



Environmental Permit

Environment Protection Act (CAP. 549)

Permit number:
NP0166/20

Approved documents
NP0166/20/1B/1C

The Environment and Resources Authority (hereinafter the Authority; the Competent Authority or ERA) in exercise of its powers under the Environment Protection Act (CAP. 549), hereby authorises:

Ms Sarah Debono obo Ecoserv Ltd (hereinafter "the Permit Holder"),
Of / Whose Registered Office (or principal place of business) is at

**12, Sir Arthur Borton Street,
Mosta MST1881**

to carry out a monitoring survey of species of reptiles

at various locations in the Maltese Islands

The validity of this permit is **up to 31st December 2020**. An application for renewal of this permit is to be submitted at least **one (1) month** prior to expiry of this permit.

Signed	Date
<p style="text-align: center;">Anthony Aquilina Unit Manager (Permitting) F/ Director Environment and Resources</p>	<p style="text-align: center;">Permit Granted: 22/04/ 2020</p>

Authorised to sign on behalf of the Competent Authority

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Conditions

Introductory Note

The permit is granted in accordance with the provisions of the Environment Protection Act and Regulation 18(2) of the Flora, Fauna and Natural Habitats Protection Regulations, 2006 (S.L. 549.44), hereinafter referred to as the Regulations, for the purpose of the activities that shall be carried out within the Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) of L-Inħawi tad-Dwejra u tal-Qawra, inkluz Ғaġret il-General (MT0000019); Kemmuna u l-Gżejjer ta' Madwarha (MT0000017); Filfla u l-Gżejjer ta' Madwarha (MT0000016); Il-Gżejjer ta' San Pawl (Selmunett) (MT0000022); L-Inħawi tar-Ramla tat-Torri u tal-Irdum tal-Madonna (MT0000009); Rdumijiet ta' Malta: Ir-Ramla taç- Ćirkewwa sal-Ponta ta' Bengħisa (MT0000024); L-Inħawi ta' Pembroke (MT0000002).

This permit is also granted in accordance with Regulation 43(d) of the Flora, Fauna and Natural Habitats Protection Regulations, 2006 (S.L. 549.44), for the purpose of exempting the permit holder from the prohibitions referred to in regulation 25(1)(b)(d) of the same Regulations, on the disturbance of protected specimens of reptiles, , in line with Regulation 44(a)(d) of S.L.549.44. in the interest of protection of wild fauna and for research purposes.

This permit is also issued in line with Regulation 7(1) of the Reptiles (Protection) Regulation, 1992 (S.L. 549.02) for the purpose of activities that shall be carried out on protected reptile species.

This permit is also being issued in line with the 'Filfla u l-Gżejjer ta' Madwarha' Conservation order (G.N. 1377 of 2016) and in line with the Il-Gżejjer ta' San Pawl (Selmunett) Conservation order (G.N. 1378 of 2016).

The activity shall, subject to the conditions of this Permit, be managed, controlled and carried out as described in the NP Application, approved documents, and/or as otherwise previously agreed in writing by the Authority.

Status Log

Detail	Date
<i>Application NP</i>	07/04/2020
<i>Permit Issued</i>	22/04/2020

Pre-Commencement of activities/ work

1. The Permit Holder shall advise of the dates of works at least seven (7) days prior to the commencement on ced.nature@era.org.mt. In the case of change of date, the permit holder is to inform ERA of such a change at least two (2) days in advance. In the case of short-term cancellation of the activity (especially outside office hours), the Authority should be contacted on 9921 0404.

Permitted Activities

2. The Permit Holder is authorised to carry out the activities and the associated activities specified in Table 1

Table 1.		
Activity	Description of specified activity	Limits of specified activity
Monitoring Survey on local reptiles	As described in NP0166/20/1C	(i) Monitoring by observation of the following species of reptiles: <i>Chalcides ocellatus</i> -the Ocellated Skink; <i>Coluber viridiflavus</i> (<i>Hierophis viridiflavus</i>)-the Western Whip Snake; <i>Elaphe situla</i> (<i>Zamenis situla</i>)- the Leopard Snake; <i>Telescopus falax</i> -the Cat Snake; <i>Hemorrhhois algirus</i> (<i>Coluber algirus</i> - the Algerian Whip Snake; <i>Podarcis filfolensis</i> - the Maltese Wall Lizard; <i>Tarentola mauritanica</i> - the Moorish Wall Gecko; and <i>Hemidactylus turcicus</i> -the Turkish Gecko.

Site

3. The activities authorised under condition 2 shall be affected in the location as marked on the aerial images shown on the approved monitoring framework document NP0166/20/1B.

Conditions of Activity/Work

4. Activities are to be held according to the approved Project Description Statement NP0166/20/1C.
5. The activities covered by this permit are restricted to the Permit Holder and researchers under her direct supervision. and any assigned or subcontracted persons approved in line with the contract agreement reference GF/Admin/60/17 signed on 9th October 2019, as part of the collaboration agreement on Research entered between The Ministry for the Environment, Sustainable Development and Climate Change on behalf of ERA and Ecoserv Ltd (hereunder referred to as the Contract Agreement), and who shall all be made aware of this permit and the contents within. The 'Conditions of Activity' below shall remain unaltered should there be any amendments to the above-cited collaboration agreement following the issuing of this permit.
6. The permit holder may choose other individuals as required to give assistance in carrying out this research. The number of persons participating in the activities in question should not exceed a maximum of two (2) individuals.

7. This permit also covers the transportation of the researchers to and from Selmunett islands on board the vessel ATLANTIS II operated by Ta' Miema Boat Services and property of Mr Joseph Anthony Hili. During site visits to Selmunett Islands (il-Gżejjer ta' San Pawl) the following conditions shall also be abided by:
 - a. Berthing of the vessel at Selmunett is only permitted against the present quay. Anchoring around the island is prohibited;
 - b. The vessel is not to be left idle whilst at the quay unless required for safety purposes.
8. Monitoring of reptiles to islands other than Malta, Gozo and Comino shall be limited to the following:
 - a. Filfla: a maximum of four (4) visits;
 - b. Selmunett: a maximum of three (3) visits;
 - c. Fungus rock: a maximum of three (3) visits;
 - d. Cominotto: a maximum of three (3) visits;

The Authority is to be informed of the dates of these visits at least five (5) working days before on the following email: ced.nature@era.org.mt or on 9921 0404.

