Comments on the draft Nature Reserves Regulations, 2019

4th November 2019

BirdLife Malta welcomes the publication of this legislation in the spirit of consolidating a number of nature reserves on the Maltese Islands, and setting clear limits to what can be permitted or otherwise to protect these important biodiversity sites. As part of the ongoing public consultation of the draft Nature Reserves Regulations, 2019, we have reviewed the proposed legislation and would like to highlight the following points for consideration.

1) General comments on regulations

- The term "surrounding area" of the nature reserves need to be defined more specifically. We highly recommend to include buffering zones around Nature Reserves to guarantee long-lasting and efficient protection. A buffer zone protects Nature Reserves and its environmental assets from potentially damaging and threatening external influences. Buffering zones form an essential transition area characterised by compatible uses, since significant negative impact on a protected area can be made by inappropriate forms of the use of the surrounding area. It would be advisable to have an adjusted buffer zone for each site to decrease potential conflict with other users.
- The term "commercial activity" needs to be clarified further.

2) Comments on proposed designated areas

Cominotto and its islands

- The islet and its cliffs and caves serve as very important habitats for seabirds, including Yelkouan Shearwater. It is highly necessary to set up a clear plan on which parts of the islets may be accessible or not in order to avoid people trespassing at environmentally sensitive areas - which is more likely to take place if the access to the beach is permitted including cave tours by private operators and individuals, around Cominotto as well as small the islets between Comino and Cominotto. Any such new delineated areas will require monitoring and enforcement.

St. Paul's Islands

- The islands have been proposed to be included as part of the Natura 2000 SPA network in Malta by BirdLife Malta in 2016[1], due to the island's importance as a Yelkouan Shearwater colony (Refer to Appendix 1)
- Commercial activities although set as prohibited under these regulations occur regularly on St. Paul's Island in the form of commercial boats berthing and people trespassing off the footpath on the island. In the St. Paul's Island buffering zone, light and noise pollution as well

[1] BirdLife Malta (2016). SPA proposals and SDF form update. Document presented to ERA by LIFE+ Malta Seabird Project. 4pp. – included as Appendix 1

as habitat degradation due to off-roading and camping is taking place regularly. Regulation needs to be properly enforced once adopted.

- widespread off-roading and camping on the saltpans on the mainland near St. Paul's Island create a lot of disturbance to the St Paul's Island seabird colony with picnics and music & light disturbances etc. A sign indicating that opposite the area is a nature reserve with explanations of what is permitted or otherwise is needed to inform people using the area for recreational purposes.

Ghallis Rock

- Rod fishing is mentioned as permitted for Ghallis Nature Reserve. Fishing with rods should be subject to permits, especially from September to May to minimize risks of illegal activities. Connected to rod fishing are threats such as cutting fishing rope, hooks or discard of fishing equipment around the Nature Reserve and should be strictly prohibited as well as included in the section of penalties. We propose fishing on the rock to be banned given it is the most practical approach at enforcing protection of the rock, and would also eliminate the dangers associated with accessing such a site.

3) Proposals for new areas to be considered as part of new legislation

A number of sites are in dire need of protection and this legislation could be an opportunity to include these areas:

- Qawra Point should be included in Annex I listed as a Nature Reserve in Malta due to its geographical location along Malta's major flyway route for waders and due to its proximity to the Salina Nature Reserve. Many resident and migratory birds depend on strategic points along their migratory route for their survival – such as the Qawra Point peninsula – and should be able to continue their flight without facing threats of illegal killing of birds (IKB). The area has become a hunting hotspot in the past years, resulting in the indiscriminate use of bird callers, and proving difficult for enforcement authorities to monitor and reach.
  An attempt to have this area declared a bird sanctuary was in the past made by the Administrative Enforcement Unit of the Malta Police Force, but did not make it through as a recommendation of the Ornis Committee (see Minutes of Ornis Committee meeting of the 5th October 2016[2] and 2nd November 2016[3]).
  The point is used by a handful of hunters, and has the added risk of a swimming zone next to an area where shotguns can be used. Declaring the area as a nature reserve would not simply benefit migratory and resident birds, but would also effectively eliminate risks of conflicting use of this area which is ultimately close to residential and commercial development.

- St. Paul's Island buffering zone: Light and noise pollution as well as habitat degradation due to off-roading is taking place regularly in this area creating disturbance for seabird colonies at St. Pauls Island. We recommend including the site as a buffering zone as indicated in the map below. Similar to permitting access to Comminotto beach, this area can be used for

[2] https://msdec.gov.mt/en/Document%20Repository/WBRU/2016/Ornis%20Committee/2016/Minutes%2005-10-2016.pdf
[3] https://msdec.gov.mt/en/Documents/Downloads/WBRU/2016/minutes21116.pdf

recreational purposes, however, guaranteeing that disturbance to the colonies minimized. Clear indications need to be formalised under article 7 “prohibition” and in line with the breeding cycle of seabird colonies at St. Paul’s Island.

