

Avian Study for incorporation into Ecology EIA

*As per ERA requirements for the Planning Application PA/00437/23
Redevelopment of the Former Jerma Palace Hotel*

*Demolition of ex-Jerma Palace Hotel, development of a mixed-use resort at the site of the
Jerma Hotel Dawret it-Torri, Triq is-Salini, Triq ir-Ridott, Marsascala*

Technical Report

Publication Date

15/09/2026

Report

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Summary

The below assessment considers the redevelopment of the Jerma Hotel site into a mixed development, including touristic, residential, retail and other commercial establishments, including two basement parking levels and two eight-storey blocks. The site of the development is Ras il-Gżira, an exposed outcrop of natural coastline and the derelict Jerma Hotel shell which rises to five floors. The proposed development footprint is within the direct line of sight of two marine SPAs and within 5 km of four terrestrial Natura 2000 sites (SCI, SAC).

The assessment highlights how the proposed development is expected to displace breeding territories of up to five terrestrial bird species, with low significance to local populations. However, light pollution from the proposed development is expected to have a significant impact on breeding procellariiform seabirds due to the grounding of fledged young which are expected to be present in the marine environment within sight of the development. Moreover, the low human disturbance in the area since the Jerma Hotel's abandonment, coupled with the increased habitat degradation and loss along the eastern coastline of Malta in the last decades, has made Ras il-Gżira and the surrounding marine environment habitable for populations of shore-, water- and seabirds wintering and stopping over in the Maltese Islands, some of which are of conservation concern and/or comprise significant proportions of the local non-breeding populations of these species.

Other impacts, such as noise, light, and chemical pollution, cumulative effects of overdevelopment and weakening climate change resilience, as well as alternative solutions for the site, are explored and discussed.

1 METHODOLOGY

The study at hand considers populations of wild birds, in particular populations of protected species and of species of conservation concern as relevant sensitive receptors.

Avian receptors can be highly mobile, many of them carrying out annual movements on a large geographic scale. Therefore, the avian study considers the occurrence of sensitive receptors according to the relevant seasons, i.e. breeding, migration and stopping over, as well as wintering.

The Area of Influence for the avifauna EIA assessment of the proposed development consists of the footprint area of the proposed resort development and a buffer zone around this area.

The assessment of potential impacts of the proposed development on avifauna receptors in the identified AoI is performed mainly through a literature review.

The main references considered are:

- Malta Breeding Bird Atlas 2008 (BirdLife Malta 2009)
- Malta Breeding Bird Atlas 2018 (Epsilon 2019)
- Malta Breeding bird Atlas 2024 (Ecoserv, in press)
- The Breeding Birds of Malta (Sultana et al. 2011)
- European Breeding Bird Atlas 2: Distribution, Abundance and Change (Keller, Herrando, Vorisek, et al. 2020)
- Malta Marine IBA Inventory Report (BirdLife Malta 2015)
- 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)
- ERA's published Terms of Reference for the EIA regarding PA/00437/23
- Project Description Statement, regarding the Redevelopment of the Former Jerma Palace Hotel, Marsaskala; AIS Ref. no: TN 267145
- ERA's Standard Data Forms (SDFs) for the relevant terrestrial and marine Natura 2000 sites located in or overlapping with the AoI, accessed on 01/07/2025 from: <https://era.org.mt/topic/natura-2000-datasheets-maps/>
- ERA's Management Plans for relevant terrestrial Natura 2000 sites and Conservation Objectives and Measures for Malta's Marine Natura 2000 sites

2 BASELINE STUDY

2.1 THE AREA OF INFLUENCE (AoI)

The site in question is that of the derelict Jerma Hotel in Marsascala, situated on Jerma Point (Ras il-Gżira), which has fallen into disrepair since 2008 and which is bordered by a rocky foreshore and surrounded to the north, east, and south by the marine environment.

The Area of Influence for the avifauna EIA assessment of the proposed Jerma Resort redevelopment, from here onwards referred to as **AoI**, consists of the actual footprint area of the proposed development and a 5.0 km buffer zone around this area (see below, Figure 1) within which receptors can be expected to respond to certain activities related to the development and operation of the proposed resort.

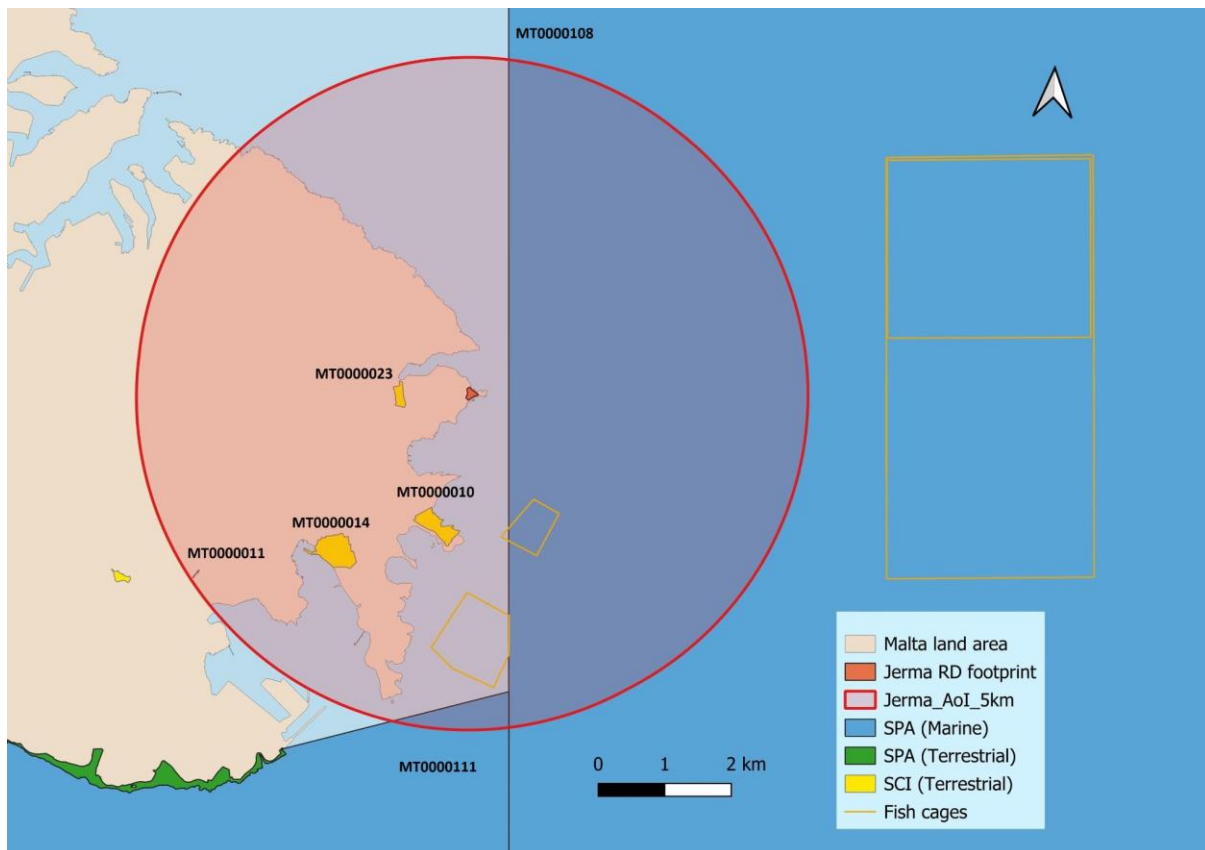


Fig. 1: The site of the resort redevelopment at Jerma (orange) and the Area of Influence (shaded red) vis-à-vis protected sites (Special Protected Areas and Sites of Community Importance) under the Natura 2000 network.

2.2 BASELINES FOR AVIFAUNA IN THE MALTESE ISLANDS AND IN THE AoI

To date, more than 400 bird species have been recorded in the Maltese Islands, including within its Fisheries Management Zone (FMZ, 25 NM). Slightly more than half of them occur in the Maltese Islands regularly¹. Around 50 bird species have been recorded breeding on the

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

Maltese Islands, of which 23 are regular breeders from wild populations². Three species, all pelagic seabirds, hold significant breeding populations in the Maltese islands from an EU, European and global perspective. These three species are listed under Annex I of the EU Birds Directive³. Information regarding the species' conservation status, population numbers, trend and range presented below are taken from BirdLife International's Data Zone⁴ and from the second edition of the European Breeding Bird Atlas⁵. All information regarding species listed in Annex I of the EU Birds Directive were obtained from the Environment, Nature and Biodiversity site of the European Commission⁶.

The baseline study informs which bird species have been recorded or can be expected to occur in the AoI, including in the relevant protected areas (Natura 2000 sites, see 2.3), and thus be sensitive receptors for the proposed Jerma resort redevelopment. This comprehensive list of bird species, including additional information can be found in Annex A of this report.

2.3 PROTECTED AREAS OVERLAPPING WITH THE AOI

The proposed development itself is not situated inside a protected site, nor does the footprint of the proposed development border directly with any site protected as part of the Natura 2000 network. However, the AoI contains four terrestrial Natura 2000 sites (SCI, SAC), and partially overlaps with two marine Special Protected Areas under the Natura 2000 network within direct line of sight of the proposed development:

- **SCI MT0000011 Ghar Dalam**

Situated entirely underground at the southwestern edge of the AoI, this SCI is not relevant for the EIA regarding avifauna and will therefore not be considered further in this report. However, the cave is designated as a Site of Community Importance (SCI) primarily due to its role as a roosting site for the Lesser Horseshoe Bat *Rhinolophus hipposideros* which might need further consideration.

- **SAC MT0000023 Il-Magħluq tal-Baħar ta' Marsascala**

This SAC is a small wetland, 1 km to the west of the planned development. The wetland shows strong signs of disturbance and degradation and is heavily encroached by urban settlements and roads. It is currently managed by Nature Trust

² 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

³ 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.

⁴ BirdLife International (2020) IUCN Red List for birds. Downloaded from <http://www.birdlife.org> on 02/07/2025.

