

APPROPRIATE ASSESSMENT FOR A NEW MATERIALS RECOVERY FACILITY (MRF)

WASTESERV MALTA LIMITED

CT2050/2019

SERVICE TENDER FOR THE ENGINEERING, PROCUREMENT
AND CONSTRUCTION OF A NEW MATERIALS RECOVERY
FACILITY

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1.0 EXECUTIVE NON-TECHNICAL SUMMARY

An Appropriate Assessment (AA) report is hereby being presented in relation to EA/00042/20. This application is entitled *“The proposed construction of a Material Recovery Facility (MRF) for the processing of grey bag and recovery of different streams of materials. The proposal includes ancillary office space, staff quarters and parking spaces”*

The scope of the AA is to determine whether the Scheme or any part thereof will have a significant impact on the integrity of various protected sites and any relevant ecosystems, habitats and species covered by the provisions of the FLORA, FAUNA AND NATURAL HABITATS REGULATIONS (SL 549.44).

Most of the envisaged ecological impacts will take place on land during the excavation and construction processes. The scheme site is surrounded by the following Natura 2000 sites which were studied in further detail:

- *Żona fil-Baħar bejn il-Ponta ta’ San Dimitri (Għawdex) u Il-Qaliet* (MT 0000105) designated as an SCI (Site of Community Interest of international importance) and SAC (Special Area of Conservation) via GN No. 682 of 2018, in accordance with the FLORA, FAUNA AND NATURAL HABITATS PROTECTION REGULATIONS, 2016 (S.L. 549.44);
- *Is-Salini* (MT 0000007) designated as an SAC (Special Area of Conservation) via GN No. 1379 of 2016, in accordance with the FLORA, FAUNA AND NATURAL HABITATS PROTECTION REGULATIONS, 2016 (S.L. 549.44);
- *L-Għadira s-Safra u l-Iskolla tal-Għallis* (MT 0000008) designated as an SAC via GN No. 1373 of 2016, in accordance with the FLORA, FAUNA AND NATURAL HABITATS PROTECTION REGULATIONS, 2016 (S.L. 549.44).
- *Żona fil-Baħar madwar Għawdex* (MT0000112) designated as a marine SPA (Special Protection Area) via GN No. 1311 of 2016, in accordance with the FLORA, FAUNA AND NATURAL HABITATS PROTECTION REGULATIONS, 2016 (S.L. 549.44);

The Terms of Reference (ToRs) for this AA were issued by the Environment and Resources Authority (ERA) in April 2024 (refer to Appendix I). In accordance to these ToRs, the screening process of the scheme determined that an AA is required as per Article 19(1) of SL 549.44, given that the scheme may cause significant impacts on the abovementioned Natura 2000 sites. Furthermore, the report assesses the terrestrial and marine ecology impacts within the site and immediate surroundings.

2.0 PROJECT DESCRIPTION

Source separated recyclable waste streams including paper, cardboard, plastics and metals were previously processed at a Material Recovery Facility at the Sant' Antnin Solid Waste Treatment Plant in Marsascale. This MRF operated between February 2008 and May 2017 but was destroyed during a fire. In the absence of such a facility, the processing of the aforementioned waste streams has been restricted to a manual sorting line and a more recent makeshift line at the Malta North Facility within the ECOHIVE complex.

The Scheme is being proposed to meet the provisions of Malta's Waste Management Plan and achieve recovery and recycling targets stipulated in the Circular Economy Package. The proposed Scheme aims to minimise as much as possible all landfilling and increase the recovery efficiency of recyclables thus rendering them more suitable for sales and/or export. The facility has also been designed in such a way to ensure that any emissions and environmental impacts arising from operations are in conformity with the latest requirements and standards stipulated in the EU INDUSTRIAL EMISSIONS DIRECTIVE 2010/75/EU (IED). The Scheme also intends to have a low processing cost per tonne of waste; good tolerance to contaminants in feed stock; minimise extended periods when waste cannot be processed, and sufficient contingency planning for planned (or unplanned) maintenance and downtime.

The total processing capacity of the proposed MRF is 70 kilotons per annum to meet future waste demand projections. The site forms part of the ECOHIVE Master Plan and lies eastwards of the Żwejra landfill, adjacent to the existing Anaerobic Digester (AD) Plant. The development footprint of the entire site is around 21,373m². It currently comprises agricultural land, a dense cover of low-lying trees and remnants of local maquis/advanced garigue community.



Figure 1: Proposed site for the new material recovery facility

3.0 METHODOLOGY

The Appropriate Assessment followed the Terms of Reference (ToRs) issued by the ERA in April 2023, enclosed in this report as Appendix I. On the basis of the ToRs, AIS Environment prepared a Method Statement outlining the approach and methodology to be followed as part of this survey, which was approved by the ERA.

3.1 Area of Study

The area mapped in Figure 2 shows the Natura 2000 sites which lie in close proximity to the MRF site. A 100m buffer zone (AoI) around the MRF site was set up to observe the ecological features in the area. The sites of concern were assessed through a literature review of existing biological data, supported by a dedicated broad-brush benthic survey.

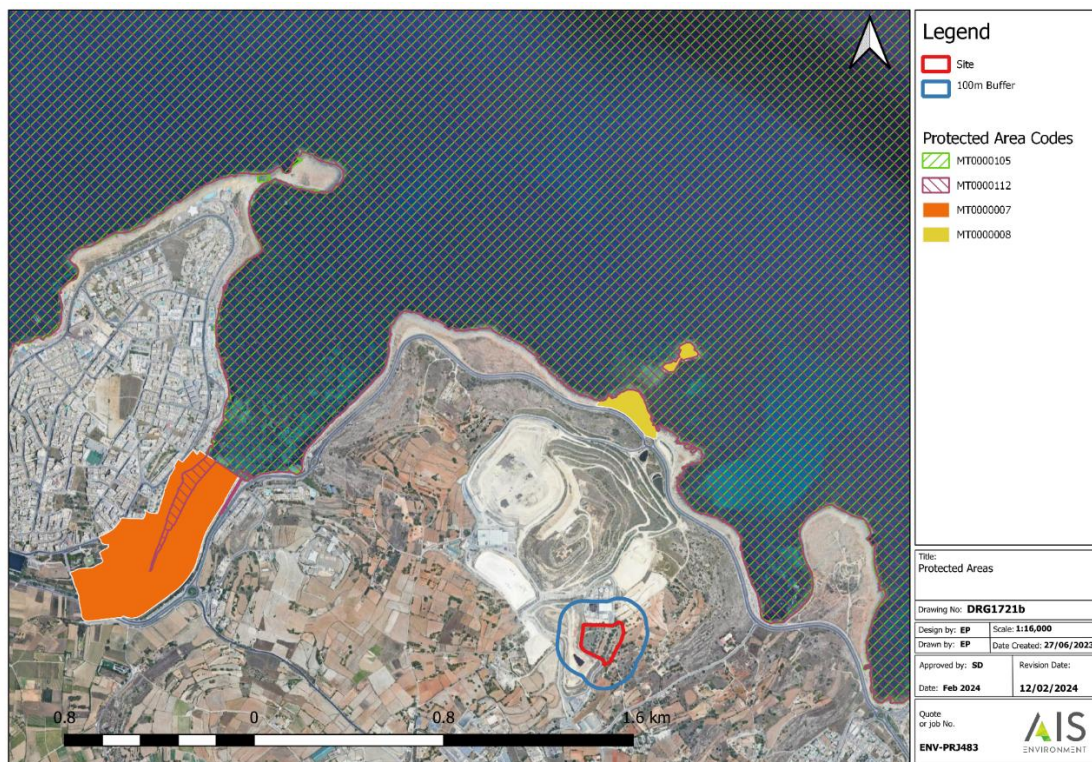


Figure 2: Sites protected within the Natura 2000 framework in proximity to the site and AOI

The Scheme is about 1.3km away from the nearest terrestrial Natura 2000 site also known as I-Għadira is-Safra u l-Iskoll tal-Għallis (MT0000008) which is designated as a Special Area of Conservation (SAC) via Government Notice 1522 of 2019. Other marine and bird protection areas are present within or in close proximity to the proposed MRF, chiefly:

- Terrestrial Environment:
 - MT0000007- Is-Salini designated as a Special Area of Conservation via Government Notice 1379 of 2016; and

- Marine Environment:
 - MT0000105 Żona fil-Baħar bejn il-Ponta ta' San Dimitri (Għawdex) u Il-Qaliet designated as a Special Area of Conservation of International Importance via Government Notice 682 of 2018; and
 - MT0000112 Żona fil-Baħar ta' madwar Għawdex – Special Protected Area via Government Notice 1311 of 2016.

The Area of Influence for the avifauna assessment of the terrestrial part of the proposed development, from here onwards referred to as AoI-1, consists of the actual site area of the proposed MRF development and a 0.1 km buffer zone around this area (Figure 3).

The additional potential impact on avifauna in the wider area, e.g. caused by light pollution from the planned development is assessed as a 5.0 km buffer around the site area of the proposed development, referred to as AoI-2 from here onward (Figure 3).

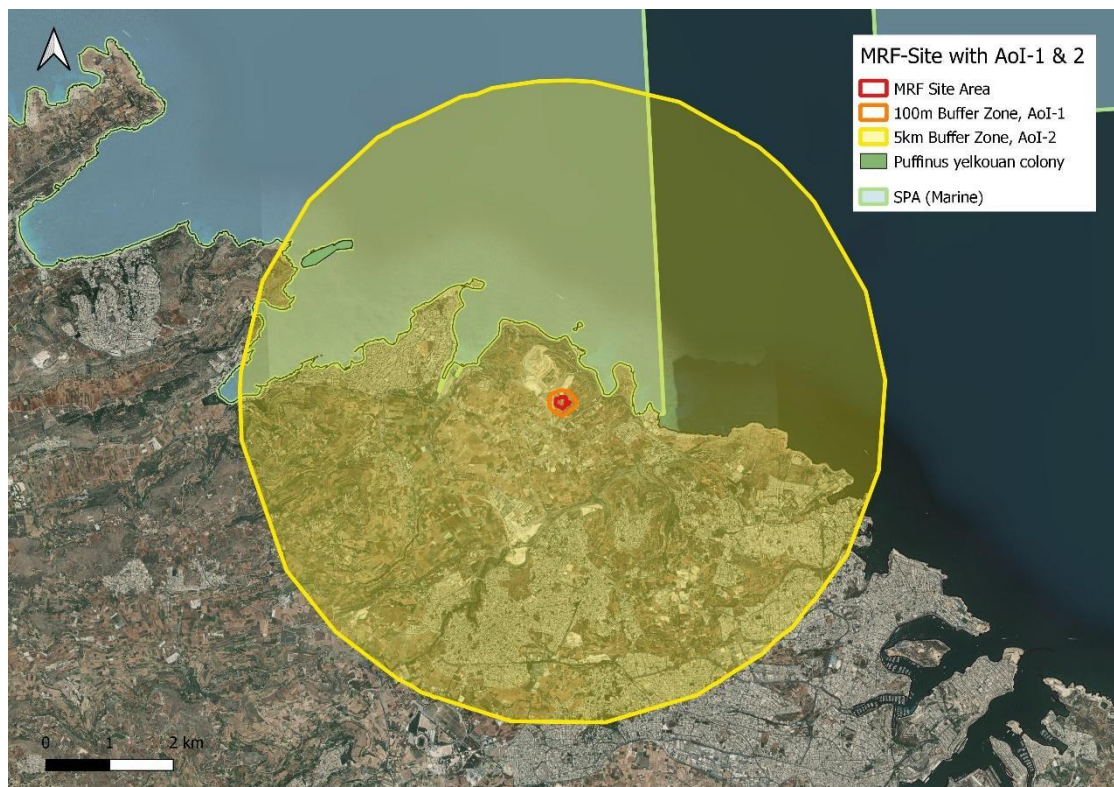


Figure 3: Proposed MRF Site with AoIs relevant to avifauna

3.2 Literature searches

3.2.1 Terrestrial study

A thorough literature review of readily available data and previous studies in the AOI. This included a review of the following sources:

- CENTRAL MALTA LOCAL PLAN

- SPED (STRATEGIC PLAN FOR THE ENVIRONMENT AND DEVELOPMENT)
- S.L. 549.44 - FLORA, FAUNA, AND NATURAL HABITATS PROTECTION REGULATIONS
- S.L. 549.123 - TREES AND WOODLANDS PROTECTION REGULATIONS
- LONG-TERM WASTE MANAGEMENT PLAN 2021-2030
- Previous environmental studies carried out in the same area

3.2.2 Avifauna study

The assessment of potential impacts on avifauna receptors in the identified Aols was performed through a literature review. The main references considered were:

- Malta Breeding Bird Atlas 2008 (BirdLife Malta 2009)
- Malta Breeding Bird Atlas 2018 (Epsilon 2019)
- The Breeding Birds of Malta (Sultana et al. 2011)
- Malta Marine IBA Inventory Report (BirdLife Malta 2015)
- Marine Strategy Framework Directive (MSFD) initial assessment report, seabirds (Borg et al. 2013)
- Marine Strategy Framework Directive (MSFD) second assessment report (ERA 2020)
- BirdLife International (2020) IUCN Red List for birds (<http://www.birdlife.org>)
- Bird species of Annex I of the Birds Directive (Last updated: 14/09/2020)
- Draft Guidelines for the Reduction of Light Pollution in the Maltese Islands (Environment and Resources Authority 2020).

The Natura 2000 sites that are either situated within or partially overlapping with the Aol-2 are the Special Area of Conservation (SAC) L-Għadira s-Safra (MT0000008), the SAC Is-Salini (MT0000007), the SAC Il-Gżejjer ta' San Pawl (Selmunett, MT0000022), as well as the marine Special Protection Area (SPA) Żona fil-Baħar madwar Għawdex (MT0000112).

The report details the conservation status of the relevant bird species within the Aols and in the above-mentioned Natura 2000 sites.

3.3 Impact Assessment

The methodology outlined below was performed to determine the impact assessment of the project on the Aols and the Natura 2000 sites. When an impact could not be determined with certainty, the worst-case scenario was taken. The impact assessment will be conducted in line with EC guidance documents.¹

The impacts section of the Appropriate Assessment covered the following aspects:

¹ European Communities (2001). *Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.* https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura_2000_assess_en.pdf.

- a) a description of the impact of the project on conservation objectives for the area and protected species and habitats it harbours, and on other indicators, including impacts on key species, extent of fragmentation, etc.
- b) a description of proposed measures to eliminate, mitigate or compensate anticipated adverse effects on protected species and habitats. The following aspects related to the proposed mitigation measures will be considered and assessed:
 - i. A reasonably detailed identification of the measures to be introduced for all relevant phases of the project;
 - ii. An explanation of how the measures will eliminate and/or mitigate adverse effects;
 - iii. Evidence of how the mitigation measures will be tangibly implemented and by whom;
 - iv. Evidence of the degree of confidence in their likely success;
 - v. A timescale, relative to the project, when they will be implemented;
 - vi. Explanation of how any mitigation failure will be addressed; and
 - vii. Proposals for decommissioning as appropriate.
- c) a description of any anticipated residual adverse effects arising from the proposed development on protected species and habitats.
- d) a proposal of a feasible ecological monitoring programme, for the pre-, during and post-construction phases, to include details such as the frequency of the proposed monitoring scheme.
- e) a comprehensive evaluation of all possible project alternatives/scenarios (including the zero option) and their impacts on protected species and habitats. Potential alternative schemes might include alternative technologies, alternative layouts, and relocation or downsizing of the project.

For each of the identified impacts, the following information is provided in a table format:

- » Impact type and specific intervention leading to impact
- » Project phase (construction/operation/decommissioning)
- » Sensitivity & resilience toward impact
- » Direct/indirect/cumulative
- » Beneficial/adverse
- » Impact severity (high/medium/low)
- » Extent (in relation to site coverage and surroundings and associated features)
- » Short-/medium-/long-term
- » Duration (temporary/permanent)
- » Reversible or irreversible effects of the impact and extent or irreversibility as well as description of any associated conditions/assumptions for irreversibility
- » Probability of impact occurring (inevitable/likely/unlikely/remote/uncertain)

APPROPRIATE ASSESSMENT

- » Impact significance
- » Scope of mitigation
- » Residual impacts

4.0 SITE DESCRIPTION

4.1 Terrestrial conditions

The site currently comprises agricultural land, a dense cover of low-lying trees and remnants of local maquis/advanced garigue community.

The area surrounding the site is mostly rural in character, aside of the engineered landfills and waste management operations conducted by Wasteserv. The ecological features nearest to the site are small pockets of afforested areas, coastal garigue and other natural communities reminiscent of garigue, steppe and degraded areas.

While the scheme site and buffer do not directly encroach any protected areas, several terrestrial, avian and marine Natura 2000 sites are present within walking distance of the proposed development.

4.1.1 Local plans

The CENTRAL MALTA LOCAL PLAN (Malta Environment and Planning Authority, 2006) shows that the scheme site is located within an Ecological Area (CG22) as indicated in Figure 4. The surrounding areas are classified as 'Agricultural Area' (CG24) awaiting classification of agricultural value (see Figure 4).

Two areas are marked as Sites of Scientific Importance (CG22), within the vicinity of the scheme site. One lies to the North of the facility well outside of the Area of Influence of the scheme, while the second is positioned further South and in close proximity to the ECOHIVE complex South entrance. The area to the South of the site will be considered in further detail due to potential ecological impacts arising from the transportation of material to and from the site via the adjacent access roads. Both are marked in a light purple outline in Figure 4.

The entire coastal stretch of Qalet San Marku is also protected through the provisions of the CENTRAL MALTA LOCAL PLAN as this part of the coast is designated as a "Protected Natural Coast with public access" (NA04). This area is however considered sufficiently detached from the scheme and will not be considered within the assessment.

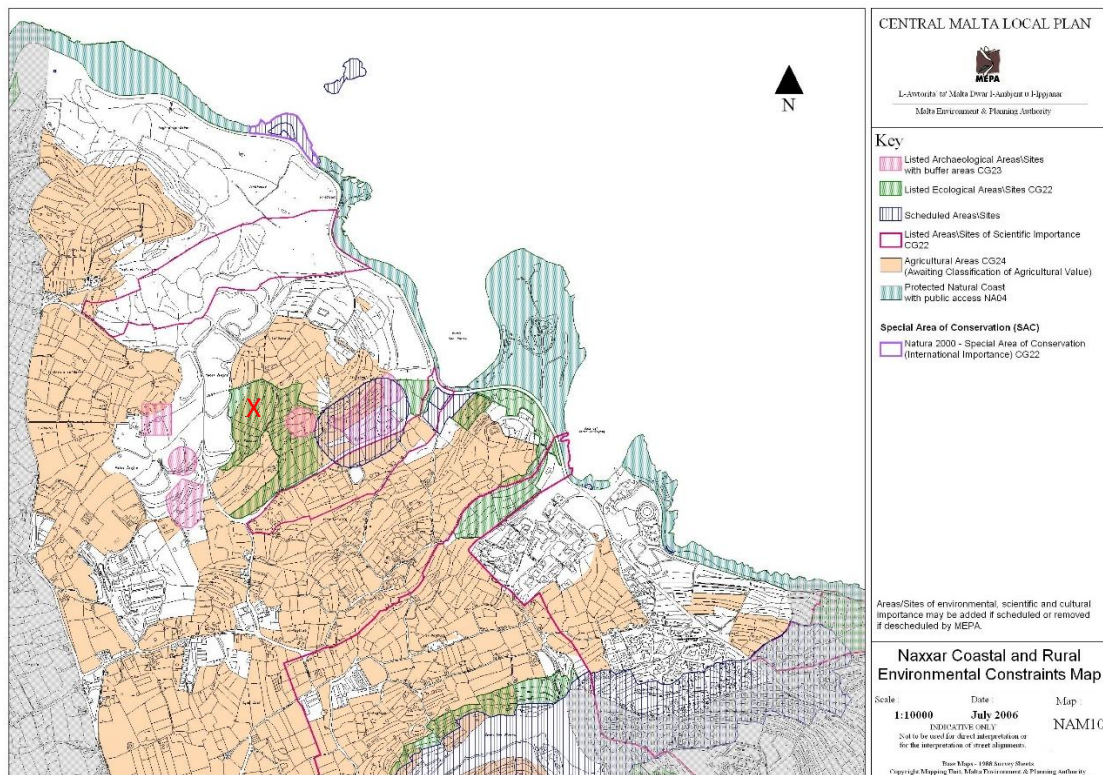


Figure 4: Naxxar coastal and rural environmental constraints map (Central Malta Local Plan, 2006) Site marked as X

In Figure 5, seven Areas of Ecological Importance (AEI) surrounding the scheme and AOI are marked as A to G. These AEIs were identified through the NORTH HARBOURS LOCAL PLAN (NHLP) survey in 1996 and have been used to designate protection areas in the Local Plans of 2006.

