (including general rural settings such as rural settlements and hamlets, and isolated rural buildings) and old/historic village cores. The widespread, excessive planting of conspicuously "foreign" (i.e. incongruous) trees such as *Washingtonia robusta* --presumably as an attempt to imitate "exotic" pseudo-tropical resorts-- often detracts from the aesthetic quality of the planted area.

- **the provisions of Structure Plan policy *RCO 32*:**

  *The planting of appropriate species of trees will be encouraged where they enhance the landscape, particularly along roadsides, where they provide a screen to visually unattractive areas, and alongside footpaths where they provide shade. Species which attract birds will be encouraged in suitable locations.*

- **growing habits** such as approximate size, likely growth form, and evergreen or deciduous nature (in the case of rural areas, these aspects are included in ***Appendix 3***) and suitability for screening (this factor is itself dependent on growing habits);

- **the creation of specific microclimates**-- e.g. shade-providing species usually render recreational areas more user-friendly; species that act as windbreaks are particularly useful in urban and agricultural areas; certain microclimates may be important (and others deleterious) for ecological reasons such as the establishment or otherwise of undergrowth.

- **the provisions of policy *RCO 4* of the Structure Plan**, since planting schemes may also, if not carefully executed, have a negative impact on the landscape:

  *The Planning Authority will not permit the development of any structure or activity which in the view of the Authority would adversely affect scenic value because it would:*

  1. *Break a presently undisturbed skyline*
  2. *Visually dominate or disrupt its surroundings because of its mass or location*
  3. *Obstruct a pleasant and particularly a panoramic view*
  4. *Adversely affect any element of the visual composition-- for example, cause the destruction or deterioration of traditional random stone walls*
  5. *Adversely affect existing trees or shrubs*
  6. *Introduce alien forms, materials, textures, or colours.*

5. The restrictive considerations, but not the exemptions, stipulated in ***Section 5 (Urban Areas)*** of these guidelines are also valid for the countryside wherever applicable (e.g. safety on roads passing through rural areas, the environmental context of monuments or elements of cultural heritage located in such areas, etc.).

In view of the above, the Planning Authority will also generally seek consultation with the Environment Protection Department and the Department of Agriculture, on development permit applications concerning planting and landscaping, as may be necessary.

# 4. PLANTING IN RURAL AREAS

## 4.1 Ensuring compatibility with rural habitats

The Maltese countryside supports a rich array of different habitat types; under natural conditions, different plant species are best adapted to live in different environments. Habitats of major relevance to these guidelines are described in ***Appendix 2***.

### *4.1.1 Minimising disturbance of thriving rural habitats*

Within thriving natural or semi-natural habitats, planting (including afforestation) and other interventions are generally unnecessary and disruptive, and should therefore be avoided in line with **Policy RCO 30** of the Structure Plan:

*"There is a general presumption against the siting of afforestation projects where stable indigenous (native species) natural vegetational communities are already established, but encouragement of the siting of afforestation projects on abandoned agricultural land and on derelict ground will be given."*

### *4.1.2 Planting in degraded rural environments*

In contrast, degraded environments frequently require restoration, often by means of careful planting. Planting operations within degraded rural habitats (which nevertheless still possess conservation value) should be directed at their reinstatement or restoration. Other forms of planting that may contribute to further deterioration of the habitat in question or which would amount to a net replacement of the habitat with a less natural plantation would be in conflict with the rationale of Structure Plan policy **RCO 30** and will therefore not be considered favourably by the Planning Authority.

An important related aspect is afforestation, i.e. the creation or extension of semi-natural woodlands through large-scale tree planting. Such planting is actively promoted by the Structure Plan through its policies **RCO 6** (see ***Section 1***) and **RCO 30** (see ***Section 4.1.1*** above), subject to proper

environmental safeguards and provided that it does not entail environmentally-damaging "reclamation" of natural or semi-natural habitats of conservation value (e.g. garrigue).

### *4.1.3 Successful integration of plantations with the rural environment*

Whenever planting is carried out for the purposes of environmental restoration (including reforestation), extension of existing natural ecosystems (e.g. through afforestation), the creation of new semi-natural ecosystems (e.g. afforestation proper) or soft landscaping on uncultivated rural sites, it is important to ensure that the overall scheme --including the planting pattern and subsequent management -- reflects natural vegetation patterns and is in all respects compatible with the surrounding rural environment, as follows:

1. The tree and/or plant species used should be truly **characteristic** of the corresponding habitat; otherwise, the net result would be replacement (or, at best, alteration) of that habitat rather than its restoration. Moreover, adequately detailed studies should be carried out beforehand to ensure that the proportions of different species used is also truly representative of the original vegetation community, thus avoiding the promotion of ecological imbalances. The trees and/or vegetation planted should also represent different age-groups; phased planting over a period of time enables a more faithful replication of natural "age structures" than simple planting at one go.

2. In order to respect the characteristic habitat diversity of the Maltese countryside, **unnatural combinations** of species which normally characterise distinct environments and which would usually not occur together should be avoided. The overall planting scheme would thereby also blend better (both visually and ecologically) into the landscape. This aspect is particularly important for the creation of new wooded areas through afforestation, as demonstrated by several local case studies of unnatural combinations of trees which failed to develop into fully-fledged woodland or maquis ecosystems.

3. Large-scale **monocultures** (planting schemes making exclusive use of one species) should be avoided. They are, generally, not truly representative of natural vegetated areas and, at most, regenerate into impoverished ecosystems with a relatively low ecological diversity. Moreover, they are also more prone to damage from pest attacks, while their excessive homogeneity is often visually monotonousWhereas **rectilinear plantations** and straight-line rows are usually simpler to maintain, such overly regular patterns should not be resorted to in rural areas as they

are conspicuously unnatural and often jar with their rural surroundings. Clustered patterns, as occur naturally, are more appropriate.

4. Afforestation and medium-scale to large-scale tree planting and landscaping projects in uncultivated sites should consist of a **tiered arrangement** which gives due importance to understorey vegetation (in many cases, the development of undergrowth can occur naturally once the right conditions are provided in the course of planting of the overlying "canopy" of trees). From an ecological point of view, the undergrowth is a fundamental component of the ecosystem. From a visual point of view, the various layers of vegetation provide for a combination of "softening" of views, screening of structures and ground cover. Stepped layouts also avoid sharp transitions between the planted trees and the surrounding terrain and are therefore desirable unless their increased land take would cause adverse environmental impacts. For convenience, a generalised layout is depicted in ***Figure 1***, although this should not be considered as a rigid blueprint. [Note: Whilst tiered layouts are generally desirable in the countryside, they are (with a few exceptions) inappropriate for cultivated fields and orchards].


**Fig. 1**

5. In order to avoid an eventual degeneration of carefully executed planting (be it habitat restoration, afforestation, etc.) and the ensuing futility of the overall scheme, it is important to ensure that the site is **properly managed**. In certain sites, non-intervention may be the best form of management, whereas others may require continued maintenance-- thus, each case would have to be dealt with on its own merits. The regulated assistance of voluntary organisations and private enterprises willing to participate in environmental management should be actively considered in this regard (within a proper environmental management framework for

the area); foreign aid could also be elicited, although this should not include the importation of trees or vegetation which would infringe the provisions of ***Sections 4.2 and 4.3*** below.

## 4.2 Using suitable vegetation

### *4.2.1 Problems caused by the use of alien species in rural areas*

One of the key problems identified with planting projects, including afforestation and rural landscaping, is the inappropriate use of alien (exotic) species introduced from overseas. Some of these are ill-suited to local conditions and die out or exhibit stunted growth. Others, such as many species coming from regions with a Mediterranean-type climate (e.g. South Africa, California, parts of Chile and parts of Australia) and tolerant opportunistic species ("weeds") manage to thrive and often become pests if planted in rural areas, due to the following reasons:

1. In most cases they fail to support an adequate undergrowth (except for ubiquitous weeds which often contribute to further displacement of characteristic native plants), thus rendering the planted area analogous to an "ecological desert". Such is the case with *Acacia* and *Eucalyptus* trees, which unfortunately are widely planted in the countryside and which were formerly used on a large scale for afforestation.

2. Some are invasive and eventually displace native flora and fauna (including threatened species) from nearby natural habitats, thereby phasing out the local biodiversity. The castor oil tree *Ricinus communis* (Riġnu) has overrun whole valleys, while the Kaffir fig *Carpobrotus edulis* (Swaba' tal-Madonna) has suppressed rare specialised plants from sand dunes and saline marshlands.

Moreover, the planting of suitable indigenous vegetation presents a tangible opportunity for rehabilitating the countryside by assisting it in regenerating its characteristic vegetation, yet the opportunity is wasted if the species used do not fulfil this objective.

### *4.2.2 Using suitable species*

The Structure plan, through its policy **RCO 31**, requires that the use of exotic species **in the countryside** (especially in large-scale projects) be progressively phased out:

*"Afforestation projects sited in non-urban areas will make use only of indigenous and archaeophytic (brought by man in prehistoric times, and now naturally occuring) species. The use of exotic (not native to the country) species will be limited to urban areas."*

In line with this policy, the use of species not listed in ***Appendix 3*** is to be considered as unacceptable in the countryside (subject to the provisions of ***Sections 4.5 and 4.6***); wherever a permit is required (e.g. as part of a larger development or intervention), the planting of such species will generally only be allowed in urban areas in line with ***Section 5***. For guidance purposes, a non-exhaustive list of species that are expressly unacceptable is included in ***Appendix 5***, without prejudice to the provisions of this section (***Section 4***) and to the list in ***Appendix 3***. It is envisaged that the list in ***Appendix 5*** will be updated as other invasive, or otherwise harmful, "pest" species are identified. It should be pointed out that alien stock of native species is also considered as unacceptable for the reasons specified in ***Section 4.3***. Nonetheless, in the case of urban areas, especially gardens and other open spaces, the use of Mediterranean-type species is particularly encouraged in view of their adaptability to grow in local climatic conditions. A non-exhaustive list of Mediterranean-type species that may be used in such circumstances is included in ***Appendix 4***.

### *4.2.3 Undoing existing problems*

In many instances, especially in the case of **invasive species**, it is indeed desirable that even existing alien specimens be eradicated. In the case of afforestation projects, a scheme of gradual replacement of exotic (especially invasive) trees with appropriate indigenous / archaeophytic trees should be embarked upon. This should make initial use of the existing trees as "nurse" trees providing shade and physical protection for more vulnerable saplings of the desired species, followed by the removal of the alien tree when the planted saplings have become firmly established (this process may take a number of years-- e.g. about 5 years in the case of carob trees). The initial use as "nurse" tree may not be advisable if the tree has properties that inhibit the growth of other saplings, and outright (though careful) removal should be sought.

It should be stressed that any such interventions should be carried out "**surgically**" rather than *en masse* and should be done **gradually and very carefully** so as not to subject already ailing

habitats to an ecological shock. Moreover, they should be preceded by detailed studies to avoid **unscientific tampering**; for example, the use of fire actually encourages the spread of pests such as *Acacia saligna (= A. cyanophylla)*, and creates ecological imbalances that transform other opportunistic species, including certain native species such as bramble *Rubus ulmifolius* (Għollieq), into serious pests. Similarly, indiscriminate ploughing and/or dredging of watercourses often destroys most sensitive species but renders resilient plants such as reeds, *Arundo donax* (Qasab), more vigorous, to the extent that they become invasive pests.

## 4.3 Respecting genetic diversity

### *4.3.1 Why be concerned ?*

Following the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992, it is nowadays internationally recognised that intra-specific (within-species) variation is a fundamental component of biodiversity, which needs to be safeguarded. In simple terms, vegetation (including trees) that has been growing in the Maltese Islands for thousands of years has developed particular genetic traits (locally adapted ecotypes), which are particular to these Islands. The importation and planting of foreign stock of the same species will in effect contaminate and/or dilute the local genetic pool and may, in the long run, lead to a gradual phasing out of the actual Maltese gene pool.

While this aspect may appear to be trivial at face value (although it has long been appreciated in the agricultural sector), it constitutes a serious threat, as its ultimate impact may effectively be the extinction of native populations of the less common vegetation types. Paradoxically, one such example, which is imminently threatened by the importation of foreign stock, is the alerce *Tetraclinis articulata* (Għargħar), the Maltese national tree!