4) Comments on specific parts of the regulation

Article 7: Prohibition

- Further clarification is needed in this section, e.g. for certain activities allowed in nature reserves (see above section two *Ghallis Rock*)
- Paragraph e.) should include the wording “and in its surrounding area/buffering zone”
- Paragraph f.) “loud music and unnecessary noise or light” needs to be specified further, such as no direct light and noise to rock surface during specific hours and times of the year from a specific distance for each Nature Reserve. In the case of bright lights and loud music from fix sources, for instance Café del Mar in Qawra which directly impacts seabird colonies at St. Paul’s Island. Yachts moored off the islet of Cominotto and St. Pauls should be limited from October to July during all hours of the day and in the cases of Fungus Rock and Filfla all year. Loud music influences reproductive behaviour of seabird negatively and can cause relocation of colonies. Negative impacts caused by light pollution can range from changes in biochemistry and behaviour, to the direct cause of mortality due to stranding birds on land, collision and relocation of populations.
- Paragraph h.) should include the wording “and its surrounding/buffering zone” to avoid for instance harmful activities connected to diving and spear fishing - which should be obliged to hold/apply for permits - in the area.

Article 9 Application criteria and supplementary provisions

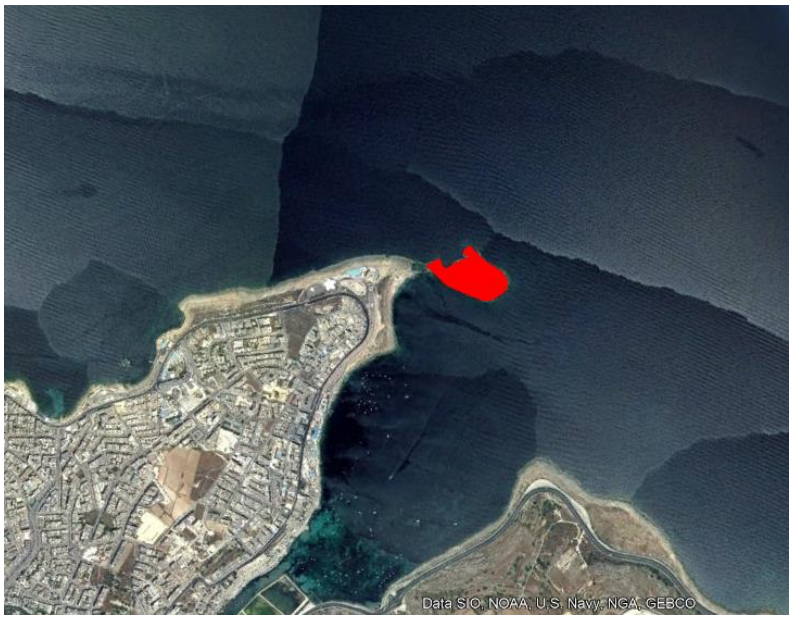
- Section 2) "Provided that the permit fee may be waivered, or reduced, by the competent authority for bona fide research purposes at the request, made in writing, by the applicant." We would like to clarify at this point if under the new regulation a fee is imposed especially for activities that fall under Article 8. 2b.) “the management and monitoring operations of the Nature Reserve in line with the provisions of the Flora, Fauna and Natural Habitats Protection Regulations and other operations indicated as essential by the competent authority for the management of the site” is enforced. BirdLife Malta has studied seabird habitats in Nature Reserves for the past decades and recommends to waiver permits that are beneficial for scientific research activities with the aim of environmental and biodiversity protection.
- Permit holders undertaking activities or operations should be responsible for not introducing any species to Nature Reserves. Therefore, we recommend to include the obligation of filling in a biosecurity protocol and form in connection to permits.

Article 11 Offences and penalties

- Gravity of offence should include the factor of trespassing into Nature Reserves
- Gravity of offences should include the factor of playing music on portable speakers and boats moored close to Nature Reserves, especially after sunset and before sunrise

Annex I: Maps - recommended areas to be included into the Nature Reserves Regulation

Map 1: Area in front of St. Pauls Island – light and noise pollution and habitat degradation is taking place regularly in this area creating disturbance for seabird colonies at St. Pauls Island



Map 2: Qawra Point – disturbance due to illegal killing of birds (IKB)

Annex II: Example - Biosecurity Plan for Filfla

FILFLA BIOSECURITY PLAN

James Crymble & Martin Austad (BirdLife Malta)

Dr. Karen Varnham (RSPB)

2018

LIFE Arċipelagu Garnija (LIFE14 NAT/MT/991)

Securing the Maltese Islands for the Yelkouan Shearwater *Puffinus yelkouan.*

Action C1: Implement effective predator management and/or biosecurity at Yelkouan shearwater colonies

LIFE14 NAT/MT/991 LIFE Arċipelagu Garnija
Securing the Maltese islands for the Yelkouan Shearwater
Puffinus yelkouan

FILFLA BIOSECURITY PLAN

Report written by:	James Crymble, Martin Austad, Karen Varnham
Contact:	James.crymble@birdlifemalta.org
Report completed on:	11/2018