Site A is granted a level 4 degree of environmental protection due to its dense vegetation of maquis-like shrubs and trees intermingled with agricultural land. Both the scheme site and the majority of the AOI fall within the boundaries of Site A. The remaining 6 areas are found in the near vicinity of the scheme site. Due to the considerable distance from the scheme and/or access roads to and from the scheme, it is considered unlikely that impacts from the scheme affect the other 6 designated sites.

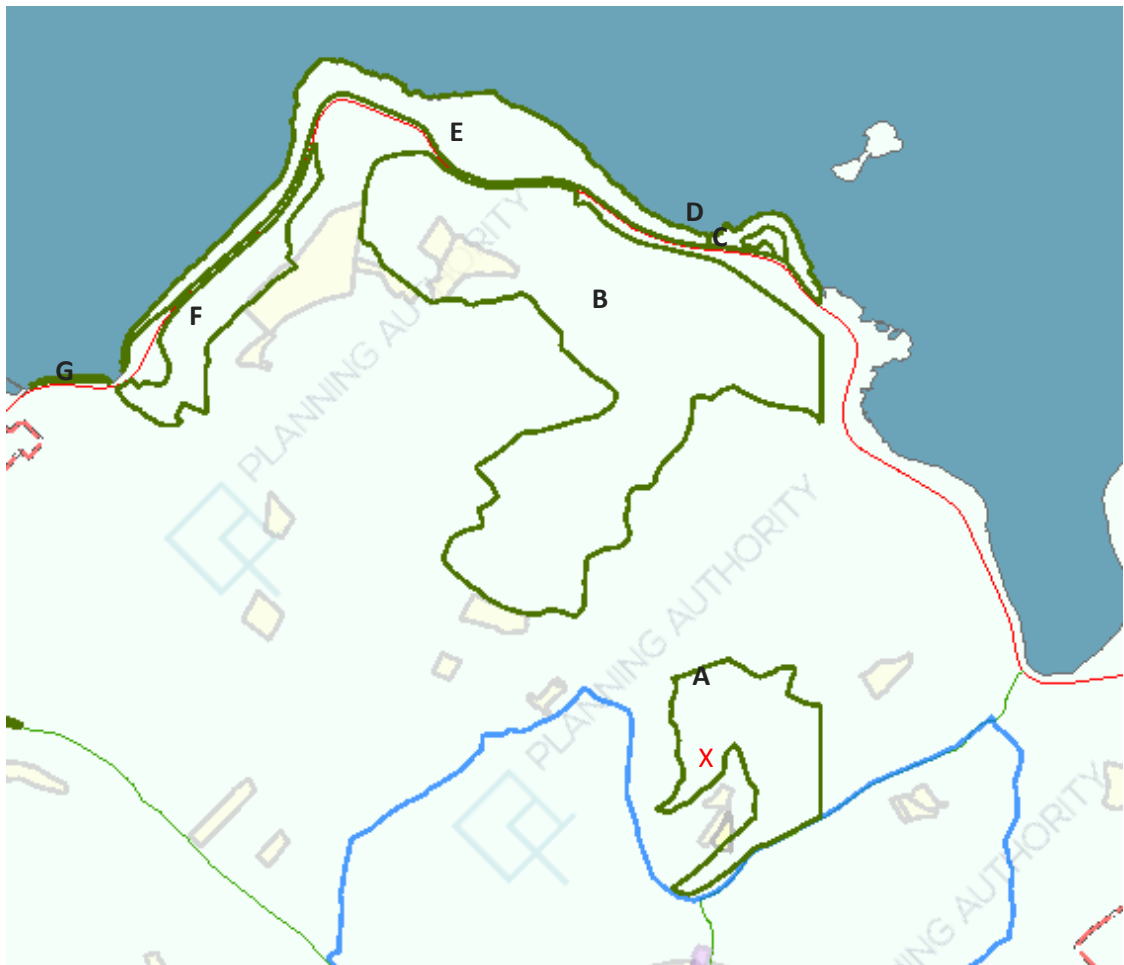


Figure 5: Areas of Ecological Importance (A-G) around the site are marked with a green outline (PA Geoserver) Site marked with a red X

4.1.2 Previous studies

4.1.2.1 Ta' Hammud vegetation report II – AGL Design Landscape Architects (2018)

The scope of the study was to identify, map and assess the status of trees likely affected by the proposed development. The consultants surveyed the site in the winter period of 2017. The quoted study was a follow-up survey of a similar exercise carried out in 2012, and includes a description and justification of differences between the two reports. The survey resulted in the identification of a variety of trees, mostly native, within the Area of Interest, most notably *Ceratonia siliqua* (Carob), *Olea europaea* (Olive), *Pinus halepensis* (Aleppo Pines) and *Pistacia lentiscus* (Lentisc), which are protected within protected areas and in Out of Development Zones (ODZ). Any works to be carried out on species (of plants) protected through S.L.549.44 and S.L.549.64 shall require permitting in advance by ERA in line with the provisions of the said Regulations. The report also gives recommendations of best practice should the existing trees be considered for transplanting, particularly the Carob and Olive trees, and potentially considered for the Lentisc shrubs. The resulting map of existing trees can be viewed in Figure 6 (see overleaf).



Figure 6: results of vegetation study presented in ta' Hammud Report (2017)

4.1.2.2 Terrestrial Ecology Baseline Study and Impact Assessment – Doublet and Zammit (2022)

Wasteserv Malta has commissioned an in-depth study carried out by a third-party consultant for a terrestrial ecology baseline study and impact assessment of a number of proposed developments within the ECOHIVE complex, including the Materials Recovery Facility covered by this EIA but also for the proposal of an Organic Waste Processing Plant (OPP), Thermal Treatment Facility (TTF), storage area and access road within the same complex. The full title is 'Terrestrial Ecology Baseline Study and Impact Assessment in relation to the removal of soil in areas within the ECOHIVE Complex'.

The scope of the report was to assess whether the schemes will cause impacts on protected sites and natural ecosystems, habitats and species. The schemes' footprints as planned at the time of writing were presented within the report for all aforementioned proposals conjoined. The overall perceived impacts on the identified ecological receptors were discussed, mitigation measures proposed and residual impacts and compensatory measures stated within said report. The assessment addressed Terms of Reference for a terrestrial ecology baseline study and impact assessment (EclA) as put forward by the Environment and Resources Authority in July 2022.

The report identified a wide variety of flora and fauna recorded within the scheme site and/or observed passing through. The report concluded that impacts of the proposed schema are likely cumulative and will arise primarily from the loss of habitat and food availability for protected species during the construction phase, while during the operational phase, these impacts will persist and further impacts may arise through the illumination of the site and the surrounding area.

The following figures (See Figure 7 and Figure 8) present the habitats and tree species recorded during the assessment.

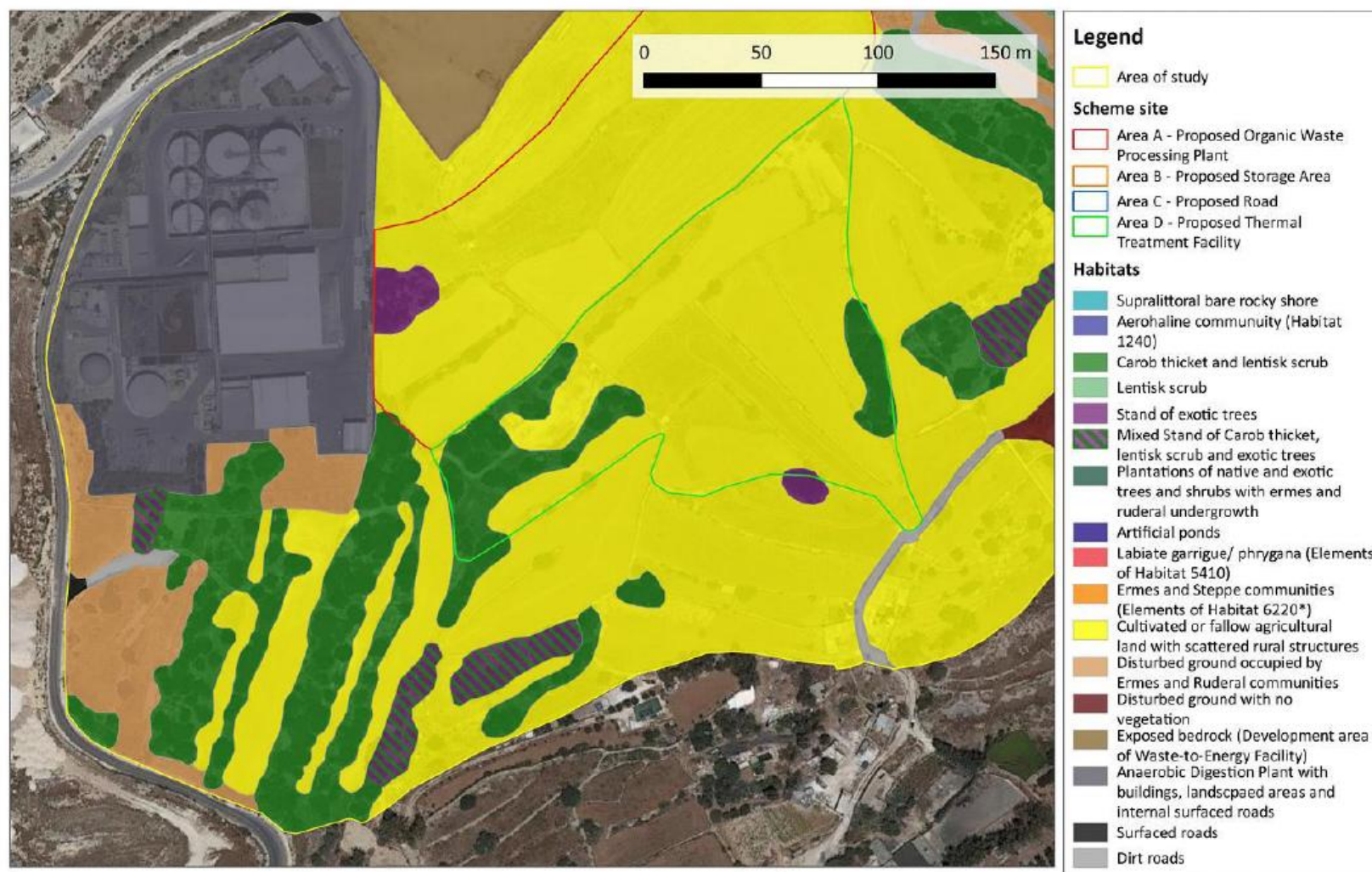


Figure 7: Habitat map of the AOI (Source: Baseline and impact assessment..., Doublet and Zammit, 2022)

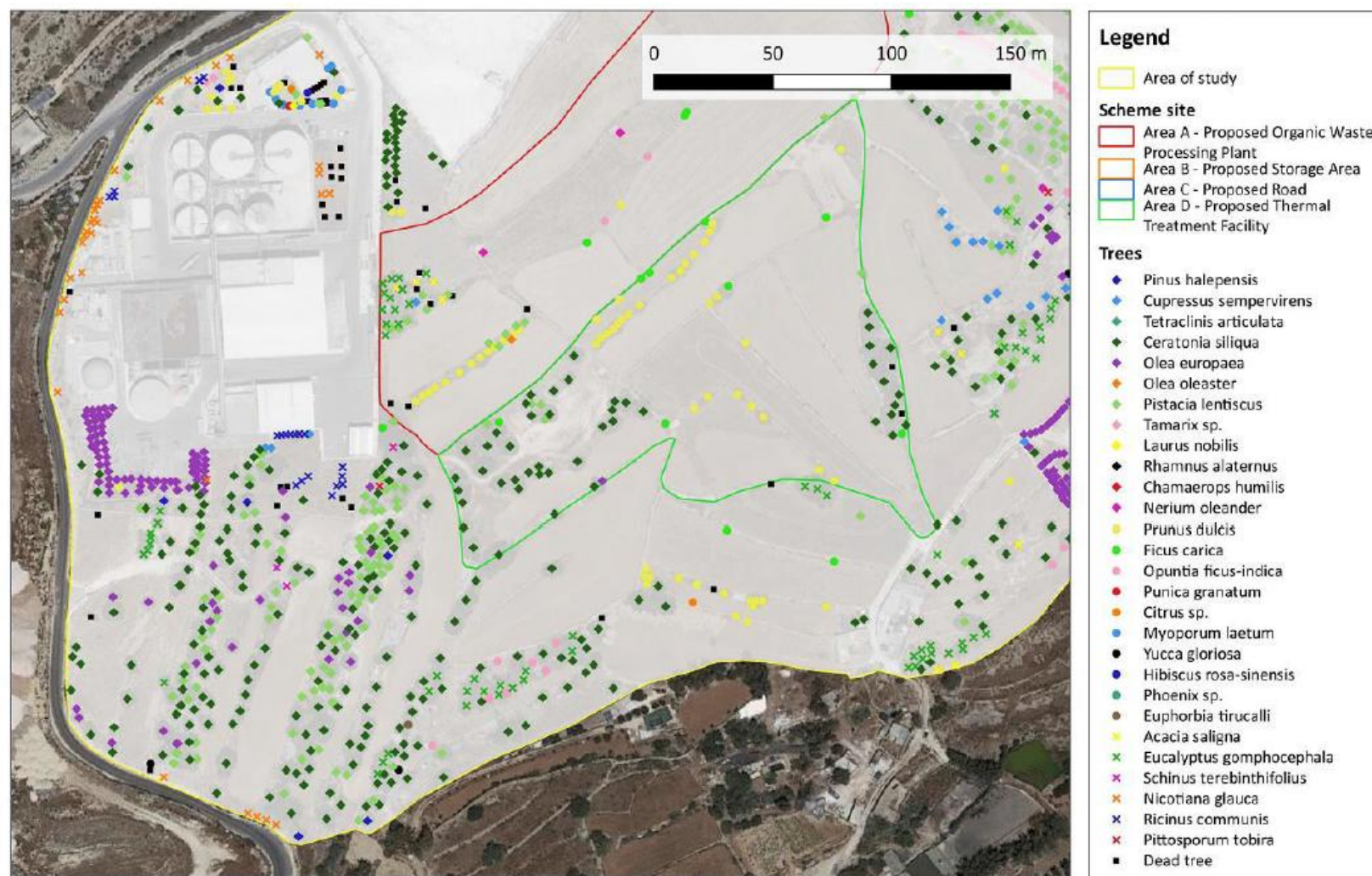


Figure 8: Trees in the AOI (Source: Baseline and impact assessment..., Doublet and Zammit, 2022)

4.1.3 Site survey

The main ecological components of the scheme site and surrounding the terrestrial Aol comprise of:

- » the Żwejra landfill border hosting ruderal and opportunistic species
- » soft landscaping around the existing bio-digester plant complex
- » small patches of mature invasive species to the North of the site
- » a considerable area of disturbed ground to the North-East of the site
- » the scheme site and a considerable area to the South-East comprise remnants of maquis communities bordering bare (tilled) or fallow fields

Inside the ECOHIVE complex, the ecological landscape dynamics are considerably influenced by ongoing waste management operations.

Dense populations of *Glebionis coronaria* (White wall-rocket), *Avena sterilis* (Sterile oat), *Arundo donax* (Greater reed), *Diploaxis tenuifolia* (Perennial wall-rocket), *Borago officinalis* (Borage), *Foeniculum vulgare* (Common fennel) and *Ricinus communis* (Caster oil plant) amongst other species cover the large heaps of the Żwejra landfill to the South-West of the site. To the West of the site, these communities become patchy and less diverse. The observed species overall hold little ecological importance, while some species are considered invasive.

A list of floral species encountered during the broad-brush survey within the Aol (including fauna) is provided in Table 1.

No fauna species were observed during the survey; however, the habitat likely supports a variety of mammalian, reptile and insect species. Previous studies² with a seasonal sampling frequency recorded the presence of the following species: the Algerian Hedgehog (*Atelerix algirus*), the Western whip snake (*Coluber viridiflavivorus*), the Leopard snake (*Elaphe situla*), the Moorish wall gecko (*Tarentola mauritanica*) and the Oscillated skink (*Chalcides ocellatus*) among others.

The presence of bats cannot be excluded from this area, as old dilapidated farmland buildings in the vicinity of the AOI can provide attractive roosting sites, and the maquis and agricultural land may offer foraging opportunities. No roosts are documented publicly within the AOI at the time of writing, however previous studies² recorded the presence of four species using the general area as feeding or commuting grounds.

² Terrestrial Ecology Baseline Study and Impact Assessment by Mr Doublet and Mr Zammit (2022)

Table 1: List of vegetative species encountered on site

SPECIES NAME	ENGLISH NAME	PROTECTION	TYPICAL HABITAT IN AoI
<i>Antirrhinum tortuosum</i>	Greater snapdragon	None	Agricultural land & disturbed areas
<i>Arundo donax</i>	Greater reed	None	Agricultural land & disturbed areas
<i>Asparagus aphyllus</i>	Mediterranean asparagus	None	Agricultural land, disturbed areas & maquis
<i>Asphodelus aestivus</i>	Summer asphodel	None	Maquis areas
<i>Avena sterilis</i>	Sterile oat	None	Agricultural land, disturbed areas
<i>Borago officinalis</i>	Borage	None	Disturbed areas & agricultural land
<i>Bromus spp.</i>	Brome grass	None	Agricultural land, disturbed areas
<i>Capparis orientalis</i>	Caper bush	Schedule VIII of S.L. 549.44	Soft landscaped areas
<i>Ceratonia siliqua</i>	Carob tree	Schedule I Part A Table 2 S.L.549.123	Maquis
<i>Conyza bonariensis</i>	Hairy Fleabane	None	Soft landscaped area
<i>Cupressus semprevivens</i>	Cypress tree		Soft landscaped areas
<i>Diplotaxis tenuifolia</i>	Perennial wall rocket	None	Agricultural land & disturbed areas
<i>Dittrichia viscosa</i>	False yellowhead	None	Agricultural land & disturbed areas
<i>Ecbalium elaterium</i>	Squirting cucumber	None	Agricultural land & disturbed areas
<i>Eucalyptus gomphocephala</i>	Tuart tree	None (not located in public urban space or used for beekeeping)	Agricultural land
<i>Foeniculum vulgare</i>	Common fennel	None	Disturbed areas, agricultural land & maquis
<i>Galactites tomentosa</i>	Mediterranean thistle	None	Agricultural land & disturbed areas
<i>Glebionis coronaria</i>	Crown daisy	None	Agricultural land & disturbed areas
<i>Ipomoea alba</i>	Moonflower vine	None	Soft landscaping areas
<i>Lavatera arborea</i>	Mallow tree	None	Disturbed areas, & soft landscaped areas
<i>Lonicera implexa</i>	Evergreen honeysuckle	None	Agricultural land

<i>Mercurialis annua</i>	Annual mercury	None	Soft landscaped areas & disturbed areas
<i>Nicotiana glauca</i>	Tree tobacco	Schedule II (invasive) S.L. 549.123	Disturbed area & soft landscaped areas
<i>Olea europaea</i>	Olive tree	Schedule I Part A Table 2 S.L. 549.123	Maquis
<i>Oxalis pes-caprae</i>	Bermuda buttercup	None	Disturbed areas, Agricultural land
<i>Pinus halepensis</i>	Aleppo pine tree	Schedule I Part A Table 2 S.L.549.123	Soft landscaped areas, Maquis
<i>Piptatherum miliaceum</i>	Smilgrass	None	Agricultural land, disturbed areas
<i>Pistacia lentiscus</i>	Lentisk tree	Schedule I Part A Table 2 S.L. 549.123	Maquis
<i>Pittisporum tobira</i>	Japanese mock orange	None	Soft landscaped areas
<i>Plantago spp.</i>	Plantain	None	Disturbed areas
<i>Portulaca spp.</i>	Purslane	None	Agricultural land
<i>Ricinus communis</i>	Castor oil tree	Schedule II (invasive) S.L. 549.123	Disturbed areas
<i>Sulla coronaria</i>	Sulla	None	Agricultural land
<i>Sonchus oleraceus</i>	Sow thistle	None	Disturbed areas & garigue

Table 2: Protected tree species within the AOI

SPECIES NAME	ENGLISH NAME	PROTECTION	TYPICAL HABITAT IN AOI	AMOUNT IN AOI
<i>Capparis orientalis</i>	Caper bush	Schedule VIII of S.L. 549.44	Soft landscaped areas	Scattered individuals
<i>Ceratonia siliqua</i>	Carob tree	Schedule I Part A Table 2 S.L.549.123	Maquis	162
<i>Cupressus sempervivens</i>	Cypress tree	Schedule I Part A Table 2 S.L.549.123	Soft landscaped areas	1
<i>Olea europaea</i>	Olive tree	Schedule I Part A Table 2 S.L. 549.123	Maquis	24
<i>Pinus halepensis</i>	Aleppo pine tree	Schedule I Part A Table 2 S.L.549.123	Soft landscaped area, Maquis	9
<i>Pistacia lentiscus</i>	Lentisk tree	Schedule I Part A Table 2 S.L. 549.123	Maquis	48
Total protected trees affected by the proposed development				244



Figure 9: Terrestrial ecology map showing habitats and land uses within the scheme's AOI

4.1.4 Is-Salini

Is-Salini (MT0000007) is designated as a Special Area of Conservation (SAC) of international importance since the site encompasses the following habitats included in Schedule I of the Flora and Natural Habitats Protection Regulations (S.L. 549.44):

- Habitat 1150 – *Coastal lagoons*
- Habitat 1310 – *Salicornia and other annuals colonising mud and sand*
- Habitat 1410 – *Mediterranean salt meadows*
- Habitat 1420 – *Mediterranean and thermo-Atlantic halophilous scrubs*
- Habitat 92D0 – *Southern riparian galleries and thickets (Nerio-Tamaricetea and Securinegion tinctoriae)*

Is-Salini occupies an area of 23.67ha and is one of the last remaining salt marshes in the Maltese islands and is characterised by an estuary whereby sea water meets freshwater originating from a complex of valley systems at Naxxar and limits of Burmarrad. The consistent flow of freshwater to the site renders this marshland unique in the Maltese islands, as other marshlands are more saline or brackish in nature. The site also encompasses agricultural land and an afforested area known as Kennedy Grove with a number of tree plantations of pine trees, olive trees and tamarisk trees.