Moreover, some imported stocks of locally occurring species such as the myrtle *Myrtus communis* (Riħan) are quite different (even morphologically) from the local wild populations of the same species.

Similarly, the importation of certain plant species which are closely related to indigenous species may lead to hybridisation, which may have an analogous (if not worse) effect since vigorous hybrids often outcompete the parent species. In some cases, hybrids of largely artificial origin even become uncontrollable pests, as borne out by grasses growing on certain British river banks.

Such “genetic pollution through introgression” is to be avoided by ensuring that plants used in soft landscaping originate from native local stocks of the species concerned. This will be adopted by the Planning Authority as a criterion for the evaluation of landscaping schemes.

## 4.4 Site engineering

Planting also provides a valuable tool for site engineering such as stabilisation of land. For example, esparto grass *Lygeum spartum* is capable of growing on bare clay slopes and retards their erosion; the great reed *Arundo donax* also has soil-binding properties, although it is somewhat invasive and its use is not always appropriate from an ecological viewpoint.

The species to be used in such projects depends on the properties required, and therefore individual projects have to be considered essentially on their own merits. However, it is fundamental that the requirements raised in the foregoing sections of these guidelines be met; this can be enforced through the Development Control process since site engineering works require a development permit. Moreover, in view of the potential risk of interference with fundamental natural processes, such landscaping/engineering projects will only be considered if supported by a detailed method statement prepared by appropriately qualified professionals.

## 4.5 Planting within agricultural land

In addition to indigenous or archaeophytic species, non-invasive exotic species (see ***Appendix 6***) grown for their agricultural importance may also be planted on agricultural land. It is neither feasible nor desirable to preclude the production of existing and/or potential crop species that are capable of thriving under local climatic conditions and which may acquire economic importance, as long as these do not pose any significant threat to the surrounding environment (subject also to ***Sections 4.2 and 4.3 above***).

Moreover, the species listed in ***Appendix 6*** are also considered suitable for soft landscaping and other non-crop planting **within** cultivated agricultural land.

The foregoing provisions of this section (***Section 4.5***) are subject to the following conditions:

1. For the purposes of this section, the term “agricultural land” refers exclusively to already-cultivated land (including existing orchards) and land covered by a valid permit for agricultural development (in this respect, compatibility with the relative permit conditions and approved

plans and drawings is required). It does not cover natural or semi-natural habitats and sites reclaimed for cultivation without the requisite planning permits, nor does it cover developments that are not connected with the cultivation of crop plants (e.g. farms for animal husbandry);

2. They apply only **within** the actual physical boundaries of the agricultural land in question; and

3. Within scheduled areas, they apply only if the Planning Authority is fully satisfied that the proposed planting will not have any adverse effects on the surrounding environment and is compatible with its location.

## 4.6 Planting within cemeteries

Soft landscaping of cemeteries that are located outside development zones is governed by the provisions of both ***Sections 4.1 to 4.4 above*** (rural areas) and ***Section 5 below*** (urban areas). However, the use of cypress trees (*Cupressus sempervirens* -- Ċipress) is considered acceptable for planting inside cemeteries.

Planting within cemeteries that are located entirely within urban areas is governed by ***Section 5*** only.

# 5. PLANTING IN URBAN AREAS

Most of the considerations which hold for rural areas are irrelevant to urban areas, and undue restrictions on the planting of indigenous and non-indigenous species within such areas are not desirable. Planting schemes proposed for urban areas will be considered favourably as long as the Planning Authority is satisfied that the proposals are harmless in all respects (adequately detailed statements may be required in some cases) and that the following important considerations are fulfilled:

1. **Exceedingly invasive species** which are capable of invading rural areas even from within urban sites are not to be used at all-- the Castor oil tree *Ricinus communis* (Riġnu) is one such species which has escaped from urban areas and which has overrun a number of rural valleys; the cape sorrell *Oxalis pes-caprae* (Ħaxixa Ingliża) has likewise spread beyond control and is now a ubiquitous weed in the countryside. The use of such species is considered unacceptable irrespective of their proposed siting; wherever any doubt exists about whether a species falls within this category, a precautionary approach shall be adopted.

2. In view of the considerations raised in ***Section 4.3*** and subject to the provisions of (1) above, the use of **non-invasive exotic species** is preferable to the use of imported stock of native species (which would otherwise have to be resorted to when local stock is not readily available) for the purpose of planting in urban areas.

3. **Urban fringes** (i.e. sites lining the extreme periphery of an urban area-- e.g. along ring-roads-- such that they lie at the urban-rural interface) should be treated like rural areas, since environmentally-impacting interventions therein (e.g. the planting of invasive species) is likely to affect the adjoining countryside. Wherever an ecologically/scientifically valuable enclave is sited within an urban area (e.g. the valley bed and steep valley sides at Il-Wied ta' Għajn Żejtuna, Mellieħa), its immediate surroundings qualify for similar treatment in line with the provisions of the Structure Plan (**Paragraph 15.32 and policy RCO 15**):

   *" Even built-up and urban areas may include elements of scientific and natural iterest which are worthy of preservation...*
   *There is a general presumption against developments in urban and other built-up areas which are insensitive to the continued existence of identified features of scientific importance and significant elements of the country's natural heritage present within the area."*

4. Species that form **aggressive root systems** -- e.g. carob trees *Ceratonia siliqua* (Ħarrub) as well as *Ficus* spp. such as *Ficus microcarpa* (= *F. nitida)* and *Ficus elastica* -- may directly damage buildings, roads, underground services, paved areas and monuments (including historic features and archaeological sites) in their vicinity and may therefore give rise to long-term financial and environmental costs unless carefully sited or appropriate measures taken to eliminate of minimize the problem. Indirect consequences include possible nuisances and hazards to traffic and/or pedestrians, as well as sanitary hazards. The use of such species in urban areas should either be confined to wide, unpaved open spaces where the potential for structural damage is minimal (e.g. large roundabouts which do not have any infrastructural services passing through them), or contained within adequately robust planters or copper impregnated geotextiles or other measures as directed by a qualified arboriculturalist, that help control the spread of roots; skilful occasional grooming may also be required. Wherever these techniques are not feasible and/or insufficient, the use of such species is to be avoided altogether. Root treatment or the introduction of root inhibitors may also be resorted to rectify aggressive rooting.

5. The presence of other species in areas frequented by pedestrians, especially children, may be undesirable for reasons related to **health and safety**-- e.g. *Acacia saligna* (=*A. cyanophylla*) may induce allergic reactions in asthmatics, *Ricinus communis* and *Nerium oleander* are notoriously toxic if ingested. The use of these species (especially in public places) is not acceptable; this provision will also be applied to other trees or plants, in addition to those known of, which may (according to future scientific evidence) induce significant risk to public health. In certain cases (particularly *Acacia saligna* and *Ricinus communis*), the gradual removal of already existing specimens should also be pursued.

   Other plants may exhibit the same properties to a milder extent, and are generally harmless (except to highly susceptible individuals) unless used improperly. Total restriction of their use is not considered feasible, but it is nonetheless important to ensure that they are used carefully (e.g. sited away from children's play areas); an indicative list is included in ***Appendix 7.***

   Particular attention should also be given to the precise siting of plants with **long spikes** (e.g. certain palm trees), which may cause physical injury if inappropriately located.

6. All large shrubs which form thick growths may be detrimental to **road safety** if planted near road junctions, bends and pedestrian crossings, since they obstruct the visibility for pedestrians and drivers. The use of such shrubs in inappropriate locations will not be accepted. On the other hand, careful use of certain species of vegetation in centre strips may provide a screen that protects from the glaring headlamps of oncoming traffic; any such use will need to be approved in advance by the Transport Planning Unit of the Planning Authority since this issue extends beyond environmental considerations.

7. The **planting layout** to be adopted should be compatible with the surrounding urban fabric and with the intended use of the planted area. The concept of the right plant in the right place within the right planting distance should be applied throughout, for example, formal layouts may be preferable in city centres whereas informal gardens would be more suitable in peripheral sites, with the inclusion of Mediterranean plants that are amenable to xeriscaping as a first preference, however the following guidelines would also need to be considered:

   - Planting layouts in gardens should provide for adequate passage of wheelchairs and should not obstruct paths (e.g. through lateral growth of vegetation) in a way which would hinder such passage or which would cause difficulties to blind persons;

   - The design of would-be gardens and playing fields must not be excessive in the proportion of paved areas as compared to planted areas, since this would merely produce a "concrete desert" that is particularly inhospitable to users and plants during the hot summer months; and

   - The siting of bird-attracting trees relative to public facilities such as seats/benches and car parking spaces, and vice-versa, should be given due attention. Bird droppings accumulate under such trees (e.g. *Ficus microcarpa*), often rendering any underlying facilities unusable or unpleasant to use.

8. The historic relevance of urban structures should also be respected. Competition with cultural, architectural, historical or archaeological monuments, and distortion of structures or contexts should be avoided.

   Planting within the ramparts or glacis of historic military fortifications, which were never intended for the purpose, is also generally undesirable. In some cases, damage to historic features has been noted (e.g. at St Paul's battery at Delimara); accordingly, removal of trees from these sites could be necessary to protect the underlying historic heritage. However, in many other cases, plantations on glacis (e.g. at Sa Maison) and similar areas (e.g. clay slopes below Fort Chambray in Gozo) have grown into quasi-seminatural woodlands which have also contributed positively to an enhancement of the landscape-- wherever these are not causing any severe damage to the fortifications, they are to be conserved; the Planning Authority would require adequate proof of such damage (as well as reliable assurance that removal of trees would have any beneficial effect) before acceding to their uprooting.

9. The species used should be resistant to drought, pests and diseases, and should be capable of thriving under conditions prevailing in the urban environment (including pollution,

microclimate created by nearby buildings and structures, heat from car and road surface reflections, trampling and continual disturbance, etc.) and should possess properties which help to create an all-year-round pleasant and diverse urban environment. Resistance to vandalism and fire is also desirable wherever possible.

For the purpose of this section, the term “urban area” refers to existing and committed built-up areas as delineated in the *“Pjan Regolatur (1988)”*; they should be construed as excluding urban fringes (as defined in ***Appendix 8***), sites just within the limits to development (e.g. along peripheral ring roads), rural settlements and hamlets, built-up areas (and/or open spaces) lying outside development zones, roads and paths (including major roads, country roads, tracks, walkways, and footpaths) passing through rural areas, and the immediate surroundings of ecologically valuable enclaves sited within built-up areas (e.g. the valley bed and steep valley sides at Il-Wied ta' Għajn Żejtuna, Mellieħa); the last-mentioned is nevertheless included in the list of restrictions listed above so as to avoid misunderstandings.

# APPENDIX 1:
## General guideline for compensatory planting

In line with ***Section 2***, wherever removal of existing trees is to be allowed, compensatory planting (henceforth referred to as "replacement") in accordance with the following tables shall be sought by the Planning Authority:

***Table 1: Replacement of indigenous trees***

| Location of tree(s) removed | Protected area (ODZ or within scheme) | | | Other sites ODZ | | | Sites within Scheme (except protected areas) | | |
|---|---|---|---|---|---|---|---|---|---|
| Approximate age of trees removed (years) | > 100 | 10-100 | < 10 | > 100 | 10-100 | < 10 | > 100 | 10-100 | <10 |
| Number of trees to be planted per individual tree removed | 50 | 40 | 20 | 50 | 30 | 10 | 40 | 20 | 5 |

***Table 2: Replacement of non-indigenous trees***

| Approximate age of trees removed (years) | > 100 | 10 - 100 | < 10 |
|---|---|---|---|
| Number of trees to be planted per individual tree removed | 20 | 10 | 2 |

**Note:** **1.** The terms "removed" and "removal" also cover trees uprooted, destroyed, mutilated or damaged in a manner (and/or to an extent), which the Planning Authority regards as serious. The term "protected area" covers all sites and areas covered protected by existing legislation, and includes scheduled sites/ areas, sites/areas covered by Emergency Conservation Orders, areas zoned for conservation in Local Plans and Action Plans, sites protected under the provisions of the Environment Protection Act (1991) and/or its subsidiary regulations and sites protected by virtue of the Antiquities (Protection) Act of 1925.