Data Project

Project location:	Malta
Project start date:	01/09/2015
Project end date:	31/08/2020
Total budget:	1,261.940€
EU contribution:	757.220€
(%) of eligible costs:	60%

Data Beneficiary

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Project Website:	http://birdlifemalta.org/arcipelagugarnija/

Cover photo: Aerial view of Filfla by Paulo Lago

Suggested citation: Crymble J., Austad M., Varnham K., (2018) Filfla Biosecurity Plan. LIFE Arċipelagu Garnija (LIFE14 NAT/MT/991) Action C1 report. BirdLife Malta & RSPB, 27 pp

1. Introduction

The purpose of this Biosecurity Plan is to provide a robust framework for the prevention of rodent incursion on the islet of Filfla, particularly by brown rats *Rattus norvegicus* and black rats *R. rattus.* Filfla is free of all mammalian invasive non-native species (INNS). This Plan is intended for use by BirdLife Malta staff (currently LIFE Arċipelagu Garnija Project) and all entities permitted to land on Filfla. This Plan details the necessary information required for a rapid response in case of detection of invasive mammals.

Filfla u l-Gżejjer ta' Madwarha is a Special Area of Conservation (SAC) of International Importance and a Special Protection Area (SPA). This six-hectare island is situated around 4.5km from the south coast of Malta. It is a flat-topped limestone plateau with surrounding cliffs around 60m high. It measures around 300m by 150m, including boulder scree. It is home to an important colony of Mediterranean storm petrels *Hydrobates pelagicus melitensis* and holds 50% of the global population of this subspecies, a Scopoli's shearwater *Calonectris diomedea* colony of around 200 pairs, and is known to have supported a colony of Yelkouan shearwaters *Puffinus yelkouan* in the past. An assessment of rat activity carried out in 2017 and 2018 by BirdLife Malta, using non-toxic chocolate flavoured wax blocks, trail cameras and visual searches, found no sign of rats or other non-native mammals. The island's boulder scree is accessible by boat only in very good sea conditions and BirdLife Malta typically visit 5-15 times per year at present, with most visits taking place between April and August in order to monitor Mediterranean storm petrel, Scopoli's shearwater and Yellow-legged gull colonies. The island is usually accessible from March, sea conditions permitting. The plateau is accessed twice per year by the Armed Forces Malta (AFM) helicopter, or by rope access from the boulder scree, to monitor the Yellow-legged gull colony in March and May.

Filfla is further designated as a Strict Nature Reserve by the Maltese government. As such, permission must be obtained from the Environment & Resources Authority (ERA) before landing on the island. Illegal non-permitted landings are likely to occur year round by recreational boats. AFM and Transport Malta patrol boats pass Filfla infrequently but better enforcement is needed to prevent these landings. The waters surrounding Filfla are popular with local fishermen. Fishing boats are predominantly open-topped traditional craft *Luzzu* from the harbour of Wied iż-Żurrieq, and to a lesser extent Għar Lapsi and Marsaxlokk. Pleasure boats and other leisure craft also represent a risk of introducing non-native animals. Larger vessels, i.e. cargo ships, are unlikely to pose a biosecurity risk to Filfla as the main shipping routes are sufficiently far (> 4km, further than the known maximum swimming distance of black or brown rats), from the island. However, establishing a policy within the legal framework for a minimum set-back distance for large ships must be a priority.

The island's distance from other islands (4.5km), and its inaccessibility for landing, means that it is at relatively low risk of invasion by non-native mammals. The biggest risks are likely to come from boats landing in the island, including boats carrying permitted researchers to the island. Simple measures should be put in place to minimise the risks of invasive species arriving on the island and, if they do arrive, of establishing breeding populations.

Surveillance (and associated record-keeping) is the responsibility of:
Project Warden: James Crymble, BirdLife Malta
Project Warden: Martin Austad, BirdLife Malta

Stephen Saliba, Environment & Resources Authority

2. The site

Table 1. Site summary for Filfla (Adapted from SIRP template)

Size of island	Total area 9ha
Area under ERA management	The entire island is government owned
Other ownership/key stakeholders	ERA as island managers. BirdLife Malta & other research entities as conservation workers. AFM / Transport Malta as local enforcement.
Habitats present on the island	Plateau – garrigue / steppe vegetation, characterised by tree mallow *Lavatera arborea* and *Suaeda vera*. Boulder scree – bare rock with small patches of vegetation including *Lavatera arborea* and *Capparis spinosa* Maritime cliffs with associated caves and crevices
Distance from neighbouring islands/mainland. Consider prevailing currents/winds and proximity to a river mouth/estuary	4.5km from the south coast of Malta Prevailing winds are north-westerly, which comes from the Maltese mainland. No rivers or estuaries nearby, weak tidal flows around the island
Is the island inhabited? Or does it have regular visitors? What else is brought to the island and by what route and method? (e.g. livestock, agricultural feed, building materials; by boat or by air, from where?)	Island is uninhabited. Staff from LIFE Arċipelagu Garnija Project visit the island infrequently. Transport is by small open-topped boat and by AFM helicopter. Staff stay overnight with appropriate equipment to conduct fieldwork. Other entities, including ERA also visit the island infrequently, one or two times annually Illegal landings – no data but thought to be infrequent
Are ERA or LIFE Arċipelagu Garnija staff resident (year-round or seasonally)? If not, how frequently do they visit? How long are the visits and what time of year?	No staff are resident on the island. Staff from LIFE Arċipelagu Garnija visit the island 5-15 times per year. Visits last no more than 18 hours
Are there buildings & businesses? (give number and type)	A few scattered ruins – low walls and foundations No businesses
Who & what comes to the island? From where & how?	Only permitted research parties are allowed to land. Mainly LIFE Arċipelagu Garnija staff and ERA. Helicopter departs from AFM Luqa barracks. Boat depart from harbour of Wied iż-Żurrieq