The site entails a salt harvesting complex made up of a canal which provides freshwater input to the marshland. Some of the most common species at the site include: *Limbarda crithmoides* (Golden samphire), *Suaeda vera* (Shrubby seablite), *Salsola soda* (Smooth-leaved saltwort), *Arthrocnemum macrostachyum* (Glaucous glasswort) and *Phragmites australis* (Common reed), whilst the water channel is inundated with dead *Posidonia oceanica* debris.

The Management Plan of the site reports that a canal joins Is-Salini marshland to a seasonal watercourse. The canal is covered with vegetation on its side, mainly composing of *Cynodon dactylon* (Bermuda Grass), *Avena sterilis* (Awned oats), and random sporadic patches of *Juncus subulatus* (Somerset rush), *Lythrum junceum* (Creeping loosestrife) and *Cressa cretica* (Mediterranean alkaliweed). When dry, the vegetation community within the canal tends to change to one which is dominated by typical saltmarsh pioneer and annual species. Pockets of *Thymra capitata* (Mediterranean thyme), the indigenous *Erica multiflora* (Mediterranean Heath) and *Teucrium fruticans* (Olive-leaved germander), typical of garigue communities, are found on the border of the saltmarsh habitats.



Figure 10: Photograph of is-Salini canal taken in Spring 2020

Is-Salini is also known to be one of the few localities in Malta that accommodates the following rare plant species: the restricted *Elymus flaccidifolius* (Marsh Couch), the endangered *Ruppia maritima* (Beaked Tassel Pondweed), the endangered *Calystegia sepium* (Saltmarsh bindweed), *Parapholis filiformis* (Slender sea hard-grass) and *Orobanche cernua* (Drooping broomrape). More importantly, the site accommodates two Annex II species of international conservation importance, chiefly: the small passerine bird found almost exclusively in reed beds, *Acrocephalus scirpaceus* (Eurasian reed warbler) and the only freshwater fish in the Maltese islands: *Aphanius fasciatus* (Mediterranean Killifish).

Other faunal species documented from the site include: the earwig *Anisolabis maritima*, the jumping spider *Neaetha membra* as well as other grasshopper and sand hopper species. Endemics include *Trochoidea spratti* (Maltese top snail), the endemic snail *Muticaria macrostoma* (Maltese door snail), *Anthermis urvilleana* (Maltese sea chamomille), *Chiliadenus bocconeii* (Maltese fleabane), *Allium lojaconoi* (Maltese dwarf garlic) and the seagrass *Zostera* spp. (Eel grass)

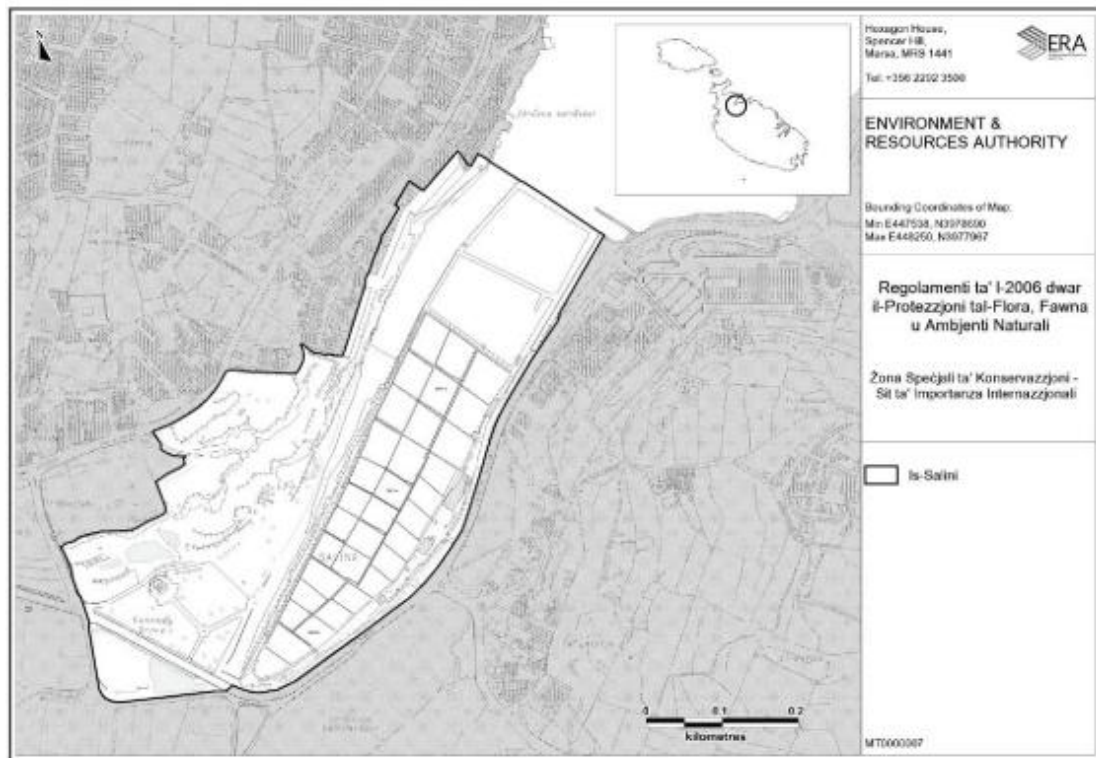


Figure 11: Is-Salini Natura 2000 site

4.1.5 L-Għadira s-Safra u l-Iskolla tal-Għallis

L-Għadira s-Safra u l-Iskolla tal-Għallis is a Natura 2000 (MT0000008) transitional coastal wetland covering 1.54 hectares of land. The site has been designated as a Special Area of Conservation through the provisions of G.N. 1379 of 2016 in accordance with the Flora, Fauna and Natural Habitats Protection Regulations, 2016.

The site is a particularly rare ecosystem in the Maltese islands as transitional wetlands comprising of brackish water (water that is considered neither saline nor freshwater) are a unique feature in a predominantly xeric Mediterranean region. The site comprises of rockpools which are replenished with rainwater during rainy periods, and seawater by wave action from the nearby sea. The excessive heat during the summer months evaporates most of the freshwater, leaving puddles of saline water. Therefore, this ecosystem supports biotic assemblages that are typical of freshwater habitats during the winter months, and species which are more tolerant to saline conditions during the summer months.

According to the Natura 2000 standard data form of the site, the site was initially proposed as an SCI (Site of Community Importance) in G.N 288 of 1995 and its status confirmed in 2008. L-Għadira s-Safra u l-Iskolla tal-Għallis comprises of two Annex I habitat types:

- Habitat 1420 – *Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)*
- Habitat 3170 – *Mediterranean temporary ponds*

L-Għadira s-Safra u l-Iskolla tal-Għallis requires austere protection as it accommodates a number of particularly rare species, including the endangered Prickle Grass (*Crypsis aculeata*), the rare tadpole shrimp (*Triops canciiformis*) and the Fairy Shrimp (*Branchipus schaefferi*). These species are also supported by a community of other rare inhabitants, including: *Cressa cretica* (Morning glory) which is confined to saline marshlands in the Maltese islands, the endangered *Polygonum maritimum* (Sea knotgrass) as well as the endangered woodlouse *Tylos latrellei sardous*. More importantly, the site accommodates *Riella helicophylla*, a liverwort listed as an Annex II species in the Habitats Directive (Directive 92/43/EEC).



Figure 12: Photograph of the dry rockpools at l-Għadira s-Safra u l-Iskolla tal-Għallis taken in May 2020

The vegetation that dominates the site comprises of *Plantago* spp. individuals, *Crithmum maritimum* (Sea fennel) and *Limbarda crithmoides* (Golden samphire), which are species which are typical of coastal garigue areas. Some sections leading to the upper embankment and the road have also been planted with *Tamarix* spp. trees, mostly through afforestation projects.

The conservation objectives of the site are to minimise and restrict public access to the protected brackish rockpools and increase the natural buffer of the site through the maintenance and improvement of the scheduled Annex I habitats. Other measures targeting the improved educational awareness of the site's importance, effective monitoring strategies and enforcement of existing legislations are also proposed in the government notice. Furthermore, through the redevelopment project of the Coast Road, it is envisaged that the

site will expand in size through inland relocation and the rehabilitation of the carriageway to increase the buffer area.

G.N. 1373 of 2016 also recognises various anthropogenic impacts which remain mostly unmitigated, including: “littering, trampling, presence of ruderal and invasive alien species and the permanent destruction of the clay layer”. It also recognises the fact that due to its small size, the presence of the adjacent arterial road network and recreational activities are direct threats to the habitats present within the site.

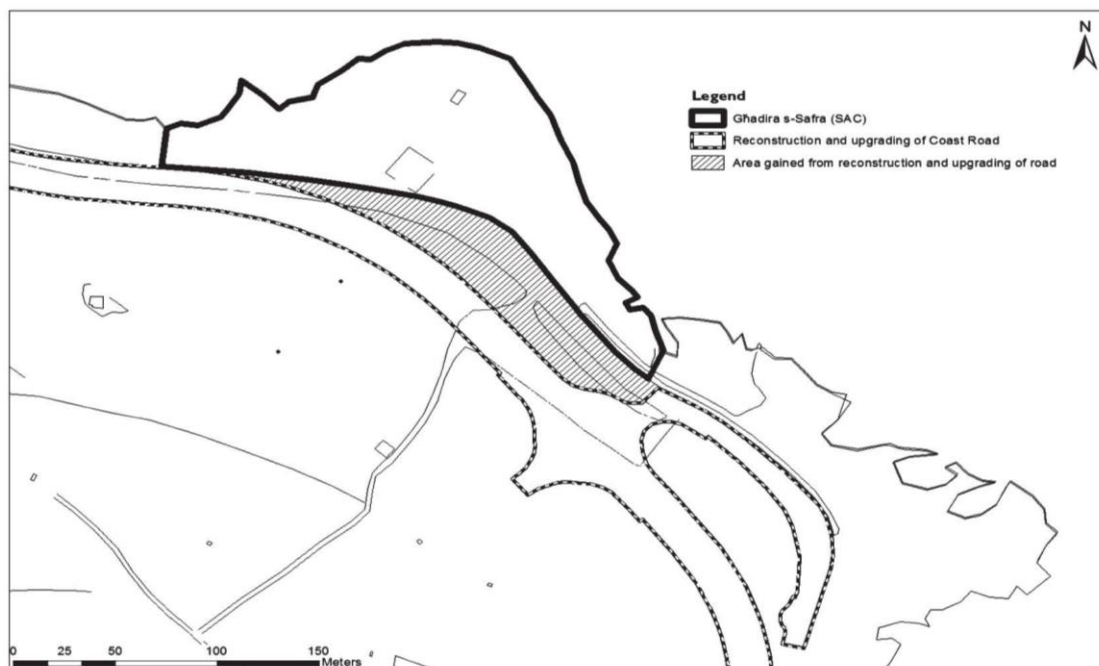


Figure 13: L-Ghadira s-Safra u l-Iskolla tal-Ghallis site boundary

4.2 Avifauna conditions

More than 400 bird species have been recorded in the Maltese Islands and their Fisheries Management Zone (FMZ) of 25 Nautical Miles (Bonavia, pers. comm.). Slightly above two hundred of these species occur in the Maltese Islands regularly³. Up to 48 bird species have been recorded breeding on the Maltese Islands, of which 23 are regular breeders from wild populations⁴. Three species, all pelagic seabirds, hold significant breeding populations in the Maltese islands from an EU, European and global perspective, and are listed under Annex I of the EU Birds Directive⁵. Information regarding the species' conservation status, population

³Bonavia et al. (2005): *Systematic list 1996-1999*, *Il-Merill* 31, 1-34.

Bonavia et al. (2010): *Systematic list 2000-2005*, *Il-Merill* 32, 55-109.

⁴Epsilon Malta Ltd, Nature Conservation Consultants (2019). *Malta Breeding Bird Atlas 2018*. Malta: Wild Birds Regulation Unit, Ministry for the Environment, Sustainable Development and climate Change

⁵Maltese Environment and Resources Authority - ERA (2020): Update of Articles 8, 9 and 10 of the Marine Strategy Framework Directive (2008/56/EC) in Malta's Marine Waters. Second Assessment Report, pp.321-344.

numbers, trends and range presented below are derived from BirdLife International's Data Zone⁶. All information regarding species listed in Annex I of the EU Birds Directive such as population numbers in the EU were obtained from the Environment, Nature and Biodiversity site of the European Commission⁷.

The 5.0 km buffer zone around the proposed development, Aol-2, overlaps to various extents with the following five sites that are protected within the Natura 2000 network and of conservation interest in relation to bird species:

- » SAC Pembroke (MT0000002)
- » SAC Is-Salini (MT0000007)
- » SAC L-Għadira s-Safra u l-Iskoll tal-Għallis (MT0000008)
- » SAC Il-Gzejjer ta' San Pawl (Selmunett, MT0000022)
- » SPA Żona fil-Baħar madwar Għawdex (MT0000112)

The avifauna baseline study intends to inform which receptors (bird species) are expected to occur in the Aols, including in the above listed, potentially impacted protected areas in relevant numbers.

4.2.1 Breeding landbirds within the Aol-1

Four bird species have been reported as confirmed, probably, or possibly breeding within the Aol-1 according to the Malta Breeding Bird Atlas 2008⁸ and 2018⁹, considering the breeding seasons 2008, 2017 and 2018. Two of the four species regularly choose anthropogenic structures as nest sites.

Table 1: List of breeding bird species in the Aol-1 and their status

SPECIES	BREEDING STATUS IN Aol-1	ABUNDANCE STATUS	TREND IN MALTA	TREND IN EUROPE	CONSERVATION STATUS	ANNEX I (EU BIRDS DIRECTIVE)
Blue Rock Thrush <i>Monticola solitarius</i>	Possible	Frequent	Stable	Unknown	Least Concern	No
Sardinian Warbler <i>Curruca melanocephala</i>	Probable	Common	Decreasing	Stable	Least Concern	No

⁶ BirdLife International (2020) IUCN Red List for birds. Downloaded from <http://www.birdlife.org> on 18/09/2020.

⁷ https://ec.europa.eu/environment/nature/conservation/wildbirds/threatened/index_en.htm

⁸ Raine, A., Sultana, J., and Gillings, S. (2009) Malta Breeding Bird Atlas 2008. Malta: BirdLife Malta

⁹ Epsilon Malta Ltd, Nature Conservation Consultants (2019). Malta Breeding Bird Atlas 2018. Malta: Wild Birds Regulation Unit, Ministry for the Environment, Sustainable Development and climate Change

Zitting Cisticola <i>Cisticola juncidis</i>	Probable	Abundant	Stable	Increasing	Least Concern	No
Spanish Sparrow <i>Passer hispaniolensis</i>	Confirmed	Abundant	Stable	Decreasing	Least Concern	No

4.2.2 Seabirds of Maltese breeding populations utilising the Aol-2

Three pelagic seabird species from the order Procellariiformes – the Yelkouan Shearwater *Puffinus yelkouan*, Scopoli's Shearwater *Calonectris diomedea*, and Mediterranean Storm-petrel *Hydrobates pelagicus melitensis* – nest on the Maltese Islands and inhabit Maltese waters in significant population numbers from a global and European population perspective. All three species are listed in Annex I of the EU Birds Directive. One of them, the Yelkouan Shearwater, is listed as Vulnerable on the INTERNATIONAL UNION FOR CONSERVATION OF NATURE (IUCN) Redlist and holds a breeding colony inside the Aol-2 (see below). The designation of the marine SPA Żona fil-baħar madwar Għawdex (MT0000112), which partially overlaps with the Aol-2 was triggered by two of the above-mentioned species: the Yelkouan Shearwater and the Scopoli's Shearwater.

In addition to the three procellariiform seabird species, Malta hosts a breeding population of Yellow-legged Gull *Larus michahellis*, not listed in Annex I of the EU Birds Directive.

- **Scopoli's Shearwater *Calonectris diomedea* – Least Concern, Annex I**

The Scopoli's Shearwater is currently listed as Least Concern by the IUCN. It is listed under Annex I of the EU Birds Directive. The species is endemic (breeding) to the Mediterranean basin, with major colonies in the Central Mediterranean. The global population size was last estimated in 2013 at 285,000 – 446 000 mature individuals equating to 142,478 – 222,886 breeding pairs, showing a decreasing trend. For the Maltese islands, the total population estimate in 2018 was 2670 – 3605 breeding pairs according to Malta's second assessment report for the MSFD, roughly equating to around 1.6 – 1.9% of the global breeding population. Previous figures reported in 2013 had estimated the total Maltese population to be 3,046 – 3,962 breeding pairs. The available data suggests a decreasing population trend. Birds only approach land to breed, entering and leaving the colonies under the cover of darkness. Adults in and near the colonies and fledglings are sensitive to light pollution¹⁰. The closest breeding colony to the proposed development is Irdum tal-Madonna (SPA MT0000009) – which is not expected to be impacted directly by noise and light pollution from the development.

The Scopoli's Shearwater inhabits Maltese waters from February to November, with the highest activity at and in front of the colonies mainly from March to October. The species is strictly pelagic, foraging frequently together in large numbers on shoaling fish and squid by plunge-diving and pursue-diving, up to 15m deep. During the breeding period, Scopoli's Shearwaters congregate in large flocks, sitting on the water's surface exhibiting 'rafting'

¹⁰Rodríguez et al. (2017). Seabird mortality induced by land-based artificial lights. *Conservation Biology*, 31(5), 986-1001.