**2.** Wherever the age of a particular tree is not known, estimation on the basis of "standard" criteria such as stem thickness (girth), height and other available knowledge will be resorted to. The commissioning of expert advice may be required where appropriate.

**3.** Notwithstanding the provisions of the tables above, the Planning Authority will not allow the removal (including uprooting, destruction, mutilation or damaging) of trees that are considered as having outstanding value, including very old trees, important landmarks, unique/rare indigenous trees growing in the wild, and trees that qualify for protection as Level 1 or Level 2 Sites of Scientific

Importance. In the case of other trees of (lesser) conservation value, consent for removal shall only be granted if the Planning Authority is satisfied that a valid justification exists, that the removal would be compatible with existing policies, and that no other alternative that is less environmentally damaging exists.

**4.** The table is generally applicable to trees only. However, the Planning Authority may also require an analogous replacement scheme for shrubs or other vegetation uprooted, destroyed or damaged.

**5.** The matrix shown above is only intended to give a rough guidance on the **minimum** number of trees required for compensatory/replacement planting. The Planning Authority reserves the right for more stringent requirements, and for additional conditions on the type, positioning, and maintenance of the trees planted.

**6.** The planting referred to in this Appendix is intended for compensation/replacement of uprooted, destroyed and/or damaged specimens and is not to be considered as extra "planning gain".

**7.** Unless directed otherwise by the Planning Authority in writing, replacement is to make use of trees of the same species as the tree removed, and shall be subject to the provisions applicable for new planting as specified in the attached guidelines (especially ***Section 4.3***). The Planning Authority may also make additional requirements regarding the age and/or size of the individual trees used for replacement.

**8.** In some cases, the Planning Authority's requirement for the use of trees whose species, size, age and/or lifespan is different from that of the trees earmarked for removal may considerably increase the expenditure required for replacement when compared to the use of specimens whose characteristics are similar to the pre-existing trees. In such cases, the Authority may agree to a reduction in the mandatory number of trees to be planted (see tables above) so as to make up for the increased expense.

**9.** Replacement planting may make use of more than one site (e.g. if this would be preferable from an environmental/planning viewpoint, or if dictated by spatial restrictions in the available sites), provided that consent has been obtained in advance from the Planning Authority in writing.

**10.** Large-scale compensatory planting may in certain instances constitute development and/or afforestation. In line with the provisions of the Development Planning Act and the General Development Order (1997), the Planning Authority may request that the proposed planting be covered by a development permit.

**11.** In order to guarantee successful replacement, the Planning Authority must be satisfied, in advance of commencement of works, that planting, maintenance and aftercare will not be hindered in any way by:

- inappropriate site selection;

- ownership of the land on which replacement planting is to occur;
- unclear responsibilities connected with planting, maintenance, aftercare, and/or liaison with the Planning authority and with other agencies; and
- methodologies, strategies, plans and/or time frames adopted for replacement.

The Planning Authority may also impose additional permit conditions (and/or financial guarantees) covering the above details and any contractual agreements that may be connected therewith. Monitoring reports and/or progress reports may also be required by the Planning Authority and may also be covered by similar conditions and/or guarantees.

# APPENDIX 2:

## List of characteristic habitat/ ecosystem types of the Maltese Islands

1. **Woodland** vegetation, known in Maltese as *"bosk"*, is the ecological climax in the Maltese Islands and is normally encountered in sheltered locations, which enable the growth of large, tall trees; only a few small remnants survive. The **Mediterranean sclerophyll forest** is dominated by the holm oak *Quercus ilex* (Ballut), together with smaller trees (similar to the species that dominate maquis habitats) and creepers as undergrowth. **Coniferous woodland** is dominated by Aleppo pine *Pinus halepensis* (Żnuber), which can grow in more exposed areas; it supports relatively little undergrowth.

2. **Maquis**, known in Maltese as *"makkja"*, consists of lower-growing trees and tall shrubs, with creepers as undergrowth. It is typically predominant on sheltered slopes (including valley sides), and generally substitutes woodland where this has been destroyed. Important components of maquis include the bay laurel *Laurus nobilis* (Rand), myrtle *Myrtus communis* (Riħan), carob *Ceratonia siliqua* (Ħarrub), olive *Olea europaea* (Żebbuġ), hawthorn *Crataegus monogyna* (Żagħrun), azarole *Crataegus azarolus* (Għanżalor) and ivy *Hedera helix* (Liedna). In turn, these support an important undergrowth largely composed of herbaceous plants such as the acanthus *Acanthus mollis* (Ħannewija). The alerce *Tetraclinis articulata* (Għargħar), Malta's National Tree, forms a **coniferous maquis** of which only scanty remnants survive in the wild; it can grow in relatively exposed areas.

3. **Garrigue** (sometimes also spelt as "garigue" and known in Maltese as *"xagħri"*), is dominated by low to moderately high woody shrubs such as thyme *Thymus capitatus* (Sagħtar), heath *Erica multiflora* (Savina), shrubby kidney vetch *Anthyllis hermanniae* (Ħatba s-Sewda) and the spurge *Euphorbia melitensis* (Tengħud); herbaceous plants such as the seaside squill *Urginea pancration* (Għansar) are also present between the shrubs. In the Maltese Islands, garrigue communities are normally associated with exposed rocky land with characteristic small soil pockets, but it is important to note that healthy garrigues display numerous localised variations determined to some extent by the degree of exposure to the wind and by the precise nature of the terrain. Thus, some garrigues support individual plant species that are largely confined to that locality. In less exposed rocky areas such as steep valley sides, a habitat intermediate in character between garrigue and maquis develops (the vegetation height varies in an undefined manner according to the degree of exposure to prevailing winds); this is generally known as **high garrigue** and is typically dominated by the tree spurge *Euphorbia dendroides* (Tengħud tas-siġra). Similar plants, which must be adapted to growth on near-vertical planes in addition to the harsh rocky surface, grow on cliff faces; such **rupestral vegetation** includes the endemic Maltese salt tree *Darniella melitensis* (Xebb) and Maltese national plant *Palaeocyanus crassifolius* (Widnet il-Baħar), as well as the caper *Capparis orientalis* (Kappar).

4. **Rocky steppe** develops where the original garrigue has been degraded through continuous disturbance, and consists of herbaceous plants (but not woody shrubs), which also occur in the garrigue but become more dominant here. These include the Seaside squill *Urginea pancration* (Għansar), the asphodel *Asphodelus aestivus* (Berwieq), the ferule *Ferula communis* (Ferla) and numerous grasses. **Grass steppe** or **grassland**, known in Maltese as "moxa" (sometimes misspelt as "mogħxa"), is a similar habitat that develops on derelict agricultural land. **Clay steppe**, which develops naturally on clay slopes, is described separately in (8) below; analogous steppes also develop naturally as edaphic climaxes in other areas.

5. **Watercourses, permanent springs, small-scale temporary / permanent streams** and **freshwater wetlands** (including ponds which evolved, or were converted into, semi-natural environments) support a characteristic vegetation which requires an abundant water supply. Such vegetation includes rushes (Simar) such as *Holoschoenus vulgaris*, *Bolboschoenus maritimus* and *Juncus* spp., sedges *Carex* spp. (Sogħda) and the bullrush *Typha domingensis* (Buda). **Riparian woodland**, also known as **broadleaved deciduous woodland** also thrives mainly in or near watercourses. This type of woodland, which consists of white poplar *Populus alba* (Luq), the willows *Salix pedicellata* and *Salix alba* (Safsaf), the ash *Fraxinus angustifolia* (Fraxxnu) and the Mediterranean elm *Ulmus canescens* (Nemmiesa), is now almost extinct since many valley beds have been converted into fields, dredged, built up or covered with concrete. **Humid, sheltered environments** in the immediate proximity of the above-mentioned wet habitats, or in the vicinity of groundwater seepage points and shady rockfaces, are often dominated by the maidenhair fern *Adiantum capillus-veneris* (Tursin il-bir) and, in a few instances, by the uncommon Horsetail *Equisetum* sp. In rocky areas such as garrigue and rocky steppe, small **temporary pools (kamenitzas)** develop during the rainy season; these also support small but attractive plants such as the rare *Damasonium bourgaei*.

6. **Coastal** vegetation is adapted to saline conditions. The dominant tree is the tamarisk *Tamarix africana* (Bruka); this tree can also withstand partial inundation and may be planted right near the water's edge. The golden samphire *Inula crithmoides* (Xorbett or Xurbebb) and the shrubby orache *Atriplex halimus* (Bjanka), which is frequently used as a hedge plant, also thrive in such conditions. Several valley mouths also support **saline marshlands** at their land-sea interface; vegetation inhabiting such areas, such as the chaste tree *Vitex agnus-castus* (Għadiba or Siġra tal-virgi), the lesser reed *Phragmites australis* (Qasab ir-riħ), the orache *Atriplex prostrata* (Selq) and some rushes of the genus *Juncus* (Simar), must withstand fluctuations in soil salinity as well as periodic alternations between inundation and drought.

7. **Sand dunes**, known in Maltese as "għaram tar-ramel", develop at the rear of sandy beaches. They support hardy plants that are capable of growing in loose sand, binding it with their roots and thereby stabilising it. Such plants, which are also salt-tolerant, include the sea daffodil *Pancratium maritimum* (Narċis il-baħar), the sea holly *Eryngium maritimum* (Xewk tar-ramel),

the sand dropseed *Sporobolus arenarius* and the sand couch-grass *Elytrigia juncea (=Elymus farctus, Agropyron junceum, A. farctus)*. The latter two species are important sand stabilisers and are thus particularly useful for the re-establisment of sand dune ecosystems where these have been severely degraded.

8. Like sand dunes, **clay slopes** also consist of an essentially loose substratum and are therefore an analogously difficult habitat. They are colonised almost exclusively by clay-binding vegetation such as the esparto grass *Lygeum spartum* (Ħalfa) and the truncated canary grass *Phalaris truncata* (Skalora salvaġġa). Since the dominant vegetation consists essentially of grasses, it is often referred to as **clay steppe**.

# APPENDIX 3:

## List of species that may be used in sites outside development zones and in urban fringes.

In line with ***Section 4.2***, and subject to the provisions of ***Section 4.3***, only indigenous and archaeophytic species are to be used in the countryside, in sites located outside development zones and in urban fringes; the use of alien species in such areas would infringe Structure Plan policy RCO 31. Subject to Structure Plan Policy RCO 30 (refer to ***Section 4.1***) and to the requirements of ***Section 4*** (see above), the following trees, shrubs, and plants are recommended for general landscaping, afforestation, environmental restoration and habitat extension/creation (including the provision of ecological corridors), as well as for other planting on abandoned fields, derelict areas and development sites (without prejudice to Structure plan policy SET 11).

It should be noted that categorisation of species as trees, shrubs, herbs and climbers/creepers (see below) is purely indicative. Several species can adopt different growth patterns according to localised factors-- e.g. all tree species may remain as low shrubs if stunted by adverse conditions, shrubs such as the endemic *Darniella melitensis* may occasionally attain enormous sizes, while certain creepers such as the evergreen honeysuckle *Lonicera implexa* as well as old specimens of perennial herbs may also grow as woody shrubs.