9. Visitors to the islands of Cominotto, Filfla, Selmunett and Fungus Rock shall follow these guidelines :
 - a. Any footwear to be used shall be free from soil and seeds;
 - b. Visitors are to keep to existing footpaths. In the case of Selmunett, all researchers are to keep to the designated footpaths, as established by the Selmunett Islands (il-Gżejjer ta' San Pawl) Nature Reserve Regulations, 1993 (S.L.549.03). Participants shall not roam over the islands so as to minimize impact on vegetation;
 - c. Prior to departure from the mainland, any bags are to be checked for the presence of rodents;
 - d. The introduction or carrying of any food items on the islands is strictly prohibited;
 - e. Littering, dumping or discarding of any material on the islands is strictly prohibited.
10. Access to Filfla by helicopter shall be carried out in such a manner that disturbance or damage to the environment is minimal. When accessing and leaving the island of Filfla, the helicopter shall not be allowed to land but shall be kept hovering above the surface at a safe distance.

Landing of the helicopter shall only to be carried out only in case of emergency circumstances. Should the helicopter be required to land, this should be done on a minimally vegetated area of the plateau and for a minimum amount of time.
11. All reasonable precautions are to be taken to keep all SACs clean and sites are to be restored to their original condition without causing any harm to the environment. Any waste generated during the activities in the permit is to be collected immediately and disposed of accordingly in accordance with the Waste Management (Activity Registration) Regulations 2007 (S.L. 549.45) and the Waste Regulations, 2011, (S.L. 549.63).

12. The permit holder shall ensure that disturbance of any specimen of any other species is kept to a minimum.
13. No specimens may be captured or handled from any site.
14. All efforts are to be made not to harm any specimens. Should injured/unhealthy specimens be encountered veterinary care should be sought by reporting on info@naturetrustmalta.org or 99999505 and ERA's Monitoring and Compliance Unit on ced.nature@era.org.mt or 99210404.
15. All activities shall take place within existing paths and clearings void of vegetation, whether dead or alive.
16. Access to motor vehicles shall be restricted to asphalted roads and access through off-roading is prohibited.

General Conditions

17. The 'Permit Holder', is responsible to ensure that all reasonable precautions are taken so that the activity conforms to the conditions in this Permit and the procedures outlined within the Permit application.
18. The activities covered by this permit are restricted to the Permit Holder, employees and/or volunteers and contracted parties commissioned for such activities/works under her supervision and direction, who shall all be made aware of this Permit and the contents within.
19. The following activities are strictly prohibited:
 - a. the deliberate picking, collection, taking, cutting, uprooting, harming, destroying or damaging deliberately destroying, keeping, transporting, selling, buying exchanging, offering for sale or for exchange, importing or exporting in any way of any specimen of wild flora;
 - b. the deliberate hunting, killing, capturing, taking, harming, disturbance particularly during periods of breeding, rearing, hibernation and migration, destruction and deterioration of breeding sites or resting places, pursuing, taking or attempting to take, deliberately killing or attempting to kill, deliberately destroying, keeping, transporting, selling, buying exchanging, offering for sale or for exchange, importing or exporting any specimen of any specimen of wild fauna, except as permitted;
 - c. cutting or damaging of reeds, tree branches etc;
 - d. generation of excessive noise, including extremely loud music or the use of noisy generators, or light pollution through the use of floodlights;
 - e. disposal, discharge or spillage of oil, fuel, paint or other pollutants, or of solid waste, ash or combustibles;
 - f. lighting of fires.
20. ERA may request updates and/or further information on the activity in question as deemed necessary.
21. The conditions imposed shall be adhered to throughout all the activities. Failure to do so may result in enforcement action and cessation of any related works or activities.

22. ERA may impose other additional rules or conditions, or may amend one or more of the listed rules or conditions, as it deems necessary for the proper conservation of a protected site or area, biodiversity and the environment in general, and to ensure public safety.
23. The Permit Holder may apply for a variation of the Permit and shall seek the Authority's written agreement prior to any operational changes, by sending to the Authority:
 - a. Written notice of the details of the proposed change, including an assessment of its possible effects or risks to the environment from the approved activity;
 - b. Any relevant supporting information;
 - c. Any relevant supporting assessments and drawings, and;
 - d. The proposed implementation date.

Any such change shall only be implemented following the issue of a variation of the permit by the Authority.

24. In accordance with Regulation 46(4) of S.L. 549.44, a brief report with photos of the activities held, including any publications as a result of the activity, is to be provided to ERA by the Permit Holder within one month of the expiry of the permit, and is to be submitted to nature.permitting@era.org.mt. Information that should be treated as confidential as outlined in Regulation 48(4) of S.L. 549.44 shall be specified.

A template for the report is available at <http://era.org.mt/en/Documents/Activity%20Report%20template.doc>

A copy of any resulting publications, scientific papers, dissertations, theses, articles and/or videos resulting from any study carried out in relation to the specimens and activities for which this Permit is being issued shall reach ERA within three months from the date of publication/finalisation as the case may be. Such studies shall clearly indicate that they were possible following Permit/s issued by the ERA.