Crymble et al. (2020): Identifying light-induced grounding hotspots for Maltese seabirds. *Il-Merill* 34, 23-43.

behaviour within a 4km radius in front of the colonies in the evenings¹¹, as described by Sultana et al. 2011. GPS-tracking of individuals from Maltese colonies during the chick-rearing period (July-October) shows that Scopoli's Shearwaters utilise at-sea areas in the Maltese EEZ, including the marine part of the Aol-2. The distribution of foraging Scopoli's Shearwaters within the FMZ (25nm), including the marine part of Aol-2 has been confirmed by vessel-based counts. Up to 7,300 individuals of the species make regular use of the SPA MT0000112, Żona fil-Baħar madwar Ġhawdex during the reproductive season as foraging ground and rafting areas in front the colonies. Frequent passage occurs through the marine part of the Aol-2 by birds commuting between breeding grounds and foraging areas. Scopoli's Shearwaters have not been reported breeding inside the Aols.

Scopoli's Shearwaters are highly susceptible to plastic ingestion and entanglement. Furthermore, as long-lived, top-level predators, they are known to bio-accumulate pollutants with potentially detrimental impacts on physiology and reproduction ¹².

- **Yelkouan Shearwater *Puffinus yelkouan* – Vulnerable, Annex I**

The IUCN lists the Yelkouan Shearwater as Vulnerable. It is furthermore listed under Annex I of the EU Birds Directive. The Yelkouan Shearwater is endemic to the Mediterranean basin. The global population size, estimated in 2011, is 15,337 – 30,519 pairs, roughly equating to 46,000 – 92,000 individuals. However, due to knowledge gaps, the quality of this estimate is moderate. According to the IUCN the global population trend is decreasing. The latest total population estimates of Yelkouan Shearwaters for the Maltese Islands (2016-2018) is 1,795 – 2,635 breeding pairs, roughly equating to 10% of the global breeding population. While previous figures reported in 2013 in the initial MSFD report suggest a short-term increase for Maltese population, this increase of the Maltese Yelkouan Shearwater population is rather a result of intense research in recent years with the result of increased monitoring intensity rather than an actual increase in population numbers¹³. The long-term trend indicates a stable population. By-catch is likely to be responsible for low adult survival rates¹⁴ as shown for Maltese Yelkouan Shearwaters. Birds only approach land to breed, entering and leaving the

¹¹ BirdLife International (2010) *Marine Important Bird Areas toolkit: standardised techniques for identifying priority sites for the conservation of seabirds at sea*. BirdLife International, Cambridge UK. Version 1.2: February 2011.

¹² Walsh PM (1990) *The use of seabirds as monitors of heavy metals in the marine environment*. In: Furness RW, Rainbow PS (eds) *Heavy metals in the marine environment*. CRC Press, Boca Raton, pp 183–204.

Costantini et al. (2014) *Oxidative stress in relation to reproduction, contaminants, gender and age in a long-lived seabird*, *Oecologia*, 175:1107–1116, DOI 10.1007/s00442-014-2975-x

Dias et al. (2019) *Global threats to seabirds*, *Biological Conservation*, 237: 525-537, DOI: 10.1016/j.biocon.2019.06.033

¹³ Maltese Environment and Resources Authority - ERA (2020): *Update of Articles 8, 9 and 10 of the Marine Strategy Framework Directive (2008/56/EC) in Malta's Marine Waters. Second Assessment Report*, pp.321-344.

¹⁴ Oppel et al. (2011) *Is the Yelkouan shearwater *Puffinus yelkouan* threatened by low adult survival probabilities?* *Biological Conservation*, 144(9), 2255-2263.

colonies under cover of darkness. Adults and fledglings are sensitive to light pollution¹⁵, and, like the Scopoli's Shearwater, the species is highly susceptible to plastic ingestion, and entanglement as well as to bio-accumulation of pollutants.

The largest Yelkouan Shearwater colony in Malta is situated at Irdum tal-Madonna (MT0000009). The colony closest to the proposed development is situated on Selmunett (MT0000022), within the 5km buffer area of the proposed MRF (Aol-2), holding approximately 45 to 70 breeding pairs¹⁶. Yelkouan Shearwater can be found in the colonies and adjacent waters, including the marine part of the Aol-2 from October to July. Outside the breeding season, the birds disperse more widely across the Central Mediterranean and a significant part of the population migrates East to the Aegean and into the Black Sea¹⁷. Yelkouan Shearwaters are strictly pelagic, foraging frequently together in flocks on shoaling fish and squid mainly by pursuit-diving, up to 50m deep. Like Scopoli's Shearwaters, Yelkouan Shearwaters congregate in flocks exhibiting rafting behaviour within a 7 km radius in front of the colonies in the evenings, according to GPS-tracking data. The individual rafts tend to be further out at sea than those of the Scopoli's Shearwaters and are made up of fewer individuals.

GPS-tracking of individuals during chick-rearing from the two main Maltese colonies (2012-14)¹⁸ suggests that Yelkouan Shearwaters forage predominantly in waters further offshore and partially outside Maltese waters. Like other shearwater species, Yelkouan Shearwaters avoid crossing over land. The Yelkouan Shearwater is one of the trigger species for the designation of the relevant marine SPAs at hand, with 3,270 – 4,650 individuals of the species making regular use of the SPA MT0000112 during the reproductive season as foraging ground and rafting areas in front of the colonies. Frequent passage occurs regularly through the marine part of the Aol-2 by birds commuting between breeding grounds and foraging areas.

- **Mediterranean Storm-petrel *Hydrobates pelagicus melitensis* – Least Concern, Annex I**

The Mediterranean Storm-petrel *Hydrobates pelagicus melitensis* is a Mediterranean subspecies, clearly separated both genetically¹⁹ and morphologically²⁰ from the Atlantic

¹⁵ Crymble et al. (2020) Identifying light-induced grounding hotspots for Maltese seabirds. *Il-Merill* 34, 23-43.

¹⁶ Metzger, B., Austad, M. (2022). Towards effective management of Malta's marine waters – Seabird Fieldwork Report 2021 (<https://era.org.mt/wp-content/uploads/2022/11/Seabird-Fieldwork-Report-2021-public.pdf>)

¹⁷ Raine, A. F., Borg, J. J., Raine, H., & Phillips, R. A. (2013): Migration strategies of the Yelkouan Shearwater *Puffinus yelkouan*. *Journal of Ornithology*, 154(2), 411-422.

¹⁸ Metzger, B., Oppel, S., Carroll, M., Meirinho, A., Dias, M. P., Barbara, N., & Lago, P. (2015). Malta Marine IBA Inventory Report. https://birdlifemalta.org/wp-content/uploads/2018/03/LIFE10NATMT090-MSP-A8_mIBA_Report_final.pdf

¹⁹ Cagnon et al. (2004): Phylogeographic differentiation of storm petrels (*Hydrobates pelagicus*) based on cytochrome b mitochondrial DNA variation. *Marine Biol.* 145(6): 1257–1264.

²⁰ Lalanne et al. (2001): Morphological differentiation between European Storm-petrel subspecies: new results regarding two Mediterranean populations. *Alauda* 69(4): 475–482.

breeding population of the European Storm-petrel. Neither IUCN/BirdLife International nor the EU Birds Directive has assessed this taxonomic unit separately. The IUCN lists the species overall as Least Concern. It is listed under Annex I of the EU Birds Directive. The Mediterranean subspecies *H. pelagicus melitensis* is endemic to the Mediterranean basin and therefore has a relatively restricted distribution range. The global estimated population size of the entire species is 430,000 – 519,999 mature individuals. However, the data quality is poor (estimated in 2015). The most recent population size estimates for the Mediterranean sub-species are 8,500 – 15,200 pairs, roughly 2 – 3% of the global population. While the global population trend is unknown, the population trend of Mediterranean sub-species is decreasing according to EU Birds Directive. The closest breeding colony to the proposed development is Irdum tal-Madonna (MT0000009) – which is not expected to be directly impacted by the proposed development.

The most recent population assessment through capture mark recapture revealed an overall population size estimate of 8,575 breeding pairs for the Maltese Population, around 7% of the estimated global population of the species and at least 56% of the entire population of the Mediterranean subspecies. The short-term trend (2008-2018) and the long-term trend (1980-2018) for the Maltese population (2008-2018) are both reported to be stable²¹.

The species is found in the Maltese EEZ year-round and in the colonies from February to October. It is by far more commonly seen in Maltese waters during the breeding season, and more frequently and in higher numbers southeast and south of Malta. Adults and fledglings are sensitive to light pollution²².

The 70% KDE of seven Storm-petrels from the Filfla colony GLS-tracked during the breeding season indicate that the birds make use of the entire Maltese EEZ, but also of areas further offshore between Malta and Libya²³.

While not being a trigger species for the designation of the marine SPA MT0000112, Storm-petrels are commonly making use of this area (including the marine part of the Aol-2) year-round, and more so during the breeding season. While Storm-petrels have been captured, ringed and released at night on Selmunett (MT0000022) inside the Aol-2 during the breeding season, breeding has not been confirmed inside the Aol-2. Passage of Storm-petrels is expected to occur frequently through the marine part of the Aol-2 by birds commuting between breeding grounds and foraging areas.

- **Yellow-legged Gull *Larus michahellis* – Least Concern**

²¹Maltese Environment and Resources Authority - ERA (2020): Update of Articles 8, 9 and 10 of the Marine Strategy Framework Directive (2008/56/EC) in Malta's Marine Waters. Second Assessment Report, pp.321-344.

²²Crymble et al. (2020): Identifying light-induced grounding hotspots for Maltese seabirds. *Il-Merill* 34, 23-43.

²³Lago, P., Austad, M. & Metzger, B. (2019): Partial migration in the Mediterranean Storm Petrel *Hydrobates pelagicus melitensis*. *Marine Ornithology* 47: 105–113.

The IUCN lists the Yellow-legged Gull as Least Concern with an increasing population trend. The Global population numbers are unknown. The European population is estimated at 409,000 – 534,000 pairs equating to 819,000 – 1,070,000 mature individuals, with an increasing trend. The latest assessment of the Maltese YLG population for Malta's Article 12 reporting to the EU²⁴ lists 250 breeding pairs for the Maltese islands with an increasing trend. The largest colony, 202 ± 24 apparently occupied nests (5-year mean), is located on Filfla. Similar numbers have been reported from Filfla before. Smaller colonies at Ta' Ċenċ, Dingli and Wardija might have expanded in the last years. The species has also established new breeding locations such as Comino, Għarb and within Aol-2 on Selmunett (MT0000022) recently²⁵. Therefore, the actual number of breeding pairs might exceed 300 pairs.

Western to Central Mediterranean populations are mainly sedentary and dispersive but some populations are partially migratory. In the Maltese Islands a large number of non-breeders are present year-round. Ring recoveries show that birds ringed on Filfla as chicks utilise other locations in Malta and abroad, mainly Sicily and Southern Italy (pers. comm.). Yellow-legged Gulls are highly opportunistic feeders and benefit from human activities, such as fishing, discard from fisheries and other vessels, food-waste, open landfills, aquaculture and agriculture. In the Maltese islands, they occur in their highest densities and largest abundances in the harbour areas, around the largest colony (Filfla), around areas with large aquaculture facilities, especially tuna pens such as those in the vicinity of St Paul's Island and the wider area off Selmun. Large numbers of feeding flocks can be observed in the Aol-2 next to the proposed development at the Magħtab landfill year-round, as well as in adjacent areas in the Aol-2 on land (SACs MT0000007, MT0000008, MT0000022) and at sea (SPA MT0000112).

4.2.3 Other avian species expected to occur in the Aols

The following is a list of species expected to make use of the Aols.

4.2.3.1 Seabird species *sensu lato*

Several seabird species *sensu lato* have been recorded to make use of the Aols, mainly crossing the area during migration, but also stopping over during the migration period or staging extended periods of time during summer or winter. Two of these species are listed as Vulnerable and one is listed as Near Threatened in the IUCN Red List. Overall, nine species are listed in Annex I of the EU Birds Directive.

- **Ferruginous Duck *Aythya nyroca* – Near Threatened, Annex I of the EU Birds Directive**

Population trend decreasing. A significant proportion of the European Ferruginous Duck population and more than 1% of the global population funnels through Gozo Channel situated in the marine SPA (MT0000112) annually, mainly during spring migration. The birds often pass in larger flocks, also alighting on the water to rest. Occasionally observed in Is-Salini

²⁴ https://circabc.europa.eu/sd/a/4e807e1b-8aa1-4ede-ac48-a13cdd32889f/MT_A12NatSum_20141031.pdf

²⁵ Crymble et al. (2020): New breeding sites of Yellow-legged Gull around the Maltese Islands. *Il-Merill* 34, 72-80.

(MT0000007). However, no larger numbers of the species have ever been recorded in the Aols.

- **Greater Flamingo *Phoenicopterus roseus* – Least Concern, Annex I of the EU Birds Directive**

Overall population trend increasing. Flamingos migrate through the Maltese Islands, including the marine SPA MT0000112, annually often gathering in larger flocks. In recent years they have been recorded in increasing numbers, mainly in autumn. Expected to pass through the Aols regularly on migration, but it is unlikely that this happens in significant numbers. Reported stopping over in Is-Salini (MT0000007).

- **Slender-billed Gull *Chroicocephalus genei* – Least Concern, Annex I of the EU Birds Directive**

European population size is decreasing. In Malta Slender-billed Gulls are recorded annually on migration mainly from (July) August to March (April) in single to low double figures of daily observations. Slender-billed Gulls are considered a coastal species. The species can be expected to occur regularly in the Aol, including foraging at Magħtab landfill and foraging, roosting and passing over the marine part of the Aol that is part of the SPA MT0000112. Furthermore, the species has been reported making use of the reserves, Is-Salini (MT0000007) and L-Għadira s-Safra (MT0000008) for foraging and roosting. However, it is very unlikely that numbers in any of the Aol reach significant levels from a global or European population perspective at any point.

- **Mediterranean Gull *Larus melanocephalus* – Least Concern, Annex I of the EU Birds Directive**

The European population trend is decreasing. In the Maltese islands the species is mainly recorded from October to April with numbers in the lower hundreds reported in the period from November to March. Regularly makes use of the SPA MT0000112, including the marine part of the Aol. Birds will also make use of the adjacent land areas for roosting as well as foraging at the landfill. SPA MT0000112. Furthermore, recorded regularly in Is-Salini (MT0000007), L-Għadira s-Safra (MT0000008) and Selmunett (MT0000022). It is not expected that Mediterranean Gulls reach relevant numbers in the Aols as compared with the European population which is equivalent to the global population.

- **Audouin's Gull *Ichthyaelus audouinii* – Vulnerable, Annex I of the EU Birds Directive**

The European breeding population is believed to be currently rapidly decreasing. Audouin's Gulls are mainly found in marine habitats year-round, very frequently following trawlers to feed discarded fish. The species is migratory and dispersive. Before 2000, the Audouin's Gull was considered a very rare bird species to the Maltese islands. The species' status has changed significantly since. From 2000 to 2009 there were 311 records of 535 individuals, with a maximum of 184 sightings during this period in 2007. During stopover on migration the species can be expected regularly in the Aols, foraging at Magħtab landfill and roosting, foraging and passing through SPA MT0000112, including the Aol-2. It has also been recorded

regularly from Is-Salini (MT0000007), L-Għadira s-Safra (MT0000008) and Selmunett (MT0000022). However, it is very unlikely that numbers in any of the aforementioned areas reach significant levels from a global or European population perspective at any point.

- **Little Tern *Sternula albifrons* – Least Concern, Annex I of the EU Birds Directive**

The overall population trend is decreasing, the European population size trend is unknown. In Malta Little Terns are recorded annually in small numbers, mainly in spring (April-May). The species is at least partially migratory and dispersal in the region. Little Terns regularly frequent coastal areas, such as lagoons and salt pans when foraging, including the marine part of the AoI-2 inside SPA MT0000112. They also have been reported from Is-Salini (MT0000007). However, it is highly unlikely that significant numbers regarding the global, European or EU population are reached inside the Aols.

- **Common Gull-billed Tern *Gelochelidon nilotica* – Least Concern, Annex I of the EU Birds Directive**

The global population is suspected to be in decline, while the European population is estimated to be increasing. The species is recorded in Malta annually in single to double digit numbers on migration, both in spring and autumn. It is likely that Gull-billed terns occur in the AoI-2 annually during passage on migration and make use of the area for foraging. However, it is highly unlikely that significant numbers regarding the European population are reached at any time.

- **Caspian Tern *Hydroprogne caspia* – Least Concern, Annex I of the EU Birds Directive**

The global population as well as the European population are both increasing. The species is recorded in Malta annually in double digit numbers on migration, both in spring and autumn. It is likely that Caspian Terns occur in the AoI-2 annually during passage on migration and that they make use of it as foraging areas, plunge-diving for fish while feeding on the wing and potentially also stopping over and resting in the relevant Natura 2000 sites. However, it is highly unlikely that significant numbers regarding the European population are reached at any time. Ringed Caspian Terns that have been recorded in Malta were ringed in Finland (e.g. 9 until 1996), confirming that birds of the European population are passing through Malta regularly.

- **Black Tern *Chlidonias niger* – Least Concern, Annex I of the EU Birds Directive**

The overall population trend is declining, while the European population trend is unknown. The species occurs in Maltese waters annually and in good numbers mainly during autumn migration, peaking in the second half of August to the beginning of September with few scattered records during spring migration. The species passes through the Maltese islands mainly in offshore areas, frequently foraging on the wing for small prey items at or close to the sea surface. The birds are often attracted to the net cages of the Maltese Tuna aquaculture industry where they feed from next to the cages but also rest on the rails of the cages. Black Terns can also be frequently observed offshore resting on the floats of FAGs of the Dolphin-fish (Lampuka, *Coryphaena hippurus*) fisheries, but also on sun-bathing turtles

(*Caretta caretta*), buoys and floating debris (all own observations). During vessel-based surveys and trips to tuna-cages in the Maltese FMZ during the end of August, numbers of up to 2000 individuals have been counted during a single trip. On migration, Black Terns are very likely to pass through the Aol-2 and use it to forage and rest during migration and stop-over. Nevertheless, it is not likely that significant threshold values are reached in the Aol as compared to the global, European and EU populations at any point.

- **Sandwich Tern *Thalasseus sandvicensis* - Least Concern, Annex I of the EU Birds Directive**

The overall and European population trends are fluctuating. In Malta Sandwich Terns occur on passage and to a lower extent wintering from (August) September to March (April). They are reported annually in double figures. As other tern species, Sandwich Terns forage in coastal waters. Within Aol-2 Sandwich Terns occur in the SPA MT0000112 annually during passage on migration and make use of it as foraging area. Furthermore, they are recorded or can be expected regularly in Is-Salini (MT0000007), L-Għadira s-Safra (MT0000008) and Selmunett (MT0000022). However, it is very unlikely that significant numbers regarding the global European or EU population are reached at any time.

- **Red-breasted Merganser *Mergus serrator* – Least Concern**, expected to pass through the marine part of the Aol-2 in small numbers on migration, observed on passage and stopover in the marine part of the Aol-2.
- **Common Shelduck *Tadorna tadorna* – Least Concern**, recorded regularly from Is-Salini (MT0000007), observed on passage and stopover in the marine part of the Aol-2.
- **Little Grebe *Tachybaptus ruficollis* – Least Concern**, regular winter visitor Is-Salini (MT0000007).
- **Great-crested Grebe *Podiceps cristatus* – Least Concern**, scarce winter visitor and passage migrants, recorded from Is-Salini (MT0000007).
- **Black-necked Grebe *Podiceps nigricollis* – Least Concern**, regular winter visitor and passage migrant in small numbers in Is-Salini (MT0000007).
- **Common Moorhen *Gallinula chloropus* – Least Concern**, recent breeding attempt from Is-Salini (MT0000007).
- **Northern Gannet *Morus bassanus* – Least Concern**, expected to pass through and potentially forage in the marine part of the Aol-2, mainly during the winter months.
- **Great Cormorant *Phalacrocorax carbo* – Least Concern**, recorded regularly in increasing numbers wintering in the Maltese islands, including the marine part of the Aol and the relevant Natura 2000 sites (MT0000007, MT0000008 and MT0000022).
- **Little Gull *Hydrocoloeus minutus* – Least Concern**, regularly passing through MT0000112 during migration, has been occasionally recorded roosting and/or foraging in singles at Is-Salini (MT0000007).
- **Black-headed Gull *Chroicocephalus ridibundus* - Least Concern**, large numbers migrate through the Maltese islands and winter there. Larger flocks forage and roost

in the Aol-2 and the relevant Natura 2000 sites (MT0000007, MT0000008, MT0000022, MT0000112).