What is the access? e.g. quays, slipways, beaches	Helicopter landing site is on the plateau of the island, exact location is dependent on weather conditions Boat landing sites are dependent on sea conditions, favoured sites include large boulders on the north-east of the island. No quay present
What species are present on the island? (especially those at risk from INNS or from eradication techniques)	Mediterranean storm-petrel, Scopoli's shearwater, Yelkouan shearwater (historic), Yellow-legged gull and Maltese wall lizard all breed in areas easily accessible to predators. No native mammals currently on the island.
Is there any archaeological interest that could be damaged by INNS?	The archaeology is stone-built and at low risk of damage from INNS. Possible subsidence damage from rat burrows if they become established

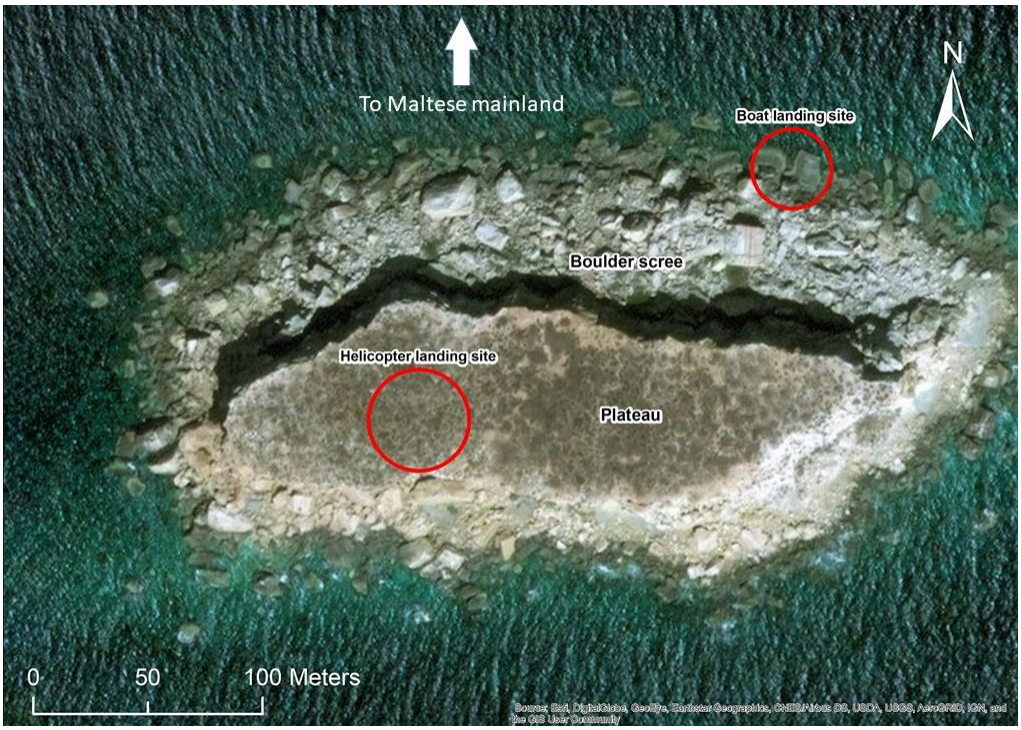


Figure 1. Map of Filfla showing the most often used landing sites for access to the island by boat and helicopter

2.2 Site geography

The boulder field (Figure 2, Left) that surrounds Filfla offers many places for rodents to hide. This will make detecting a rodent incursion difficult without a robust passive monitoring system in place. The island is visited infrequently by several different entities during the year. A rodent incursion could remain undetected for weeks or months.

The plateau of Filfla (Figure 2, Right) is expected to be more resistant to rodent incursion. However, rats (especially black rats) are strong climbers and will be able to gain access. Access to the plateau by researchers is only possible by helicopter or demanding rope access. As such, it is visited less frequently than the boulder field.