25. This permit is granted saving third party rights. The Permit holder is not exempt from any other legislation or regulations, codes of practice, conditions or requirements imposed by any other competent authorities, including the obtaining of permits, licenses, or clearances including from site owners.
26. Any accidental handling, capture or collection of specimens or part thereof, whether dead or alive, of species listed within Schedule V and VI, and endemic species not listed in Schedule X of the Flora, Fauna and Natural Habitats Protection Regulations (S.L. 549.44) shall be reported on nature.permitting@era.org.mt within seven (7) days of sampling of the specimen provided that the permit holder may only keep such specimen or part thereof for scientific research purposes. The Authority may request additional information from the permit holder, including but not limited to, an application for authorisation for the keeping of such specimens or samples.
27. The Authority may suspend or revoke this Environmental Permit in line with the provisions of CAP 549.
28. The Permit Holder shall notify the following matters to the Authority in writing at least 10 working days prior to their occurrence:
 - a. Any change in the Permit Holder's trading name, registered name or registered office address;
 - b. Any change to particulars of the Permit Holder's corporate identity.
29. Upon the joint application of a Permit Holder and a proposed transferee, the Permit Holder may request to transfer an environment permit. The permit shall not be transferred from the Permit Holder without prior approval from the Authority. Upon the Authority's decision to transfer the permit to the transferee, all rights, obligations, liabilities shall subsist onto the transferee.

30. In accordance with Regulation 47 of S.L. 549.44, details of the Permit Holder together with the details of conditions imposed in this Permit shall be maintained by the Authority in a register available for public inspection or maintained in electronic form.
31. ERA may inspect and monitor the activity at the expense of the Permit holder at rate and arrangement communicated by ERA's Compliance and Enforcement Directorate to ensure the safeguarding of the natural assets. ERA may also appoint other on-site monitors at the expense of the Permit Holder to act as an on-site liaison between the Permit Holder and ERA if the case arises.
32. The Authority's representatives may inspect and photograph any part of the site/ activity and ask for any closed or locked areas to be opened and may demand to be provided with any proof, documentation, plans, receipts or any other records.
33. This Permit including any Variation Notices or amendments to it shall be made available for any inspection by ERA officials at all times, or any legally recognised compliance and enforcement officials, when requested.
34. Whenever there is a conflict between the conditions of this Permit and approved documents, the conditions of the Permit shall prevail.
35. ERA shall not be held liable for any accidents or injuries which may occur during the activities being permitted through this Permit. It is the responsibility of the Permit Holder to ensure that all safety measures are taken.
36. This permit is without prejudice to any liability of the Permit Holder under the Act and to any punitive measures the Authority may wish to take with respect to works already carried out without permit.
37. The validity of this permit is **up to 31st December 2020**. The Permit Holder may apply for a renewal to this Permit expressing his/her intention at least four (4) weeks prior to the expiry of this permit. Request for renewals shall only be considered upon confirmation of compliance with Permit conditions and fulfilment of documentation as requested by this Permit.
38. Any aggrieved person may appeal from this decision before the Environment and Planning Review Tribunal within 30 days in terms of Article 63 of the Environment Protection Act.

TENDER REF: GF/Admin/60/17

**SERVICE TENDER FOR THE ASSESSMENT OF THE STATUS OF
LOCAL REPTILE SPECIES BASED ON FIELD DATA**

MONITORING FRAMEWORK

Submitted to

THE ENVIRONMENT AND RESOURCES AUTHORITY

Prepared by:



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ECOSERV REPORT REFERENCE: 009-20_R

January 2020

Assessment of the Status of Local Reptile Species based on Field Data**Monitoring Framework****Ecoserv's Report Reference: 009-20_R**

Version no.	Date issued	Comments
1.0	31/01/2020	First version submitted to ERA
2.0	03/03/2020	Second version, revised following ERA review.

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A. Introduction

1. In June 2019, the then Ministry for the Environment, Sustainable Development and Climate Change (MESDC)¹ had issued a call for tenders on behalf of the Environment and Resources Authority (ERA) titled “*Service tender for the assessment of the status of local reptile species based on field data*” (Tender reference: GF/Admin/60/17).
2. Ecoserv Ltd (hereafter ‘Ecoserv’) made a submission and was awarded this tender; the contract between MESDC and Ecoserv was signed on the 8th October 2019. Meetings were held with the ERA in October and November 2019 to review administrative and technical considerations at the initiation of the tender in question, and to agree on the way forward for the surveys.
3. The main objectives of the tender are the provision and implementation of a monitoring and surveillance framework for eight (8) local reptile species, by carrying out the following activities:
 - a. preparation of a monitoring and surveillance framework;
 - b. implementation of the monitoring framework for a duration of one (1) year, carrying out surveys to collect scientific data on the eight (8) species listed below:
 - i. *Chalcides ocellatus*, the Ocellated Skink;
 - ii. *Coluber viridiflavus* (*Hierophis viridiflavus*), the Western Whip Snake;
 - iii. *Elaphe situla* (*Zamenis situla*), the Leopard Snake;
 - iv. *Telescopus fallax*, the Cat Snake;
 - v. *Hemorrhoids algirus* (*Coluber algirus*), the Algerian Whip Snake;
 - vi. *Podarcis filfolensis*, the Maltese Wall Lizard;
 - vii. *Tarentola mauritanica*, the Moorish Wall Gecko; and
 - viii. *Hemidactylous turcicus*, the Turkish Gecko;
 - c. compilation of the Habitats Directive Article 17 Report datasheets for the species that are included in the Habitats Directive, by reporting their distribution, range, populations, habitats, main pressures and threats and future prospects; allowing for an assessment of their overall conservation status; and where applicable, presenting spatial data results on INSPIRE compliant maps;
 - d. assessment of the species’ threat status in line with the IUCN’s Red List criteria with the aim of compiling a Red Data fiche for each species;
 - e. general reporting on the above.
4. The outcome of this study will comprise an assessment of conservation status and the level of threat faced by the individual species listed in the tender. The results are intended to provide the Authority with the data required for its reporting obligations

¹ As of January 2020, named as ‘Ministry for the Environment, Climate Change and Planning’ (MECP)

under the EU Habitats Directive and will provide an update of the species' Red Data List status.

5. The present document is the first deliverable required by the tender, and should provide:
 - f. a detailed description of the methods that will be used for monitoring and analysis including a justification for their use in relation to collecting the required data and its subsequent processing and interpretation;
 - g. outlining the time schedules;
 - h. specifications of all equipment to be used in the surveys;
 - i. evidence of how implementation will lead to maximum resource efficiency ensuring that surveys cover as much areas with as much detail as possible.