- **Lesser Black-backed Gull *Larus fuscus* – Least Concern**, regular on migration and to some extent wintering in smaller numbers, making use of the Aol-2 for foraging and roosting, recorded in all relevant Natura 2000 sites (MT0000007, MT0000008, MT0000022, MT0000112).
- **Long-tailed Skua *Stercorarius longicaudus* - Least Concern**, expected to pass through the marine part of the Aol-2 (including MT0000112) on migration in singles.
- **Arctic Skua *Stercorarius parasiticus* – Least Concern** expected to pass through the marine part of the Aol-2 (including MT0000112) in small numbers on migration.
- **Pomarine Skua *Stercorarius pomarinus* – Least Concern** expected to pass through the marine part of the Aol-2 (including MT0000112) in small numbers on migration and when wintering.
- **Great Skua *Catharacta skua* - Least Concern** expected to pass through the marine part of the Aol-2 (including MT0000112) in small numbers on migration and when wintering.

4.2.3.2 Land-birds - Non-passeriformes

A list of non-passeriform species that are recorded in the Maltese islands regularly to frequently on migration and as winter visitors is included in this chapter. Species that have been recorded breeding on the islands are also included. Information regarding their conservation status, whether they are listed in Annex I of the EU Birds Directive, and their local occurrence (wintering, breeding, migrant) and frequency of occurrence (scarce, regular, common) is noted. Furthermore, information on their expected or reported status in the Aols including the relevant Natura 2000 sites is given. Of approximately 80 species, less than half of them are listed in Annex I of the EU Birds Directive. The majority is listed as Least Concern, while 8 are listed as Near Threatened, one is listed as Vulnerable and one is listed as Endangered.

The majority of species listed here mainly pass through the Aols during migration. It is not expected that any of the species listed below will be significantly impacted by the proposed development nor are they expected to ever reach threshold values in the Aols.

- **Common quail *Coturnix coturnix* – Least Concern**, declining, irregular breeder, common passage migrant (nocturnal), winters in small numbers, expected to occur regularly in the Aols, mainly on stopover during migration.
- **European Turtledove *Streptopelia turtur* – Vulnerable**, strong decline, would breed regularly if spring hunting was abolished, regular passage migrant in declining numbers, more common in spring, can be expected stopping over in the Aols.
- **Collared Dove *Streptopelia decaocto* – Least Concern**, trend increasing, likely to occur in the terrestrial part of the Aols.
- **European Nightjar *Caprimulgus europaeus* – Least Concern**, common on passage in spring and autumn, can be expected to pass regularly through the Aols on migration and make use of them for foraging and roosting.

- **Alpine Swift *Tachymarptis melba* – Least Concern**, recorded in small numbers during spring and autumn migration, aerial feeder, likely to pass occasionally through the Aols.
- **Pallid Swift *Apus palidus* – Least Concern**, in Malta regularly to commonly seen from March to October, small breeding populations in Malta, can be expected to make regular use of the airspace of the Aols including the relevant Natura 2000 sites (MT0000002, MT0000007, MT0000008, MT0000022, MT0000112).
- **Common Swift *Apus apus* – Least Concern**, common on migration in spring and autumn, small but increasing breeding population. Can be expected/ has been recorded to make regular use of the airspace of the Aols, including the relevant Natura 2000 sites (MT0000002, MT0000007, MT0000008, MT0000022, MT0000112).
- **Common Cuckoo *Cuculus canorus* – Least Concern**, fairly common on spring migration, less common during autumn, single breeding records in Malta. Expected to occur in the Aols during migration and stopping over, reported from Is-Salini (MT0000007).
- **Western Water Rail *Rallus aquaticus* – Least Concern**, population numbers decreasing. Frequent autumn migrant and common winter visitor in the wetlands of the Maltese islands. Some breeding attempts. Recorded from Is-Salini (MT0000007).
- **Spotted Crane *Porzana porzana* – Least Concern, Annex I of the EU Birds Directive**, small numbers in spring and autumn on migration.
- **Common Crane *Grus grus* – Least Concern, Annex I of the EU Birds Directive**, population trend increasing, recorded annually on migration in small flocks, potentially through the Aols.
- **Black Stork *Ciconia nigra* – Least Concern, Annex I of the EU Birds Directive**, European population increasing, in Malta annually in small numbers during migration, mainly in autumn.
- **White Stork *Ciconia ciconia* – Least Concern, Annex I of the EU Birds Directive**, population increasing, in Malta annually in small numbers on migration mainly autumn, to less extend in spring. White Storks are frequently foraging on landfills. Therefore, can be expected to occur in the Aols.
- **Eurasian Spoonbill *Platalea leucorodia* – Least Concern, Annex I of the EU Birds Directive**, trend increasing, in Malta mainly on passage in spring and autumn. Regularly migrating through the Aol, including MT0000112 and has been recorded in Is-Salini (MT0000007).
- **Glossy Ibis *Plegadis falcinellus* – Least Concern, Annex I of the EU Birds Directive**, European population increasing, in Malta recorded annually on migration. Has been recorded passing through the Aol-2 (MT0000112).
- **Common Little Bittern *Ixobrychus minutus* - Least Concern, Annex I of the EU Birds Directive**, European population stable, irregularly breeding in Malta, recorded annually in small numbers on migration. Expected to migrate through the Aols (at night). Recorded on stopover during migration for the Natura 2000 site Is-Salini (MT0000007).

- **Black-crowned Night Heron *Nycticorax Nycticorax* - Least Concern, Annex I of the EU Birds Directive**, decreasing in Europe, frequently migrating over Malta, regularly observed during stop-over at Salini (MT0000007), expected to migrate regularly through the Aols.
- **Squacco Heron *Ardeola ralloides* - Least Concern, Annex I of the EU Birds Directive**, European population considered stable, passing through Malta in small numbers on migration annually. Has been recorded at Is-Salini (MT0000007); expected to migrate through the Aols regularly.
- **Grey Heron *Ardea cinerea* - Least Concern**, regular visitor to the Maltese islands year-round but higher numbers during migration. Can be expected to migrate regularly through the Aols. Has been recorded regularly to frequently in all relevant Natura 2000 sites (MT0000002, MT0000006, MT0000007, MT0000008, MT0000022, MT0000112).
- **Purple Heron *Ardea purpurea* - Least Concern, Annex I of the EU Birds Directive**, European population decreasing, passing through Maltese islands annually during migration in good numbers. Has been recorded regularly at Is-Salini (MT0000007). Can be expected to pass through the Aols on migration.
- **Great White Egret *Casmerodius alba* – Least Concern, Annex I of the EU Birds Directive**, recorded annually on passage in small numbers, Is-Salini (MT0000007). Can be expected to pass through the Aols on migration.
- **Little Egret *Egretta garzetta* – Least Concern, Annex I of the EU Birds Directive**, fairly common passage migrant in spring and autumn, few individuals year-round, recently established small breeding population close to Is-Salini, at least partially founded by escapes. Recorded regularly at Is-Salini (MT0000007), recorded in the Aols and including the relevant Natura 2000 sites (MT0000002, MT0000008 and MT0000022, MT0000112) regularly.
- **Stone Curlew / Eurasian Thick-knee *Burhinus oediconemus* – Least Concern, Annex I of the EU Birds Directive**, recorded in Malta regularly in small numbers on migration in spring and autumn. Potentially passing through the Aols in low numbers.
- **Oystercatcher *Haematopus ostralegus* – Near threatened**, population declines across Europe, recorded in Malta annually in small numbers. Potentially passing through and resting/ foraging in the Aol-2 in small numbers, including MT0000022.
- **Pied Avocet *Recurvirostra avosetta* – Least Concern, Annex I of the EU Birds Directive**, recorded in Malta annually in small numbers mainly during autumn migration, potentially wintering. Recorded from Is-Salini (MT0000007).
- **Black-winged Stilt *Himantopus himantopus* – Least Concern, Annex I of the EU Birds Directive**, frequent spring migrant in the Maltese islands, expected to occur regularly in the Aols mainly on migration.
- **Grey Plover *Pluvialis squatarola* – Least Concern**, in Malta recorded annually in small numbers during spring and autumn migration. Potentially migrating through the Aols.
- **Eurasian Golden Plover *Pluvialis apricaria* - Least Concern, Annex I of the EU Birds Directive**, population trend increasing. Common in Malta during winter months, both

on migration and wintering. Expected migrating through and/or stopping over in the Aols.

- **Eurasian Dotterel *Charadrius morinellus* - Least Concern, Annex I of the EU Birds Directive**, in Malta annually in small numbers, stopping over mainly during autumn migration. Potentially migrating through and stopping over in the Aols.
- **Common Ringed Plover *Charadrius hiaticula* – Least Concern**, decreasing on EU and global level, fairly common passage migrant in spring and autumn. Recorded from Is-Salini (MT0000007). Expected to be also foraging and stopping over at MT0000022 on migration and to pass through the Aols.
- **Little Ringed Plover *Charadrius dubius* – Least Concern**, population decreasing, common passage migrant in spring and autumn; recorded regularly from Is-Salini (MT0000007). Expected to also occur in the Aols including MT0000022.
- **Kentish Plover *Charadrius alexandrinus* – Least Concern, Annex I of the EU Birds Directive**, regular passage migrant in small numbers in spring and autumn. Potentially occurring in the Aols.
- **Northern Lapwing *Vanellus vanellus* – Near Threatened**, overall declining population trend, recorded regularly in Malta during the winter months in small flocks and is a regular passage migrant in small numbers in spring and autumn. Potentially occurring in the Aols.
- **Whimbrel *Numenius phaeopus* – Least Concern**, recorded annually in small numbers in spring and autumn during migration. Expected to occur in the Aols in small numbers and irregularly, foraging/ roosting on the rocky shore and migrating through the area.
- **Eurasian Curlew *Numenius arquata* – Near Threatened**, global population trend decreasing, passing regularly through Malta during spring and autumn. Expected to occur in the Aols in small numbers and irregularly, foraging/ roosting on the rocky shore and migrating through the area.
- **Black-tailed Godwit *Limosa limosa* – Near Threatened**, population trend decreasing, in Malta recorded annually, mainly on spring migration. Potentially migrating through the Aols in small numbers.
- **Ruddy Turnstone *Arenaria interpres* – Least Concern**, recorded in Malta annually in small numbers in spring and autumn. Expected to occur in the Aol-2 in small numbers and irregularly, foraging/ roosting on the rocky shore and migrating through the area at night.
- **Red Knot *Calidris canutus* – Near Threatened**, global population trend decreasing, recorded in Malta almost annually in small numbers on passage. Potentially passing through the Aols on migration.
- **Ruff *Calidris pugnax* – Least Concern, Annex I of the EU Birds Directive**, population trend decreasing, recorded in the Maltese islands regularly and in good numbers, mainly during spring migration, including in Is-Salini (MT0000007). Expected to be passing through the Aols on migration.

- **Curlew Sandpiper *Calidris ferruginea* – Near Threatened**, suspected to be declining, in Malta regularly in small flocks on passage migration in spring and autumn. Recorded in Is-Salini (MT0000007) and expected to be passing through the Aols on migration.
- **Temminck's Stint *Calidris temminckii* – Least Concern**, population trend stable, recorded in Malta in small numbers during spring and autumn migration, including in Is-Salini (MT0000007). Expected to be passing through the Aols on migration occasionally.
- **Sanderling *Calidris alba* – Least Concern**, passing through Malta annually in small numbers during spring and autumn. Potentially passing through the Aols.
- **Dunlin *Calidris alpina* – Least Concern**, recorded in Malta annually in small numbers mainly on passage in spring and autumn including in Is-Salini (MT0000007). Expected to be passing through the Aols on migration.
- **Little Stint *Calidris minuta* – Least Concern**, singles recorded in Malta year-round, common during spring and autumn migration. Observations at Is-Salini (MT0000007) and expected to be passing through the Aols on migration.
- **Eurasian Woodcock *Scolopax rusticola* – Least Concern**, trend estimated stable, observed in Malta during the winter months, expected to occur in the Aols during migration and wintering.
- **Great Snipe *Gallinago media* – Near Threatened, Annex I of the EU Birds Directive**, overall trend decreasing, in Malta encountered annually in singles on spring migration. It is expected that the species occasionally passes through the Aol-2 on migration.
- **Common Snipe *Gallinago gallinago* – Least Concern**, common passage migrant, mainly in spring, regularly observed at Is-Salini (MT0000007). Can be expected to occur at L-Għadira s-Safra u l-Iskoll tal-Għallis (MT0000008) and to pass through the Aols on migration.
- **Jack Snipe *Lymnocyptes minimus* – Least Concern**, population trend stable, passing through the Maltese islands annually in small numbers during the winter months, potentially passing through and stopping over in the Aols.
- **Common Sandpiper *Actitis hypoleucos* – Least Concern**, overall population trend decreasing, common passage migrant in Malta in spring and autumn, recorded in small numbers year-round. Recorded or expected regularly in the Aols, including all relevant Natura2000 sites (MT0000002, MT0000007, MT0000008, MT0000022, MT0000112).
- **Green Sandpiper *Tringa ochropus* – Least Concern**, population trend increasing, regular passage migrant through the Maltese islands in spring and autumn and expected to pass through the Aols on migration.
- **Spotted Redshank *Tringa erythropus* – Least Concern**, population trend stable, recorded annually in Malta in small numbers on migration and in winter. Expected to occasionally pass through the Aols.

- **Common Greenshank *Tringa nebularia* – Least Concern**, population stable, common visitor to the Maltese islands in relatively low numbers on spring and autumn migration. Expected to pass through the Aols.
- **Common Redshank *Tringa totanus* – Least Concern**, European population has undergone a moderate decline, a regular passage migrant in Malta in small numbers, both in spring and autumn. Expected to pass through the Aols.
- **Wood Sandpiper *Tringa glareola* – Least Concern, Annex I of the EU Birds Directive**, population trend stable, common passage migrant in the Maltese islands in spring and autumn. Expected to pass through the Aols.
- **Marsh Sandpiper *Tringa stagnatilis* – Least Concern**, overall population trend decreasing, recorded in Malta regularly in small numbers on migration. Recorded from Is-Salini (MT0000007). Potentially passing through the Aols.
- **Collared Pratincole *Glareola pratincola* – Least Concern, Annex I of the EU Birds Directive**, overall population trend decreasing, recorded almost annually in singles, mainly during spring migration. Recorded from Is-Salini (MT0000007). Potentially passing through the Aol.
- **Eurasian Scops-owl *Otus scops* – Least Concern**, global population trend declining, regularly recorded in the Maltese islands, mainly during migration. Can be expected to pass through the Aols occasionally and in low numbers and also use the terrestrial area during stopover on migration.
- **Short-eared Owl *Asio flammeus* – Least Concern, Annex I of the EU Birds Directive**, population trend in Europe fluctuating, recorded annually in small numbers, mainly on migration, has been reported nesting in the Maltese islands, at least two times in recent years. Can be expected to pass through the Aols on migration.
- **Osprey *Pandion haliaetus* – Least Concern, Annex I of the EU Birds Directive**, European population trend increasing, regularly recorded in the Maltese islands on spring and autumn migration. Has been observed foraging and roosting at Is-Salini (MT0000007). Can be expected to pass through the Aols regularly in small numbers.
- **European Honey-buzzard *Pernis apivorus* – Least Concern, Annex I of the EU Birds Directive**, overall population trend decreasing, common passage migrant over the Maltese islands, mainly in autumn. Can be expected to migrate through the Aols regularly.
- **Egyptian Vulture *Neophron percnopterus* – Endangered, Annex I of the EU Birds Directive**, population trend declining in entire range, recorded in Malta almost annually in singles on migration, mainly in autumn. Birds might be attracted to the landfill and therefore the species might occur in the Aols occasionally on migration.
- **Short-toed Snake-eagle *Circaetus gallicus* – Least Concern, Annex I of the EU Birds Directive**, population trend stable, appears on passage in the Maltese islands annually in small numbers, mainly in autumn. Potentially passes through the Aols on migration.
- **Lesser spotted Eagle *Aquila pomarina* – Least Concern, Annex I of the EU Birds Directive**, European population estimated stable, in Malta almost recorded annually

in singles to small flocks mainly on autumn migration. Potentially passes through the Aols on migration.

- **Booted Eagle *Aquila pennata* – Least Concern, Annex I of the EU Birds Directive**, population size increasing in Europe, recorded in Malta almost annually in singles mainly during autumn migration. Potentially passes through the Aols on migration.
- **Western Marsh Harriers *Circus aeruginosus* – Least Concern, Annex I of the EU Birds Directive**, population trend in Europe increasing, common passage migrant to the Maltese islands both in spring and autumn. Has been reported at Is-Salini (MT0000007). Can be expected to appear in the Aols on passage migration regularly.
- **Montagu's Harrier *Circus pygargus* – Least Concern, Annex I of the EU Birds Directive**, population decreasing in the EU, recorded in the Maltese islands annually in double figure numbers during spring and autumn migration. Can be expected to migrate through the Aols occasionally.
- **Eurasian Sparrowhawk *Accipiter nisus* – Least Concern**, overall population trend stable, recorded annually in Malta in small numbers on migration, mainly in autumn. Can be expected to pass through the Aols occasionally.
- **Black Kite *Milvus migrans* – Least Concern, Annex I of the EU Birds Directive**, population trend unknown, recorded in Malta annually in double figure numbers on migration. Species is attracted to landfills. Can be expected to occur in the Aols occasionally.
- **Common Hoopoe *Upupa epops* – Least Concern**, overall population trend decreasing, common passage migrant in Malta, both in spring and autumn, at least one breeding recorded in recent years. Has been observed at Is-Salini (MT0000007). Can be expected to pass through the Aols and foraging and roosting there during stop-over on migration.
- **European Bee-eater *Merops apiaster*, Least Concern**, overall population trend declining, common spring migrant in Malta, less common in autumn, has made single breeding attempts on the islands in recent years. Regularly observed in all relevant Natura 2000 sites and can be expected regularly in the Aols on migration.
- **European Roller *Coracias garrulus* – Least Concern, Annex I of the EU Birds Directive**, European population trend decreasing, recorded in Malta annually in small numbers, mainly during spring migration. Can be expected to pass through the Aols occasionally.
- **Common Kingfisher *Alcedo atthis* – Least Concern, Annex I of the EU Birds Directive**, European population trend decreasing, common winter visitor and passage migrant in Malta. Observed regularly making use of all relevant Natura 2000 sites. Expected to pass through the Aols regularly on migration and when wintering.
- **Eurasian Wryneck *Jynx torquilla* – Least Concern**, population trends: long-term decline, short-term increase, fairly common passage migrant and winter visitor to the Maltese islands. Can be expected to be present in the Aols during migration, stopping over and potentially also wintering in the terrestrial part.