⁵ Keller, Herrando, Vorisek, et al. (2020): *European Breeding Bird Atlas 2: Distribution, Abundance and Change*

⁶ https://ec.europa.eu/environment/nature/conservation/wildbirds/threatened/index_en.htm

Malta with restoration work ongoing. No sensitive avian receptor species have been recorded breeding there in relevant numbers (data available since 2008). Nevertheless, given the scarcity of wetland habitat in Malta and the improvement of the site due to the restoration efforts, the site is relevant for avifauna. Especially during the migratory and wintering periods, it can host sensitive avian receptors of a wide variety of waterbirds and shorebirds, including species on Annex I of the EU Birds Directive. A management plan for the SAC exists: https://era.org.mt/wp-content/uploads/2019/05/Il-Magħluq_tā_Marsaskala_ManagementPlan.pdf.

- **SAC MT10000010 Xrobb l-Għagin**

This coastal SAC is situated less than 2 km to the south-southwest of the planned development. It is currently managed by Nature Trust Malta. Especially during the migratory and wintering periods, it hosts a variety of sensitive avian receptors including species on Annex I of the EU Birds Directive. The proposed development would be in direct line of sight from this SAC, over Munxar. No actual management plan for the SAC is publicly available, however, the site has a designation report: https://era.org.mt/wp-content/uploads/2024/08/Xrobb_l-Għagin_Designation_Report.pdf.

- **SAC MT0000014 Il-Ballut ta' Marsaxlokk**

This SAC is a small coastal wetland, slightly more than 3 km to the southwest of the planned development. The wetland shows strong signs of disturbance and degradation and is threatened by the impacts of climate change (sea-level rise, salt-water incursion, increased wave energy). It is currently managed by Nature Trust Malta with restoration work ongoing. No sensitive avian receptor species have been recorded breeding there in relevant numbers (data available since 2008). Nevertheless, given the scarcity of wetland habitat in Malta and the improvement of the site due to the restoration efforts, the site is relevant for avifauna. Especially during the migratory and wintering periods, it can host sensitive avian receptors of a wide variety of waterbirds and shorebirds, including species on Annex I of the EU Birds Directive. An actual management plan for the SAC exists: https://era.org.mt/wp-content/uploads/2019/05/Il-Ballut_tā_Marsaxlokk_ManagementPlan.pdf.

- **SPA MT0000108 Il-Baħar tal-Lvant**

The marine SPA il-Baħar tal-Lvant (MT0000108) has its western border less than 500 m east of the proposed development and constitutes nearly half of the AoI. The SPA designation is triggered by the Maltese populations of *Calonectris diomedea* and *Hydrobates pelagicus*, of which it hosts internationally important numbers (c. 3800 individuals of each of the species). The area is used by these two species mainly as an important foraging ground, but also during commutes and for social interactions and resting. Other relevant sensitive avian receptors in the SPA are the Maltese population of *Puffinus yelkouan* as well as large numbers of *Chlidonias niger* passing through the area and stopping over for extended periods of time during migration,

especially in late summer/early autumn⁷. All four species are listed in Annex I of the EU Birds Directive and Appendix II of the Bern Convention, and the three species of procellariiform seabirds (*C. diomedea*, *H. pelagicus* and *P. yelkouan*) are also listed in Annex II of the SPA/BD protocol of the Barcelona Convention. No specific Management plan exists for this Natura 2000 site. However, a document on Conservation objectives and measures has been published and approved: https://era.org.mt/wp-content/uploads/2023/02/MPAs-Conservation-Objectives-and-Measures_final_Feb2023.pdf.

- **SPA MT0000111 Il-Baħar tal-Lbiċ**

The marine SPA Il-Baħar tal-Lbiċ (MT0000111) has its closest border approximately 4.5 km south of the proposed development. It overlaps only slightly with the marine part of the AoI, but is within direct line of sight from the site of the proposed development. The SPA designation is triggered by the Maltese populations of *Calonectris diomedea* (6000 individuals), *Hydrobates pelagicus* (15000 to 20000 individuals) and *Puffinus yelkouan* (840 to 1350 individuals), all reaching numbers of international significance. The area is used by these three species as an important foraging ground, during commutes and for social interactions and resting. Other relevant sensitive avian receptors in the SPA are significant numbers of *Chlidonias niger* passing through the area and stopping over during migration, especially in late summer/early autumn⁷. As mentioned above, all four species are listed in binding international legal instruments. No specific Management plan exists for this Natura 2000 site, however a document on Conservation objectives and measures has been published and approved: https://era.org.mt/wp-content/uploads/2023/02/MPAs-Conservation-Objectives-and-Measures_final_Feb2023.pdf.

2.4 INVESTIGATION OF THE ECOLOGY OF SITE AND SURROUNDINGS - AVIFAUNA

2.4.1 Breeding bird species in the AoI

According to the latest Maltese Breeding Bird Atlas (Ecoserv, in press WBRU 2025), fourteen bird species have been reported breeding within the 1 km x 1 km squares which overlap with the AoI (See Table 1). Two of these species, *Anas platyrhynchos* and *Columba livia f. domestica*, are of feral origin and thus are not considered further in this report. Of the remaining twelve species, five have been recorded breeding in squares within 1 km of the footprint of the proposed development. All five are known to breed within urban environments and can be expected to associate strongly to also breed inside the development footprint.

All these breeding bird species are classified as Least Concern by the IUCN and none show decreasing population trends. None are known to have an unfavourable population trend in Malta and none are believed to reach threshold numbers of significance at the site as

⁷ Gatt & Metzger (accepted paper) At-sea surveys expose pelagic migration of seabirds in the Central Mediterranean. Il-Merill.

compared with the national breeding population numbers. One species - *Calandrella brachydactyla* - is listed in Annex I of the EU Birds Directive. However, this species is present in one square at the border of the AoI and has population strongholds in other areas of the Maltese islands.

Table 1: List of breeding bird species in the AoI

Species	Breeding status at site	Abundance status in Malta	Trend in Malta	Trend in Europe	Annex I (EU Birds Directive)	Within 1km of footprint
Feral Mallard <i>Anas platyrhynchos</i>	Confirmed	Scarce	Unknown	Increasing	No	Yes
Feral Pigeon <i>Columba livia</i> f. <i>domestica</i>	Probable	Frequent	Increasing	Decreasing	No	Yes
Eurasian collared dove <i>Streptopelia decaocto</i>	Probable	Common	Increasing	Increasing	No	No
Common Moorhen <i>Gallinula chloropus</i>	Confirmed	Scarce	Increasing	Stable	No	No
Greater Short-toed Lark <i>Calandrella brachydactyla</i>	Possible	Common	Increasing	Unknown	Yes	No
Zitting Cisticola <i>Cisticola juncidis</i>	Confirmed	Abundant	Increasing	Increasing	No	Yes
Barn Swallow <i>Hirundo rustica</i>	Confirmed	Scarce	Increasing	Decreasing	No	Yes
Cetti's Warbler <i>Cettia cetti</i>	Possible	Common	Stable	Stable	No	No
Sardinian Warbler <i>Curruca melanocephala</i>	Possible	Abundant	Increasing	Increasing	No	Yes
Spectacled Warbler <i>Curruca conspicillata</i>	Probable	Common	Increasing	Stable	No	No
Spotted Flycatcher <i>Muscicapa striata</i>	Confirmed	Scarce	Increasing	Decreasing	No	No
Blue Rock-thrush <i>Monticola solitarius</i>	Probable	Common	Increasing	Unknown	No	Yes

Spanish Sparrow <i>Passer hispaniolensis</i>	Probable	Abundant	Uncertain	Decreasing	No	Yes
Eurasian Tree Sparrow <i>Passer montanus</i>	Confirmed	Common	Increasing	Decreasing	No	No

2.4.2 Non-breeding bird species in the AoI

Annex A provides a complete list of all non-breeding bird species that have been reported or can be expected to occur in the AoI, including their conservation status and details regarding their occurrence. The potential impacts are assessed considering the relevant sensitive avian receptors in this list.

The list comprises 30 non-breeding seabird species *sensu lato*, 81 non-passerine land- and shore-birds, and 80 passerine species. While overall it is unlikely that any of these species occur in the AoI in significant numbers relative to their global population, there are several seabird, wader, and waterbird species of conservation concern that are known to make regular use of the coast adjacent to the footprint of the proposed development and the wider AoI. Of note are

Audouin's Gulls *Larus audouinii* (BD Annex I, Vulnerable) on migration, stopover, and wintering in the adjacent and wider marine AoI, Slender-billed Gull *Larus genei* (BD Annex I, Annex II Bern Convention) wintering and on passage in the adjacent and wider AoI, Mediterranean Gull *Larus melanocephalus* (BD Annex I) wintering and on passage in the adjacent and wider AoI, Black Terns *Chlidonias niger* (BD Annex I, Annex II Bern Convention) on migration and stopover in the wider marine AoI, Dunlin *Calidris alpina* (Annex II Bern Convention, Near Threatened) on passage and stopover on the shore adjacent to the site footprint, and Kentish Plover *Charadrius alexandrinus* (BD Annex I, Annex II Bern Convention) on passage and stopover on the shore adjacent to the site footprint.

In the case of the Black Tern in particular, numbers passing through and stopping over in the AoI could potentially make up a significant proportion of the European breeding population⁸. For many of the other species, the AoI represents one of the most important areas of occurrence in the Maltese Islands during winter or in passage. In the case of wintering species, significant proportions of the local wintering population could be expected to make use of the AoI, while passage waterbirds and waders make regular use of the coastline on passage. Therefore, the below detailed impacts could be expected to affect these avian receptors.

⁸ Gatt & Metzger (accepted paper) At-sea surveys expose pelagic migration of seabirds in the Central Mediterranean. II-Merill.

3 PREDICTION OF POTENTIAL IMPACTS

3.1 CONSTRUCTION PHASE

3.1.1 Temporary disturbance and reduction of habitat in the AoI

The site of the Jerma Hotel Redevelopment will be a source of noise, vibration, dust and direct disturbance during the construction phase. Additionally, the construction site will create light pollution during night-time activities and from security lighting (see below). These factors are expected to negatively affect the avian assemblages in the AoI. Overall, the proposed development will result in the loss of potential breeding habitat for up to five native terrestrial bird species within the footprint of the proposed development.

While the proposed development is not situated inside Natura 2000 sites, the habitats disturbed during the construction phase in the wider area provide nesting territories for additional land birds within the AoI (listed in Table 1). The roads leading to the construction site will experience higher traffic volume of heavy machinery, creating additional disturbance, light and noise pollution, dust, vibration and direct disturbance. Material from demolition, excavation and construction will need to be stored at least temporarily on site, increasing the area of disturbance. Material from demolition of the derelict hotel and from excavation will have to be transported and stored elsewhere, potentially creating additional disturbance and habitat destruction elsewhere, possibly even outside the AoI.