Figure 2. Left: Photo of typical storm petrel nesting habitat in Boulder scree of Filfla. **Right**: Filfla plateau in early spring, dense vegetation is tree mallow *Lavatera arborea.*

3. Biosecurity concerns

3.1 Risk species

Invasive species	Impact speed	Impact severity	Likelihood of arrival	Describe the impacts of an invasion
Brown rat *Rattus norvegicus*	Rapid	High	High – likely stowaways and strong swimmers	Predation of juvenile of birds and eggs of all species breeding on Filfla. • Significant declines in productivity for all species • Loss of breeding populations of all seabirds
Black rat *Rattus rattus*	Rapid	High	High – likely stowaways	Predation of juvenile birds and eggs of all species breeding on Filfla. • Significant declines in productivity for all species • Loss of breeding populations of all seabirds
House mouse *Mus musculus*	Rapid	High	Moderate - likely stowaways	Predation of juvenile birds and eggs of all species breeding on Filfla • Decline in productivity for all species - especially storm-petrel • Significant decline in breeding populations of all seabird species • Loss of breeding storm-petrel population

Table 2. Invasive non-native species which pose a risk to Filfla

Table 3. Quantifying impacts of INNS (Adapted from SIRP template)

Impact category	Explanation of severity of impact		
	Biodiversity	**Economic**	**Cultural**
Critical	Loss of a threatened native species / species occurring in internationally important numbers	Significant costs of controlling rodents	Extinction or permanent destruction of cultural value
High	Loss or significant decline of at least one native species	High costs of controlling rodents	Major degradation of cultural significance
Medium	Decline in population of several native species	Continued costs in managing rodents	Degradation in an area or decline in species of significance
Low	Decline in population of at least one species	Costs of managing rodents	Small changes in abundance of culturally significant native species or quality of an area on the island.

3. Incursion pathways

3.1 Natural pathways

The Maltese mainland supports both black rats and brown rats. The nearest harbour to Filfla is Wied iż-Żurrieq, approximately 4.5km from Filfla. This distance is greater than the current maximum recorded swimming distance for house mouse, black rat and brown rat. Brown rats are strong swimmers and have been recorded swimming up at least 2km, and some authorities believe they could swim up to 4km in the right conditions. Lack of a strong tides or currents and a warm sea-surface temperature year-round would possibly make the crossing easier. Therefore, natural incursion by brown rats cannot be ruled out entirely. Rodents discovered on-board a vessel whilst at-sea and thrown overboard and those on flotsam or other debris could be carried to the island, or swim once within achievable distance. The northern side of Filfla faces the Maltese mainland, is easily accessible to rodents, has the highest boat traffic and is the side of the island where most permitted landings by boat occur. Therefore, the northern side is classified as 'High risk' of incursion. The southern side of Filfla is also easily accessible and boats infrequently pass, therefore is classified as 'Moderate risk'. The plateau is classified as 'Low risk', due to difficult access (Figure 3).

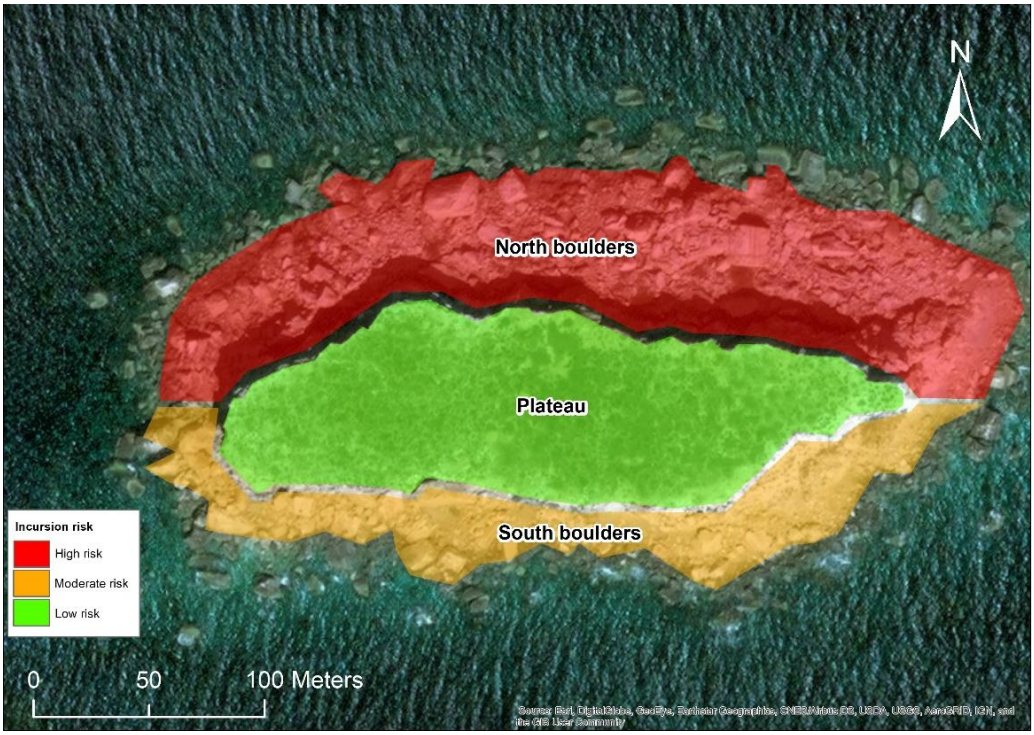


Figure 3. Map of Filfla showing general zones of incursion risk

Figure 4. Map of likely incursion points on Filfla with normal fieldwork activities by LIFE Arċipelagu Garnija project team

3.2 Human-assisted pathways

Table 4 lists the invasion pathways for Filfla. The main pathways include: landings on Filfla (both permitted and illegal); various vessels used for fishing or leisure in the waters around Filfla; shipwrecks; and large vessels that pass close to the island. The vast majority of boats that use the waters around Filfla are small open-topped vessels and are therefore lower risk than larger enclosed vessels, although some of these vessels do visit the area infrequently. It is illegal to anchor within one nautical mile of Filfla. Large cargo ships pass at distances sufficiently greater than the maximum swimming distance for rodents. It is unlikely that intentional release of rodents on Filfla will occur but cannot be ruled out entirely.