- **Lesser Kestrel *Falco naumanni* – Least Concern, Annex I of the EU Birds Directive,** population trend previous severe declines, recently stable, fairly common passage migrant to the Maltese islands in spring and autumn. Expected to pass through the Aols on migration and also foraging in the terrestrial area when stopping over.
- **Common Kestrel *Falco tinnunculus* – Least Concern,** population trend decreasing, present in Malta year-round, common during passage in spring and autumn, breeding almost annually in very low numbers (1-3 pairs). Can be expected to forage in the terrestrial part of the Aols year-round (local birds). Passage migrants can be expected to pass through all Aols.
- **Red-footed Falcon *Falco vespertinus* – Near Threatened, Annex I of the EU Birds Directive,** European population trend declining, in Malta fairly regularly encountered on migration, numbers higher in spring. Can be expected to pass through the Aols and forage in the terrestrial part during passage.
- **Eleonora's Falcon *Falco eleonora* – Least Concern, Annex I of the EU Birds Directive,** European population size increasing, recorded in Malta annually in fairly good numbers on migration in spring and autumn. Can be expected to pass through the Aols, including the relevant Natura 2000 sites on migration.
- **Merlin *Falco columbarius* – Least Concern, Annex I of the EU Birds Directive,** population trend fluctuating, recorded in Malta annually in low numbers mainly on autumn migration. Might occasionally migrate through the Aols.
- **Eurasian Hobby *Falco subbuteo* – Least Concern,** overall population trend declining, fairly common in Malta on migration in spring and autumn. Can be expected to migrate through the Aols regularly.
- **Peregrine Falcon *Falco peregrinus* – Least Concern, Annex I of the EU Birds Directive,** population trend increasing, potentially regular breeder in the Maltese islands in very low numbers, would be more common if left undisturbed/ not persecuted, also appears on passage and as winter visitor. Can be expected to make use of the Aols including the relevant Natura 2000 sites regularly and year-round, especially hunting for Black-headed Gulls etc. in the landfill area.

4.2.3.3 Passeriformes

A list of all passerine species that are recorded in the Maltese islands regularly to frequently on migration and as winter visitors is provided. Those species that are residents i.e. breeding on the islands are also included. Information regarding their conservation status, whether they are listed in Annex I of the EU Birds Directive, and their local occurrence (wintering, breeding, migrant) and frequency of occurrence (scarce, regular, common) is noted. Furthermore, information on their expected or reported status in the Aols including the relevant Natura 2000 site is given.

The vast majority of species is listed as Least Concern (only two are listed as Near Threatened, both not in Annex I of the EU Birds Directive) and only seven species are listed in Annex I of the EU Birds Directive (all Least Concern). Of all passerine species that have been recorded breeding in the Maltese islands, two are listed in Annex I of the EU Birds Directive. One of

them is a common breeder – the Greater Short-toed Lark *Calandrella brachydactyla* (see above) while the other one has been reported breeding irregularly - the Tawny Pipit *Anthus campestris*.

In general, small passerines have relatively higher reproductive rates and shorter lifespans (generation cycles) compared to often larger non-passerine species. This, together with a large distribution range and often a greater distribution density in most species listed below, reduces their overall population vulnerability. The majority of migratory species listed here mainly migrate during the night and cross the area in broad front. It is not expected that any of the species listed below will reach threshold values in the Aols.

- **Eurasian Golden Oriole *Oriolus oriolus*** - Least Concern, common passage migrant, expected frequently in the Aols on migration.
- **Red-backed Shrike *Lanius collurio*** - Least Concern, Annex I, passage in low numbers, not expected to occur in the Aols in relevant numbers.
- **Woodchat Shrike *Lanius senator*** - Least Concern, regular passage migrant, expected to occur in the Aols occasionally.
- **Penduline Tit *Remiz pendulinus*** - Least Concern, passage in small numbers, might migrate through the Aols occasionally and in small numbers.
- **Greater Short-toed Lark *Calandrella brachydactyla*** - Least Concern, Annex I, common breeder and passage migrant, reported breeding in the Aol-2, not expected to occur in the Aols in relevant numbers, but expected to pass through on migration and potentially stopping over.
- **Woodlark *Lullula arborea*** - Least Concern, Annex I, regular passage migrant in low numbers, expected to also pass through the Aols.
- **Eurasian Skylark *Alauda arvensis*** - Least Concern, common on passage and wintering, expected to occur in the Aols regularly.
- **Zitting Cisticola *Cisticola juncidis*** - Least Concern, probable breeder in the Aol-1.
- **Olivaceous Warbler *Iduna pallida*** - Least Concern, passage in low numbers, potentially occurring in the Aols.
- **Isabelline Warbler *Iduna opaca*** - Least Concern, passage in low numbers, potentially occurring in the Aols.
- **Icterine Warbler *Hippolais icterina*** - Least Concern, regular passage migrant, expected to pass through the Aols regularly on migration.
- **Moustached Warbler *Acrocephalus melanopogon*** - Least Concern, passage and wintering in low numbers, expected to pass through the Aols occasionally in very low numbers.
- **Sedge Warbler *Acrocephalus schoenobaenus*** – Least Concern, regular passage migrant, to pass through the Aols regularly on migration.
- **Common Reed Warbler *Acrocephalus scirpaceus*** - Least Concern, breeds in Malta in small numbers, regular passage migrant, single winter records. Expected to pass through the Aols regularly on migration.

- **Great Reed Warbler *Acrocephalus arundinaceus*** - Least Concern, regular passage migrant, expected to pass through the Aols regularly on migration.
- **Savi's Warbler *Locustella luscinioides*** - Least Concern, passage migrant in low numbers, expected to pass through the Aols occasionally on migration.
- **Northern House Martin *Delichon urbicum*** - Least Concern, rare breeder, common passage migrant, expected to make use of the airspace of the Aols regularly, foraging in the area during migration, potentially roosting in the area, too.
- **Red-rumped Swallow *Cecropis daurica*** - Least Concern, regular passage migrant, expected to make use of the airspace of the Aols regularly, foraging in the area during migration, potentially roosting in the area, too.
- **Barn Swallow *Hirundo rustica*** - Least Concern, breeder in low numbers, common passage migrant, expected to make use of the airspace of the Aols regularly, foraging in the area during migration and potentially during breeding. Potentially roosting in the terrestrial part of the area, too.
- **Common Sand Martin *Riparia riparia*** - Least Concern, regular passage migrant, expected to make use of the airspace of the Aols regularly, foraging in the area during migration and potentially roosting.
- **Eastern Bonelli's Warbler *Phylloscopus orientalis*** - Least Concern, regular passage migrant, expected to pass through the Aols occasionally during migration.
- **Western Bonelli's Warbler *Phylloscopus bonelli*** - Least Concern, regular passage migrant expected to pass through the Aols occasionally during migration.
- **Wood Warbler *Phylloscopus sibilatrix*** - Least Concern, common passage migrant, in good numbers, expected to regularly occur in the Aols on passage.
- **Yellow-browed Warbler *Phylloscopus inornatus*** - Least Concern, regular passage migrant, expected to occur occasionally in the Aols on migration.
- **Willow Warbler *Phylloscopus trochilus*** - Least Concern, common passage migrant, expected to regularly pass through the Aols on migration.
- **Common Chiffchaff *Phylloscopus collybita*** - Least Concern, common passage migrant and winter visitor, expected to pass through the Aols regularly on migration and winter in the terrestrial part regularly.
- **Cetti's Warbler *Cettia cetti*** - Least Concern, common breeder, including at Is-Salini (MT0000007). Expected to occur in the Aol regularly also during dispersal.
- **Eurasian Blackcap *Sylvia atricapilla*** - Least Concern, common passage migrant and winter visitor. Expected to pass through the Aols regularly during migration and make use of its terrestrial part during stop-over and wintering.
- **Garden Warbler *Sylvia borin*** - Least Concern, common passage migrant. Expected to pass through the Aols regularly during migration and make use of its terrestrial part during stop-over.
- **Lesser Whitethroat *Curruca curruca*** - Least Concern, passage migrant in small numbers. Expected to occur in the Aols occasionally on migration.
- **Sardinian Warbler *Curruca melanocephala*** - Least Concern, common breeder in Malta and probable breeder in the Aol-1, present year-round.

- **Subalpine Warbler *Curruca cantillans*** - Least Concern, common passage migrant, expected to regularly pass through the Aols during migration.
- **Common Whitethroat *Curruca communis*** - Least Concern, common passage migrant, expected to regularly pass through the Aol during migration.
- **Spectacled Warbler *Curruca conspicillata*** - Least Concern, regular breeder.
- **Common Starling *Sturnus vulgaris*** - Least Concern, breeding in small numbers, common passage migrant and winter visitor, expected to occur in the Aols regularly in good number on passage and while wintering, including making use of the terrestrial area for foraging and potentially roosting.
- **Mistle Thrush *Turdus viscivorus*** - Least Concern, regular passage migrant, can be expected to pass through the Aols occasionally on migration.
- **Song Thrush *Turdus philomelos*** - Least Concern, common passage migrant and winter visitor, can be expected to occur regularly in the Aols.
- **Redwing *Turdus iliacus*** - Near Threatened, regular passage migrant in small numbers, potentially wintering, can be expected to occasionally occur in the Aols on migration.
- **Eurasian Blackbird *Turdus merula*** - Least Concern, regular passage migrant and winter visitor, can be expected in the Aols on passage and during wintering.
- **Fieldfare *Turdus pilaris*** - Least Concern, regular passage migrant, potentially wintering, can be expected to occasionally occur in the Aols on migration.
- **Rufous-tailed Scrub-robin *Cercotrichas galactotes*** - Least Concern, rare but regular visitor, potentially occurring irregularly in singles in the Aols.
- **Spotted Flycatcher *Muscicapa striata*** - Least Concern, breeder in increasing numbers, common passage migrant, expected to be present regularly in the Aols on passage and stopping over.
- **European Robin *Erithacus rubecula*** - Least Concern, very common passage migrant and winter visitor. Expected to be present in the Aols outside the breeding season in good numbers.
- **Bluethroat *Luscinia svecica*** - Least Concern, Annex I, regular passage migrant, potentially wintering in small numbers, can be expected to pass through the Aols occasionally on migration.
- **Common Nightingale *Luscinia megarhynchos*** - Least Concern, common passage migrant, one breeding record from 1995, expected to pass through the Aols on migration.
- **Semicollared Flycatcher *Ficedula semitorquata*** - Least Concern, Annex I, regular passage migrant in small numbers, expected to pass through the Aols occasionally on migration.
- **European Pied Flycatcher *Ficedula hypoleuca*** - Least Concern, common passage migrant, expected to be present regularly in the Aols during the migration periods.
- **Collared Flycatcher *Ficedula albicollis*** – Least Concern, Annex I, regular passage migrant in low numbers, expected to pass through the Aols during the migration periods.

- **Black Redstart *Phoenicurus ochruros*** - Least Concern, common passage migrant, common winter visitor, expected to be regularly present in the Aols during the non-breeding period.
- **Common Redstart *Phoenicurus phoenicurus*** - Least Concern, common passage migrant, expected to regularly occur in the Aols during the migration periods.
- **Rufous-tailed Rock-thrush *Monticola saxatilis*** - Least Concern, regular passage migrant, can be expected to occur in the Aols on passage and stop-over in the migration periods.
- **Blue Rock-thrush *Monticola solitarius*** - Least Concern, common breeder, possibly breeding in the Aol-1, expected to make use of the terrestrial part of the Aols year-round.
- **Whinchat *Saxicola rubetra*** - Least Concern, common passage migrant, expected to pass through the Aols on migration and also stopping over in the terrestrial area.
- **Common Stonechat *Saxicola rubicola*** - Least Concern, common passage migrant and winter visitor, expected to be common in the Aols during the non-breeding period.
- **Northern Wheatear *Oenanthe oenanthe*** - Least Concern, common passage migrant, can be expected to pass through the Aols on migration regularly.
- **Isabelline Wheatear *Oenanthe isabellina*** - Least Concern, regular passage migrant in low numbers, might occasionally pass through the Aols on migration.
- **Black-eared Wheatear *Oenanthe hispanica*** - Least Concern, regular passage migrant, expected to occur in the Aols regularly in low numbers during migration.
- **Goldcrest *Regulus regulus*** - Least Concern, regular passage migrant and winter visitor, can be expected to regularly occur in the Aols on passage.
- **Common Firecrest *Regulus ignicapilla*** - Least Concern, regular passage migrant and winter visitor, can be expected to regularly occur in the Aols on passage.
- **Dunnock *Prunella modularis*** - Least Concern, regular passage migrant and winter visitor, expected to be present in the Aols outside the breeding season in small numbers.
- **Spanish Sparrow *Passer hispaniolensis*** - Least Concern, common breeder and regular passage migrant, common breeding resident confirmed in the Aol-1.
- **Eurasian Tree Sparrow *Passer montanus*** - Least Concern, expected to occur in the Aols during dispersal and in the non-breeding period in low numbers.
- **Tree Pipit *Anthus trivialis*** - Least Concern, common passage migrant, during migration, expected to occur regularly in the Aols on passage.
- **Red-throated Pipit *Anthus cervinus*** - Least Concern, regular passage migrant, wintering in low numbers, expected to occasionally pass through the Aols during migration and stopping over.
- **Meadow Pipit *Anthus pratensis*** - Near Threatened, common passage migrant and winter visitor, expected to make regular use of the terrestrial part of the Aols on stop-over during migration and as foraging grounds in winter.
- **Water Pipit *Anthus spinoletta*** - Least Concern, rare passage migrant or winter visitor, expected to make use of the Aols during migration occasionally.

- **Tawny Pipit *Anthus campestris*** - Least Concern, Annex I, rare breeder, regular passage migrant, expected to pass through the Aols occasionally on migration.
- **Western Yellow Wagtail *Motacilla flava*** - Least Concern, common passage migrant, expected to pass through the Aols regularly during migration, including foraging and potentially roosting during stop-over in the terrestrial part.
- **Grey Wagtail *Motacilla cinerea*** - Least Concern, rare breeder, regular passage migrant and winter visitor, expected to occur in the Aols occasionally to regularly in singles.
- **White Wagtail *Motacilla alba*** - Least Concern, common passage migrant and winter visitor, expected to be regularly present in the Aols during the non-breeding period.
- **Common Chaffinch *Fringilla coelebs*** - Least Concern, regular passage migrant and winter visitor, potential breeder, but no breeding confirmed in recent years, expected to occur in the Aols regularly during migration and as winter visitor.
- **Hawfinch *Coccothraustes coccothraustes*** - Least Concern, regular passage migrant and winter visitor, expected to occur in the Aols occasionally on migration and as winter visitor.
- **European Greenfinch *Chloris chloris*** - Least Concern, common passage migrant and winter visitor, has bred occasionally on the Maltese islands but no confirmed breeding record in recent years. Can be expected to occur in the Aols regularly during migration and as a winter visitor.
- **Common Linnet *Linaria cannabina*** - Least Concern, common passage migrant and winter visitor, irregular breeder in very low numbers, expected to occur in the Aols regularly during migration and as winter visitor, potentially year-round.
- **European Goldfinch *Carduelis carduelis*** - Least Concern, common passage migrant and winter visitor, irregular breeder in very low numbers, expected to occur in the Aols regularly during migration and as winter visitor, potentially year-round.
- **European Serin *Serinus serinus*** - Least Concern, common passage migrant and winter visitor, irregular breeder in very low numbers, expected to occur in the Aols regularly during migration and as winter visitor.
- **Eurasian Siskin *Spinus spinus*** - Least Concern, regular passage migrant and winter visitor, expected to occur in the Aols on migration and as winter visitor occasionally.
- **Corn Bunting *Emberiza calandra*** - Least Concern, formerly regular breeder in Malta in very small numbers with decreasing trend, might occasionally occur in the Aols during dispersal.
- **Ortolan Bunting *Emberiza hortulana*** - Least Concern, Annex I, regular passage migrant, expected to occasionally pass through the Aols during migration.
- **Reed Bunting *Emberiza schoeniclus*** - Least Concern, regular passage migrant and winter visitor, expected to pass through the Aols occasionally during migration and in the winter months.

5.0 IMPACT ASSESSMENT

5.1 Construction Phase

5.1.1 Terrestrial environment

The site footprint takes up 21,373 sq.m total. The following phases are envisaged during the construction of the plant:

- » Phase 1: Hoarding, site preparation, removal and re-distribution of vegetation, clearing loose material, excavation setting out and excavation.
- » Phase 2: Foundation setting out and construction of lower-level walls
- » Phase 3: Further excavation and movement of backfill to be utilised in the relevant areas; engineering of site with backfilling; removal of backfill which will not be utilised off site
- » Phase 4: Formalisation of landscaped areas with transplanted elements, inclusive of further hoarding.
- » Phase 5: Setting out and construction of foundations at various levels
- » Phase 6: Construction of main buildings and ancillaries
- » Phase 7: Commissioning

Phase 1 will require the removal of all of the trees and vegetation within the site boundary. The project will impact approximately 244 individual protected tree species, which are comprised predominantly by Carob trees (162), followed by Lentisk trees (48), Olive trees (24), Aleppo pines (9) and Cypress trees (1). Some individuals of the Caper bush may also be affected.

Where deemed possible, mature trees will be relocated to the perimeter of the site, which will feature a landscaping scheme of circa 2,690sqm. The landscaping scheme as currently proposed features 37 trees and shrubs, as described in Table 3.

Table 3: Proposed Landscaping plan tree species

SCIENTIFIC NAME	ENGLISH NAME	QUANTITY
<i>Olea europaea</i>	Olive tree	14
<i>Ceratonia siliqua</i>	Carob tree	14
<i>Tamarix africana</i>	African tamarisk	3
<i>Laurus nobilis</i>	Bay laurel	2
<i>Rosmarinus officinalis prostratus</i>	Rosemary	4
Total individual trees/shrubs		37

The option of relocation or removal will be determined by the soil depth, which will be confirmed at the start of the excavation phase. Should the soil depth be confirmed as too shallow to remove the full root ball without damages, the trees will be removed and not transplanted as the chance of survival is low. Adequate compensation will be provided as advised by the ERA within the planned planting scheme or in the near vicinity of the site, with care taken to plant a cohort of species typical of the ecosystems expected within maquis habitats.

Additional indirect impacts may occur during the excavation period, which is likely to generate a significant amount of dust and noise. These impacts can be adequately mitigated by using site hoarding around the perimeter of the planned excavation area, employing the use of wheel-washing facilities and wetting down any exposed stockpiles.

Despite a significant impact on the ecological features present at the site, construction works will not be carried out within the confinements of any terrestrial Natura 2000 sites mentioned in the previous sections of this report. Therefore, no loss of habitats, species and ecosystems are expected from such sites through the excavation and construction processes, as these activities are confined to the AoI.

The impacts caused by the generation of particulates during the construction phase are not considered to be compromising impacts due to the temporary incidence, reversibility and attenuation over time. The adverse impacts from the generation of dust and silting of surface water are therefore considered to be insignificant, especially given the considerable distance to the nearest Natura 2000 sites, the topography of the site and the predominant wind direction.