Breeding territories and nest sites of the Sardinian Warbler, Spanish Sparrow, Blue Rock-thrush, Zitting Cisticola, and Barn Swallow will be disturbed or lost during the construction phase as it is inevitable that works are carried out during their breeding seasons (February – August). 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 species in the footprint of the proposed development and its direct vicinity.

Additionally, foraging areas of the above listed breeding species are expected to be reduced temporarily during the construction phase and additional broods in the surroundings of the proposed development may fail if works are carried out during the breeding season (February – August).

Temporary habitat loss and disturbance is expected to result in the reduction and disturbance of foraging, resting and roosting areas for many other bird species that are breeding, wintering, or stopping over in the AoI. As the construction phase is expected to span more than one year, works will impact various shore-, water- and seabird species which currently make use of the rocky promontory and the shallow waters above the reef in the vicinity of the proposed development to rest and forage during migration stopover in both spring and autumn and while wintering in the Maltese Islands.

Overall, the direct impacts during the construction phase of the Jerma redevelopment will act temporarily and mainly on a localised scale in the AoI and, but also along the access roads. The works are therefore expected to be of a **moderate adverse impact** on local

breeders of common species, as well as individuals of non-breeding species stopping over in the AoI, some of which are of conservation concern, at least short-term.

3.1.2 Light pollution during night-time construction (AoI)

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 light pollution in front of their colonies has been recently proven for *P. yelkouan* in Malta¹³. Furthermore, ALAN causes the stranding and grounding of seabird fledglings on their first flight out of the colony. Unless grounded individuals are found and released, they are likely to die¹⁴. In general, light pollution from ALAN is additive and light trespass that creates skyglow adds to light pollution in areas in the AoI (and potentially even beyond) that are otherwise dark. Furthermore, birds attracted to ALAN may be injured or killed by collisions with manmade structures.

While the site of the proposed development is not situated within the immediate line of sight of any seabird nest sites, seabird fledglings are known to strand at light polluted sites across the Maltese Islands¹⁵. This is relevant if night-time construction activities are carried out during the fledging seasons of the sensitive avian receptors. The most sensitive periods for fledging seabirds are during their respective fledging periods: June/July for Yelkouan Shearwaters and September/October for Scopoli's Shearwaters. Mediterranean Storm-petrels have an asynchronous breeding season, with fledglings expected between June and October.

Due to the exposed location of the proposed development at the easternmost promontory of the Maltese Islands and its direct line of sight with marine SPAs of importance to procellariiform seabirds, the temporary negative impact of ALAN during construction, if not mitigated, will potentially act on significant numbers of all breeding seabird species (Scopoli's Shearwater, Yelkouan Shearwater and European Storm-petrel). Such impacts are expected to be of **major adverse impact**.

Additionally, ALAN is known to have negative consequences on nocturnally migrating birds. Bright lights are known to attract, disorient, trap and ground birds in active migration during the night¹⁶. The lit-up construction site during night-time operation is highly likely to have the above-mentioned impacts on nocturnally migrating birds passing within the AoI. This is

¹³ 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>

¹⁴ 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>

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

¹⁶ 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).

especially problematic for shore- and waterbirds using the coastline along the promontory as a guidance line, and species which may be making use of protected sites and rare habitats within the AoI and within direct line of sight (e.g. wetlands and other terrestrial SPAs listed above). Moreover, due to the varied phenology of the species involved, sensitive periods to migrating land-, shore- and waterbirds are spread across the year. Therefore ALAN is expected to have an overall **moderate impact** on nocturnally migrating birds.

3.1.3 Pollution during the construction phase (including demolition)

The demolition of the derelict Jerma hotel is expected to create substantial amounts of dust and waste. If this waste is not contained appropriately and spills into the environment it can be expected to have a negative impact on sensitive receptors, including birds.

Likewise, the construction of the proposed development will produce large amounts of waste material from the excavation, packaging material (plastic sheets, Styrofoam, etc.), the netting of the scaffolding etc.

Situated on a headland, the area of the proposed development is very exposed and can experience strong winds and high waves under certain meteorological conditions. This is expected to elevate the risk that waste material, such as harmful dust, micro- and macroplastics, will end up in the marine environment, including protected Natura 2000 sites in the AoI and potentially beyond. Such unintended spills can have significant detrimental effects on sensitive receptors including marine and coastal avifauna, if left unmitigated. Once released into the environment, plastic fragments persist, with their physical breakdown into smaller fragments actually facilitating their take-up by living creatures. They are also known to absorb toxins and harmful chemicals such as persistent organic pollutants (POPs), increasing further their potential negative impact on sensitive receptors when ingested and when accumulating along the food chain. Bioaccumulation and biomagnification are particularly problematic phenomena for seabirds which are long-lived organisms on top of marine food webs. The increased contamination of the marine SPAs within the AoI is of concern due to their importance for foraging seabirds, including SPA trigger species and species of conservation concern.

3.2 OPERATIONAL PHASE

3.2.1 Permanent loss of habitat

Overall, the proposed development will potentially result in the permanent loss of habitat for up to five terrestrial breeding bird species within the footprint of the proposed development. Once the Jerma Hotel redevelopment is finalized, the area will experience much higher vehicular traffic and more people frequenting the site. The site is expected to have permanent high elevated levels of disturbance and noise pollution during standard operations as compared to the site's state today. Events such as private and commercial functions will create additional peaks in traffic, disturbance and noise pollution. Of the five potential terrestrial breeding bird species in the development footprint, the Spanish Sparrow, Sardinian Warbler, Blue Rock-thrush, and Barn Swallow are not particularly sensitive to human disturbance and three of them make use of human-made structures as

nest sites (i.e. build nests in ventilator shafts or other crevices in stonework, or build nest cups against walls/under balconies). The Sardinian Warbler readily nests in shrubs and trees in gardens, parks and alike. Therefore, the extent of permanent habitat loss will depend on the provision of undisturbed nest sites within the operational development and landscaping of the unbuilt areas, roofs, etc. for the nesting and foraging opportunities. The Zitting Cisticola, which nests in grasses, is expected to experience a permanent loss of habitat as a result of the proposed project, such habitat loss impact is expected to be of **moderate adversity**.

Bird species which are stopping over during migration or wintering in the area will also be impacted by direct habitat loss within the footprint of the proposed development and its close vicinity in the AoI. While a large proportion of the proposed footprint is currently built up, the low level of human disturbance due to the site's current derelict status means that both artificial land cover and the adjacent natural coastline and marine areas are hospitable for passage or wintering species, some of which are sensitive receptors of conservation concern. As a result, the redevelopment of the site and the level of activity associated with the proposed mixed-use commercial development will result in the degradation and/or loss of habitat to species listed in Annex A, and in particular the six non-breeding shore- and seabird species listed above. Therefore, the expected loss of nesting and foraging habitat is expected to be of **moderate to major adverse impact** on terrestrial avifauna.

3.2.2 Pollution and disturbance

The operation of the Jerma development, with two underground stories of carpark, 90 hotel rooms and 342 serviced apartments, 146 residential units, as well as the commercial outlets is expected to increase vehicular traffic and human pressure at site and in the wider area drastically. This is expected to permanently and significantly increase the noise pollution but also the air pollution from vehicular combustion engines and tyre abrasion in the area, both with negative impact on avifauna. Direct disturbance from increased human activities in the AoI, including the introduction of domestic animals such as cats and dogs, is expected to have a significant negative impact on sensitive receptors feeding and resting in the area during stopover on migration and when wintering, including the rocky shores. It is also expected to increase the pressure on sensitive receptors in the wider AoI including the relevant terrestrial protected areas due to increased activity originating from this site (e.g. excursions, quad bike and other vehicular tours), as well as in the wider marine environment, including inside the relevant marine SPAs due to the expected increase in maritime activities (e.g. leisure crafts, dive boats, boat parties, jet skis, craft rental etc.). Therefore, such aforementioned human disturbances are expected to have a **moderate to major adverse impact** on avian assemblages.

Situated on a headland, the area of the proposed development is very exposed and can experience strong winds and high waves under certain meteorological conditions. This is expected to elevate the risk that waste material resulting from increased human activities will end up in the marine environment, including protected Natura 2000 sites in the AoI (and potentially beyond). Such unintended spills can have significant detrimental effects on sensitive receptors including marine and coastal avifauna, if left unmitigated. Once released into the environment, plastic fragments persist, with their physical breakdown into smaller

fragments actually facilitating their take-up by living organisms. They are also known to absorb toxins and harmful chemicals such as persistent organic pollutants (POPs), increasing further their potential negative impact on sensitive receptors when ingested and when accumulating along the food chain. Bioaccumulation and biomagnification are particularly problematic phenomena for seabirds which are mostly long-lived organisms on top of marine food webs. The increased contamination of the marine SPAs within the AoI is of concern due to their importance for foraging seabirds, including SPA trigger species and species of conservation concern. Overall, the impacts of the exposure of harmful pollutants on avifauna is expected to be **moderate adverse**.

3.2.3 Permanent light pollution

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 light pollution in front of their colonies has been recently proven for *P. yelkouan* in Malta¹⁷. Furthermore, ALAN causes the stranding and grounding of seabird fledglings on their first flight out of the colony. Unless grounded individuals are found and released, they are likely to die¹⁸. In general, light pollution from ALAN is additive and light trespass that creates skyglow adds to light pollution in areas in the AoI (and potentially even beyond) that are otherwise dark. Furthermore, birds attracted to ALAN may be injured or killed by collisions with manmade structures.

While the site of the proposed development is not situated within the immediate line of sight of any seabird nest sites, seabird fledglings are known to strand at light polluted sites across the Maltese Islands¹⁹. The derelict hotel at the site of the proposed development is currently dark and is shielding light from the built-up and urbanized area of Marsaskala from spilling out to the shoreline of the promontory and the surrounding sea, keeping the area relatively darker at night. Therefore, so far no seabird fledglings have been reported being grounded due to ALAN in this area.