B. Outline of Monitoring Approach

6. One of the objectives of the tender as regards the monitoring framework is to design a methodology that should be simple enough to allow for reproducibility, ensure maximum resource efficiency, whilst making sure that the surveys provide the necessary details covering as much areas as possible, and at minimal cost and with reliable results. The current proposal seeks to address these criteria by considering the following characteristics.
7. The eight reptile species that are the subject of the present study have diverse behaviours and occur in different habitats, which therefore requires different approaches in surveys to assess their abundance and habitat associations. The lizard and gecko species are ubiquitous in different habitats, while the snake species are not very frequent; hence an extensive study design that incorporates an appropriate sampling area and coverage, as well as sampling during the day, and during dusk and the early night (given that different species are diurnal/nocturnal/crepuscular), and in different habitats, is crucial for successful and meaningful data collection and assessment.
8. Of the eight reptile species that will be surveyed, one snake – the *Telescopus fallax* (Cat Snake) and the two gecko species - *Tarentola mauritanica* (Moorish Wall Gecko) and *Hemidactylous turcicus* (Turkish Gecko) – are crepuscular to nocturnal, while the other five species are diurnal. Therefore, the proposed survey design will incorporate sampling during daytime and during dusk and the early night.
9. Following review of the available literature and, on the basis of knowledge of the behavior and biological characteristics of the local herpetofauna held by the present contributors, the habitats described below will be considered in the survey being proposed by the present tenderer:

a. Adlittoral / coastal habitat

The Maltese Wall Lizard is ubiquitous in adlittoral areas that are characterized by garrigue-like and steppic habitats and abandoned fields located in coastal areas close to the sea. To a lesser extent, this habitat type also supports the Ocellated Skink and the Moorish Wall Gecko, in places where there are rock faces, boulder screes and rubble accumulations. The combination of low-lying vegetation, piles of boulders / rubble walls and bedrock with numerous crevices, seem to support a high abundance of these species and may possibly be the most important habitats for them on the Maltese Islands. It is therefore proposed that this habitat type will be incorporated in the survey design.

b. Garrigue

Inland garrigue is known to serve as habitat for the Maltese Wall Lizard, the Ocellated Skink and the snake species. The combination of low-lying vegetation, bedrock with crevices and holes and loose stones in which these species can seek refuge, seem to support a high abundance of these reptiles. These species, along with the Moorish Wall Gecko, albeit to a lesser extent, also occur where accumulations and / or piles of boulders or rubble occur in this habitat type. It is therefore proposed that this habitat type will be incorporated in the survey design.

c. Maquis

Inland maquis, mostly in local valleys and other sheltered areas, is known to serve as habitat for the snake species, the Ocellated Skink and to a lesser extent, the Moorish Wall Gecko. The combination of vegetation, rocky faces or walls, and in places rubble walls and / or accumulations of boulders, stones or rubble, are known to support these reptiles. It is therefore proposed that this habitat type will be incorporated in the survey design.

d. Rubble walls in arable land

Rubble walls that border agricultural land, including ones that delimit country lanes and roads from cultivated fields, are well known to serve as a habitat for many of the herpetofauna that are the subject of the present study, in particular the Ocellated Skink, Maltese Wall Lizard, some of the snake species and the Moorish Wall Gecko. It is therefore proposed that this habitat type will be incorporated in the survey design.

e. Urban areas / buildings

The periphery of urban areas, particularly those that are characterised by old dwellings, especially townhouses and farmhouses, are known to serve as habitat for the Turkish Gecko, and to a lesser extent the Moorish Gecko and Maltese Wall Lizard. It is also of interest to acquire data on the abundance of these species and possibly of the other reptiles from this urban habitat and compare them with those recorded from the aforementioned natural habitats. It is therefore proposed that this habitat type will be incorporated in the survey design.

f. Urban gardens

Urban gardens are known to serve as habitat for the Maltese Wall Lizard, the Ocellated Skink, the two species of Gecko, and possibly some of the snake species. It is therefore proposed that this habitat type will be incorporated in the survey design.

10. In selecting the study locations every effort has been made to identify appropriate and representative sampling areas and individual sites within them, keeping in mind that although it is desirable to survey as large a sampling area as possible and as numerous sites / habitats as possible, this can only be done in practice within the constraints of the available time and funding. Based on knowledge of the occurrence of the target herpetofauna, it is proposed to carry out surveys at the locations listed in Section C below.
11. One or more sites selected on the basis of occurrence of different habitats, nested within each of the identified locations, will be surveyed. All locations and sites identified will be surveyed in each of three seasons: spring, summer and autumn, to achieve an appropriate level of temporal replication. Given that the ambient temperature during winter is usually too low to allow emergence of reptiles, the winter season will not be considered in the present study.
12. The seasonal (3-monthly) repeat sampling will provide even temporal coverage and identify seasonal patterns. We propose the application of a standardized field methodological approach (see Section D below) that is easily reproducible, not just for the one-year duration of the monitoring programme covered by this proposal, but also for subsequent years when the Authority may require repeat monitoring sessions. Data collected on the required attributes will be processed by considering the type of habitats where individuals would have been recorded in the field surveys, and the results will then be extrapolated to the overall distribution of those particular habitats in the Maltese Islands.

C. Study locations

13. It is proposed to carry out surveys at a different number of locations as indicated in Table 1. The three main Islands (Malta, Gozo and Comino) have been sub-divided into areas where the survey locations will be distributed (north, south, central, east, west); whereas the whole land area of each of the minor islets will be considered for the selection of the survey locations.
14. At each location, one or more sites will be surveyed. A site will represent either a particular natural habitat type (e.g. adlittoral/coastal, garrigue, maquis and rubble walls in arable land), or an urban area/building, or an urban garden.