The list below also indicates whether the species in question are evergreen or deciduous. The following key is being used:

E/D = Whether evergreen or deciduous
E = Evergreen
SD = Summer deciduous
WD = Winter deciduous

| Scientific name | Maltese name | English name | Habitat | E/D |
|---|---|---|---|---|
| **Conifers** | | | | |
| *Pinus halepensis* | Żnuber | Aleppo pine | Coniferous woodland | E |
| *Tetraclinis articulata* | Għargħar | Alerce / Sandarac gum tree | Coniferous maquis | E |

## Palms

| | | | | |
|---|---|---|---|---|
| *Chamaerops humilis* | Ġummar | Dwarf fan palm | Garrigue / maquis | E |

## Trees attaining large to moderately large sizes

| | | | | |
|---|---|---|---|---|
| *Ceratonia siliqua* | Ħarruba | Carob | Maquis | E |
| *Fraxinus angustifolia* | Fraxxnu | Narrow-leaved ash | Riparian woodland | WD |
| *Laurus nobilis* | Rand | Bay laurel | Maquis / woodland | E |
| *Olea europaea* | Żebbuġa | Olive | Maquis | E |
| *Populus alba* | Luq | White poplar | Riparian woodland | WD |
| *Quercus ilex* | Ballut | Holm oak | Sclerophyll forest | E |
| *Salix alba* | Żafżafa l-kbira / Safsafa l-kbira | White willow | Riparian woodland | WD |
| *Salix pedicellata* | Żafżafa ż-żgħira / Safsafa ż-żgħira | Mediterranean willow | Riparian woodland | WD |
| *Ulmus canescens* | Nemmiesa | Mediterranean elm / Grey-leaved elm | Riparian woodland | WD |

## Trees attaining small to moderate sizes

| | | | | |
|---|---|---|---|---|
| *Anagyris foetida* | Fula tal-klieb | Bean trefoil tree | Maquis | SD |
| *Cercis siliquastrum* | Siġra ta' Ġuda | Judas Tree | Maquis | WD |
| *Crataegus azarolus* | Għanżalor | Azarole | Maquis | WD |
| *Crataegus monogyna* | Żargħun | Common hawthorn | Maquis | WD |
| *Crataegus x ruscinonensis* | Għanżalor salvaġġ | Hybrid Hawthorn | Maquis | WD |
| *Mespilus germanica* | Fomm il-lipp / Omm il-epp | Medlar | Cultivated / Maquis (probably extinct from the wild) | WD |
| *Myrtus communis* | Riħan | Myrtle | Maquis | E |
| *Olea oleaster* (=*O. europaea* var. *sylvestris*) | Żebbuġa salvaġġa | Wild olive | Maquis / garrigue | E |
| *Paliurus spina-christi* | Xewk ta' Kristu / Xewk tal-kuruna | Christ's thorn | Maquis (almost extinct form the wild) | WD |
| *Phillyrea latifolia* | --- | Mock privet | Maquis (almost extinct from the wild) | E |
| *Phyllyrea media* | --- | Small mock privet | Maquis (very rare) | E |
| *Pistacia lentiscus* | Deru | Lentisk / Mastic tree | Maquis | E |
| *Pistacia terebinthus* | Skornabekk | Terebinth / Turpentine tree | Maquis | WD |
| *Pistacia x saportae* | Deru bagħal | Hybrid mastic tree | Maquis | E |
| *Prunus dulcis* (=*Amygdalus communis*) | Lewż | Almond | Maquis / cultivated | SD |
| *Prunus spinosa* | Prajn / Prejn | Sloe / Blackthorn | Maquis | WD |
| *Punica granatum* | Rummien | Pomegranate | Maquis / cultivated | WD |
| *Pyrus pyraster* | Lanġas salvaġġ | Wild pear | Maquis | WD |

| | | | | |
|---|---|---|---|---|
| *Pyrus spinosus* (= *Pyrus amygdaliformis*) | Langas salvaġġ | Almond-leaved pear | Maquis | WD |
| *Rhamnus alaternus* | Alaternu | Mediterranean buckthorn | Maquis | E |
| *Rhamnus oleoides* | Żiju | Small buckthorn | Garrigue / maquis | E |
| *Rhus coriaria* | Xumakk tal-konz | Common sumack | Maquis | WD |
| *Sambucus ebulus* | Nittiena / Sebuqa ż-żgħira | Dwarf elder | Maquis / Riparian woodland | WD |
| *Sambucus nigra* | Sebuqa l-kbira | Common elder | Maquis / Riparian woodland | WD |
| *Spartium junceum* | Ġenista safra | Spanish broom | Maquis | E |
| *Tamarix africana* (**not** *Tamarix gallica*) | Bruka | African tamarisk | Coastal / marshlands / sand dunes | E |
| *Viburnum tinus* | --- | Laurustinus | Maquis | E |
| *Vitex agnus-castus* | Għadiba / Siġra tal-virgi / Bżar tal-patrijiet | Chaste tree | Mainly coastal | WD |

## Large shrubs

***(Under optimal conditions, species listed generally exceed 1 metre in height at maturity)***

| | | | | |
|---|---|---|---|---|
| *Anthyllis hermanniae* | Ħatba s-sewda | Shrubby kidney-vetch | Garrigue | E |
| *Atriplex halimus* | Bjanka | Shrubby orache | Mainly coastal / disturbed ground | E |
| *Capparis orientalis* | Kappar | Caper | Rupestral / garrigue | WD |
| *Capparis spinosa* | Kappar | Spiny caper | Rupestral / garrigue | WD |
| *Cremnophyton lanfrancoi* | Bjanka ta' l-irdum | Maltese cliff-orache | Rupestral | E |
| *Darniella melitensis* | Xebb / Siġra ta' l-Irmied | Maltese salt tree | Rupestral / coastal | E |
| *Ephedra fragilis* | --- | Shrubby joint pine | Maquis | leafless |
| *Erica multiflora* | Savina / Issopu | Mediterranean Heath | Garrigue | E |
| *Euphorbia dendroides* | Tengħud tas-siġra | Tree spurge | High garrigue | WD |
| *Hippocrepis emerus* (=*Coronilla emerus*) | --- | Pale crown-Vetch | Garrigue / maquis | E |
| *Lycium intricatum* | Għawseġ | Southern tea-tree | Rupestral / coastal | WD |
| *Medicago arborea* | Nefel tas-siġra | Tree medick | Garrigue / maquis | E |
| *Nerium oleander*[1] (the wild type only with single pink flowers – see footnote) | Siġra tal-wirdien / Siġret il-ġarab | Oleander | Watercourses | E |

[1] The use of the wild type of *Nerium oleander* (with single pink flowers) is acceptable in appropriate rural areas (including urban fringes). It is very probable that this form of *Nerium oleander* used to be a native a few hundred years ago. Its case is comparable to that of *Cercis siliquastrum*, which has been extinct for several centuries. Other forms of *N. oleander* are however to be restricted to urban areas.

| | | | | |
|---|---|---|---|---|
| *Periploca angustifolia* (= *P. laevigata* ssp. *angustifolia*) | Siġret il-ħarir | Wolfbane | Garrigue | WD |
| *Rosmarinus officinalis* | Klin | Rosemary | Garrigue / maquis | E |
| *Senecio bicolor* | Kromb il-Baħar | Silvery ragwort | Coastal | E |

## Small shrubs

***(Species listed rarely exceed 1 metre in height at maturity)***

| | | | | |
|---|---|---|---|---|
| *Aloe vera* | Sabbar | Yellow aloe | Maquis | E |
| *Antirrhirum tortuosum* | Papoċċi ħomor | Red Snapdragon | Rupestral | annual |
| *Arthrocnemum glaucum (=A. macrostachyum)* | Almeridja | Glaucous Glasswort | Coastal | E |
| *Cichorium spinosum* | Qanfuda | Hedgehog plant | Coastal / garrigue | SD |
| *Chiliadenus bocconei* | Tulliera | Maltese Fleabane | Garrigue | E |
| *Cistus creticus*<br>ssp. *creticus*<br>ssp. *eriocephalus* | <br>---<br>--- | <br>Hoary rockrose<br>Hoary rockrose | <br>Garrigue<br>Garrigue | <br>E<br>E |
| *Cistus monspeliensis* | --- | White rockrose | Garrigue | E |
| *Convolvulus oleifolius* | Leblieb | Olive-leaved bindweed | Garrigue | E |
| *Coronilla valentina* | --- | Shrubby crown-vetch | Garrigue / coastal | E |
| *Crucianella rupestris* | --- | Rock crosswort | Coastal / rupestral | E |
| *Euphorbia characias* | Tengħud | Large Spurge | Garrigue | SD |
| *Euphorbia melitensis* | Tengħud tax-xagħri | Maltese spurge | Garrigue | SD |
| *Fagonia cretica* | --- | --- | Clay slopes | E |
| *Halimione portulacoides* | --- | Sea purslane | Coastal | E |
| *Halocnemum strobilaceum* | --- | Sea purslane | Coastal | E |
| *Helichrysum melitense* | Sempreviva | Maltese everlasting | Rupestral / coastal | E |
| *Inula crithmoides* | Xorbett / Xurbebb | Golden samphire | Coastal | E |
| *Limonium* spp. (native species only) | --- | Sea lavenders | Coastal | WD |
| *Ononis natrix* | Broxka | Bush restharrow | Garrigue | E |
| *Origanum onites* | Riegnu | White marjoram | Cultivated | E |
| *Origanum vulgare* | Riegnu | Common marjoram | Cultivated | E |
| *Palaeocyanus crassifolius* | Widnet il-baħar | Maltese rock centuary | Rupestral | E |
| *Phagnalon graecum* ssp. *ginzbergeri* | Lixka | --- | Garrigue | E |

| | | | | |
|---|---|---|---|---|
| *Phagnalon rupestre* | Lixka | --- | Garrigue / rupestral | E |
| *Phlomis fruticosa* | Salvja tal-Madonna / Salvjun / Ħabaq tal-Madonna | Great sage | Garrigue | E |
| *Prasium majus* | Te' Sqalli | White hedge-nettle | Garrigue | E |
| *Ruscus hypophyllum* | Belladonna | Greater butcher's broom | Maquis / riparian | E |
| *Ruta chalepensis* | Fejġel | Wall rue | Garrigue | E |
| *Salvia officinalis* | Salvja | Common sage | Cultivated | E |
| *Salvia fruticosa* (=*Salvia triloba*) | Salvja | Three-lobed sage | Garrigue | E |
| *Sarcocornia fruticosa* (=*Arthrocnemum fruticosum*) | Almeridja | Shrubby glasswort | Coastal | E |
| *Sarcopoterium spinosum* | --- | Thorny burnet | Garrigue | E |
| *Satureja calamintha* (=*Calamintha nepeta*) | Kammilta | Lesser calamint | Garrigue / steppe | E |
| *Satureja graeca* (=*Micromeria graeca*) | Sagħtrija | Greek savory | Garrigue | E |
| *Satureja microphylla* (=*Micromeria microphylla*) | Xpakkapietra | Maltese savory | Garrigue | E |
| *Sedum sediforme* | --- | Stonecrop | Garrigue / steppe / rupestral | E |
| *Sedum* spp. (native species only) | Beżżul il-Baqar | Stonecrops | Garrigue / steppe / rupestral | annual |
| *Silene fruticosa* | Lsien l-Għasfur | Shrubby catchfly | Garrigue | E |
| *Suaeda vera* | Għobbejra tal-Irmied | Shrubby seablite | Coastal | E |
| *Teucrium flavum* | Borgħom | Yellow germander | Garrigue | E |
| *Teucrium fruticans* | Żebbuġija | Tree germander | Garrigue | E |
| *Thymus capitatus* (=*Thymbra capitata / Coridothymus capitatus* ) | Sagħtar | Mediterranean thyme | Garrigue | E |
| *Triadenia aegyptica* (=*Hypericum aegypticum*) | Fexfiex | Egyptian St John's Wort | Rupestral / garrigue / coastal | E |

## Climbers, creepers and lianes

| | | | | |
|---|---|---|---|---|
| *Asparagus aphyllus* | Sprağ xewwieki / Ċaqċieqa | Mediterranean aspargus | Steppe / maquis | E |
| *Clematis cirrhosa* | Kiesħa / Bajda | Evergreen traveller's joy / Virgin's bower | Maquis | E |
| *Hedera helix* | Liedna | Ivy | Maquis / woodland | E |
| *Lonicera implexa* | Qarn il-mogħża | Evergreen honeysuckle | Maquis / garrigue | E |
| *Rosa gallica* | Warda taż-żejt | Provence rose | Maquis | WD |
| *Rosa sempervirens* | Girlanda tal-wied | Evergreen rose | Maquis | E |
| *Rubia peregrina* | Robbja salvaġġa | Wild Madder | Maquis | E |
| *Smilax aspera* | Zalza pajżana / Pajżana | Mediterranean sarsaparilla | Maquis / garrigue | E |
| *Tamus comunis* | --- | Black bryony | Maquis / garrigue | E |
| *Vitis vinifera* ssp. *sylvestris* | Dielja salvaġġa | Wild grape vine | Maquis / garrigue | WD |