The proposed development is situated at an exposed location, the easternmost promontory of the Maltese Islands. The two main blocks of the developments tower to a significant height of eight stories and are characterized by wide fronts each facing one of the sea fronts of the promontory. This is expected to lead to a significant light spill far out into the marine environment, including relevant marine SPAs, which are in its direct line of sight. This can be expected to lead to a significant number of seabird groundings in the area. Thus, the expected **major adverse impact** of ALAN during operation is expected to act permanently

¹⁷ 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>

¹⁸ 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>

¹⁹ Crymble et al. (2020): Identifying light-induced grounding hotspots for Maltese seabirds. *Il-Merill* 34, 23-43.

on a significant number of all breeding seabird species (Scopoli's Shearwater, Yelkouan Shearwater and European Storm-petrel), if not adequately mitigated.

Additionally, ALAN is known to have negative consequences on nocturnally migrating birds in general. Bright lights are known to attract, disorient, trap and ground birds in active migration during the night²⁰. ALAN from light spill during operation will act permanently and significantly on sensitive receptors passing through the AoI at night during their annual migration periods if no adequate mitigation measures are in place. This is especially problematic for waders and waterbirds using the coastline along the promontory as a guidance line, and species which may be making use of protected sites and rare habitats within the AoI and within direct line of sight (e.g. wetlands and other terrestrial SPAs listed above). Due to the varied phenology of the species involved, sensitive periods to migrating land-, shore- and waterbirds are spread year round. Therefore, the overall impact of ALAN on nocturnally migrating birds is expected to be **moderate adverse** during the operational phase.

3.2.4 Urban heat island effect

The increase in concreted and asphalted areas is expected to raise the ambient temperature in and around the footprint of the proposed development significantly. This increase in ambient air temperature, known as the urban heat island effect, will be additive to the temperature rise in the area caused by the large number of air conditioning systems of all the hotel rooms, serviced apartment and residential units, etc. If not mitigated, the rise in ambient air temperature is expected to have a **moderate to major adverse impact** on the local microclimate, detrimental to the avifauna community in the AoI.

3.2.5 Cumulative effects of overdevelopment, mass tourism, climate change

Malta is currently by far the most densely populated and built up country in Europe. Additional to the growth of its permanent population, the unsustainable increase in tourist numbers puts severe direct stress on the country's natural habitats and resources, as well as on its infrastructure, such as landfills, waste management, and wastewater treatment plants, resulting in failures of mitigation measures against spills into the natural environment. These pressures act on open, undisturbed terrestrial areas, groundwater supply, but also unpolluted and undisturbed marine habitats. Malta is also characterized by an ongoing construction boom, including large-scale and high-rising development projects, still using widely unsustainable designs, materials and building practices, cumulatively contributing to the negative impacts of habitat loss and climate change.

The increasing construction of higher buildings along most of Malta's low lying eastern shorelines, including Buggibba, Qawra, Pembroke, St Julians, Tigne, Xgħajra etc. is continuously reducing available habitat for sensitive avian receptors that require undisturbed and unobstructed coastal areas.

²⁰ 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 effects of climate change, such as sea level rise, increasing average ambient temperatures and marine heat waves, increasing drought stress, etc. are further exacerbating the pressures on the environment, with indirect, permanent, and adverse long-term negative effects on local avian biodiversity²¹. Increased storm frequencies and amplitudes caused by climate change are further threatening avian biodiversity at land at sea. Furthermore, sea level rise paired with an increase in severe storms is expected to increase the erosion and destruction of Maltese coastlines and coastal habitats. It can also lead to potential destruction of coastal developments and flooding of underground car parks next to the sea. This in turn will further increase the risks of debris and problematic material ending up in the marine environment, where it will be detrimental to sensitive avian receptors. Apart from the direct contributions that increasing urbanisation has on climate change impacts, these developments also work counter to adaptation and mitigation measures necessary.

Moreover, the proposed development can be expected to result in knock-on effects on the adjacent areas, increasing the extent of large, commercial projects, human activity, infrastructural improvements to cater for increased use and associated impacts leading to increased cumulative effects of habitat degradation and loss.

Overall, the cumulative effect of overdevelopment, mass tourism and climate change is expected to have a **moderate to high adverse impact** on both the environment including avian receptors.

3.3 DECOMMISSIONING PHASE

Comparable impacts as listed in the construction phase will apply to the decommissioning phase.

²¹ BirdLife International. (2018). *State of the world's birds: taking the pulse of the planet*. BirdLife International.

4 PROPOSED MITIGATION MEASURES

4.1 MITIGATION DURING THE CONSTRUCTION PHASE

To mitigate the impact of the proposed development during the construction phase, including the demolition of current structures, on local breeding birds, it is recommended that the demolition takes place outside the breeding seasons of the relevant terrestrial avian receptors (February - August). This will ensure that no active nests will be destroyed within the footprint of the proposed development.

To reduce the impacts of noise, vibration, dust and direct disturbance, it is highly recommended that physical barriers are erected around the footprint of the proposed development to mitigate its impact on sensitive avian receptors in the AoI. Such a physical barrier is expected to also prevent some of the ALAN spilling into the AoI and can potentially keep debris and building material from being washed or blown into the marine environment.

All material from demolition, excavation and construction would need to be processed, transported, stored and disposed of or recycled according to the highest standards in order to mitigate any potential negative impact of such material on the avian receptors, including that from spillover into the marine environment.

The construction period is to be kept as short as possible in order to reduce the disturbance of the avian community in the AoI during construction.

Night time construction is to be avoided in order to mitigate the potential impact of ALAN during this period. This is especially important if the construction phase coincides with any of the fledging periods of sensitive receptors, in this case procellariiform seabirds nesting in the Maltese islands. Any required lighting during the construction phase would need to follow the Guidelines for the Reduction of Light Pollution in the Maltese Islands (2020) published by ERA/PA, in order to further mitigate potential impacts of ALAN on sensitive avian receptors in the AoI: The extent of lighting should be reduced, not be directed towards the sea, upwards towards the sky, or onto adjacent peripheral habitat, and avoiding the use of bright “cold” white lights in favour of warm light (< 3000 K). In the event that bright lights at night must be used, it is recommended to avoid the most sensitive periods for seabirds, which would experience the most significant impact from such disturbance. In addition, staff and management should be appropriately informed on procedures for the rescue of grounded seabirds.

Apart from a physical barrier around the proposed development during construction, it is crucial that highest standards are implemented at site to avoid any accidental spillage of construction waste, insulation material, paint, packaging etc. into the environment. As the site is known to be exposed in rough weather, it is very important that e.g. netting of scaffolding, plastic sheets etc. are carefully secured at all times. All waste material would need to be removed from site asap and disposed of adequately. Any leaking of any substances hazardous to sensitive avian receptors into the marine environment has to be avoided at all costs.

4.2 MITIGATION DURING THE OPERATIONAL PHASE

To mitigate the permanent loss of habitat for up to five terrestrial breeding bird species within the footprint of the proposed development, it is highly recommended to implement landscaping measures (i.e. appropriate flora, ideally indigenous species) and architectural features that provide suitable nest sites (potentially also nest boxes if ventilator shafts are sealed), foraging areas and roosting habitat for all species. Such landscaping measures can also mitigate the impact on sensitive receptors that are not breeding in the area, but stopping over during migration or wintering.

To mitigate the impact of increased vehicular traffic on sensitive receptors in the AoI, it is highly recommended to reduce the amount of parking spaces of the proposed development and take other measures that disincentivize car use in the area and, instead, incentivize other means of mobility, such as electric shuttle buses, cycle lanes, pedestrianized roads etc.

To mitigate the permanent and significant increase in disturbance and noise from heavily increased human density and activities in the area, it is highly recommended to create buffer zones and closed off areas along the shore that are out of bounds for people. This will allow sensitive receptors such as shore- and waterbirds resting and foraging in the area on migration or when wintering to continue using the area and to find undisturbed habitat pockets. It is important that such areas are sheltered from human activities with buffer zones from both the land and the sea sides. It is also important that such areas effectively exclude domestic animals, such as cats and dogs. Any activities creating excessive noise levels in the area, such as boat parties, speed boat, jet ski and quad bike rentals, loud music from bars or lido clubs, festivals, fireworks etc. would need to be avoided to mitigate the expected permanent and significant impact of noise disturbance on sensitive receptors in the AoI.

Activities making use of bright lights would need to be avoided in order to mitigate the potential impact of ALAN on sensitive receptors in the AoI. This is especially important for times of the year that coincide with the fledging periods of procellariiform seabirds nesting in the Maltese Islands. Any lighting of the proposed development would need to strictly follow the GUIDELINES FOR THE REDUCTION OF LIGHT POLLUTION IN THE MALTESE ISLANDS (2020) published by ERA/PA, in order to further mitigate potential impacts of ALAN on sensitive avian receptors in the AoI. In particular, care would have to be taken in all lighting design to avoid light spilling into the marine environment, which includes relevant Natura 2000 sites in the AoI within line of sight of the proposed development. In addition, staff and management should be appropriately informed on procedures for the rescue of grounded seabirds.

To mitigate the impact of the proposed development on the ambient temperature and to reduce the urban heat island effect, it is highly recommended to reduce the overall volume of the project, the number of airconditioning units, reduce sealed surface areas exposed to the sun, and seek alternative building materials that have a lower climate impact. Effective landscaping with green open areas, green roofs and green walls as well as large evergreen trees are proposed as potentially suitable measures.

5 RESIDUAL IMPACTS

Minor adverse and/or negligible residual impacts are expected with respect to the local terrestrial breeding bird population in the AoI during the construction phase. While these widely temporary impacts are expected to be significant within the footprint of the proposed development and its direct vicinity, it will likely not have significant residual impacts on the overall breeding populations of avian receptors in the AoI, as long as the relevant mitigation measures as outlined above are carefully implemented.

The scale and significance of the permanent residual impact from noise and all other forms of human disturbance, including light pollution, on avian receptors in the AoI during the operational phase will widely depend on how strictly the relevant mitigation measures will be implemented. Various sensitive, long-lived species are attracted to the promontory and adjacent waters for foraging, on passage (bottleneck situation) and on stopover (e.g. *Charadrius alexandrinus*, *Larus audouinii*, *Chlidonias niger*, nocturnal migrants etc.). These will be at highest risk to encounter significant residual impacts in the long term. Such impacts are expected to remain of moderate adversity after mitigation measures are adopted.