15. The proposed geographical locations of the survey sites in natural habitats, urban areas/buildings and urban gardens, were discussed with the ERA, and the agreed lists of geographical locations are given in Tables 2 – 4 respectively.
16. Aerial images showing the approximate geographical positions of the proposed locations on all seven islands as listed in Tables 2 – 4, are given in Figures 1 – 3. The positioning of sites is not exact at this stage; these will be confirmed following the first session of fieldwork, during which the most appropriate position to carry out the surveys will be identified on-site and their geographical coordinates will be recorded using a hand-held GPS set.

Table 1: Proposed number of locations per habitat that will be included in the study.

Island	Proposed Locations per habitat						
	Natural habitats				Urban areas / buildings	Urban gardens	Total number of Locations
	Adlittoral	Garrigue	Maquis	Rubble walls			
Malta	10 ^x				3	2	15
Gozo	3				2	1	6
Comino	2 [*]				1	-	3
Fungus Rock		1					1
Cominotto		1 [#]					1
St. Paul's Islands		1 [#]					1
Filfla	2 ^{**}						1

Notes:

- ^x 'Central' locations proposed for Malta do not have an 'adlittoral' habitat that can be surveyed.
- ^{*} 'Maquis' may not be present in all locations on Comino
- [#] One location with two sites surveyed (both garrigue)
- ^{**} One location with four sites surveyed (two adlittoral / coastal and two garrigue)

Table 2: Proposed geographical locations for surveying 'Natural Habitats'

NATURAL HABITATS *		
Island / Region		Proposed locations
MALTA		<i>(2 Locations in each of 5 Regions in Malta)</i>
North	<i>Location 1</i>	L-Ahrax tal-Mellieha to Armier / Torri l-Abjad area
	<i>Location 2</i>	Ghajn Tuffieha / Rdum Majjiesa area
South	<i>Location 1</i>	Delimara peninsula
	<i>Location 2</i>	Wied il-Ghajn / Zonqor area
Central ⁺	<i>Location 1</i>	Wied ta' l-Isqof (l/o Rabat)
	<i>Location 2</i>	Wied Qirda / Wied il-Kbir (l/o Siggiewi - Qormi)
East	<i>Location 1</i>	Gharghur / Madliena / Pembroke
	<i>Location 2</i>	Wied Ghollieqa / Manoel Island
West	<i>Location 1</i>	Wied iz-Zurrieq
	<i>Location 2</i>	Migra l-Ferha area
GOZO		<i>(1 Locality in each of 3 Regions in Gozo)</i>
North		Wied tad-Dwejra area
South		Wied tal-Qala / Hondoq ir-Rummien area
Central		Wied tal-Qbajjar
COMINO #		<i>(1 Location in each of 2 Regions in Comino)</i>
North		Santa Marija Bay / valley leading to bay
South		Wied Ernu
FUNGUS ROCK		One location on land area
COMINOTTO ^x		One location on land area
ST. PAUL'S ISLANDS ^x		One location on land area
FILFLA ^{**}		One location on land area
<p>Notes:</p> <p>* At each location under 'Natural Habitats' on the main islands, 4 sites will be surveyed, each site representing a particular habitat type, i.e.: Adlittoral, Garrigue, Maquis and Rubble walls in arable land.</p> <p>⁺ Central locations do not have an 'adlittoral'</p> <p>[#] On Comino, 'Maquis' is very sparse and may not be found in all locations identified.</p> <p>^x On Cominotto and St. Paul's Islands, one location with two sites (both garrigue) per island will be surveyed.</p> <p>^{**} On Filfla, one location with four sites surveyed (two adlittoral / coastal and two garrigue)</p>		

Table 3: Proposed geographical locations for surveying 'Urban areas / Buildings'.

URBAN AREAS / BUILDINGS	
MALTA	Proposed locations
North	Mellieha
South	Zabbar (approaching Marsascalea)
Central	Rabat
GOZO	
North	San Lawrenz
South	Qala
COMINO	
One location	San Niklaw Bay

Table 4: Proposed geographical locations for surveying 'Urban Gardens'.

URBAN GARDENS	
<i>Region</i>	Proposed locations
MALTA	
North	Gnien l-Gharusa tal-Mosta, Mosta
South	Is-Sabbara area (Cottonera)
GOZO	
Central	Villa Rundle Gardens, Rabat



Figure 1: Aerial image showing the proposed locations on the island of MALTA for surveys of reptiles (Legend: red circles = locations identified under ‘Natural Habitats’, green dots = locations for ‘Gardens’, blue dots = locations for ‘Urban buildings’) (Base map source: Google Maps, 2020)



Figure 2: Aerial image showing the proposed locations on the islands of GOZO and COMINO for surveys of reptiles (Legend: red circles = locations identified under ‘Natural Habitats’, green dots = locations for ‘Gardens’, blue dots = locations for ‘Urban buildings’) (Base map source: Google Maps, 2020)