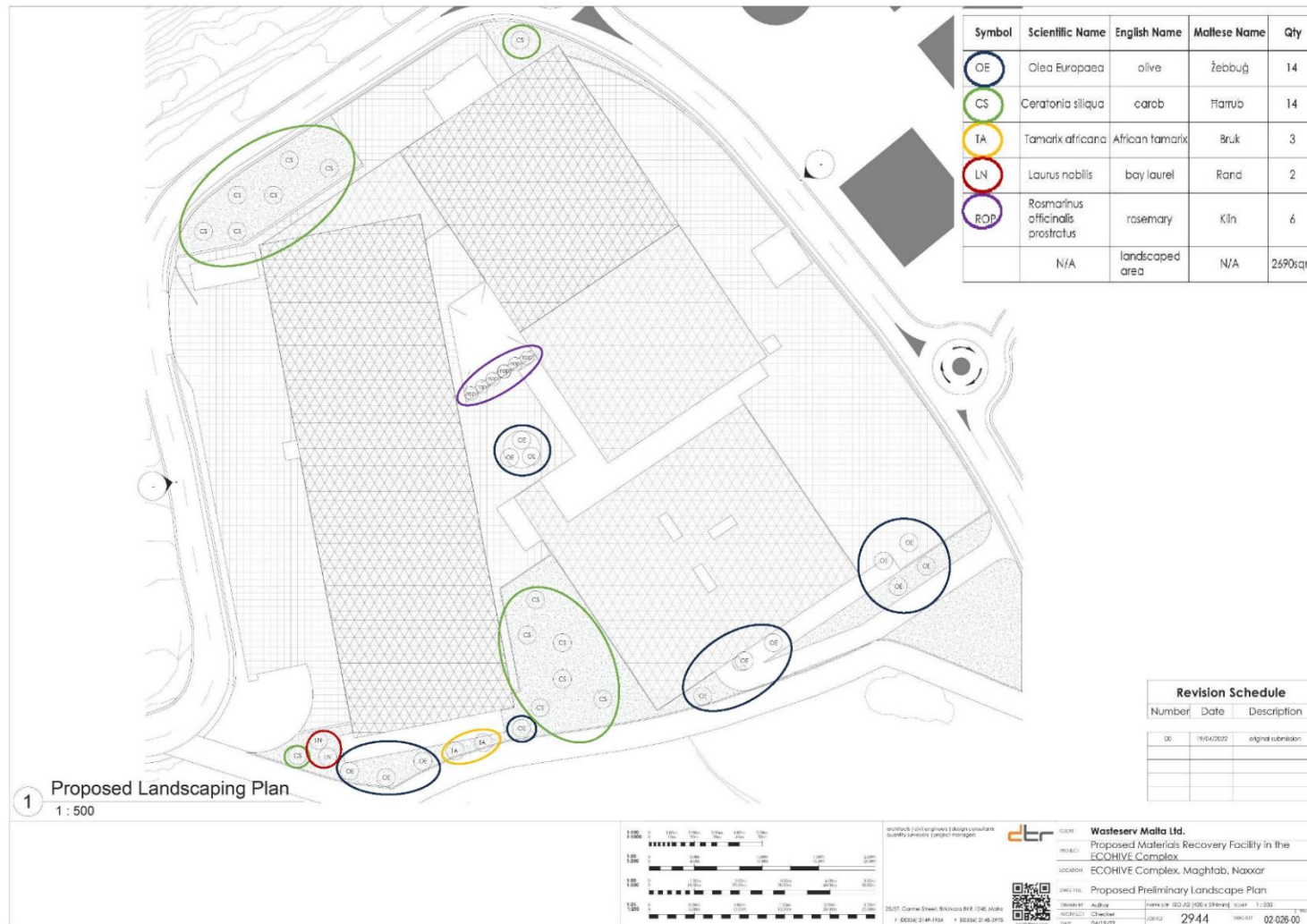


Figure 14: Proposed landscaping plan

5.1.2 Avifauna

The proposed development will result in a temporary loss of potential breeding habitat for up to 4 terrestrial songbird species within the Aol-1. While the terrestrial part of the development, including the Aol-1, are not situated inside Natura 2000 sites, the habitats disturbed during the construction phase including the buffer area set at 0.1 km around the proposed development provide nesting territories for some land birds^{26, 27}. Furthermore, the roads leading to the construction site will experience higher traffic volume of heavy machinery, creating additional disturbance, noise pollution, dust etc. Material from excavation and construction will need to be stored at least temporarily. Overall, the proposed development will lead to temporary and localised, short-term disturbance for these terrestrial bird species in the Aol-1.

Several breeding territories of the Sardinian Warbler and the Zitting Cisticola will be disturbed or lost during the construction phase if works are carried out during the breeding season (March – August). Up to 2 breeding pairs of Blue Rock Thrush will be disturbed during the construction phase if works are carried out during the breeding season (March – July). The disturbance can potentially lead to the complete temporary displacement, and consecutive reduction in breeding success up to loss of nest sites leading to reproductive failure of the breeding pairs of all three species in the Aol-1 during the construction phase if it coincides with the breeding season.

Foraging areas and potential colonial nest sites of the Spanish Sparrow can be expected to be reduced temporarily during the construction phase and some broods may fail if works are carried out during the breeding season (March – August).

Temporary habitat loss and disturbance is expected to result in the destruction of foraging areas for other breeding, wintering, and/or staging species in the Aol-1 depending on the period of the year in which the construction works will take place.

The impacts during the construction phase of the MRF and ancillary facilities will act temporarily on a localised scale in the Aol-1 and, to some extent, the access roads. The works are not expected to impact a significant proportion of the relevant bird populations on a national or wider scale. However, they are expected to impact few local breeders of common species significantly at least short-term.

Artificial light at night (ALAN) is well documented to negatively affect birds, including seabirds. Adults from all three procellariiform species nesting on the Maltese Islands actively avoid approaching breeding areas under high levels of illumination and may desert colonies as a result of exposure to ALAN. That seabirds are negatively affected even by temporary

²⁶ Sultana et al. (2011): *The Breeding Birds of Malta*. BirdLife Malta, Malta.

²⁷ Epsilon Malta Ltd, Nature Conservation Consultants (2019). *Malta Breeding Bird Atlas 2018*. Malta: Wild Birds Regulation Unit, Ministry for the Environment, Sustainable Development and climate Change

light pollution in front of their colonies has been recently proven for *P. yelkouan* in Malta²⁸. Furthermore, ALAN causes the stranding of seabird fledglings on their first flight out of the colony. These may be injured or killed by collisions with manmade structures such as street light poles, or they might get grounded. Unless grounded individuals are found and released, they are likely to die²⁹. In general, light pollution from ALAN is additive and light trespass that creates skyglow adds to light pollution in areas that are otherwise dark.

The proposed development including the Aol-1 is not situated within the immediate line of sight of any seabird nest sites. However, a *P. yelkouan* colony holding a significant number of breeding pairs is located on St Paul's Island (MT0000022) within the 5.0 km buffer zone Aol-2, in which additional sky glow from ALAN from the construction site can have significant impacts. This is relevant if night-time construction activities are carried out during the reproductive season (February to July). The negative impact will potentially act on 45-70 breeding pairs. Including their offspring and prospecting birds, this equates to 225-350 individuals.

Additionally, ALAN is known to have negative consequences on nocturnally migrating birds in general. Bright lights are known to attract, disorient, and ground birds in active migration during the night³⁰ if construction work or operations are carried out at night during spring or autumn migration with no mitigation measures in place. The lit-up construction site during night-time operation is highly likely to have above-mentioned impacts on nocturnally migrating birds passing within the Aol-2 (5.0 km buffer). However, it is extremely unlikely that the additional ALAN from the construction site will impact threshold numbers of significance of birds of any species during their nocturnal migration.

5.2 Operational Phase

5.2.1 Terrestrial environment

The operational phase will cause two main impacts to the surrounding area: a) vehicular traffic and b) increased lighting in the currently dark areas. These impacts will persist throughout the duration of the works. Vehicular traffic is not expected to increase significantly, as currently all grey bag trips generated in Malta and Gozo are already passing through the ECOHIVE complex. The continuation of traffic, which may increase in the future due to population growth, causes the deposition of particulate matter and gases related to combustion; however, the envisaged frequencies will be comparable to the current traffic present in the wider ECOHIVE complex. Mitigation measures such as sensor-operated lights,

²⁸ Austad, M., Oppel, S., Crymble, J., Greetham, H., Sahin, D., Lago, P. & Metzger, B. (2023). The effects of temporally distinct light pollution from ships on nocturnal colony attendance in a threatened seabird. *J Ornithol* 164, 527–536. <https://doi.org/10.1007/s10336-023-02045-z>

²⁹ Rodríguez, A., Holmes, N. D., Ryan, P. G., Wilson, K. J., Faulquier, L., Murillo, Y., Raine, A. F., Penniman, J. F., Neves, V., Rodríguez, B., Negro, J. J., Chiaradia, A., Dann, P., Anderson, T., Metzger, B., Shirai, M., Deppe, L., Wheeler, J., Hodum, P., ... Corre, M. Le. (2017). Seabird mortality induced by land-based artificial lights. *Conservation Biology*, 31(5), 986–1001. <https://doi.org/10.1111/cobi.12900>

³⁰ Evans Ogden, L. J. (2002). Summary report on the bird friendly building program: Effect of light reduction on collision of migratory birds. In *Fatal Light Awareness Program* (Vol. 1).

down-turned light fixtures and other measures as indicated in the GUIDELINES FOR ECOLOGICALLY RESPONSIBLE LIGHTING³¹ will be implemented to the extent possible to minimise the potential light spillover into the adjacent agricultural areas.

5.3 Decommissioning Phase

The decommissioning phase could comprise different activities. Depending on the condition of the structures on site, the operators will decide on whether they should be repurposed or demolished. This decision will have the largest impact on determining the severity and length of the decommissioning phase. Assuming the worst-case scenario of full demolition, the ecology impacts would be of a similar nature to those arising during the construction works.

5.4 Summary of Impacts

The attributes/descriptors for the anticipated ecology impacts identified for each project development phase are summarised in Table 4.

³¹ Source: <https://birdlifemalta.org/wp-content/uploads/2020/07/Guidelines-for-Ecologically-Responsible-Lighting.pdf>

Table 4: Summary of impacts table

IMPACT TYPE AND SOURCE			IMPACT RECEPTOR		EFFECT AND SCALE							PROBABILITY OF IMPACT OCCURRING	OVERALL IMPACT SIGNIFICANCE	PROPOSED MITIGATION MEASURES	RESIDUAL IMPACT SIGNIFICANCE	OTHER REQUIREMENTS
IMPACT TYPE	SPECIFIC INTERVENTION LEADING TO IMPACT	PROJECT PHASE	RECEPTOR TYPE	SENSITIVITY & RESILIENCE TOWARDS IMPACT	DIRECT/INDIRECT/CUMULATIVE	BENEFICIAL / ADVERSE	SEVERITY	PHYSICAL/ GEOGRAPHIC EXTENT OF IMPACT	SHORT/ MEDIUM / LONG TERM	TEMPORARY / PERMANENT	REVERSIBLE / IRREVERSIBLE					
Loss of terrestrial ecosystems in Aol	Uprooting of trees and shrubs; demolition of rubble walls; expropriation of land; shifting of soil; excavation of rock; access routes	Construction	Terrestrial species & ecosystems	High	Direct	Adverse	High	Local	Long-term	Permanent	Irreversible	Inevitable	Significant	Compensatory planting of mature trees through the proposed soft landscaping and rehabilitation of the area. Protected species should be transplanted whenever possible.	Significant	ERA permits and monitoring to ensure that no additional harm is done to nearby species and habitats.
Airborne and waterborne particulate matter deposition in Natura 2000 sites	Excavation and construction activities	Construction	Terrestrial species & ecosystems	High	Direct	Adverse	Moderate	Broad	Short-term	Temporary	Reversible	Remote	Not significant	Use of hoarding, dust suppressors and good construction site practices in line with the Environmental Management Construction Site Regulations, 2007.	None	N/A
Noise, vibration & light pollution on Natura 2000 sites	Excavation and construction activities	Construction	Terrestrial species & ecosystems	High	Direct	Adverse	High	Broad	Short-term	Temporary	Reversible	Remote	Not significant	N/A	None	N/A
Loss of habitat for terrestrial avian species	Destruction of (disused) agricultural land in ODZ	Construction	Terrestrial avian species	High & Low	Direct	Adverse	Low	Local in footprint and Aol-1	Short-term	Temporary	Reversible	Inevitable	Significant (locally)	Keep time short, keep footprint low, avoid (if possible) reproductive season, habitat restoration	Not significant	N/A
Noise, vibration, and light pollution negatively affecting terrestrial avian	Construction activities, operation	Construction	Terrestrial avian species	Moderate & Moderate	Direct	Adverse	Low	Local, in footprint and Aol-1	Shortterm	Temporary	Reversible	High	Significant (locally)	Limit night-time activities, reduce light pollution, avoid (if possible) sensitive periods	Not significant	N/A

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assemblage s in Aol-1																
Light pollution negatively impacting nocturnally migrating birds	Lighting during construction	Construction	Nocturnally migrating birds	Moderate & Moderate	Direct	Adverse	Low	Broad (Aol-1 and Aol-2)	Short-term	Temporary	Reversible	High	Significant	Limit night-time activities, reduce light pollution, avoid (if possible) sensitive periods	Not significant	N/A
Colony disturbance grounding of seabird fledgling, associated induced mortality caused by ALAN	Lighting during construction and operation	Construction, operation	Procellariiform seabirds, specifically <i>P. yelkouan</i>	High & Low	Direct	Adverse	High	Broad (Aol-2)	Short-term, potentially long term	Temporary, potentially permanent	Reversible	High	Significant	Limit night-time activities, reduce light pollution, avoid (if possible) sensitive periods.	Not significant	Strictly follow guidelines for the reduction of light pollution
Exposure of (marine) avifauna to macro-/microplastics, other harmful substances	Spills, leakage of material from MRF into the environment during standard operations including transport or during accidents	Operation	Marine avian species and others	High & Low	Direct	Adverse (beneficial as compared to current open landfill situation)	high	Broad (Aol-2 and beyond)	Long term	Permanent	Reversible	Inevitable	Significant	Infrastructure & protocols in place to minimize spills of any harmful material into the environment	Not significant (positively significant as compared to current open landfill)	N/A
Contribution or otherwise to climate change, impacting biodiversity	Reduction in methane from open landfill, reduction in CO2	Operation	Biotic and abiotic environment	Moderate & Moderate	Indirect/Cumulative	Beneficial	Moderate	Very broad	Long-term	Permanent	Reversible, with difficulty	High	Significant	N/A	Not significant (positively significant as compared to current open landfill)	N/A

6.0 MITIGATION MEASURES

6.1 Construction Phase

6.1.1 Avifauna

Situated in an ODZ, the proposed MRF with ancillary facilities will result in the permanent reduction of breeding habitat on its footprint (and via disturbance, noise, and habitat alteration in the Aol-1 and along access roads) for up to four receptor species (see Table 1). Depending on how the non-built landscape and flat roofs of the planned development will be landscaped, this will result in the permanent loss of several breeding pairs *C. melanocephala*, *C. juncidis* and *M. solitarius*. Furthermore, it will lead to a reduction in foraging and roosting habitat as well as potential nesting sites for a population of breeding pairs (up to a few tens) of *P. hispaniolensis*.

Localised, permanent habitat loss and disturbance are additionally expected to result in the destruction of foraging areas for other breeding, wintering, and/or staging species making use of the footprint of the planned development and buffer zone (Aol-1).

Overall numbers of birds impacted are expected to remain well below levels of significance when considering the local (national), EU or international populations of any bird species making use of the area, thus no significant impacts on avifauna are expected in the footprint including the buffer zone (Aol-1) during standard operations.

The proposed development including the Aol-1 is not situated within the immediate line of sight of any seabird nest sites. However, a *P. yelkouan* colony holding a significant number of breeding pairs is located on Saint Paul's Island (MT0000022) within the 5.0 km buffer zone Aol-2, in which additional sky glow from ALAN emitted by the MRF during operation can have significant impacts. This is relevant when operations are carried out during night-time or if the MRF including the ancillary facilities remain illuminated during the night outside working hours. The negative impact will be permanent and potentially act on 45-70 breeding pairs. Including their offspring and prospecting birds, this equates to 225-350 individuals.

Additionally, ALAN is known to have negative consequences on nocturnally migrating birds in general. Bright lights are known to attract, disorient, and ground birds in active migration during the night³² if the MRF carries out night-time operations (or remains lit-up in general) during the spring or autumn migration period with no mitigation measures in place. The lit-up MRF is highly likely to have above-mentioned impacts on nocturnally migrating birds passing within the Aol-2 (5.0 km buffer). However, it is extremely unlikely that the additional ALAN from the MRF will impact threshold numbers of significance of birds of any species passing through the wider area (Aol-2) during their nocturnal migration.

³² Evans Ogden, L. J. (2002). Summary report on the bird friendly building program: Effect of light reduction on collision of migratory birds. In *Fatal Light Awareness Program* (Vol. 1).

The waste separation and treatment inside the proposed MRF as well as the recovery of the waste and (preparation for) recycling – if carried out appropriately – can have several indirect beneficial impacts on avifauna as compared to the current situation (open landfill at Maghtab).

It can lead to a reduction in the amount of plastic waste that is openly accessible to birds at the landfill and that can be blown or washed into the sea, as it is currently the case at the open landfill and can be observed regularly. Once in the marine environment, plastics are known to have a strong detrimental impact on avifauna and other marine life³³. The reduction in the number of plastics ending in the sea will reduce the number of birds suffering from entanglement and/or ingestion of macro-plastics and will lead to a reduction in the number of micro-plastics ingested by avifauna, directly or indirectly.

The proposed MRF can contribute to a reduction in the use and waste of resources (material and energy) if separated waste is reused and recycled towards a more circular and sustainable economy.

The proposed development also contributes towards a potential reduction in greenhouse gas emissions. Municipal solid waste landfills are among the largest sources of human-related methane emissions (Refs). As a greenhouse gas, methane is more than 25 times as potent as carbon dioxide at trapping heat in the atmosphere (Refs). Recycling plastic waste (e.g. from pellets) can significantly reduce carbon emissions by more than 40% as compared to conventional plastic production³⁴. Anthropogenic greenhouse gas emissions are the main cause of climate change with negative impacts on biodiversity worldwide, including avifaunal communities. In connection with the Waste to Energy plant and the Composting plant, the MRF with plastic recycling facilities can contribute to the future reduction in the emission of greenhouse gas methane, leaking from the open landfill at Maghtab with potentially beneficial impact on biodiversity, including avifauna.

Manipulating, preparing and transporting material destined for recycling can lead to spills of such material into the environment with potentially detrimental effects on living organisms including avifauna, if left unmitigated. Small and lightweight plastic pellets (nurdles) can easily be blown or washed into the environment in large quantities during production, handling, shipping etc. if infrastructure is inadequate and/or protocols preventing such spills are not strictly adhered to. This is specifically of concern as operations (e.g. export of material for recycling abroad) are expected by vessels. Once released into the environment, the small plastic pellets are also known to absorb toxins and harmful chemicals like persistent organic pollutants (POP), increasing their potential impact for birds and other

³³ Kühn, S. & van Franeker, J. A. (2020) Quantitative overview of marine debris ingested by marine megafauna. *Marine Pollution Bulletin*, 151, 110858. <https://doi.org/10.1016/j.marpolbul.2019.110858>

³⁴ Saleem, J., F. Tahir, M. Z. Khalid Baig, T. Al-Ansari, G. McKay (2023): Assessing the environmental footprint of recycled plastic pellets: A life-cycle assessment perspective, *Environmental Technology & Innovation*, Volume 32, <https://doi.org/10.1016/j.eti.2023.103289>.

wildlife when accumulating in the food chain³⁵. Wasteserv Malta has been active in the recycling sector for many years, and a number of mitigation measures are already in place to manage and reduce the potential occurrence and severity of the aforementioned environmental impacts.

Transporting, manipulating, and storing flammable material in large quantities imposes significant risks. Processing and storing such material increases the fire hazard risks. Some types of plastics are known to produce toxic fumes when burning (e.g. hydrogen chloride is released when burning PVC). In fact, the previous MRF in Malta, based at Sant' Antnin, Marsascala, was destroyed in a large blaze in 2017³⁶, producing a plume of toxic fumes and residues in the firefighting water runoff with negative short- and long-term impacts on the environment. There is a large risk that in the event of a fire in the MRF, the plume of the blaze as well as the run-off from firefighting water will release toxins into the environment, with detrimental short- to long-term effects on living organisms including avifauna.

6.1.2 Terrestrial study

The proposed development is not situated within any terrestrial Natura 2000 site, and it does not have any direct or indirect impacts on such sites. Therefore, no mitigation measures are being suggested within the boundaries of the neighbouring Natura 2000 site. However, there are several ecologically significant areas within the Area of Interest (AOI) that require the implementation of best practice and mitigation measures to reduce some of the identified impacts.

The ENVIRONMENTAL MANAGEMENT CONSTRUCTION SITE REGULATIONS (S.L. 522.09) should be enforced to avoid the impacts from being generated in the first place and to ensure that environmental degradation is kept as low as possible. These regulations provide details on the containment and transportation measures for loose construction material on site and in transit, and other measures to prevent carrying out and/or depositing particulate matter.