Potentially significant numbers of procellariiform seabird fledglings will be at risk of grounding from light pollution caused by the proposed development. Whether or not this residual impact will be significant depends on the strict implementation of mitigation measures. However, it is unlikely that the project and associated infrastructure catering for increased activity in the area would not contribute to increased skyglow, especially given the exposed nature of the proposed project and its direct line of sight to relevant marine SPAs and therefore minor to moderate adverse residual impacts are expected. Therefore, funding should be made available for monitoring and rescue efforts within the AoI by the relevant entities.

The residual impact caused by harmful substances such as micro- and macroplastics ending up in the environment will be of minor adverse impact if mitigation measures are adequately implemented. However, as many of such substances can remain in the marine environment for extended periods and are accumulating along the food chains, their impact is expected to remain of minor adversity to avian receptors, especially seabirds at the top of marine food webs long-term.

Residual cumulative impacts from non-sustainable development in the Maltese islands and specifically along the eastern shoreline, of which the proposed development forms part, will potentially remain significant on avian receptors in the long-term. Such impacts also include those caused by climate change and the urban heat island effect. As long as developments are not climate neutral and do not make use of truly sustainable designs and materials and procedures and as long as the population numbers and tourist arrivals grow further alongside non-sustainably, residual cumulative impacts on avian receptors are expected to be of minor to moderate impact. In this case, compensatory measures would need to be considered.

6 SUMMARY OF IMPACTS

Impact type and source			Impact receptor		Effect & 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 toward impact	Direct/ Indirect / Cumulative	Beneficial/ Adverse	Severity	Physical/ geographic extent of impact	Short-/ Medium-/ Long-term	Temporary/ Permanent	Reversible/ Irreversible					
Disturbance to terrestrial avian breeding species, including loss of nesting/foraging habitat	Demolition, construction, and transportation of materials in a wider area	Construction, Decommissioning	Terrestrial avian species	High & Low	Direct	Adverse	Low	Local in footprint and Aol	Short-term	Temporary	Reversible	Inevitable	Moderate	Keep time short, retain all works, machinery, materials and waste within the site footprint, avoid reproductive season for demolition, habitat restoration	Minor	N/A
Loss of nesting/foraging habitat to terrestrial avian species	Operation of proposed development	Operation	Terrestrial avian species	High & Low	Direct	Adverse	Low	Local in footprint and Aol	Long-term	Permanent	Reversible	Inevitable	Moderate	Landscaping measures and architectural features that provide nesting/foraging/roosting habitat	Minor	N/A
Loss of roosting and foraging habitat for avian assemblages	Direct human disturbance, noise and light pollution	Operation, decommissioning	All avian species making use of the Aol, including wintering and passage populations of conservation concern	High & Moderate	Direct	Adverse	Moderate to High	Local in footprint and Aol	Long-term	Permanent	Reversible	Inevitable	Moderate to Major	Install containment barriers during construction/decommissioning, reduce nighttime activities, create buffer zones along the shore, avoid activities that produce excessive noise and light pollution, follow guidelines on avoidance of light pollution	Moderate	N/A
Grounding of seabird fledglings, associated induced mortality caused by ALAN	ALAN	Construction, operation, decommissioning	Breeding procellariiform seabirds	High & Low	Direct	Adverse	High	Broad	Long-term	Permanent	Reversible	High	Major	Limit night-time activities, reduce light pollution in accordance with published guidelines, avoid sensitive period	Minor to Moderate	Funding the monitoring and rescue of seabird grounding in the Aol.

ALAN negatively impacting nocturnally migrating birds	ALAN	Construciton, operation, decommissioning	Nocturnally migrating birds	Moderate & Moderate	Direct	Adverse	Low	Broad)	Long - term	Permanent	Reversible	High	Moderate	Limit night-time activities, reduce light pollution in accordance with published guidelines, avoid sensitive periods	Minor	N/A
Exposure of avifauna to harmful substances, reducing life expectancy, physiological health state, reproductive success	Pollution and spillage of material during construction, operation, decommissioning	Construction, operation, decommissioning	Avian species	Moderate & Low	Direct	Adverse	High	Broad (Aol and beyond)	Long-term	Permanent	Irreversible	High	Moderate	Infrastructure and procedures to minimise and address pollution events	Minor	N/A
Cumulative effects impacting biodiversity, including overall habitat destruction and climate change	Cumulative habitat degradation and loss along eastern shore, urban heat-island effect	Operation	Biotic and abiotic environment	Moderate & Low	Indirect/ Cumulative	Adverse	Moderate	Very broad	Long-term	Permanent	Reversible with difficulty	Inevitable	Moderate to Major	Take holistic approach to planning, reduce footprint, floor area and parking, shift to climate neutral or positive design, construction and operation, implement adequate landscaping	Minor to moderate	Consider alternative solutions for area

ANNEX A: LIST OF BIRD SPECIES IN THE AOI

The following species are expected to make use of the AoI including Natura 2000 sites, identified as a 5km buffer area around the planned Jerma Hotel redevelopment:

Seabirds *sensu lato*

Ferruginous Duck *Aythya nyroca* – Near Threatened, Annex I, population trend decreasing. A significant proportion of the European Ferruginous Duck population and more than 1% of the global population might funnel through Gozo Channel annually, mainly during spring passage. However, dependent on the weather conditions, a proportion of birds can be expected to also pass through the AoI, including the SPAs MT0000108 and MT0000111. No significant numbers of the species have been recorded resting or stopping over in the AoI.

Greater Flamingo *Phoenicopterus roseus* – Least Concern, Annex I, overall population trend increasing. Flamingos migrate through the Maltese Islands, including the mSPAs MT0000108 and MT0000111 annually often gathering in larger flocks. In recent years they have been recorded in increasing numbers, mainly in autumn. They are expected to pass through the AoI regularly on migration, but it is unlikely that this happens in significant numbers.

Slender-billed Gull *Larus genei* – Least Concern, Annex I, European population size 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 and have recently been recorded wintering in small, but increasing, numbers. Slender-billed Gulls are considered a coastal species. The species can be expected to occur regularly in the AoI, including foraging in good numbers at the sewage outflow in front of the WWTP at Ix-Xghajra and can be expected foraging, roosting and passing over the marine part of the AoI, including the SPAs MT0000108 and MT0000111 and aquaculture facilities. It is very unlikely that numbers in the areas reach significant levels from a global or European population perspective at any point.

Mediterranean Gull *Larus melanocephalus* – Least Concern, Annex I, European population trend decreasing. In the Maltese islands the species is mainly recorded from October to April with larger numbers reported in the period from November to March. Regularly makes use of the marine part of the AoI, including the SPAs MT0000108 and MT0000111, both during passage on migration and wintering, foraging and resting there. Often strongly associated with the WWTP outlet at ta' Barkat limits of Xghajra and also with the aquaculture facilities in the AoI. It is not expected that Mediterranean Gulls reach relevant numbers in the AoI as compared with the European population which is equivalent to the global population.

Audouin's Gull *Larus audouinii* – Vulnerable, Annex I, European breeding population is rapidly decreasing following the collapse of the largest breeding colony. Audouin's Gulls are mainly found in marine habitats year-round, very frequently following trawlers to feed on 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, but local sightings have been

increasing; From 2000 to 2009 there were 311 records of 535 individuals, with a maximum of 184 sightings in 2007. During stopover on migration the species can be expected regularly in the marine part of the AoI, foraging roosting, passing through the area, including the marine SPAs MT0000108 and MT0000111 and the aquaculture facilities. The small local wintering population is known to make use of the AoI. While it is unlikely that numbers reach significant levels from a global or European population perspective at any point, they may represent a significant proportion of the local non-breeding populations.

Little Tern *Sternula albifrons* – Least Concern, Annex I, 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, including the marine part of the AoI. It is highly unlikely that significant numbers regarding the global, European or EU population are reached inside the AoI at any time.

Common Gull-billed Tern *Gelochelidon nilotica* – Least Concern, Annex I, 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. Gull-billed terns have been reported to occur in the AOI, including the relevant marine SPAs 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, the global as well as the European population trends of this species are increasing. It is recorded in Malta annually in double digit numbers on migration, both in spring and autumn. Caspian Terns have been recorded to occur in the AoI, including the relevant marine SPAs MT0000112 annually during passage on migration and that they make use of it as foraging area, plunge-diving for fish while feeding on the wing. 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, the global population trend of the species is declining, while the European population trend is unknown. Black terns occur in Maltese waters annually and in large numbers mainly during autumn migration, peaking in the second half of August to the beginning of September with few scattered records from 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 FADs 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 at the end of August, numbers of up to 2000 individuals were counted during a single trip inside the SPA MT10000108. On migration, Black Terns are reported to pass through the AoI

and use it to forage and rest during migration and stop-over. It is possible that significant threshold values are reached in the AoI as compared to the global, European and EU populations.

Sandwich Tern *Thalasseus sandvicensis* - Least Concern, Annex I, 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. Sandwich Terns occur in the marine part of the AoI, including the SPAs MT0000108 and MT0000111 annually during passage on migration and make use of it as foraging area. It is unlikely that significant numbers regarding the global European or EU population are reached inside the AoI at any time.

Red-breasted Merganser *Mergus serrator* - Least Concern, passes through the marine part of the AoI, including within SPA MT0000108 in small numbers on migration; also observed in singles on stopover for resting and foraging in the shallow coastal waters next to the proposed development.

Common Shelduck *Tadorna tadorna* - Least Concern, recorded regularly in small numbers from the AoI, mainly on passage, including in the SPA MT0000108.

Garganey *Spatula querquedula* - Least Concern, recorded as a regular passage migrant over the Maltese Islands and the FMZ, expected also to occur in the AoI, including the SPAs MT0000108 and MT0000111.

Northern Shoveler *Spatula clypeata* - Least Concern, expected regular passage migrant in the AoI, including the SPAs MT0000108 and MT0000111.

Mallard *Anas platyrhynchos* - Least Concern, feral individuals recorded from SAC MT0000023, including reproduction.

Pintail *Anas acuta* - Least Concern, expected regular passage migrant in the AoI, including the relevant SPAs.

Common Teal *Anas crecca* - Least Concern, expected regular passage migrant in the AoI, including the relevant SPAs.

Little Grebe *Tachybaptus ruficollis* - Least Concern, regular winter visitor to the Maltese islands, expected to make use of the AoI, including the relevant SPAs and SACs.

Great-crested Grebe *Podiceps cristatus* - Least Concern, winter visitor and passage migrant, recorded from the AoI on passage, expected to make use of the relevant SPAs.