Table 4. Invasion pathways for Filfla

Pathway	Invasive Species	Risk level
Boat transport carrying permitted research parties with equipment - This represents the greatest biosecurity risk faced by Filfla	Brown rat Black rat House mouse	Medium Medium Medium
Illegal landings on Filfla – Low probability that boats would carry rodents but rodent control measures at point of departure are unknown/insufficient.	Brown rat Black rat House mouse	Medium Medium Medium
Shipwreck – low probability of occurrence but higher likelihood that larger vessels would carry rodents.	Brown rat Black rat House mouse	Low Low Low
Swimming – out of known range but may be assisted by boat owners that expel rodents whilst at-sea	Brown rat Black rat House mouse	Medium Low Low
Helicopter – Lands very occasionally. Mostly carries only people and their personal equipment.	Brown rat Black rat House mouse	Low Low Low

4. Prevention plan

The aim of this plan is to prevent the introduction of mammalian INNS to Filfla. The main incursion risks are human-assisted pathways: landings on the island; marine activity in the surrounding waters. Preventing INNS from becoming established is by far the cheapest and easiest solution as well as the one likely to cause the least damage to native species. All marine users in the vicinity of Filfla and visitors to the island must take the following precautions to prevent introduction of rodents (Table 5).

(see Appendix 1).

4.1 Creating barriers

Table 5. Establishing barriers to the invasion pathways on Filfla

Pathway	Barrier	Who implements*
Boat / Helicopter transport carrying permitted research parties	1.Provide training for relevant personnel in recognising signs of rodents and non-native species 2. Thoroughly check the boat/helicopter for signs of INNS before leaving harbour 3. Take precautions when moving materials onto the island – move small volumes only and check any stored prior to movement. Where possible, pack equipment in rodent-proof containers, and pack or re-pack on day of travel 4. Encourage culture of biosecurity among staff of permitted research parties – ensure boots and other personal equipment are free from plant seeds, invertebrates etc.	LIFE Arċipelagu Garnija Project staff / other permitted research parties/ ERA/ AFM/ boat operator
Illegal landings on Filfla / Storm debris / Swimming / Human assisted release	1. Increase AFM / Transport Malta patrols around Filfla 2. Inform and educate marine users of the risks of INNS incursion on Filfla 3. Set out and check non-toxic monitoring stations on the island – 8-10 in total, checked on every visit 4. Implement respective incursion response plan if any credible sign of INNS is found	LIFE Arċipelagu Garnija Project staff / ERA / AFM / Transport Malta.
Shipwreck	1. Implement incursion response plan in the event of a shipwreck on the island.	LIFE Arċipelagu Garnija Project staff

5. Surveillance (Routine Monitoring)

5.1 Detection techniques

1) Seven non-toxic chocolate flavoured wax blocks should be located in areas likely to appeal to rodents. These should be checked on every visit to the island by a permitted group. Fresh wax blocks

will be deployed and the old ones removed on each visit to the island (these can be melted down with extra flavouring and re-cast). Data will be recorded in a Biosecurity log (Appendix 5).

2) Camera traps have been placed at entrances to storm petrel nesting caves. SD cards are retrieved and new ones deployed on every visit. Footage should be analysed for presence of rodents after each visit.

3) Set out four rodent motels (wooden boxes designed to appeal to rodents as nesting sites) across the island. These can be used to house monitoring tools such as wax blocks. Check on every visit to the island, looking for signs of rodent activity (droppings, bedding material, feeding signs etc.)

4) Visual searches for sign – droppings, footprints, feeding, carcasses. If any fresh droppings are found, place these in labelled plastic bags / sample tubes and freeze immediately on returning home. Fresh droppings can be tested for DNA and identified to species level.