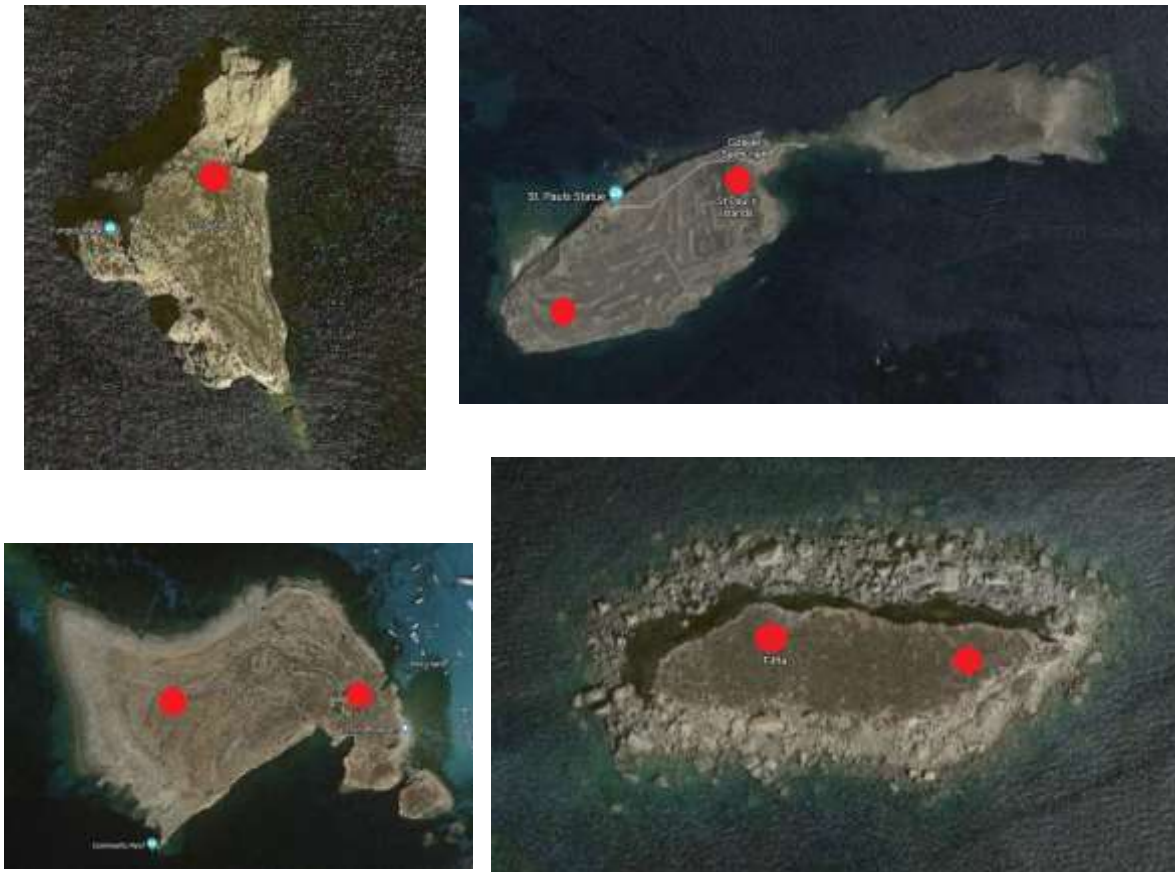


Figure 3: Aerial images showing the proposed locations of sites to be surveyed for reptiles on the minor islands (clockwise from top left): FUNGUS ROCK, ST. PAUL'S ISLANDS, FILFLA and COMINOTTO (Legend: red dots = approximate positions of sites of type 'garrigue') (Base map source: Google Maps, 2020)

D. Field methodology

17. Fieldwork in relation to the surveys detailed above, will entail a census methodology using direct observation and non-destructive sampling with minimal disturbance. This survey methodology, sometimes also referred to as 'visual encounter surveys' is based on that proposed by Heyer (1988), Crosswhite et al. (1999) and Greenwood & Robinson (2006). Such methodology has been used in the Mediterranean region to survey herpetofauna; see for example Pizzuti Piccoli and De Lorenzis (2018).
18. At each site in the locations under 'Natural Habitats' and 'Urban Gardens', direct counts will be made along two transects, each of which will be 100 m long. The field observer will walk slowly along the transect, stopping briefly in places as necessary, and will count any reptiles seen on either side of the transect line to a distance of 3 m on either side along the whole length of the transect, making use of binoculars to scan ahead for target individuals before walking to a new position along the line. It is estimated that around 20 minutes will be spent surveying each transect.

- In the case of garrigue, maquis, adlittoral / coastal and urban garden, each 100 m long transect will be 6 m wide; i.e. 3 m on each side of the central line.
 - For rubble wall habitats, each transect will be taken as a cumulative length of 100m of rubble walls surveyed to a height such that the total area surveyed per 'transect' will be of 200m².
19. For Filfla in particular, being an island with significant difficulties to access the garrigue and adlittoral zones, some modification to the above methodology will be used.

These have been discussed with the ERA, and agreement reached as follows:

- For Garrigue: *"to carry out the surveying on the periphery of the plateau, and making observations 6m inland."*;
 - For Adlittoral: *"to carry out the surveying from the periphery of the plateau using binoculars, and to carry out a visual census from the top of a number of boulders along a transect in the adlittoral/coastal area."* This approach applying two methods for the adlittoral, will be done only during the first (Spring) survey, after which, discussions will be held again with the ERA to agree on the methodology for subsequent surveys on Filfla.
20. For urban areas / buildings, three vertical walls of different buildings, each wall measuring 6 m by 20 m or equivalent area, will be surveyed at each site. At various points, the field observer will scan the wall area using binoculars when necessary, while staying stationary, and count the reptiles seen on the wall. Given that this habitat type will mainly target the two Gecko species, walls that will have a low intensity artificial light source on them (e.g. a street lamp) will be preferred as these are known to be more attractive to the targeted reptiles given that they tend to congregate near lights which attract flying insects. It is estimated that around 10 – 15 minutes will be spent surveying each wall.
21. One complete survey, using the locations and sites listed in Tables 1 – 4 above, will be carried out in each of three seasons in 2020: spring, summer and autumn, to achieve an appropriate level of temporal replication. Given that the ambient temperature during winter is usually too low to allow emergence of reptiles, this season will not be considered in the present study.
22. The timing of the field censuses will consider the diurnal behaviour of the species being studied. Field censuses will be carried out in the morning and evenings/dusk. In the morning, fieldwork will be carried out during a time when the ambient temperature is optimal for emergence of reptiles and when they are most active. Therefore this may change depending on season: for example, in spring and autumn when the ambient temperature is lower than in summer, the time of field censuses will be between 10:00 and 14:00 but in summer when the ambient temperature is higher than in spring and autumn, the time of the field censuses will be between 08:00 and 10:00 and between 16:00 and 18:00. In the case of field censuses that will be held during dusk and later, the

time of data collection will start at dusk (i.e. after sunset) and extend some three to four hours after that. The same timing will be retained across locations and sites.