Black-necked Grebe *Podiceps nigricollis* - Least Concern, regular winter visitor and passage migrant in Malta, including in the AoI and its marine SPAs and wetland SACs.

Common Moorhen *Gallinula chloropus* - Least Concern, year-round, recent breeding records from inside the AoI.

Northern Gannet *Morus bassanus* – Least Concern, regularly reported to pass through, rest and forage in the marine part of the AoI in small numbers, including the SPAs MT0000108 and MT0000111, mainly during the winter months.

Great Cormorant *Phalacrocorax carbo* – Least Concern, recorded regularly and in increasing numbers wintering in the Maltese islands, observed foraging and resting in sizeable flocks in the marine part of the AoI including the relevant SPAs MT0000108 and MT0000111 reserves. Often associated with the aquaculture facilities in the AoI.

Little Gull *Hydrocoloeus minutus* – Least Concern, expected to be regularly passing through, foraging and resting in the marine part of the AoI during migration and when wintering including the SPAs MT0000108 and MT0000111.

Black-headed Gull *Chroicocephalus ridibundus* – Least Concern, large numbers migrate through the Maltese islands and spend the winter here. Sizeable flocks can be seen passing through and foraging and roosting in the AoI including in the SPAs MT0000108 and MT0000111. Often strongly associated with the WWTP outlet at ta' Barkat limits of Xghajra and to some extent also with the aquaculture facilities in the AoI.

Lesser Black-backed Gull *Larus fuscus* – Least Concern, regular on migration and to some extent wintering in smaller numbers, making use of the AoI for foraging and roosting, including the SPAs MT0000108 and MT0000111. Regularly associated with the aquaculture facilities in the AoI.

Long-tailed Skua *Stercorarius longicaudus* – Least Concern, expected to pass through the marine part of the AoI including relevant mSPAs on migration in small numbers.

Arctic Skua *Stercorarius parasiticus* – Least Concern expected to pass through the marine part of the AoI including relevant mSPAs on migration in small numbers.

Pomarine Skua *Stercorarius pomarinus* – Least Concern expected to pass through the marine part of the AoI including relevant mSPAs on migration in small numbers.

Great Skua *Catharacta skua* – Least Concern expected to make use of marine parts of the AoI, including relevant mSPAs in small numbers on migration and when wintering.

Land-birds (Non-passeriformes)

Common quail *Coturnix coturnix* – Least Concern, declining, irregular breeder, common passage migrant (nocturnal), winters in small numbers, expected to occur regularly in the AoI, mainly on stopover during migration.

European Turtledove *Streptopelia turtur* – Vulnerable, strongly declining, would breed regularly if spring hunting was abolished, regular passage migrant in declining numbers, more commonly seen in spring; can be expected stopping over in the terrestrial part of the AoI regularly in small numbers.

Collared Dove *Streptopelia decaocto* – Least Concern, trend increasing. Reported to be possibly breeding bird in the AoI.

European Nightjar *Caprimulgus europaeus* – Least Concern, common on passage in spring and autumn, can be expected to pass regularly through the AoI on migration and make use of its terrestrial parts, including the Natura 2000 sites 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 AoI.

Pallid Swift *Apus pallidus* – 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 AoI, including all relevant Natura 2000 sites.

Common Swift *Apus apus* – Least Concern, common on migration in spring and autumn, small but increasing breeding population. Has been recorded to make regular use of the airspace of the AoI including all relevant Natura 2000 sites.

Common Cuckoo *Cuculus canorus* – Least Concern, fairly common on spring migration, less common during autumn, single breeding records in Malta. Expected to occur regularly in the AoI during migration and stopping over in the terrestrial part of it, including in the relevant Natura 2000 sites.

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. Expected to make use of the protected wetlands in the AoI (MT0000014, MT0000023) in small numbers on stopover and potentially also wintering.

Spotted Crake *Porzana porzana* – Least Concern, Annex I, small numbers in spring and autumn on migration. Expected to make use of the protected wetlands in the AoI (MT0000014, MT0000023) in small numbers on stopover.

Common Crane *Grus grus* – Least Concern, Annex I, population trend increasing, recorded annually on migration in small flocks, potentially passing through the AoI.

Black Stork *Ciconia nigra* – Least Concern, Annex I, European population increasing, in Malta annually in small numbers during migration, mainly in autumn.

White Stork *Ciconia ciconia* – Least Concern, Annex I, population increasing, in Malta annually in small numbers on migration mainly autumn, to less extend in spring. White Storks have been recorded in the AoI.

Eurasian Spoonbill *Platalea leucorodia* – Least Concern, Annex I, trend increasing, in Malta mainly on passage in spring and autumn. Expected to be regularly migrating through the AoI, including the relevant Natura 2000 sites.

Glossy Ibis *Plegadis falcinellus* - Least Concern, Annex I, European population increasing, in Malta recorded annually on migration. Expected to be regularly passing through the AoI, including relevant Natura 2000 sites.

Common Little Bittern *Ixobrychus minutus* - Least Concern, Annex I, European population stable, irregularly breeding in Malta, recorded annually in small numbers on migration. Expected to regularly migrate through the AoI (at night) and to stop over in the protected wetlands in the AoI (MT0000014, MT0000023) in small numbers.

Black-crowned Night Heron *Nycticorax Nycticorax* - Least Concern, Annex I, decreasing in Europe, frequently migrating over Malta, can be expected to migrate regularly through the AoI, including the relevant Natura 2000 sites.

Squacco Heron *Ardeola ralloides* - Least Concern, Annex I, European population considered stable, passing through Malta in small numbers on migration annually. Can be expected to migrate through the AoI occasionally, including the Natura 2000 sites. Can be also expected to be stopping over on the headland in front of the planned development as well as in the protected wetlands in the AoI (MT0000014, MT0000023).

Grey Heron *Ardea cinerea* - Least Concern, regular visitor to the Maltese islands year-round but higher numbers during migration. Has been reported to migrate regularly through the AoI in good numbers, including all relevant Natura 2000 sites. Is also expected to be stopping over on the headland in front of the planned development, as well as in the protected wetlands in the AoI (MT0000014, MT0000023).

Purple Heron *Ardea purpurea* - Least Concern, Annex I, European population decreasing, passing through the Maltese Islands annually during migration in good numbers. Can be expected to pass through the AoI on migration regularly, including through all relevant Natura 2000 sites and occasionally stopping over in the protected wetlands (MT0000014, MT0000023).

Great White Egret *Casmerodius alba* - Least Concern, Annex I, recorded annually on passage in small numbers. Can be expected to pass through the AoI occasionally on migration, including the relevant Natura 2000 site.

Little Egret *Egretta garzetta* - Least Concern, Annex I, fairly common passage migrant in spring and autumn, few individuals year-round, recently established small breeding population, at least partially founded by escapes. Recorded regularly from the AoI, including the relevant Natura 2000 sites.

Cattle Egret *Bubulcus ibis* - Least Concern, Annex I, fairly common passage migrant in spring and autumn, some individuals year-round, established a small breeding population, at least partially founded by escapes. Recorded regularly in the AoI, including in the relevant Natura2000 sites.

Stone Curlew / Eurasian Thick-knee *Burhinus oedicnemus* - Least Concern, Annex I, recorded in Malta regularly in small numbers on migration in spring and autumn. Expected to be passing through the AoI in low numbers, mainly during the night.

Oystercatcher *Haematopus ostralegus* – Near threatened, population declines across Europe, recorded in Malta annually in small numbers. Expected to be regularly passing through and resting/ foraging in the AoI in small numbers, including passing through relevant Natura 2000 sites.

Pied Avocet *Recurvirostra avosetta* – Least Concern, Annex I, recorded in Malta annually in small numbers mainly during autumn migration. Expected to be passing through the AoI on migration.

Black-winged Stilt *Himantopus himantopus* – Least Concern, Annex I, frequent spring migrant and scarce breeder of up to 3 pairs in the Maltese Islands. Can be expected to regularly pass through the AoI, as well as resting and foraging along the rocky shores inside the AoI next to the planned development and in the brackish lagoons of the relevant Natura 2000 sites (MT0000014, MT0000023).

Grey Plover *Pluvialis squatarola* – Least Concern, in Malta recorded annually in small numbers during spring and autumn migration, including migrating through and stopping over in the AoI.

Eurasian Golden Plover *Pluvialis apricaria* – Least Concern, Annex I, population trend increasing. Common in Malta during winter months, both on migration and wintering. Has been reported migrating through and/or stopping over in the AoI, including relevant Natura 2000 sites.

Eurasian Dotterel *Charadrius morinellus* – Least Concern, Annex I, in Malta annually in small numbers during migration, expected to be migrating through and potentially stopping over in the AoI.

Common Ringed Plover *Charadrius hiaticula* – Least Concern, decreasing on EU and global level, fairly common passage migrant in spring and autumn. Recorded from AoI. Expected to be regularly foraging and resting in the headland next to the proposed development and passing through and stopping over in the relevant Natura 2000 sites.

Little Ringed Plover *Charadrius dubius* – Least Concern, population decreasing, common passage migrant in spring and autumn, breeding annually in few pairs. Recorded regularly inside the AoI on migration, including relevant Natura 2000 sites.

Kentish Plover *Charadrius alexandrinus* – Least Concern, Annex I, population decreasing, regular passage migrant in small numbers in spring and autumn. The Jerma headland inside the AoI, in direct vicinity to the planned development, is the site in the Maltese Islands where most individuals are seen. Expected to regularly pass through the AoI on migration, including relevant Natura 2000 sites.

Northern Lapwing *Vanellus vanellus* – Near Threatened, overall declining population trend, recorded regularly in Malta during the winter months in small flocks; regular passage migrant in small numbers in spring and autumn. Expected passing through the AoI, including relevant Natura 2000 sites on migration.

Whimbrel *Numenius phaeopus* – Least Concern, recorded annually in small numbers in spring and autumn during migration. Expected to occur in the AoI regularly, foraging/roosting on the rocky shore and migrating through the area at night, including the relevant Natura 2000 sites.

Eurasian Curlew *Numenius arquata* – Near Threatened, global population trend decreasing, passing regularly through Malta during spring and autumn. Expected to occur in the AoI in small numbers and irregularly, foraging/roosting on the rocky shore and migrating through the area at night, including the relevant Natura 2000 sites.