Any sightings by third parties will be checked firstly by interview and then by site inspection (Appendix 2 + Appendix 3). New staff and volunteers should be taught the basic biosecurity surveillance in their induction. Surveillance tool checks should be part of the routine work and checks should be recorded in the Biosecurity Log (Appendix 5)

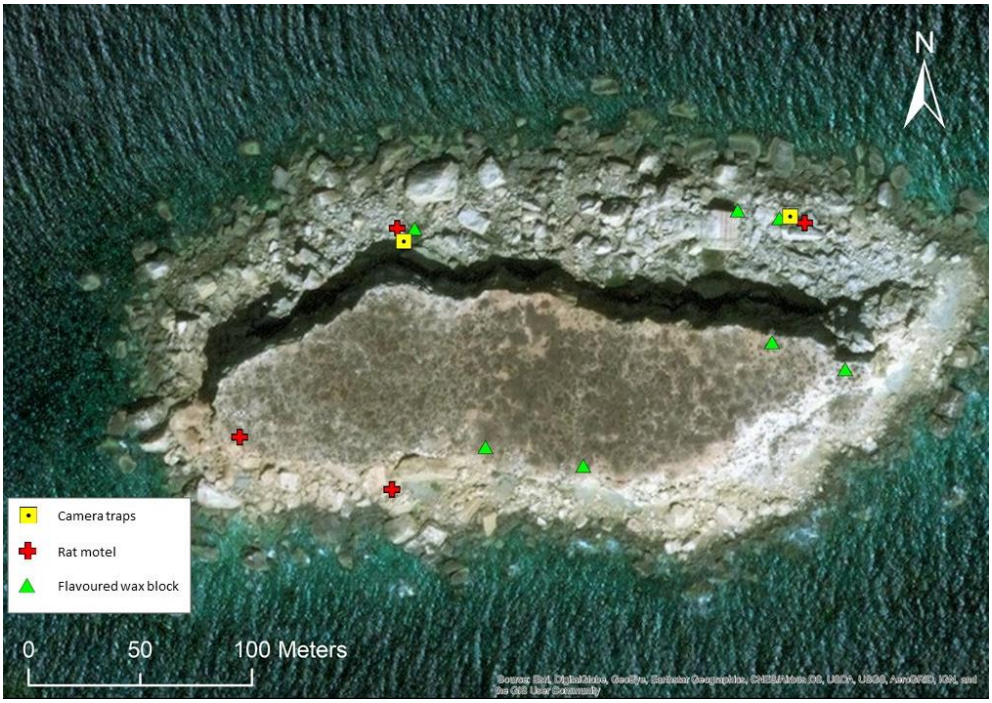


Figure 5. Map of surveillance tools for 2019-2020

6. Incursion response

6.1 Confirming incursion

It is important to confirm a possible rodent incursion so that the appropriate actions may be carried out in response. It is the responsibility of the managing / competent authority to detect potential INNS sign and should be carried out by trained personnel. They should be able to identify clear cut cases of signs left by rodents and other INNS, such as teeth-marks, footprints, burrows and droppings (see Appendix 7). Expert advice should always be on hand as needed, however, to help interpret the evidence. If there is any uncertainty over the sign at least two experts should be contacted for their opinions (Table 6).

If signs of mammalian INNS are found on the island that are classed as **possible (see section 6.3.1)**, but not **probable or definite (see section 6.3.2)** sign of INNS, the routine surveillance should be immediately replaced with the relevant intensive surveillance protocol(s), as detailed in **section 6.3.1 (rodents)**

If signs are found which are classed as **probable or definite** sign of INNS then the relevant full incursion response plan(s) should be launched, as detailed in **section 6.3.2 (rodents).** See the appropriate sections for definitions of possible, probable and definite signs. **If in doubt, seek advice from the people listed in Table 7 below, in particular the Seabird Island Restoration Project Team.**

Any known or credible incursion should be responded to immediately with the aim of initiating the full incursion response plan within 48 hours, preferably less.

Table 6. Responding to signs of mammalian INNS on Filfla

	Action	Responsible
1	Anyone discovering known or suspected INNS sign or told about suspected INNS sign by a third party should immediately inform all the people listed in Table 7 (the SIRP team are also available to advise on biosecurity issues, or help identify rodent sign at any time).	LIFE Arċipelagu Garnija Project staff and volunteers & ERA
2	To respond to signs of INNS classified as **possible but not probable or definite**, initiate the relevant **intensive surveillance protocol(s)** (detailed in Table 9, section 7.3.1). This includes additional non-toxic monitoring such as trail cameras (suitable for all species) and wax monitoring blocks	LIFE Arċipelagu Garnija Project staff & ERA

3	To respond to signs of INNS classified as **probable or definite**, initiate the relevant full **incursion response plan(s)** (detailed in section 7.3.2). This includes the additional monitoring devices listed above as well as using rodenticide bait in a grid of stations across the island.	LIFE Arċipelagu Garnija Project staff & ERA

6.2 Response readiness

Table 7. Who to notify in the event of any sign of mammalian INNS – possible, probable or definite

	Name	Role	Contact details
1	James Crymble Martin Austad	LIFE Arċipelagu Garnija Project staff	James.crymble@birdlifemalta.org Martin.austad@birdlifemalta.org
2	Karen Varnham Laura Bambini	RSPB Seabird Island Restoration Project (SIRP) Team	Karen.varnham@rspb.org.uk Laura.Bambini@rspb.org.uk
3	Stephen Saliba	ERA	stephen.c.saliba@era.org.mt

6.3 Responding to signs of invasive species: rodents

6.3.1 Responding to possible signs of rodents (intensive surveillance)

Possible signs include finding one or more dead birds or other animals showing possible signs of predation, unclear or degraded footprints, burrows or droppings, sightings made by people unfamiliar with rodents or unclear sightings made by people who are familiar with rodents, bulky high risk cargoes being brought to the island, or storm debris washing ashore on the island. Contact the SIRP team if any further information or advice is needed.