23. The timing of the surveys at the respective sites will be distributed as follows:
 - a. Surveys done in the morning: all locations and sites listed in Table 1, including the three main islands and the minor islets;
 - b. Surveys done at dusk / during the early night: locations and sites listed for the three main islands (Malta, Gozo and Comino), and excluding the minor islets (Fungus Rock, Cominotto, St. Paul's Islands and Fifla).
24. For surveys held during dusk and early night, visual observation will be aided through the use of a shaded low-intensity flashlight, permission for this will be requested to the ERA Nature Permitting section when applying for the necessary permits. When possible, photographs will be taken, except at night since flash photography will disturb the animals.
25. In proposing the above field methodology, safety considerations and other limitations have been taken into account.
26. The raw data that will be collected at each site surveyed and for each species encountered, will include the following:
 - Date, time
 - General weather conditions
 - Extent of survey area (GPS coordinates)
 - Locations of recorded species (GPS coordinates)
 - Number of individuals recorded
 - Habitat type where individuals are recorded
 - Any visible threats
 - General observations as necessary.

E. Reporting

27. The data collected during field surveys carried out in each seasonal survey will be compiled in brief post-survey reports, and submitted to the ERA.
28. In compiling the overall results required for the interim and final reporting, the data on population density, distribution and other relevant data recorded in each habitat type as revealed by the survey will be extrapolated, where appropriate, to the total area of the respective habitat area present in that part of the island surveyed. These total areas will be estimated from a GIS habitats or land use map.

29. The post-survey reports will address the following attributes for each species:
- Biological information:
- Distribution
 - Range
 - Population density and size
 - Pressures and threats.
30. The Interim and Final reports will address the following attributes for each species:
- Biological information:
- Distribution
 - Range
 - Population density and size
 - Habitat for the species
 - Pressures and threats
 - Conservation Measures
 - Future prospects.
- And, where applicable;
- Trends, their directions and magnitudes
 - Favourable Reference Values
 - Change and reason for change
 - conservation status of the above-mentioned parameters; as well as
 - overall conservation status.
31. All spatial data presented as part of the results of the surveys will be INSPIRE compliant. Geographical Information System (GIS) maps will be produced alongside any relevant metadata including requested projection, datum, scale, etc. The final maps will identify the species' distribution and range as requested, and will be based on the results of the field surveys.
32. The data arising from the monitoring exercise will be used for the compilation of the Interim and Final reports, accompanied by maps, Article 17 data sheets and IUCN Red Data fiches, as required by the tender.
33. The following reports/documents will be produced:
- i. Seasonal-survey field reports;
 - ii. Interim progress report;
 - iii. Maps depicting the results of surveys for all eight species of reptiles surveyed;
 - iv. Article 17 Datasheets as per requirements of the EU Habitats Directive for the species listed in the Habitats Directive (i.e. excluding *Hemorrhois algirus*, *Tarentola mauritanica* and *Hemidactylous turcicus*);
 - v. IUCN Red Data fiche for each species;
 - vi. Final report.

34. Ecoserv will be completing fields in the Article 17 datasheets that are related to the monitoring programme. Given that some parts of the data sheets are also related to management measures or other administrative matters, these latter parts will be left for ERA's completion, as the competent authority responsible for such measures.

F. Equipment specifications

35. Equipment that will be used throughout the monitoring surveys for reptiles as needed, includes the following with the given specifications.

a. GPS receiver

Model:	Garmin GPSMAP 66st
Satellite systems	Multiple Global Navigation Satellite Systems (GNSS) & ABC sensor capabilities
Interface	High-speed USB and NMEA 0183 compatible
Display Resolution	240 x 400 pixels
Waterproof	Yes, IPX7

b. Camera

Model:	Panasonic Lumix DMC-SZ10
Digital zoom	4x
Effective Still Resolution	16
Max Focal Length	288mm
Min Focal Length	24mm
Optical Sensor Resolution	16.6 megapixels

c. Binoculars

Model:	Nikon 7 x 50 CF WP
Magnification	7 x
Angular Field of View (Real)	7.2°
Angular Field of View (Apparent)	47.5°
FOV at 1000 yds (914.4 m)	377 ft (345 m)
Wide FOV	Yes
Relative brightness	50.4

Model:	Yukon Sideview 10 x 21
Magnification	10 x
Angular Field of View	5.5°
Minimum focusing distance	7 m
Lens diameter	21 mm

G. Personnel

36. All fieldwork and reporting under this monitoring programme will be carried out by scientific personnel engaged by Ecoserv Ltd. The overall co-ordination of the project and fieldwork will be supervised by the Ecologists Prof Patrick J Schembri and Prof Joseph A Borg, who will be assisted by Ms Sarah Debono, Project Manager at Ecoserv Ltd, to coordinate the team of scientists from Ecoserv undertaking the field surveys, and to provide the required input to the consultants. Mapping will be undertaken by Ms Ashley Hili.
37. Ms Debono will act as the contact person for this tender, ensuring effective liaison between the Contracting Authority and the project team at any time during the contract period for the achievement of objectives and deliverables, and with respect to progress on work carried out on the various survey deliverables.

H. Timetable of Activities

38. During the kick-off meeting with the ERA held on 16 October 2019, it was agreed that the first survey for this tender will commence in Spring 2020, following the endorsement of the Monitoring Framework by ERA and receipt of the Nature Permits required.
39. In considering all the fieldwork specified above, which includes surveys carried out during morning and dusk/early night on all three main islands and also monitoring at the minor islets, and respective reporting; it is estimated that each seasonal survey will span between 6 – 8 weeks. This will also depend on the conditions at the time of survey, in terms of weather, terrain, potential disturbances, etc.
40. Field surveys will be carried out during the last two months of every season. Noting that the seasons of concern start on the 21st calendar dates of March, June, and September; we propose to start each seasonal survey as follows: around mid-April for Spring; mid-July for Summer; and mid-October for Autumn. Due to the varying conditions that can be expected, it is not feasible to provide a specific number of days or specific dates for the surveys, as this could lead to possible underestimates. However, Ecoserv will ensure

that the surveys as proposed, will be carried out to the extent described. Close liaison with the ERA will be maintained during the execution of the surveys.