Black-tailed Godwit *Limosa limosa* – Near Threatened, population trend decreasing, in Malta recorded annually, mainly on spring migration. Potentially migrating through the AoI 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 AoI in small numbers and regularly, foraging/roosting on the rocky shore and migrating through the area at night, including the relevant Natura 2000 sites.

Red Knot *Calidris canutus* – Near Threatened, global population trend decreasing, recorded in Malta almost annually in small numbers on passage. Potentially passing through the AoI on migration.

Ruff *Calidris pugnax* – Least Concern, Annex I, population trend decreasing, recorded in the Maltese islands regularly and in good numbers, mainly during spring migration. Expected to be passing through the AoI on migration, including the relevant Natura 2000 sites.

Curlew Sandpiper *Calidris ferruginea* – Near Threatened, suspected to be declining, in Malta regularly in small flocks on passage migration in spring and autumn, expected to be passing through the AoI on migration.

Temminck's Stint *Calidris temminckii* – Least Concern, population trend stable, recorded in Malta in small numbers during spring and autumn migration, expected to be passing through the AoI on migration occasionally.

Sanderling *Calidris alba* – Least Concern, passing through Malta annually in small numbers during spring and autumn. Potentially passing through the AoI.

Dunlin *Calidris alpina* – Near Threatened, population trend decreasing, recorded in Malta annually in small numbers mainly on passage in spring and autumn, expected to be passing through the AoI on migration.

Little Stint *Calidris minuta* – Least Concern, singles recorded in Malta year-round, common during spring and autumn migration, expected to be passing through the AoI on migration.

Eurasian Woodcock *Scolopax rusticola* – Least Concern, trend estimated stable, observed in Malta during the winter months, expected to occur in the AoI during passage and foraging/wintering.

Great Snipe *Gallinago media* – Near Threatened, Annex I, overall trend decreasing, in Malta encountered annually in singles on spring migration. It is likely that the species occasionally passes through the AoI on migration.

Common Snipe *Gallinago gallinago* – Least Concern, common passage migrant, mainly in spring. Reported to occur in the AoI on migration, stopping over to forage and rest, including in the relevant Natura 2000 sites.

Jack Snipe *Lymnocryptes minimus* – Least Concern, population trend stable, passing through the Maltese islands annually in small numbers during the winter months, occasionally passing through and stopping over in the AoI.

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 regularly in the AoI, including in all relevant Natura 2000 sites and including the rocky shores of the Jerma headlands in direct vicinity to the proposed development..

Green Sandpiper *Tringa ochropus* – Least Concern, population trend increasing, regular passage migrant through the Maltese islands in spring and autumn, expected to pass through the AoI on migration regularly.

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 AoI in small numbers.

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 occasionally pass through the AoI in low numbers.

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 AoI in low numbers.

Wood Sandpiper *Tringa glareola* – Least Concern, Annex I, population trend stable, common passage migrant in the Maltese islands in spring and autumn. Expected to regularly pass through the AoI.

Marsh Sandpiper *Tringa stagnatilis* – Least Concern, overall population trend decreasing, recorded in Malta regularly in small numbers on migration, potentially passing through the AoI.

Collared Pratincole *Glareola pratincola* – Least Concern, Annex I, overall population trend decreasing, recorded almost annually in singles, mainly on short stop-overs during spring migration, potentially passing through the AoI.

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 AoI regularly and also to make use of the terrestrial part of the area during stopover on migration, including the relevant Natura 2000 sites.

Short-eared Owl *Asio flammeus* – Least Concern, Annex I, population trend in Europe fluctuating, recorded annually in small numbers, mainly on migration, has been reported nesting in the Maltese islands, at least three times in recent years. Has been reported and can be expected to pass through the AoI regularly and also use the area during stopover on migration, including the relevant Natura 2000 sites.

Osprey *Pandion haliaetus* – Least Concern, Annex I, European population trend increasing, regularly recorded in the Maltese islands on spring and autumn migration. Can be expected to pass through the AoI regularly in small numbers.

European Honey-buzzard *Pernis apivorus* – Least Concern, Annex I, overall population trend decreasing, common passage migrant over the Maltese islands, mainly in autumn. Can be expected to migrate through the AoI regularly.

Egyptian Vulture *Neophron percnopterus* – Endangered, Annex I, population trend declining in entire range, recorded in Malta almost annually in singles on migration, mainly in autumn. Singles might occur in the AoI occasionally on migration.

Short-toed Snake-eagle *Circaetus gallicus* – Least Concern, Annex I, population trend stable, appears on passage in the Maltese islands annually in small numbers, mainly in autumn. Potentially passes through the AoI on migration.

Lesser spotted Eagle *Aquila pomarina* – Least Concern, Annex I, European population estimated stable, in Malta almost recorded annually in singles to small flocks mainly on autumn migration. Potentially passes through the AoI on migration.

Booted Eagle *Aquila pennata* – Least Concern, Annex I, population size increasing in Europe, recorded in Malta almost annually in singles mainly during autumn migration. Potentially passes through the AoI on migration.

Western Marsh Harriers *Circus aeruginosus* – Least Concern, Annex I, population trend in Europe increasing, common passage migrant to the Maltese islands both in spring and autumn. Can be expected to appear in the AoI on passage migration regularly and also to forage and roost in the AoI, including the relevant Natura 2000 sites.

Montagu's Harrier *Circus pygargus* – Least Concern, Annex I, 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 AoI regularly.

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 AoI occasionally.

Black Kite *Milvus migrans* – Least Concern, Annex I, population trend unknown, recorded in Malta annually in double figure numbers on migration. The species is attracted to landfills. Can be expected to occur in the AoI 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 record in recent years. Can be expected to pass through the AoI and foraging and roosting there during stop-over on migration, including the footprint of the planned development.

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 AoI during migration.

European Roller *Coracias garrulus* – Least Concern, Annex I, European population trend decreasing, recorded in Malta annually in small numbers, mainly during spring migration. Can be expected to pass through the AoI or to stay in the area during stopover occasionally.

Common Kingfisher *Alcedo atthis* – Least Concern, Annex I, European population trend decreasing, common winter visitor and passage migrant in Malta. Observed regularly making use of all relevant Natura2000 sites. Expected to be present in the AoI regularly on migration and when wintering in small numbers, including the rocky shores in direct vicinity to the planned development.

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 AoI during migration, stopping over and potentially also wintering, including the relevant Natura 2000 sites.

Lesser Kestrel *Falco naumanni* – Least Concern, Annex I, population trend previous severe declines, recently stable, fairly common passage migrant to the Maltese islands in spring and autumn.. Expected to pass through the AoI on migration and also foraging in the terrestrial parts of the area when stopping over, including the relevant Natura 2000 sites.

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 foraging in the AoI year-round (local birds). Migrants can be expected to pass through the area and also forage there on migration and when wintering, including in the relevant Natura 2000 sites.

Red-footed Falcon *Falco vespertinus* – Near Threatened, Annex I, European population trend declining, in Malta fairly regularly encountered on migration, numbers higher in spring.

Can be expected to pass through the AoI and forage there during passage, including the relevant Natura 2000 sites.

Eleonora's Falcon *Falco eleonora* – Least Concern, Annex I, 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 AoI, including the relevant Natura 2000 sites on migration occasionally.

Merlin *Falco columbarius* – Least Concern, Annex I, population trend fluctuating, recorded in Malta annually in low numbers mainly on autumn migration. Might occasionally migrate through the AoI.

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 AoI regularly in small numbers.

Peregrine Falcon *Falco peregrinus* – Least Concern, Annex I, population trend increasing, potential 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 AoI including the relevant Natura 2000 sites regularly and year-round.

Passeriformes

Here we provide a list of all passerine species that are recorded in the Maltese islands regularly to frequently on migration and as winter visitors. We also include those species that are residents i.e. breeding on the islands. 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 AoI, including in the relevant Natura2000 site is given.

The vast majority of species is listed as Least Concern, two are listed as Near Threatened, both not in Annex I. Seven species are listed in Annex I of the EU-Birds-Directive all listed as Least Concern. Two passerine species listed in Annex I have been recorded breeding in the Maltese islands, one a common breeder – the Greater Short-toed Lark *Calandrella brachydactyla*, 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 life-spans (generation cycles) compared to most larger non-passerine species. This, together with a large distribution range and often 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 likely that any of the species listed below will reach threshold values in the AoI. However, as previously outlined, even broad-front passerine migrants funnel spatially over peninsulas and islands to avoid open sea crossings, and migration over the Mediterranean concentrates temporally as large numbers of birds take advantage of favourable meteorological conditions. In most such “pulse” nights

with high numbers and densities of birds actively migrating, the vast majority of birds is likely to pass high over the Maltese islands in a single night without stopover, with mainly some young, inexperienced and weak birds coming down to land and rest. If however, the meteorological conditions change during such nights of high migratory activities, e.g. with a rain-front, deep clouds or fog moving in or the birds suddenly encountering stronger headwinds, the flow of migration slows down, shifts to lower altitudes and birds start being attracted to land where so called bird falls might occur on small islands. Under these circumstances, birds will also be highly attracted by anthropogenic lights of man-made lit up structures such as the proposed development.

Species list of Passeriformes regularly encountered on the Maltese islands

Eurasian Golden Oriole *Oriolus oriolus* - *Least Concern*, common passage migrant, expected frequently in the AoI.

Red-backed Shrike *Lanius collurio* - *Least Concern, Annex I*, passage in low numbers, not expected to occur in the AoI in relevant numbers.

Woodchat Shrike *Lanius senator* - *Least Concern*, regular passage migrant, expected to occur in the AoI occasionally.

Penduline Tit *Remiz pendulinus* - *Least Concern*, passage in small numbers, might migrate through the AoI occasionally and in small numbers.

Greater Short-toed Lark *Calandrella brachydactyla* - *Least Concern, Annex I*, common breeder and passage migrant, possibly breeding in the AoI and expected to pass through on migration and potentially stopping over in larger numbers.

Woodlark *Lullula arborea* - *Least Concern, Annex I*, passage migrant low numbers, expected to also pass through the AoI.

Eurasian Skylark *Alauda arvensis* - *Least Concern*, common on passage and wintering, expected to make use of the AoI regularly, including the relevant Natura 2000 sites.

Zitting Cisticola *Cisticola juncidis* - *Least Concern*, common breeder in the AoI, including the relevant Natura 2000 sites.