## Herbaceous plants

| | | | |
|---|---|---|---|
| *Acanthus mollis* | Ħannewija | Acanthus / Bear's breeches | Maquis / watercourses |
| *Alisma plantago-aquatica* | --- | --- | Watercourses |
| *Allium* spp. (native species only) | Tewm | Garlic | Garrigue / maquis |
| *Anacamptis* spp. (native species only) | --- | Pyramidal orchids | Garrigue / rocky steppe |
| *Anthemis urvilleana* | Bebbuna tal-baħar | Sea-chamomile | Coastal |
| *Asphodelus aestivus* | Berwieq | Asphodel | Steppe |
| *Atriplex prostrata* | Selq il-baħar | --- | Coastal |
| *Bolboschoenus maritimus* | Simar | Rush | Watercourses |
| *Bromus alopecuros* | Ħurtan / Ħortan | Foxtail brome | Watercourses |
| *Carex* spp. (native species only) | Sogħda | Sedges | Watercourses |
| *Centaurea melitensis* | --- | --- | Rupestral / garrigue |
| *Crocus longiflorus* | Żagħfran | Crocus | Rocky steppe |
| *Cyperus* spp. (native species only) | Bordi | Galingales | Watercourses |
| *Damasonium bourgaei* | --- | Star-fruit | Kamenitzas / pools |
| *Desmazeria pignattii* | --- | Pignatti's fern grass | Coastal |
| *Elymus farctus* | --- | Sand couch-grass | Sand dunes |
| *Eryngium maritimum* | Xewk tar-ramel | Sea holly | Sand dunes |
| *Ferula communis* | Ferla | Ferule | Steppe |
| *Festuca* spp. (native species only) | Żwien | --- | Watercourses |
| *Gladiolus dubius* | Ħabb il-qamħ | Southern gladiolus | Watercourses |
| *Gladiolus italicus* | Ħabb il-qamħ | Corn flag | Grass steppe |
| *Gynandriris sisyrinchium* | Fjurduliż | Spanish nut-iris | Steppe |
| *Hedysarum coronarium* | Silla | Crested sulla | Cultivated / steppe |
| *Holoschoenus vulgaris* | Simar | Clubrush | Watercourses |

| | | | |
|---|---|---|---|
| *Hyoseris frutescens* | Żigland | --- | Rupestral |
| *Iris* spp. (native species only) | Fjurduliż | Iris / Fleur-de-lys | Steppe |
| *Juncus* spp. (native species only) | Simar | Rush | Watercourses / coastal wetlands |
| *Lotus cytisoides* | --- | Birdsfoot trefoil | Garrigue / steppe |
| *Lygeum spartum* | Ħalfa | Esparto grass | Clay slopes / steppe |
| *Malva* spp. (native species only) | Ħobbejża | Mallows | Disturbed ground |
| *Matthiola incana* ssp. *melitensis* ssp. *incana* | Ġiżi | Common stock | • Cliffs<br>• Cultivated |
| *Mesembryanthemum crystallinum* | --- | --- | Coastal / disturbed ground |
| *Muscari* spp. (native species only) | Basal il-ħnieżer | Grape-hyacinths | Steppe |
| *Narcissus* spp. (native species only) | Narċis / Ranċis | Narcissus | Grass steppe |
| *Pancratium maritimum* | Narċis il-baħar | Sea daffodil | Sand dunes |
| *Phalaris truncata* | Skalora salvaġġa | Truncated canary grass | Clay slopes |
| *Phragmites australis* | Qasab ir-riħ | Lesser reed | Coastal marshlands |
| *Ruscus hypophyllum* | Belladonna | Greater butcher's-broom | Maquis |
| *Ruta chalepensis* | Fejġel | Wall rue | Garrigue |
| *Scilla sicula* | Għansal ikħal | Sicilian squill | Garrigue / steppe |
| *Sedum* spp. (native species only) | Beżżul il-baqra | Stonecrops | Garrigue / steppe |
| *Sporobolus arenarius* | --- | Sand dropseed | Sand dunes |
| *Typha domingensis* | Buda | Bullrush | Watercourses / pools |
| *Urginea pancration* (=*Urginea maritima*) | Għansal / Għansar | Seaside squill | Rocky steppe / garrigue |

## Ferns and horsetails

| | | | |
|---|---|---|---|
| *Adiantum capillus-veneris* | Tursin il-bir | Maidenhair fern | Humid rockfaces |
| *Anogramma leptophyllum* | Tursin ir-riħ | Annual maidenhair | Humid rockfaces |
| *Asplenium marinum* | --- | Sea spleenwort | Humid rockfaces |
| *Asplenium trichomanes* | --- | Common spleenwort | Humid rockfaces |
| *Ceterach officinarum* | --- | Rusty-back fern | Humid rockfaces |
| *Equisetum ramosissimum* | --- | Horsetail | Springs / watercourses |
| *Phyllitis sagittata* | Felċi tal-bir / Lsien iċ-Ċerv | Mule's fern | Humid rockfaces |
| *Phyllitis scolopendrium* | --- | Hart's tongue fern | Humid rockfaces |
| *Pteridium aquilinum* | Feliċilla | Bracken | Clay sites |

# APPENDIX 4:

## List of Mediterranean-type plant species that are acceptable only in gardens and urban plantings (excluding urban fringes)

The species listed in this appendix grow in Mediterranean-type climates and are therefore adapted to situations of low water availability. Their planting in gardens and other urban locations (excluding urban fringes - see definition in **Appendix 8**) is therefore encouraged. However, in order to avoid invasion of natural habitats by non-native species, these Mediterranean-type plants are **not** to be planted in rural areas and urban fringes (see also **Appendix 5**), since they would more readily take root and compete with local species, leading to the latter's displacement and consequent ecological imbalances.

| **Botanical name** | **Invasiveness Index[2]** | **Common name** | **Origin** |
|---|---|---|---|
| | | | |
| Abutilon megapotamicum | 0 | Flowering Maple Abutilon Apollo Fir | Greece |
| Acca sellowiana | 0 | Pineapple guava | Brazil |
| Aeonium arboreum | 1 | Tree Sempervivum Tree Houseleek | Morocco |
| Agapanthus africanus | 0 | African Lily | Cape of Good Hope |
| Agave americana | 4 | Century plant | Mexico |
| Albizia julibrissin | 1 | Silk tree | Asia |
| Aloe arborescens | 1 | Candelabra Aloe | South Africa |
| Aloe vera | 2 | Medicinal Aloe | Canary Islands |
| Aloysia triphylla | 0 | Lemon Verbena | South America |
| Anisodonthea capensis | 0 | Cape Mallow | South Africa |
| Aptenia cordifolia | 4 | Babysun Rose | South Africa |
| Araucaria heterophylla | 0 | Norfolk Island Pine | Norfolk Island |
| Asparagus densiflorus | 1 | Plume Asparagus | South Africa |
| Asparagus setaceus | 2 | Fern Asparagus | South Africa |
| Bauhinia purpurea | 0 | Purple Orchid tree | India/Burma |
| Beaucarnea recurvata | 0 | Pony Tail | Mexico |
| Bignonia species<br>(term used in the wider sense and includes species of Tecoma, Tecomaria, Stenolobium, Doxantha (=Macfadyena), Pandorea)<br><br>Doxantha unguis-cati<br>Campsis radicans | 0<br><br><br><br><br><br>1<br>1 | Trumpet vines | South America |
| Bougainvillea glabra- B. spectabilis | 0<br>0 | Paper flower | Brazil |
| Brachychiton acerifolius<br>B. populneum | 0<br>0 | Flame tree | Australia |
| Brugmansia cornigera | 0 | Angel's trumpet | Peru |
| Buddleja davidii<br>B. (=Nicodemia) | 0<br>0 | Butterfly bush | China |

[2] This index is only meant as an indicative guide on the environmental impacts of these species, with 4 being highly invasive or environmentally damaging and 1 being the least invasive. 0 signifies non-invasiveness.

| | | | |
|---|---|---|---|
| madagascarensis | | | |
| Butia capitata | 0 | Jelly Palm | Brazil |
| Calliandra tweedii | 0 | Mexican flame bush | South Brazil |
| Callistemon citrinus | 0 | Bottle brush | Australia |
| Carissa macrocarpa | 0 | Natal Palm | Natal |
| Carpobrotus edulis | 4 | Hottentot fig/Kaffir Fig | South Africa |
| Caesalpinia(Poinciana) gilliesi | 0 | Bird of Paradise bush | South America |
| Casuarina equistiformis<br>C. cunninghamiana | 1<br>1 | Horsetail tree/She-oak | North Australia |
| Ceanothus thyrsiflorus | 0 | Wild Lilac | South U.S.A. |
| Cestrum nocturnum | 0 | Night Jessamine | West Indies |
| Chorisia speciosa | 0 | Floss-Silk tree | Brazil |
| Chrysanthemum species (including spp. of Argyranthemum, Leucanthemum and Dendranthema) | 0 | Daisy bush | Canary Islands |
| Cinnamomum camphora | 0 | Camphor tree | China/Japan |
| Citrus japonica | 0 | Cumquat | China |
| Cordyline indivisa | 0 | Blue Dracaena | New Zealand |
| Coronilla glauca | 1 | Crown Vetch | Mediterranean |
| Cortaderia selloana | 0 | Pampas grass | Argentina |
| Crataegus species (except native stock) | 1 | Hawthorn | Europe/North Africa |
| Cycas revoluta | 0 | Sago Palm | South Japan/Java |
| Dasylirion glaucophyllum | 0 | Grass tree | Mexico |
| Dracaena draco | 0 | Dragon tree | Canary Islands |
| Duranta repens | 0 | Pigeon Berry | U.S.A./West Indies |
| Echinocactus grusonii | 0 | Golden Barrel | Mexico |
| Echium fastuosum | 0 | Pride of Madeira | Canary Islands |
| Erythrina corallodendron | 0 | Coral tree | West Indies |
| Eucalyptus camaldulensis | 1 | Red Gum | Australia |
| Euonymus japonicus | 0 | Evergreen Euonymus | Japan/Korea |
| Euphorbia candelabrum | 0 | | Sudan Uganda |
| Felicia amelloides - | 0 | Blue Daisy | South Africa |
| Ficus australis | 0 | Rusty Fig | Australia |
| Ficus nitida | 1 | Indian Laurel Fig | India/Malaysia |
| Gazania x chansonette | 0 | Treasure flower | South Africa |
| Grevillea robusta | 0 | Silk Oak | Australia |
| Hebe species | 0 | Veronica | New Zealand |
| Hedera canariensis | 0 | Algerian Ivy | Spain/Canary Islands/North West Africa |
| Hibiscus rosa-sinensis | 0 | Chinese Hibiscus | Tropical Asia |
| Ilex aquifolium | 0 | Christam Holly | Europe |
| Jacaranda mimosifolia | 0 | Mimosa-Leaved Ebony | Brazil |
| Jasminum sambac | 0 | Arabian Jasmine | Arabia/India |
| Lagunaria patrsonii | 0 | Pyramid tree | Australia |
| Lantana camara | 1 | Shrub Verbena | Latin America |
| Lantana montevidensis | 0 | Trailing Lantana | Tropical America |
| | | | |
| Lavandula angustifolia | 0 | Lavander | Mediterranean |