Some of the proposed mitigation measures are highlighted below:

- Heavy machinery should not trample on natural areas located outside of the scheme site boundary
- Chemical spillages from machinery should be avoided by storing wastes and chemicals in bunded areas within the construction site
- All construction debris and soil should not be stockpiled near the base of trees and/or natural areas, but should be hauled away for proper disposal or in designated waste management areas
- Compensatory planting should not be carried out during the summer period.
- The necessary environmental permits to carry out interventions on protected species are obtained from the ERA

³⁵ Teuten et al. (2009) *Transport and release of chemicals from plastics to the environment and to wildlife*. *Philosophical Transactions of the Royal Society B*, 364, 2027–2045. doi:10.1098/rstb.2008.0284

³⁶ *Times of Malta* (22nd May 2017) 'Watch: Health warning issued as fierce fire rages at Sant' Antnin waste recycling plant', <https://timesofmalta.com/articles/view/sant-antnin-plant-on-fire.648706>

- Uprooting of invasive alien species should follow the recommendations in the ERA Guidelines on Works Involving Trees (2019) on managing non-native plant invaders and restoring native plant communities in terrestrial settings in the Maltese islands.
- Replacement/compensatory planting is necessary, with some of the species to be considered include: *Olea europea*, *Ceratonia siliqua* and *Pistacia lentiscus*.
- Should transplanting of trees be necessary, they should be pruned (not more than 25% of overall crown) to stimulate growth and reduce water loss. The trees should be watered for two consecutive days before removal, and the branches should be tied together during the transplantation phase.
- Before transplanting mature trees, the soil depth needs to be determined. For trees which are within soil less than 75cm deep, transplanting is not recommended as the majority of the root ball will be within the bedrock.
- Root pruning is recommended to ensure the root ball is of equal size to the tree canopy. This practice is not relevant to Aleppo pines, which are not suitable for transplanting as they are tap-root species.
- For trees found within soil of adequate depth, an excavator or hand-held tools are necessary to dig a trench around the tree which is of equal depth to the tree height³⁷. The excavator/manual tools should also dig a new pit which is around twice the original size of the root ball.
- Transplanting of *Olea europea* and *Ceratonia siliqua* should take place between February and March, and the tree should be regularly monitored for growth. Follow-ups are required for at least 3 years after the specimen has been transplanted
- Transplanting should ideally be carried out in two phases: The first year (wet season) soil depth is determined and trees earmarked for transplanting are subjected to root pruning. In the second year, the same trees are relocated to the transplanting area.
- Negligence during construction activities can be mitigated through regular and effective environmental monitoring to ensure that the construction impacts are not spilling over into the adjacent habitats.
- Hoarding should be set up (in line with the ENVIRONMENTAL MANAGEMENT CONSTRUCTION SITE REGULATIONS, 2007) along the construction site to minimise dispersion of particulates. This should be covered with suitable mesh or material that precludes dispersion of particulate matter.
- Pre-soaking, dust suppressors and covered stockpiles are considered good practices to minimise dust emissions.
- Works should not be carried out during the night time due to the recorded presence of nocturnal species in the area
- Although rodent control is encouraged when setting up a construction site, care must be taken not to negatively influence any resident fauna in the immediate surroundings

³⁷ Shallower depths may be permissible should the root ball be smaller than the tree height

- Construction vehicles and machinery should be well-maintained and serviced such that they can be operated at the best of their environmental performance.
- If lighting is required, downward facing luminaires should be installed within the facility to reduce light pollution during the operational phase

6.1.3 Avifauna study

To reduce the residual impact on local terrestrial breeding bird populations the following recommendations are made:

- The construction phase for the planned development is kept as short as possible;
- The construction phase is timed to a period outside the main reproductive season (March to August) of the bird species breeding in the area, thus focusing on the autumn and winter months. However, if this appears to be unfeasible, it is recommended that:
 - The footprint of the construction sites including the Aol-1 is kept as small as possible, specifically in the areas of natural and semi-natural habitat (agricultural land, garrigue on disused agricultural land);
 - Adherence to best practice procedures to keep noise pollution and dust production and dispersal at the construction site at a minimum;
 - No works will be carried out during the night. If this is not feasible, and artificial light is required, such lighting should strictly follow ERA's draft "Guidelines for the Reduction of Light Pollution in the Maltese Islands" throughout the duration of any nighttime works³⁸;
 - Adequate landscaping will be applied to restore the disturbed habitat in all affected areas in the Aol-1 at the end of the construction phase to mitigate any longer-term impact. It is recommended that solely native plants are used for habitat restoration, that species with known benefit to avifauna are chosen, and that fruiting plants which may provide resources to rats are avoided.
- Regardless of the months of construction, no works should be carried out during the night. If this is not feasible, and artificial light is required, such lighting should strictly follow ERA's draft "Guidelines for the Reduction of Light Pollution in the Maltese Islands" throughout the duration of any nighttime works.

6.2 Operational Phase

Overall, the localised negative impact on terrestrial ecology and avifauna (area of the footprint of the MRF including the Aol-1 and access roads) during standard operations is expected to be not significant. However, as the proposed site for the MRF development is situated in an ODZ, it is highly recommended to implement the following mitigation measures: the permanent reduction of breeding habitat for *C. melanocephala*, and *C. juncidis* and the foraging and roosting habitat for all avifauna utilising the site is kept as small as

³⁸ Environment and Resources Authority (2020): Guidelines for the Reduction of Light Pollution in the Maltese Islands. Draft Public Consultation Document downloaded from <https://era.org.mt/topic/public-consultation-guidelines-for-the-reduction-of-light-pollution-in-the-maltese-islands/> on 12-07-2023.

possible by landscaping the open spaces (e.g. borders of parking areas, roofs) and planting native flora. The local reduction of the breeding populations of *M. solitarius* and *P. hispaniolensis* can be partially reversed by the installation of breeding facilities such as nest boxes at the buildings of the proposed development.

Additionally, it is suggested that physical sound barriers are installed along the footprint of the proposed development. Such barriers will additionally reduce the disturbance of avifauna in the Aol-1 and light trespass into the environment. Furthermore, depending on the design, such barriers could significantly reduce the amount of material (plastic pellets, pieces of sheets foil, paper or cardboard to be released into the environment during standard operations such as loading, unloading, packing.

Any artificial light structure – fixed or mobile – that is required during standard operational procedures at night should strictly follow ERA's draft "Guidelines for the Reduction of Light Pollution in the Maltese Islands" throughout the duration of any nighttime works³⁹. This is crucial to avoid potentially significant impact from light pollution (glare, trespass, sky glow) on seabirds and other avian receptors making use of the Aol-2, specifically the protected areas.

To reduce the number of plastics and other, potentially toxic material ending in the (marine) environment where it has strong and wide reaching negative long-term impacts on avifauna it is necessary that the MRF has adequate infrastructure in place such as catchment facilities and filters/ treatment facilities for run-off (from rain, but also flash-floods, firefighting measures, etc.).

Infrastructure and procedures would need to be in place to keep any fire hazard risks at the proposed development at a minimum and to make sure that in the event of fire or comparable accidents no material with negative impact to wildlife is leaked into the environment.

6.3 Decommissioning Phase

For the decommissioning phase, the same mitigation measures are recommended as during the construction phase. Additionally, to reduce the impact of any remaining contamination at the site (e.g. soil containing plastic residues, oil, heavy metals, etc.), any such contaminated material would need to be removed and disposed of adequately.

Furthermore, it has been highlighted that the proposed MRF is situated in an ODZ. Therefore, it can be expected that as part of the decommissioning phase the area covered with concrete and tarmac is unsealed and the habitat is restored to a status that is comparable to the current habitats. Landscaping could restore the area towards the current features present, but any planting activities should make use of native wild flora. It is

³⁹_{36/37} Environment and Resources Authority (2020): Guidelines for the Reduction of Light Pollution in the Maltese Islands. Draft Public Consultation Document downloaded from <https://era.org.mt/topic/public-consultation-guidelines-for-the-reduction-of-light-pollution-in-the-maltese-islands/> on 12-07-20223.

expected that the demolition waste is either recycled or disposed of adequately to minimise any potential impact on avifauna.

7.0 RESIDUAL IMPACTS, COMPENSATORY MEASURES AND MONITORING PROGRAMME

7.1 Residual Impacts

7.1.1 Terrestrial

Despite the comprehensive adoption of the recommended mitigation measures, a number of unavoidable residual impacts are still expected to arise, namely:

- Impact on ecologically sensitive terrestrial ecosystems and assemblages falling directly within the footprint of the site.
- Accumulation of minimal dust, vibration and noise impacts within the immediate terrestrial ecosystems abutting the construction site boundary
- Increase in night-time light in previously dark agricultural areas in the surroundings

7.1.2 Avifauna

No significant negative residual impacts on avifauna are expected from the proposed development alone if the mitigation measures highlighted above are implemented. The reduction of any risks of material ending up in the marine environment, both during standard operations and in the event of accidents is considered especially important, together with keeping light pollution from the MRF at a minimum.

Indirect residual impact on avifauna in the wider area and in the longer run might be positive as compared to the current situation in which large proportions of material still end up in the open landfill. However, the permanent destruction of habitat available for breeding and foraging as a result of the proposed development has negative cumulative effects.

It needs to be emphasized that further cumulative effects on avifauna can be expected, given that the MRF is not a standalone development in the area. The proposed development forms part of WasteServ's larger ECOHIVE complex, including a Waste to Energy plant, an Organic Processing Plant (OPP), as well as a Thermal Treatment Facility (TTF). These will be situated in direct vicinity of the MRF within the Aol-2. Additionally, construction works for the Second Sicily-Malta Interconnector are foreseen to take place in the wider area too (Aol-2), with the onshore cable route partially situated within the Aol-1. Cumulative effects can be expected both during the construction and operational phase of the ECOHIVE Project. The effects on avifauna would originate from increased habitat loss and modification (taking into account the cumulative footprint), disturbance (e.g. from noise, increased traffic in the area) and (additive) light pollution, among others.

7.2 Compensatory Measures

Transplantation of trees and planting of new trees is being proposed as a significant compensatory measure to counter the loss of trees and vegetation from the site footprint.

It is highly recommended that an area of an equivalent size to that of the planned development is unsealed, where natural habitat can be restored and protected to compensate for the sealing and habitat loss caused by the planned development. This is especially important due to the cumulative effect of ongoing development in the Maltese islands with an increasing loss of natural or semi-natural open and unbuilt habitats and unsealed areas which contribute to a healthy ecological assemblage.

7.3 Monitoring Programme

Should the Scheme be permitted to be developed, a monitoring programme should be set up and implemented during the construction phases of development. The construction management plan prepared at project planning phase will be updated by the chosen contractor in order to ascertain that the best practicable environmental options available are followed through.

During the construction phase, periodic monitoring is being recommended to ensure that mitigation measures are in place and working as they should. This would ensure that no unwarranted impacts arise due to deviations from proposed working practices. Such deviations could have additional impacts over and above those originally predicted. All monitoring data should be presented to the relevant authorities at pre-agreed frequencies.

A tree specialist is recommended to oversee/enact interventions directly related to the pruning or relocation of the native tree species. All interventions related to native trees are subject to permits provided by the Environment and Resources Authority.

8.0 ALTERNATIVE SOLUTIONS

Table 5 assesses the ecological impact of different hypothetical alternatives which could be adopted during the implementation of the project.

Table 5: Alternative scenario assessment for the Scheme

ALTERNATIVE TYPE	POSSIBLE ALTERNATIVE SOLUTIONS	EVIDENCE OF HOW THE ALTERNATIVE SOLUTIONS WERE ASSESSED	DESCRIBE THE RELATIVE EFFECTS ON THE CONSERVATION OF THE SITE/HABITAT TYPE/SPECIES
Zero Option	Continued use of the makeshift temporary line at the Malta North	The applicant has considered not developing the MRF facility and maintain the use of the temporary makeshift line at the Malta North	The take up of land and the associated ecological impacts on the species present within the scheme site would be completely circumvented if the Zero Option is implemented. Nevertheless, the construction and operation of the Scheme is not envisaged to yield any significant adverse impacts on the adjacent Natura 2000 sites. Furthermore, implementing the Zero Option could lead to additional landfilling pressures in the future which could gradually encroach the boundaries of the adjacent Natura 2000 sites.
Down Sizing	Reducing the footprint of the new MRF building whilst investing heavily in the existing makeshift temporary line to meet the future demands of waste management in Malta.	The applicant has considered operating a smaller MRF plant that would work in parallel with the temporary makeshift line at the Malta North	A down sized scheme site footprint would reduce the terrestrial ecological impacts associated with construction works. Nevertheless, the scheme's impacts were not considered to be significant and adverse on the adjacent Natura 2000 sites. Consequently, the facility has been designed to meet the future needs of the nation without comprising its operational effectiveness and efficiency. Since the impacts on Natura 2000 sites are insignificant, the new MRF was not down sized.
Alternative sites	Locating the new MRF at Sant'Antnin or any other site which is located at a considerable distance from Natura 2000 sites	Alternative site assessment for the MRF has already considered Sant'Antnin as a	Locating the MRF project to an alternative site which is positioned even further away from Natura 2000 sites would completely circumvent any potential ecological impacts that may occur during construction and operation. However, the AA clearly states that the Scheme site as proposed is unlikely to generate any significant impacts on the adjacent Natura 2000 sites since these are located

APPROPRIATE ASSESSMENT

		potential alternative site.	further than a 1km away. Additionally, the centralisation of WSM's waste management facilities at the ECOHIVE complex helps to compartmentalise their operational impacts and improve their operational efficiencies leading to certain environmental benefits.
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9.0 CONCLUDING REMARKS

Overall, the development of the MRF at Magħtab – assessed as a standalone – is not expected to give rise to any significant negative impacts on the nearby Natura 2000 sites if the appropriate mitigation measures are adopted. While the area is not of specifically high ecological value, the development will add to the increasing loss of seminatural and natural habitats on the Maltese islands, resulting in an overall high cumulative pressure on the biodiversity depending on these habitats.

With these mitigation measures in place, specifically concerning light pollution and leakage of detrimental material, the impact magnitude and extent of the proposed development on the SACs and the marine SPA and on the relevant populations triggering it are expected to be not significant in relation to Article 6(3) of the EU Habitats Directive. The overall dynamics and conservation status of the Natura 2000 sites will therefore not be impacted significantly.

APPENDIX 1

TERMS OF REFERENCE



Terms of Reference for the preparation of an
Appropriate Assessment

EA/00042/20:

The proposed construction of a Material Recovery Facility (MRF) for the processing of grey bag and recovery of different streams of materials. The proposal includes ancillary office space, staff quarters and parking spaces.

**Site at, Ecohive Complex, Tul il-Kosta / Triq ir-Ramla,
Triq ta' Saverja, Naxxar**

28/04/2023

- Note 1** This document is intended to set out minimum specifications that need to be satisfied in order to determine whether the proposed intervention or any part thereof will have a significant impact on the integrity of any relevant protected sites, ecosystems, habitats and species covered by the provisions of the Flora, Fauna and Natural Habitats Regulations (S.L. 549.44).
- Note 2** The applicant is to propose consultants for ERA's attention prior to the commencement of the Appropriate Assessment (AA) studies.
- Note 3** It is the consultants' responsibility to adopt and justify the appropriate methodologies and areas of influence. Furthermore, in the interest of optimising the assessment process, the proposed methodology is to be discussed with ERA prior to actual commencement of the studies.
- Note 4** Unless otherwise specified in these Terms of Reference (TORs) and in the absence of any site-specific conservation objectives drawn up by ERA, the assessment shall be guided by the following environmental objectives:
- Where the conservation status is favourable, this is retained and not reduced; and
 - Where the conservation status is not favourable, this is improved.
- Note 5** The requirement for further AA studies needs to address the issues outlined in the screening carried out by ERA, as well as any other AA-relevant impacts identified by the consultants. Should further surveys be deemed necessary by the consultants, ERA is to be informed of such need PRIOR to the commencement of such surveys.
- Note 6** Wherever available, already-existing information should be made use of without any unnecessary duplication of work. Any uncertainties and gaps in information should be acknowledged.
- Note 7** The consultants should refer to the appropriate EU guidance documents, and should clearly quote such sources accordingly.
- Note 8** ERA reserves the right to question (or disagree with) the methodologies and area of influence, to request revisions thereof, and to request additional information or studies at any stage prior to, during and following completion of the AA.
- Note 9** These TORs are primarily intended to guide the AA investigations rather than as a basis for tendering or other non-ERA processes. In this regard any use for such purposes is at the sole risk of the applicant, as requirements may vary following technical negotiations, updating of legislation or standards, changes to the proposed project, or other circumstances.

The proposal requires the submission of an Appropriate Assessment (AA) as per Regulation 19(1) of the Flora, Fauna and Natural Habitats Protection Regulations, (S.L. 549.44), given that the project may cause significant impacts on protected sites:

- Terrestrial environment:
 - MT0000007- *Is-Salini* designated as a Special Area of Conservation via Government Notice 1379 of 2016; and
 - MT0000008 - *L-Għadira s-Safra u l-Iskoll tal-Għallis* designated as Special Area of Conservation via Government Notice 1522 of 2019
- Marine environment:
 - MT0000105 *Żona fil-Baħar bejn il-Ponta ta' San Dimitri (Għawdex) u Il-Qaliet* designated as a Special Area of Conservation of International Importance via Government Notice 682 of 2018; and
 - MT0000112 *Żona fil-Baħar ta' madwar Għawdex* – Special Protected Area via Government Notice 1311 of 2016.

as declared through the provisions of the Flora, Fauna and Natural Habitats Regulations (S.L. 549.44).

Note: It should be noted that the AA shall not be restricted to the above-mentioned protected sites only, which have been identified through screening to determine whether the proposal requires the submission of an AA. It is the consultants' responsibility to adopt and justify the appropriate area of influence, based on the available information, which takes into consideration any relevant protected site, ecosystems, habitats and species covered by the provisions of the Flora, Fauna and Natural Habitats Regulations (S.L. 549.44).

The Appropriate Assessment report should follow the following format:

1. Executive Non-Technical Summary

A description of the salient points of the AA study including surveys, impacts and their significance, proposed mitigations measures, and any residual impacts.

2. Project Description

A description of the proposed project, with particular emphasis on those elements that are likely to give rise to potentially significant effects on the on the integrity of the protected site, or on its habitats, species and ecosystems. The description shall also address any foreseeable consequential requirements or implications of the proposal (e.g. need for new or altered access or infrastructure).

3. Site Description

A general description of the site environment within the area of influence, with particular emphasis on the salient features of the site and its species, habitats and ecosystems. Any other aspects of the physical environment and its processes that may in any way interact with the development or its impacts shall also be described.

The description shall also address any other constraints relevant to the site, including statutory legal protection, any relevant management plan framework.

4. Impact Assessment vis-à-vis the integrity of the site and its species, habitats and ecosystems.

An evaluation of the way in which the integrity of the site and its species, habitats and ecosystems are likely to be affected by the project.

Impact assessment should clearly indicate all foreseeable direct and indirect impacts, and their expected timeframes (short/long-term, etc.). Any impact interactions (e.g. accumulation, synergy, interaction with natural forces) shall also be identified and assessed. The significance of all AA-relevant impacts must also be discussed.

Impact assessment shall also take into account practical implications (e.g. conflicts with site protection or management plan implementation, any foreseeable constraints on future management plan formulation, etc.)

5. Mitigation Measures

Where possible, measures should be identified to eliminate and/or mitigate adverse effects on the integrity of the site as well as on the relevant habitats and species.

In this regard, the AA should include:

- A reasonably detailed identification of the measures to be introduced for all relevant phases of the project;
- An explanation of how the measures will eliminate and/or mitigate adverse effects;
- Evidence of how the mitigation measures will be tangibly implemented and by whom;
- Evidence of the degree of confidence in their likely success;
- A timescale, relative to the project, when they will be implemented;
- An explanation of any proposed monitoring scheme and how any mitigation failure will be addressed; and
- Proposals for decommissioning as may be appropriate.

6. Residual Impacts

The report should include a prediction of residual impacts and implications of the proposal on the site and its species, habitats and ecosystems, following the implementation of the mitigation measures. The report shall also evaluate the significance of such residual impacts and implications. Residual impacts are to be evaluated individually as well as holistically. The latter should indicate whether the proposal will or will not adversely affect the integrity of the site(s) concerned.

7. Alternative solutions

A list of alternatives to the proposal is to be submitted. Examples of alternatives may include, but not necessarily limited to, alternative technologies, alternative layouts, and relocation or downsizing of the project. The zero-option (do-nothing scenario) should also be considered. Each alternative is to be thoroughly assessed by comparing it with the original proposal and clearly indicating the relative effects on the site's listed habitats and species.