Olivaceous Warbler *Iduna pallida* - *Least Concern*, passage in low numbers, potentially occurring in the AoI.

Isabelline Warbler *Iduna opaca* - *Least Concern*, passage in low numbers, potentially occurring in the AoI.

Icterine Warbler *Hippolais icterina* - *Least Concern*, regular passage migrant, expected to pass through the AoI regularly on migration.

Moustached Warbler *Acrocephalus melanopogon* - *Least Concern*, passage and wintering in low numbers, expected to pass through the AoI occasionally in very low numbers.

Sedge Warbler *Acrocephalus schoenobaenus* - *Least Concern*, regular passage migrant, expected to pass through the AoI regularly on migration.

Common Reed Warbler *Acrocephalus scirpaceus* - *Least Concern*, breeder in small numbers, regular passage migrant, single winter records. Expected to pass through the AoI regularly on migration.

Great Reed Warbler *Acrocephalus arundinaceus* - *Least Concern*, regular passage migrant, expected to pass through the AoI regularly on migration.

Savi's Warbler *Locustella luscinioides* - *Least Concern*, passage migrant in low numbers, expected to pass through the AoI occasionally on migration.

Northern House Martin *Delichon urbicum* - *Least Concern*, rare breeder, common passage migrant, expected to make use of the airspace of the AoI 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 AoI regularly, foraging in the area during migration, potentially roosting in the area, too.

Barn Swallow *Hirundo rustica* - *Least Concern*, breeder in low numbers, including in the AoI, common passage migrant, expected to make use of the airspace of the AoI regularly, foraging in the area during migration and potentially during breeding. Potentially roosting in the area, too.

Common Sand Martin *Riparia riparia* - *Least Concern*, regular passage migrant, expected to make use of the airspace of the AoI 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 AoI occasionally during migration.

Western Bonelli's Warbler *Phylloscopus bonelli* - *Least Concern*, regular passage migrant expected to pass through the AoI occasionally during migration.

Wood Warbler *Phylloscopus sibilatrix* - *Least Concern*, common passage migrant, expected to regularly occur in the AoI on passage.

Yellow-browed Warbler *Phylloscopus inornatus* - *Least Concern*, passage migrant, expected to occur occasionally in the AoI on migration.

Willow Warbler *Phylloscopus trochilus* - *Least Concern*, common passage migrant, expected to regularly pass through the AoI on migration.

Common Chiffchaff *Phylloscopus collybita* - *Least Concern*, common passage migrant and winter visitor, expected to pass through the AoI regularly on migration and winter there regularly.

Cetti's Warbler *Cettia cetti* - *Least Concern*, common breeder, possibly breeding also in the AoI.

Eurasian Blackcap *Sylvia atricapilla* - *Least Concern*, common passage migrant and winter visitor. Single breeding records in Malta in some years. Expected to pass through the AoI regularly during migration and make use of it during stop-over and wintering.

Garden Warbler *Sylvia borin* - *Least Concern*, common passage migrant. Expected to pass through the AoI regularly during migration and make use of it during stop-over.

Lesser Whitethroat *Sylvia curruca* - *Least Concern*, passage migrant in small numbers. Expected to occur in the AoI occasionally on migration.

Sardinian Warbler *Sylvia melanocephala* - *Least Concern*, common breeder in the AoI in good numbers, including the footprint of the planned development and present year-round.

Subalpine Warbler *Sylvia cantillans* - *Least Concern*, common passage migrant, expected to regularly pass through the AoI during migration.

Common Whitethroat *Sylvia communis* - *Least Concern*, common passage migrant, expected to regularly pass through the AoI during migration.

Spectacled Warbler *Sylvia conspicillata* - *Least Concern*, regular breeder in Malta, including in the AoI.

Common Starling *Sturnus vulgaris* - *Least Concern*, breeding in small numbers, common passage migrant and winter visitor, regularly recorded from the reserves, expected to occur in the AoI regularly in good number on passage and while wintering, including making use of the area for foraging and potentially roosting.

Mistle Thrush *Turdus viscivorus* - *Least Concern*, regular passage migrant, can be expected to pass through the AoI occasionally on migration.

Song Thrush *Turdus philomelos* - *Least Concern*, common passage migrant and winter visitor, can be expected to occur regularly in the AoI.

Redwing *Turdus iliacus* - *Near Threatened*, regular passage migrant in small numbers, potentially wintering, can be expected to occasionally occur in the AoI on migration.

Eurasian Blackbird *Turdus merula* - *Least Concern*, regular passage migrant and winter visitor, can be expected in the AoI on passage and during wintering.

Fieldfare *Turdus pilaris* - *Least Concern*, regular passage migrant, potentially wintering, can be expected to occasionally occur in the AoI on migration.

Rufous-tailed Scrub-robin *Cercotrichas galactotes* - *Least Concern*, rare visitor, potentially occurring irregularly in the AoI in very low numbers.

Spotted Flycatcher *Muscicapa striata* - *Least Concern*, breeder in increasing numbers, including in the AoI, common passage migrant, expected to be present regularly in the AoI on passage and stopping over.

European Robin *Erithacus rubecula* - *Least Concern*, common passage migrant and winter visitor. Expected to be present in the AoI outside the breeding season in good numbers.

Bluethroat *Luscinia svecica* - *Least Concern, Annex I*, regular passage migrant, wintering in small numbers, including in the AoI in suitable Natura 2000 sites (e.g. MT0000014), can be expected to pass through the AoI on migration.

Common Nightingale *Luscinia megarhynchos* - *Least Concern*, common passage migrant, one breeding record from 1995, expected to regularly pass through the AoI on migration.

Semicollared Flycatcher *Ficedula semitorquata* - *Least Concern, Annex I*, regular passage migrant in small numbers, expected to pass through the AoI occasionally on migration.

European Pied Flycatcher *Ficedula hypoleuca* - *Least Concern*, common passage migrant, expected to be present regularly in the AoI during the migration periods.

Collared Flycatcher *Ficedula albicollis* - *Least Concern, Annex I*, regular passage migrant in low numbers, expected to pass through the AoI during the migration periods.

Black Redstart *Phoenicurus ochruros* - *Least Concern*, common passage migrant, common winter visitor, expected to be regularly present in the AoI during the non-breeding period, including the footprint of the planned development.

Common Redstart *Phoenicurus phoenicurus* - *Least Concern*, common passage migrant, expected to regularly occur in the AoI during the migration periods.

Rufous-tailed Rock-thrush *Monticola saxatilis* - *Least Concern*, regular passage migrant in low numbers, can be expected to occur in the AoI on passage and stop-over in the migration periods.

Blue Rock-thrush *Monticola solitarius* - *Least Concern*, common breeder, including in the AoI, and even in the derelict Jerma hotel in the footprint of the planned development; making use of the AoI year-round.

Whinchat *Saxicola rubetra* - *Least Concern*, common passage migrant, expected to pass through the AoI on migration and also stopping over in the area.

Common Stonechat *Saxicola rubicola* - *Least Concern*, common passage migrant and winter visitor, expected to be commonly wintering in the AoI.

Northern Wheatear *Oenanthe oenanthe* - *Least Concern*, common passage migrant, can be expected to pass through the AoI on migration regularly.

Isabelline Wheatear *Oenanthe isabellina* - *Least Concern*, regular passage migrant in low numbers, might occasionally pass through the AoI on migration.

Black-eared Wheatear *Oenanthe hispanica* - *Least Concern*, regular passage migrant, expected to occur in the AoI 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 AoI on passage and potentially as winter visitor.

Common Firecrest *Regulus ignicapilla* - *Least Concern*, regular passage migrant and winter visitor, can be expected to regularly occur in the AoI on passage and potentially as winter visitor.

Dunnock *Prunella modularis* - *Least Concern*, regular passage migrant and winter visitor, expected to be present in the AoI outside the breeding season in small numbers.

Spanish Sparrow *Passer hispaniolensis* - *Least Concern*, very common breeder in the Maltese Islands and regular passage migrant, common breeding resident in the AoI, including the footprint of the proposed development.

Eurasian Tree Sparrow *Passer montanus* - *Least Concern*, regular breeder in Malta, including in the AoI, where it is expected to be present year-round.

Tree Pipit *Anthus trivialis* - *Least Concern*, common passage migrant, expected to occur regularly in the AoI on passage, including stopping over.

Red-throated Pipit *Anthus cervinus* - *Least Concern*, regular passage migrant, wintering in low numbers, expected to occasionally pass through the AoI during migration and also stopping over.

Meadow Pipit *Anthus pratensis* - *Near Threatened*, common passage migrant and winter visitor, expected to make regular use of the AoI 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 AoI, especially the coastal areas including the rocky shores of the headland in front of the proposed development.

Tawny Pipit *Anthus campestris* - *Least Concern, Annex I*, rare and irregular breeder in Malta, regular passage migrant, expected to pass through the AoI and forage and rest there on migration.

Western Yellow Wagtail *Motacilla flava* - *Least Concern*, common passage migrant, expected to pass through the AoI regularly during migration, including foraging and potentially roosting during stop-over.

Grey Wagtail *Motacilla cinerea* - *Least Concern*, rare breeder, regular passage migrant and winter visitor, expected to occur in the AoI occasionally to regularly in small numbers.

White Wagtail *Motacilla alba* - *Least Concern*, common passage migrant and winter visitor, expected to be common in the AoI during the wintering 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 AoI regularly during migration and as winter visitor.

Hawfinch *Coccothraustes coccothraustes* - *Least Concern*, regular passage migrant and winter visitor, expected to occur in the AoI 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 AoI regularly during migration and as 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 AoI 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 AoI 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 AoI regularly during migration and as winter visitor.

Eurasian Siskin *Spinus spinus* - *Least Concern*, regular passage migrant and winter visitor, expected to occur in the AoI on migration and as winter visitor occasionally.

Corn Bunting *Emberiza calandra* - *Least Concern*, formerly regular breeder in small numbers, scarce in recent years, might occasionally occur in the AoI during dispersal.

Ortolan Bunting *Emberiza hortulana* - *Least Concern, Annex I*, regular passage migrant, expected to occasionally pass through the AoI during migration.

Reed Bunting *Emberiza schoeniclus* - *Least Concern*, regular passage migrant and winter visitor, expected to pass through the AoI occasionally during migration and in the winter months.