| | | | |
|---|---|---|---|
| Leonotis leonurus | 0 | Lion's Ear | Central America |
| Lonicera caprifolium<br>Lonicera japonica | 0<br>1 | Honeysuckle | Europe/West Asia |
| Melia azedarach | 2 | Indian Bead Tree/Persian Lilac | North India |
| Metrosideros exelsa | 0 | New Zealand Christmas tree | New Zealand |
| Myporum laetum | 1 | Mouse-mole tree | New Zealand |
| Myrtus communis (except native stock) | 0 | True Myrtle | Mediterranean |
| Osteospermum barberiae | 0 | African Daisy | South Africa |
| Pandorea jasminoides | 0 | Bower vine | Australia |
| Parkinsonia aculeata | 1 | Jerualem Thorn | Tropical America |
| Passiflora edulis<br>Passiflora caerulea | 0<br>1 | Passion Flower | Brazil |
| Pelargonium species | 1 | Geranium | South Africa |
| Phoenix canariensis | 1 | Date palm | Canary Islands |
| Phoenix roebellenii | 0 | Pigmy Date Palm | Laos |
| Phormium tenax | 0 | New Zealand Flax | New Zealand |
| Pinus pinea | 1 | Italian Stone Pine | South Europe/Turkey |
| Portulacaria afra | 0 | Elephant Bush | South Africa |
| Prunus pissardii | 0 | Purple-leaf Plum | South East Europe |
| Psidum guajava | 0 | Guava | South America |
| Pyracantha coccinea | 0 | Firethorn | South Europe/South West Asia |
| Pyrus salicifolia | 0 | Weeping Willow-leafed Pear | Asia/Iran |
| Quercus suber | 0 | Coark Oak | Mediterranean |
| Rhaphiolepis | 0 | Indian Hawthorn | China |
| Russelia equisetiformis | 0 | Coral plant | Mexico |
| Schinus molle | 0 | California Pepper | Ecuador |
| Senecio cineraria | 0 | | Mediterranean |
| Senna corymbosa | 1 | Flowery Senna | Argentina |
| Solandra maxima | 0 | Cup of Gold Vine | Mexico |
| Solanum rantonetti | 0 | Blue Potatoe tree | Paraguay/Argentina |
| Stephanotis floribunda | 0 | Madacascar Jasmine | Madacascar |
| Strelitzia alba | 0 | Great White Strelitzia | Natal |
| Strelitzia reginae | 0 | Bird of Paradise | Transkei/South Africa |
| Syagrus romanzoffianum | 0 | Queen Palm | South America |
| Tamarix gallica | 2 | French Tamarisk | South West Europe/Mediterranean |
| Tecoma (=Stenolobium) stans | 0 | Yellow Bells | U.S.A./South America |
| Tecomaria capensis | 0 | Cape Honeysuckle | South Africa |
| Thevetia peruviana | 0 | Yellow Oleander | West Indies/Mexico |
| Thunbergia grandiflora | 0 | Clock vine | India |
| Thymus serpyllum | 0 | Common Thyme | Mediterranean |
| Trachelospermum jasminmoides | 0 | Star Jasmine | Himalayas |
| Tulbaghia violacea | 0 | Society Garlic | South Africa |

| | | | |
|---|---|---|---|
| Verbena rigida | 0 | Vervain | Argentina/South Brazil |
| Vinca major | 2 | Greater Periwinkle | South Europe |
| Vinca minor | 1 | Periwinkle | South Europe |
| Washingtonia filifera | 1 | California Fan Palm | California/Mexico |
| Washingtonia robusta | 0 | Washington's Palm | California/Mexico |
| Yucca elephantipes | 0 | Spineless Yucca | Mexico/Guatemala |
| Wigandia caracasana | 1 | Wigandia | Venezuela |
| Westringia fruticosa | 0 | Westingia | Australia |
| Zantedeschia aethiopica | 2 | Calla | South Africa |

# APPENDIX 5:

## List of species that are unacceptable in rural areas

The species listed in this appendix are expressly unacceptable in rural areas. It should be noted that:

1. this list is without prejudice to the provisions of ***Section 4*** and ***Appendix 3***; and

2. where species marked with an (*) already exist in such sites, their gradual removal from the countryside and from urban fringes should also be sought. This should be done very carefully and after a proper ecological study has been carried out, to avoid the aggravation of environmental imbalances (e.g. see ***Note 2*** below).

| Scientific name | Maltese name | English name |
|---|---|---|
| **Trees** | | |
| *Acacia* spp.*, including:<br>• *A. cyclops* *<br>• *A. karoo* *<br>• *A. saligna* *<br>(=*A. cyanophylla*) | Akaċja / Mimosa | Acacia / Wattles |
| *Ailanthus altissima* * | Xumakk | Tree of heaven |
| *Albizia* spp., including:<br>• *A. julibrissin*<br>• *A. lebbek*<br>• *A. lophanta* | --- | --- |
| *Casuarina* spp., including:<br>• *C. equisetifolia*<br>• *C. stricta* | --- | She-oak |
| *Eucalyptus* spp.*, including:<br>• *E. camaldulensis* *[1]<br>• *E. gomphocephala* *[1] | --- | Eucalypts |
| *Ficus* spp. (except *Ficus carica*) | --- | Ficus (except Fig) |
| *Melia azedarach* | Siġra tat-tosku | Indian bead tree / Persian lilac |
| *Nicotiana glauca* | Tabakk | Tobacco |
| *Pinus brutia* [2] | --- | Calabrian pine |
| *Ricinus communis* * | Riġnu / Żejt ir-riġnu | Castor oil tree |
| *Robinia pseudoacacia* | --- | False acacia / Locust tree |
| *Schinus terebinthifolius* [3] | Siġar tal-bżar | Brazilian pepper |
| *Tamarix* spp. (other than *T. africana*) [2] | --- | Tamarisks (other than the native African tamarisk) |

| | | |
|---|---|---|
| *Ulmus* spp. (other than *U. canescens*), including:<br>• *U. minor* [2]<br>• *U. procera* [2] | Ulmi / Olmi<br>(minbarra n-Nemmiesa) | Elms (other than the native Mediterranean elm) |

## Shrubs / Perennial herbs

| | | |
|---|---|---|
| *Aeonium* spp. | Siġret il-kalli | --- |
| *Agave* spp.*, including:<br>• *A. americana* *<br>• *A. sisaliana* * | --- | Century plants |
| *Aloe* spp. (except *Aloe vera* if originating from local wild stock) | Alwe (minbarra s-sabbar, jekk toriġina minn sors lokali li jikber fis-salvaġġ) | Aloes (except *Aloe vera* if originating from local wild stock) |
| *Asclepias* spp., including:<br>• *A. curassavica*<br>• *A. fruticosa* | --- | Milkweeds |
| Cactaceae, including:<br>• *Opuntia ficus-indica* [4]<br>• *Opuntia vulgaris* [4] | Kaktus (inkluż il-Bajtar tax-xewk) | Cacti (including Prickly pears) |
| *Mirabilis* spp., including:<br>• *M. jalapa*<br>• *M. odorata* | Ħummejra | Marvel of Peru |
| *Nerium oleander*[5] | Siġra tal-wirdien / Siġret il-ġarab | Oleander |
| *Pelargonium* spp. | Sardinell | Geranium |
| *Pistacia atlantica* | --- | Eastern terebinth |
| *Pittosporum tobira* * | --- | Pittosporum |
| *Zantedeschia aethiopica* | Buqari | Arum lily / Calla lily |

## Climbers, creepers and lianes

| | | |
|---|---|---|
| *Aptenia cordifolia* *[6] | --- | Babysun Rose |
| *Carpobrotus* spp.*, including:<br>• *C. acinaciformis* *<br>• *C. edulis* * | Xuxet San Ġwann / Swaba' tal-Madonna / Dwiefer ix-xitan / Dliel il-Madliena | Kaffir fig / Hottentot fig |
| *Doxantha unguis-cati*<br>(= *Bignonia unguis-cati*) | --- | Trumpet vines |
| *Drosanthemum* spp. * | --- | --- |
| *Ipomoea acuminata* | Kampanella | Morning glory |
| *Malephora* spp.* [6] | --- | --- |
| *Passiflora caerulea* | Warda tal-passjoni | Passion flower |
| *Rubus* spp., including<br>*R. ulmifolius* [7] | Għollieq | Bramble / Blackberry |
| *Tradescanthia fluminensis* | --- | Wandering jew |
| *Tropaeolum majus* | Kapuċċinelli | Garden nasturtium |
| *Vinca major* | --- | Greater periwinkle |

**SEE NOTES OVERLEAF ➔**

## Notes:

**1.** *Eucalyptus* species are not invasive, but they release growth-inhibiting substances (allelochemicals) into the soil to prevent the growth of potentially competing vegetation. Consequently, they lead to an impoverished undergrowth. They also damage the water economy of the soil.

**2.** Alien species of elms (e.g. *Ulmus minor* and *U. procera*) hybridise readily with the indigenous Mediterranean elm *U. canescens* (Nemmiesa), a species threatened with local extinction. The imported Calabrian pine *Pinus brutia* likewise cross-breeds with the indigenous Aleppo pine *Pinus halepensis* (Żnuber), producing vigorous hybrids. A similar precautionary approach is being adopted for alien Tamarisk species (see also ***Section 4.3***)

**3.** Unless carried out with extreme caution, removal of naturalised false pepper tree *Schinus terebinthifolius* from natural habitats which it has already invaded (e.g. Wied Ħarq il-Ħamiem) is likely to favour its competitors, such as the castor oil tree *Ricinus communis* (Riġnu) which is a more serious pest.

**4.** The term "prickly pear" is often used collectively for cacti of the genus *Opuntia*, all of which are moderately invasive. *Opuntia ficus-indica* is an important crop plant grown for its fruits, as fodder, and as a windbreak sheltering more delicate crops; it therefore needs to be tolerated within agricultural land, as long as it does not invade adjacent habitats (in which case, eradication may be required); however, its use for landscaping or other non-crop use is not to be encouraged. In particular, plantations of *Opuntia ficus-indica* should be kept well away from cliff areas. *Opuntia vulgaris* is fairly commonly grown as an ornamental rather than for its fruits, which are not edible.

**5.** The use of the wild type of *Nerium oleander* (with single pink flowers) is acceptable in appropriate rural areas (including urban fringes). It is very probable that this form of *Nerium oleander* used to be a native a few hundred years ago. Its case is comparable to that of *Cercis siliquastrum*, which has been extinct for several centuries. Other forms of *N. oleander* are however to be restricted to urban areas.

**6.** *Aptenia cordifolia* and *Malephora coccinea* closely resemble *Carpobrotus edulis* and are occasionally used in landscaping in view of the extensive ground cover they provide.

**7.** Rubus ulmifolius is an indigenous species with invasive properties, particularly in areas prone to environmental disturbance. Its planting is not encouraged, but its removal from natural areas should not be sought unless absolutely necessary, as this would merely intensify the habitat disturbance that favours its invasive effect.

# APPENDIX 6:

## Trees and plants considered as suitable for non-crop planting on agricultural land

The species listed in this appendix may be used (in addition to the species listed in ***Appendix 3***) for soft landscaping and other non-crop purposes within agricultural land in accordance with ***Section 4.5*** of the main text of these guidelines. The list below is mainly limited to trees and plants that have been under cultivation for some time in the Maltese Islands and that are already occasionally used for such purposes.