41. The summary post-survey reports will be prepared during the week following the end of each seasonal survey, and submitted to the ERA. The Interim report is expected to be submitted after the 6th month of data collection, and thus this would entail the inclusion of results obtained from two seasonal surveys. The final report will be prepared following the third seasonal survey, the tender allows a five-week period after the end of the field surveys (52 weeks) for its submission.
42. The Gantt chart below indicates the general timing for the individual components proposed for the current study, and the relationships in the timing between the different components.

GANTT CHART FOR THE GENERAL TIMING OF THE MONITORING PROGRAMME FOR REPTILES

Deliverables:	Description	2019					2020												
		SEASON *		Winter 2019			Spring 2020			Summer 2020			Autumn 2020						
		Month no.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		MONTH	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
	Contract signature																		
	Mobilisation																		
1	Submission of monitoring framework and review by ERA																		
2a	Surveys for DIURNAL species																		
2b	Surveys for NOCTURNAL species																		
3 i)	Input data for assessment of species conservation status																		
3 ii)	Assessment of species conservation status																		
4	REPORTING (for all 8 species) Post-survey summary reports																		
5 i)	Interim report																		
5 ii)	Article 17 data sheet per species																		
5 iii)	Red Data Fiche per species																		
5 iv)	Compilation of maps																		
6 i)	Final Report (draft)																		
6 ii)	Article 17 data sheet per species																		
6 iii)	Red Data Fiche per species																		
6 iv)	Compilation of maps																		
6 ii)	Final Report and maps (following review by ERA; timing is not exact as this depends on time of receipt of comments and extent.)																		

* Surveys will be carried out during 3 seasons: spring, summer and autumn; excluding winter.

I. References

Crosswhite D.L., Fox S.F. & Thill R.E. (1999). Comparison of methods for monitoring reptiles and amphibians in upland forests of the Ouachita Mountains. *Proceedings of the Oklahoma Academy of Science*, 79: 45-50.

Greenwood J.J.D. & Robinson R.A. (2006). General census methods. pp. 87–183 in: Sutherland W.J. (ed.), *Ecological census techniques*. Cambridge University Press.

Heyer R.W. (1988). *Measuring and monitoring biological diversity: standard methods for amphibians*. Smithsonian Institution Press, 297 pp.

Pizzuti Piccoli A. & De Lorenzis A. (2018). Seasonal phenology of reptiles in a Mediterranean environment (Castel di Guido, Natural Park, Northern Latium, Italy). *International Journal of Environment, Agriculture and Biotechnology* 3 (4): 1340 – 1347.



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Our Ref: ERA – 60/17 – Reptiles

Date: 7 April 2020

Application for Nature Permit – Attachment 2

Project Description

1. Aim of Project

The main objectives of the project are the provision and implementation of a monitoring and surveillance framework for eight (8) local reptile species over the period of 1 year, as required by the ERA under the provisions of tender ref: GF/Admin/60/17. The species included are:

Chalcides ocellatus, the Ocellated Skink;

Coluber viridiflavus (*Hierophis viridiflavus*), the Western Whip Snake;

Elaphe situla (*Zamenis situla*), the Leopard Snake;

Telescopus fallax, the Cat Snake;

Podarcis filfolensis, the Maltese Wall Lizard;

Hemorrhois algirus (*Coluber algirus*), the Algerian Whip Snake;

Tarentola mauritanica, the Moorish Wall Gecko; and

Hemidactylous turcicus, the Turkish Gecko

2. Justification for project. What is the value of the project in scientific and educational terms?

The outcome of this study will comprise an assessment of conservation status and the level of threat faced by the individual species listed in the tender. The results are intended to provide the Authority with the data required for its reporting obligations under the EU Habitats Directive and will provide an update of the species' Red Data List status.

3. Brief project outline

Please refer to full project details in [Attachment 1](#) – the Monitoring Framework for the project as approved by the ERA on 6 March 2020.

4. Starting date and estimated duration of project including dates[s] and time[s]. When is/are the handling/collection planned? If possible, provide month[s] and date[s]

Project will be implemented in three seasonal sessions; spring, summer and autumn 2020. The first session is intended to take place during the period 15 April – 15 June 2020. Details of the distribution and timing of field sessions are given in Attachment 1. Specific dates within the indicated period cannot be provided at this stage as the field sessions are highly dependent on weather conditions.

5. The site/geographic area of the activity.

Study locations and maps are indicated in [Attachment 1](#). It has been agreed with the ERA that the exact positioning of sites will be confirmed following the first session of fieldwork, during which the most appropriate positions to carry out the surveys will be identified on-site and the geographical coordinates will be recorded using a hand-held GPS set, to communicate with the ERA.

6. How many persons are involved per visit?

One to two personnel from Ecoserv will be involved in each field session.

7. How will be the site be accessed?

Access to each location on mainland Malta and Gozo will be by vehicle to the nearest accessible public street. Locations that are deeper into the countryside or those that are off-track, will be accessed on foot through pathways leading on from the street.

The islands of Comino, Cominotto and Selmunett will be accessed by boat up to the respective jetty, and then each site will be accessed on foot.

Fungus Rock will be accessed by hand-climbing/abseiling and then on foot.

Filfla will be accessed in two ways: on the plateau by means of a helicopter, and then on foot; and for the adlittoral area access will be by boat.

8. Description of the method to be used for the project.

Please refer to full project details in [Attachment 1](#) – the Monitoring Framework for the project as approved by the ERA on 6 March 2020.

9. Safety equipment available, in case of emergency.

All the necessary safety equipment depending on the nature of the field session will be available to personnel. For land sites, this will include adequate clothing and footwear, and when travel by boat is involved, all relevant regulations for safety at sea will be followed, including the availability of life jackets and a VHF radio. Personnel will carry mobile phones at all times to ensure that emergency contacts can be made if needed.

10. Any additional information deemed necessary