| Scientific name | Maltese name | English name |
|---|---|---|
| *Actinidia chinensis* (= *A. deliciosa*) | --- | Kiwi / Chinese gooseberry |
| *Araucaria excelsa* | Awrikarja | Norfolk Island pine |
| *Arbutus unedo* | Imbragla | Strawberry tree |
| *Arundo donax* [1] | Qasab | Great reed |
| *Carica* spp., including:<br>• *C. papaya*<br>• *C. pentagona* | <br>---<br>--- | <br>• Papaya<br>• Babago |
| *Carya illinoensis* | Ġewż amerikan | Pecan nut |
| *Citrus* spp., including:<br>• *C. limon*<br>• *C. sinensis*<br>• *C. limon* unnamed variety<br>• *C. aurantium*<br>• *C. limetta*<br>• *C. reticulata*<br>• *C. medica*<br>• *C. paradisi*<br>• *C. bergamia*<br>• *C. grandis*<br>• *C. japonica* | Siġar taċ-Ċitru, inklużi:<br>• Lumi<br>• Lariġ<br>• Lumi-lariġ<br>• Lariġ tal-bakkaljaw<br>• Lumiċell<br>• Mandolin<br>• Troġ<br>• ---<br>• Bergamott<br>• ---<br>• --- | Citrus trees, including:<br>• Lemon<br>• Orange<br>• ---<br>• Seville orange<br>• Lime<br>• Tangerine<br>• Citron<br>• Grapefruit<br>• Bergamot<br>• Shaddock<br>• Kumquat |
| *Crataegus azarolus* | Għanżalor | Azarole |
| *Cupressus sempervirens* | Ċipress | Italian cypress |
| *Cydonia oblonga* | Sfarġel | Quince |
| *Diospyros* spp., including:<br>• *D. kaki*<br>• *D. lotus* | <br>• Kaki<br>• --- | <br>• Persimmon<br>• --- |
| *Eriobotrya japonica* | Naspli | Japanese medlar |
| *Ficus carica* | Tin | Fig |
| *Junglans regia* | Ġewż | Common walnut |
| *Malus* spp., including:<br>• *M. domestica*<br>• *M. sylvestris* | Tuffieħ, inklużi:<br>• Tuffieħ<br>• Tuffieħ salvaġġ | Apples, including:<br>• Apple<br>• Wild apple |
| *Mespilus germanica* | Fomm il-lipp / Omm il-epp | Medlar |

| | | |
|---|---|---|
| *Morus* spp., including:<br>• *M. alba*<br>• *M. nigra* | <br>• Ċawsli<br>• Tut | Mulberries, including:<br>• White mulberry<br>• Black mulberry |
| *Musa paradisiaca* | Banana | Banana |
| *Opuntia ficus-indica* [1] | Bajtar tax-xewk | Prickly pear |
| *Persea americana* | --- | Avocado |
| *Phoenix dactylifera* | Palma tat-tamal | Date palm |
| *Physalis* spp. | Tadam tal-fosdqa | --- |
| *Prunus dulcis*<br>(= *P. amygdalus*) | Lewż | Almond |
| *Prunus* spp., including:<br>• *P. persica*<br>• *P. armeniaca*<br>• *P. domestica*<br>• *P. avium*<br>• *P. cerasifera*<br>• *P. mahaleb*<br>• *P. cerasus*<br>• *P. spinosa*<br>• *P. salicina* | Frott irqiq, inklużi:<br>• Ħawħ<br>• Berquq<br>• Għajnbaqar<br>• Ċirasa<br>• ---<br>• ---<br>• Amarena<br>• Prajn / Prejn<br>• Għajnbaqar | <br>• Peach<br>• Apricot<br>• Plum<br>• Cherry<br>• Cherryplum<br>• Mahaleb cherry<br>• ---<br>• Sloe<br>• Chinese plum |
| *Punica granatum* | Rummien | Pomegranate |
| *Pyrus* spp., including:<br>• *P. communis*<br>• *P. pyraster* | Langas, inklużi:<br>• Langas<br>• Langas salvaġġ | Pears, including:<br>• Pear<br>• Wild pear |
| *Sorbus* spp., including:<br>• *S. aucuparia*<br>• *S. domestica* | Żorba, inklużi:<br>• Żorba salvaġġa<br>• Żorba | Rowans, including:<br>• Mountain ash<br>• Service tree |
| *Vitis* spp. [1], including:<br>• *V. berlandieri*<br>• *V. rupestris*<br>• *V. vinifera*<br>• *V. vinifera* ssp. *sylvestris*<br>• *V. vulpina* | Dwieli, inklużi d-dwieli salvaġġi | Grape vines, including wild species / varieties used as grafting stock |
| *Zizyphus jujuba* | Żinżel | Jujube |

**Note:** **1.** *Arundo donax*, *Opuntia ficus-indica* and *Vitis* spp.are potentially invasive, and their growths at the edges of cultivated plots should be carefully controlled to avoid damage to nearby habitats.

# APPENDIX 7:

## Species which should be used carefully in urban areas

Restriction on the use of particular species in urban areas is governed by the provisions of ***Section 5***. The species listed below may give rise to potential health/safety hazards and/or nuisances if used improperly. Hence, although this by no means implies that these species should not be used, it is important that when used, their properties are taken into consideration when establishing their final siting, in particular in places such as children play areas or other areas easily accessible by children and pet animals. Species identified in ***Section 5*** as unacceptable (e.g. *Acacia saligna*, *Ricinus communis*) should not be used at all.

| Scientific name of plant species | Hazard/ nuisance | Type of harmful contact | | | Impact on human body | | | Harmful part(s) of plant | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Inhale | Touch | Ingest | Irritant | Naus-eating | Lethal | Entire | Leaf | Pollen | Fruit | Seed | Sap | Bark | Root |
| **Annuals** | | | | | | | | | | | | | | | |
| *Adonis* spp. | Poisonous | | | * | * | | | * | | | | | | | |
| *Delphinium consolida* | Poisonous | | | * | | * | | * | | | | | | | |
| *Euphorbia spp.* | Poisonous | | * | * | | * | | | | | | | * | | |
| *Nicandra physalodes* | Poisonous | | | * | | * | | * | | | | | | | |
| *Papaver* spp. | Poisonous | | | * | * | | | * | | | | | | | |
| *Ricinus communis* | Poisonous | | | * | | | * | | | | | * | | | |

| Scientific name of plant species | Hazard/ nuisance | Type of harmful contact | | | Impact on human body | | | Harmful part(s) of plant | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Inhale | Touch | Ingest | Irritant | Naus-eating | Lethal | Entire | Leaf | Pollen | Fruit | Seed | Sap | Bark | Root |
| **Bulbs & Rhizomes** | | | | | | | | | | | | | | | |
| Araceae (including *Arum* spp.) | Poisonous | | | * | | | * | * | | | | | | | |
| *Caladium* hybrids | Poisonous | | * | * | | * | | | | | | | * | | |
| *Convallaria majalis* | Poisonous | | * | * | | | * | * | | | | | | | |
| *Crinum* spp. | Poisonous | | | * | | | * | * | | | | | | | |
| *Cyclamen purpurascens* | Poisonous | | | * | * | | | * | | | | | | | |
| *Dahlia* hybrids | Allergy | | | * | | * | | * | | | | | | | |
| *Freesia* hybrids | Poisonous | | | * | | | * | * | | | | | | | |
| *Iris* hybrids | Poisonous | | | * | | * | | * | | | | | | | |
| *Narcissus* spp. | Allergy, P | | | * | * | | | * | | | | | | | |
| *Ranunculus ficaria* | Poisonous | | | * | * | | | * | | | | | | | |
| *Tulipa* hybrids | Allergy | | | * | * | | | * | | | | | | | |
| *Urginea maritima* | Poisonous | | * | * | | | * | * | | | | | | | |
| *Zephyranthes* spp. | Poisonous | | | * | | | * | * | | | | | | | |
| **Cacti and similar plants** | | | | | | | | | | | | | | | |
| *Agave* (including *A. americana* & *A. sisaliana*) | Thorns | | * | | * | | | | * | | | | | | |
| Cactaceae (including *Cereus* spp., *Opuntia* spp) | Thorns | | * | | * | | | | | | | | | * | |
| Several *Euphorbia* spp. | Thorns | | * | | * | | | | | | | | | * | |

| Scientific name of plant species | Hazard/ nuisance | Type of harmful contact | | | Impact on human body | | | Harmful part(s) of plant | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Inhale | Touch | Ingest | Irritant | Naus-eating | Lethal | Entire | Leaf | Pollen | Fruit | Seed | Sap | Bark | Root |

## Other outdoor plants and trees

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apocynaceae | Poisonous | | | | | | | | | | | | | | |
| *Bougainvillea glabra* | Thorns | | * | | * | | | | | | | | | * | |
| *Brugmansia* spp. | Poisonous | | | * | * | | | * | | | | | | | |
| *Buxus* spp. | Poisonous | | | * | * | | | * | | | | | | | |
| *Chamaerops humulis* | Thorns | | * | | * | | | | * | | | | | * | |
| *Citrus* spp. | Thorns | | * | | * | | | | | | | | * | | |
| *Clematis* spp. | Poisonous | | | * | * | | | * | | | | | | | |
| *Cortaderia selloana* | Thorns | | * | | * | | | | * | | | | | | |
| *Cycas revoluta* | Poisonous | | * | * | * | | | * | | | | | | | |
| *Datura* spp. | Poisonous | | | * | | | * | * | | | | | | | |
| *Euonymus* spp. | Poisonous | | | * | | * | | * | | | | | | | |
| Euphorbiaceae (including *Euphorbia* spp.) | P, Allergy | | * | * | | * | | | | | | | * | | |
| *Hedera helix* | Poisonous | | | * | * | | | * | | | | | | | |
| *Lagunaria pattersoni* | Irritant | | | | | | | | | | | | | | |
| *Lantana camara* | Poisonous | | | * | | * | | | | | * | | | | |
| *Ligustrum* spp. | Poisonous | | | * | | * | | * | | | | | | | |
| *Lonicera* spp. | Poisonous | | | * | | * | | * | | | | | | | |
| *Lycium barbatum* | Poisonous | | | * | | * | | * | | | | | | | |
| *Nerium oleander* | Poisonous | | | * | | | * | * | | | | | | | |
| *Nicotiana* spp. | Poisonous | | | * | | | * | * | | | | | | | |
| *Pelargonium* spp. | Allergy | | * | | * | | | | | | | | * | | |

## Other outdoor plants and trees cont./

| Scientific name of plant species | Hazard/ nuisance | Type of harmful contact | | | Impact on human body | | | Harmful part(s) of plant | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Inhale | Touch | Ingest | Irritant | Naus-eating | Lethal | Entire | Leaf | Pollen | Fruit | Seed | Sap | Bark | Root |
| *Phaseolus* spp. (raw only) | Poisonous | | | * | * | | | * | | | | | | | |
| *Phoenix canariensis* | Thorns | | * | | * | | | | * | | | | | | |
| *Phoenix dactylifera* | Thorns | | * | | * | | | | * | | | | | | |
| Ranunculaceae (including *Ranunculus* spp.) | Poisonous | | | * | * | | | * | | | | | | | |
| *Rhamnus* spp. | Poisonous | | | * | | * | | * | | | | | | | |
| *Rhus* spp. | P, Allergy | * | | * | | * | | * | | * | | | | | |
| *Ricinus communis* | Poisonous | | | * | | | * | | | | | * | | | |
| *Robinia pseudoacacia* | P, Thorns | | * | * | | * | | * | | | | | | * | |
| *Ruta graveolens* | Allergy | * | | * | * | | | * | | * | | | | | |
| *Sambucus* spp. | Allergy | * | | * | | * | | * | | * | | | | | |
| Solanaceae (including *Solanum* spp.) | Poisonous | | | * | | * | | * | | | | | | | |
| *Taxus baccata* | Poisonous | | | * | | | * | | * | | | * | * | * | * |
| *Thuja orientalis* | Poisonous | | | * | | | * | * | | | | | | | |
| *Trachelospermum jasminoides* | Poisonous | | | * | | | * | * | | | | | | | |
| *Viburnum* spp. | Poisonous | | | * | * | | | * | | | | | | | |
| *Wisteria sinensis* | Poisonous | | | * | * | | | * | | | | | | | |

# APPENDIX 8:

## Glossary of key terms used in this text

The terms listed below are to be interpreted as follows wherever they appear in the attached guidelines and their appendices (cross-references between related terms are in underlined capitals for convenience). Entries indicated by an asterisk (*) are not actually used in the main text but have been included for additional reference.

1. **Afforestation**

   The creation or extension of semi-natural woodlands by the medium- to large-scale planting of trees where they did not grow formerly.

2. **Alien**

   Foreign species of vegetation or trees, not naturally occurring in the Maltese Islands and generally inappropriate for planting in rural areas due to ecological incompatibility with the native flora and fauna. The term is often used as a synonym for EXOTIC.

3. **Archaeophytic**

   Species of trees or vegetation that probably did not initially occur in the wild in the Maltese Islands, but which were brought into the Islands in relatively ancient times. Being well-adapted to the prevailing environmental conditions and ecologically compatible with the local fauna and flora, they managed to thrive in the wild without adverse effects to the natural environment, and now form an integral part thereof.

4. **Biodiversity**

   A term that describes all aspects of biological diversity, especially including the variety of different habitats (**habitat diversity**), ecosystem complexity and species richness within individual ecosystems (**species diversity**), and genetic variation between localised stocks of individual species (**genetic diversity**). It provides an indication of the overall richness of the natural environment.

5. **Broadleaf ***

   A descriptive term applied to trees with a leaf form generally wide in relation to length, often used to distinguish “ordinary” trees from conifers.

**6. Climax community**

The “highest” type of vegetation capable of growing within a particular area. Wherever soil conditions and related factors permit, vegetation patterns progress over time from relatively simple, small, low-growing plants (**pioneer communities**) to increasingly complex and higher plants through a phenomenon known as **succession**. Where the only limiting factor is climate, the ultimate vegetational assemblage is referred to as the **climatic climax** (in the Maltese Islands, this consists of **Mediterranean sclerophyll forest** dominated by holm oak). Wherever soil conditions and/or related factors pose an additional constraint, the resulting climax is less complex (indeed, succession may be limited to its initial stages) and is termed an **edaphic climax** (e.g. steppic grassland, which is elsewhere a “low” successional stage, is the edaphic climax on clay slopes).

**7. Climber**

A plant, generally with elongated, flexible stems, which typically grows upward (“climbs”) along/onto walls, trellises, other plants etc., gripping itself onto them with tendrils, hooks or sucker-like structures. They are generally usefull for camouflaging of walls and other structures, but some are invasive and may smother other vegetation.

**8. Community**

The assemblage of organisms (especially the vegetation) characterising a particular site or area. Vegetational communities (also referred to as plant communities) form an essential part of the respective ecosystem and hence the two terms are often used interchangeably.

**9. Conifer**

Non-flowering evergreen trees with slender, scaly or needle-shaped leaves, that reproduce by means of seeds contained in a cone. They belonging to the Coniferales, a large order of trees.

**10. Creeper**

A plant, generally with elongated, flexible stem, which typically spreads (“creeps”) horizontally along the ground. Creepers often provide an excellent ground cover for landscaping purposes, but some may be somewhat invasive in natural settings (they cover and smother other vegetation) unless controlled.

**11. Diversity**

Ecologically, the term is a measure of the species richness of an ecosystem or area, though it provides a more useful measure of ecosystem characteristics when it is combined with an

assessment of the relative abundance of the species present. In these guidelines, it is used more loosely as the extent of environmental variety, with particular reference to biodiversity.

**12. Ecological pest**

Any plant, tree or animal that is harmful to natural ecosystems and/or natural processes. Generally, with some exceptions, ecological pests are invasive organisms that may spread beyond control.

**13. Ecology**

The study of ecosystems--i.e. the study of the inter-relationships between different living organisms, and of living organisms with their physical environment. In its broadest sense, ecology is the study of organisms as they exist in their natural environment.

**14. Ecosystem**

A term used to describe the complex entity formed by different living organisms living in the same place (the community), their physical environment (the habitat), and their mutual inter-relationships, including the complex natural processes that occur within this complex whole.

**15. Ecotype**

A locally adapted population of a widespread species. Such populations show minor (but nonetheless important, and occasionally substantial) variations of morphology and/or physiology between them, which are related to their distinct habitat and are gentically induced. Nevertheless, they can still reproduce with other ecotypes of the same species and still remain fertile.

**16. Edaphic climax**

The vegetation climax related to, due to, dependent on, or having characteristics due to the nature of the soil. *See also* CLIMAX.

**17. Endemic**

A plant or animal species that is unique to the Maltese Islands. *Contrast with* INDIGENOUS.

**18. Exotic**

A plant or animal species brought in (imported) from overseas and not naturally occurring in the Maltese Islands. Exotic species are generally inappropriate for planting in rural areas, but many are harmless in urban sitings. *See also* ALIEN.

**19. Extinction**

The disappearance of particular species or strains of plants and animals from the Maltese Islands. Extinction leads to an irreversible loss of biodiversity. Certain species, such as the dwarf fan palm, no longer grow in the wild and are thus extinct from the Maltese countryside; several other indigenous species forming part of the Maltese biodiversity are also imminently threatened with extinction.

**20. Gene pool**

The sum total of all genetic information possessed by a local population of a particular species of tree or plant.

**21. Grafting stock**

A plant, generally a tree, cultivated not for its own sake but for the grafting onto it of species/varieties of crop plants (especially fruit trees).

**22. Habitat**

A place that provides a particular set of environmental conditions for the organism or organisms inhabiting it. It is the result of interaction of edaphic (soil) factors and climatic factors, and is in turn affected by the organisms inhabiting it. Since the habitat is so intimately related to the respective ecosystem, the term is often used as a synonym thereto.

**23. Herbaceous**

Pertaining to, or resembling a herb, i.e. a non-woody vascular plant, distinct from a shrub or tree.

**24. Imported stock (foreign stock)**

Imported (foreign) stock of indigenous species is genetically different from the plant material of truly Maltese origin (generally referred to as "native stock" in these guidelines); nonetheless, it is capable of reproducing with the locally occurring plants, thereby mixing with the local genetic pool. If the quantity of imported material is substantial (especially if it exceeds the quantity of native wild stocks, as is the case with rare and endangered species), this "dilution" effect is so great that it may in effect lead to a subtle phasing out (and hence extinction) of the local characteristics borne by the truly native stock. *See also* INDIGENOUS *and* NATIVE.

**25. Indigenous**

Species or varieties of trees and vegetation that are native to the Maltese Islands. Indigenous trees and vegetation (as well as indigenous fauna) grow in the wild in the Maltese countryside

without having been introduced by man. However, they are not necessarily confined to the Maltese Islands only (unlike ENDEMIC species, which are indigenous species that only occur naturally in the Maltese Islands) and, since the same species are also found in other areas, foreign stock of the same species is often imported into the Maltese Islands. *See also* IMPORTED STOCK *and* NATIVE.

**26. Invasive**

A vigorous plant species that can spread (often beyond control) into wild habitats, displacing indigenous species and disrupting natural ecosystems. Invasive species are usually imported alien species that are native to countries with Mediterranean-type climates (e.g. California, South Africa, Chile, parts of Australia, eastern Mediterranean). They are capable of thriving in the Maltese climate and, since they do not occur naturally in the Maltese Islands, they lack natural enemies and natural competitors which would otherwise keep them in check; as a result, they may become serious pests. The importation of analogous invasive species has been the underlying cause of severe ecological problems (sometimes even disasters) in many other countries.

**27. Landscaping**

The process of combining a design in relation to the scenic environment. In particular, "**soft landscaping**" is the use of appropriate trees and vegetation to blend with buildings (e.g. for the purpose of screening them).

**28. Liane**

A woody climber; any wiry or woody, free-hanging, climbing plant, with roots in the ground.

**29. Monoculture**

Cultivation or plantation (including afforested site) in which a single plant (crop, tree, etc.) predominates.

**30. Native**

Generally used as a synonym for INDIGENOUS. In these guidelines, some differentiation is made between the two terms, and the term "native" is here used more particularly to describe the actual specimens that originate from wild growths in the Maltese countryside without having been introduced into the Maltese Islands by man. These specimens are collectively referred to as the **native stock** of the indigenous species in question.

**31. Natural**

Not planted by man. The term includes wild vegetation and ecosystems which have been somewhat modified indirectly through the activities of human beings or their livestock (e.g. many steppic communities and some garrigues have probably become firmly established as edaphic climaxes where the long-term effects of deforestation and soil loss have prevented their succession into woodland and maquis).

**32. Opportunistic**

A species typical of unstable or periodically extreme environments, and characterised by a strong dispersal ability. Opportunistic species, commonly known as **weeds**, usually thrive in habitats/ecosystems that have been subjected to disturbance, and may overrun such habitats if disturbance is profound or prolonged; in this respect, they become invasive and therefore ecologically damaging. Opportunistic species of alien origin are particularly invasive because they lack natural enemies/competitors.

**33. Outside Development Zones (ODZ)**

Sites located beyond the limits to building development as provided for in the *"Pjan Regolatur (1988)"* or, where this has been superseded, in the relevant Local Plan. Sites located ODZ are considered as forming part of the countryside and are covered by a general presumption against development and related environmentally-impacting activities.

**34. Planting**

In these guidelines, the term "planting" includes afforestation, soft landscaping and restorative planting (i.e. the reintroduction of characteristic native species for the purposes of habitat/ecosystem regeneration, reinstatement, and restoration).

**35. Reforestation**

The re-establishment of a particular type of woodland or maquis community by judicious tree-planting on a site that was formerly occupied by such habitat prior to its extirpation.

**36. Regeneration**

The successful re-establishment of a natural or semi-natural ecosystem, on a site which it formerly occupied prior to severe degradation, following re-establishment of the appropriate conditions for its development. Regeneration may be **passive** (i.e. occurring on its own) or **artificially assisted** (as in habitat restoration).

**37. Reinstatement**

The precise artificial re-establishment of original site conditions, and/or of the original community-- e.g. by direct planting / re-introduction of species onto a degraded site. The term overlaps onto RESTORATION, although it is not exactly synonymous.

**38. Restoration**

Artificially assisted habitat/ecosystem regeneration, achieved through the creation of favourable conditions for ecosystem re-establishment. The term overlaps onto REINSTATEMENT, although it is not exactly synonymous.

**39. Riparian**

Pertaining to, situated on, or associated with a watercourse bank or valley bed. **Riparian woodland** (also termed **broadleaved deciduous woodland**) is a relatively rare ecosystem type dominated by deciduous trees such as poplars, elms, and willows, that develops along watercourses.

**40. Sclerophyll**

A plant or tree with hard, leathery, commonly evergreen leaves which have few stomatal pores, thereby resisting loss of water by transpiration. Many trees that are characteristic of Mediterranean lands with hot dry summers (such as Malta) are sclerophyllous-- e.g. the olive, carob and holm oak. The **Mediterranean sclerophyllous forest** dominated by holm oak is the climatic climax community in the Maltese Islands.

**41. Semi-natural vegetation**

Trees and vegetation originally planted by man but subsequently left to regenerate naturally, and now self-sustaining in the wild. The best example in the Maltese Islands is the semi-natural woodland at Il-Buskett.

**42. Shrub**

A perennial plant, lower than a tree, usually with many persistent woody stems branching from or near the base. The term is approximate, and no clear-cut distinction between tall shrubs and low trees exists. Indeed, many tree species may grow as low shrubs if stunted (e.g. in shallow soil, and in exposed areas, carob trees may develop a very prostrate habit) and vice-versa (e.g. the Maltese salt tree *Darniella melitensis* and the rosemary *Rosmarinus officinalis* may occasionally reach large sizes.*See also* TREE.

**43. Succulent**

A plant that has thick leaves and/or stems capable of storing water. Succulence is a xerophytic adaptation. *See also* XEROPHYTE.

**44. Tree**

A woody perennial, taller than a shrub, rising from the ground with a relatively strong and generally distinct trunk. *See also* SHRUB.

**45. Xeroscaping ***

Soft landscaping based on the use of drought-tolerant xerophytic plants. Xeroscaping is economical in terms of water demand, and is therefore particularly suitable (and sustainable) in dry climates, as in the Maltese Islands. *See also* XEROPHYTE.

**46. Xerophyte ***

Any plant or tree with special adaptations to survive in climates with a pronounced dry phase. In view of the nature of the Maltese climate, a large proportion of the indigenous Maltese flora is xerophytic. Sclerophyllous leaves, semicircular shrub habits and succulent leaves (the latter two characteristics are shared by most garrigue shrubs) are different forms of xerophytic adaptations. *See also* SUCCULENT.

**47. Urban area**

In these guidelines, the term "urban area" refers to existing and committed built-up areas as delineated in the *"Pjan Regolatur (1988)"*; they should be construed as excluding urban fringes, sites just within the limits to development (e.g. along the outer side of peripheral ring roads), rural settlements and hamlets, built-up areas (and/or open spaces) lying outside development zones, roads and paths (including major roads, country roads, tracks, walkways, and footpaths) passing through rural areas, and the immediate surroundings of ecologically valuable enclaves sited within built-up areas (e.g. the valley bed and steep valley sides at Il-Wied ta' Għajn Żejtuna, Mellieħa).

**48. Urban fringes**

Sites lining the extreme periphery of an urban area (e.g. along the outer side of a ring-road), such that they lie at the urban-rural interface. Urban fringes should be treated like rural areas, since environmentally-impacting interventions therein (e.g. the planting of invasive species) is likely to affect the adjoining countryside. Ecologically/scientifically valuable enclaves within urban areas (e.g. the valley bed and steep valley sides at Il-Wied ta' Għajn Żejtuna, Mellieħa), are being classified under the same heading for conservation purposes; in terms of Policy

RCO 1 of the Structure Plan, such enclaves are classified as “Rural Conservation Areas” notwithstanding their urban location.