All surveillance tools should be placed in sites likely to appeal to rodents, such as the shoreline and along linear landscape features such as walls. See Appendix 6 for notes on trap and bait station placement. Contact the SIRP team for advice on using surveillance tools or for interpreting any suspect sign.

1. Contact the people listed 1-3 in Table 7

2. Replace or refresh existing wax block monitoring stations (10-12) to ensure the smell of the attractant (chocolate, coconut, peanut butter etc.) is fresh and strong. Set four to eight additional wax monitoring points close to the suspected sign in sites of likely rat or mouse activity
3. Carry out regular visual searches for rat or mouse sign, such as droppings, feeding sign, footprints etc.

4. Use trail cameras to look for evidence of INNS moving at night

5. Check wax blocks and tracking tunnels, and trail cameras as often as possible over the first week twice a week for **four weeks**

If no additional sign is found during this time, return to the routine surveillance described in section 5.1. If **probable or definite** sign is found, immediately implement the full incursion response plan in **section 6.3.2** (rodents). Log all actions taken in the biosecurity log (see Appendix 5).

6.3.2 Responding to probable or definite signs of rodents (incursion response)

Probable signs of rats and mice include clear teeth-marks on surveillance tools or other items, droppings, burrows, footprints, predated birds or other clear feeding sign, shipwrecks, or partial or brief sightings made by people familiar with rodents. **Definite** signs include carcasses, confirmed rodent DNA in droppings, and clear sightings made by people with experience of rats or mice.

Incursion response timing

On islands smaller than 100ha, such as Filfla, any probable or definite sign of INNS will be met with a response that covers the entire island - essentially an island-wide eradication operation. Incursion responses are designed to tackle INNS arrivals at an early stage, to prevent them getting everywhere and thereby avoid having to carry out an expensive eradication project across the whole island. On an island the size of Filfla even a single rat is already effectively 'everywhere' and the element of urgency in responding to an incursion in order to prevent an island-wide eradication is therefore reduced. Consequently, there is more leeway in timing incursion responses on small islands and an immediate response may not always be the most effective, e.g. in summer months when there is abundant food available.

If rodents or other INNS are found during the bird breeding season a decision needs to be made about whether to implement the full incursion response plan at that time. This decision should be made on a case by case basis in discussion with SIRP & ERA staff (see Table 7 for contact details). Any disturbance to the breeding birds is regrettable but in some circumstances the risks to the birds of predatory mammalian INNS becoming established may outweigh the risks of disturbing some nests during the increased monitoring of bait stations. However, it may be preferable from an operational point of view to carry out the INNS eradication attempt in the autumn or winter when natural food availability is lower and INNS may be more likely to take bait or enter traps than during the summer months.

1. Contact the people listed 1-3 in Table 7

2. Best practice recommendations for rodent incursion response involve setting up a 50m grid of bait stations for 500m in all directions around the point where rodent sign was detected, covering an area of 1000m x 1000m or 100ha. On islands smaller than 100ha, such as Filfla, any probable or definite sign of INNS should therefore be met with an island-wide response - essentially an island-wide eradication operation.

3. Around 25-30 bait stations will be needed for the size of the island, approximating to a 50m grid (a 50m grid equates to four stations per hectare – see Appendix 6). They do not need to be set out in a grid pattern, just at the appropriate density, though to ensure even coverage and for ease of re-finding them, a grid is useful. Number all stations and record their locations with GPS so you can easily find them again. Wire three blocks of wax-based rodenticide (each approximately 20-30g depending on formulation used) into each bait station.

4. Stations in the **boulders** should be checked as often as possible for the first **two weeks** and then once a week for the next **six weeks**.

   Access to stations on the **plateau** is more difficult and should be checked **once a month**. Replenish bait as necessary to ensure a fresh supply is always available – to ensure that rodents eat a lethal dose we want the bait to be the most attractive food available on the island and mouldy or damp bait is far less appealing.

5. Even though it is unlikely to find any dead and dying rodents, if found these should be collected and disposed of according to the rodenticide manufacturer's instructions. This is very important to reduce the risks of secondary poisoning (i.e. animals being poisoned by eating poisoned rats).

6. After the first week of poison baiting, set up surveillance points at, and halfway between, each bait station and place flavoured wax at each (thus creating a 25 x 50 grid, alternating points with bait stations and surveillance tools with points with just surveillance tools). Check with the same regularity as bait stations.

7. If available, use trail cameras in any areas with active or suspected sign to confirm the presence of rodents.

8. Enter bait take, trap and surveillance check data into a LIFE Arċipelagu Garnija baiting database on the day it is gathered.

If any further information or advice is needed, please contact the Seabird Island Restoration Project Team at any time (contact details in Table 7 above).

6.3.3 Responding to signs of non-rodent mammalian INNS

It is highly unlikely that other mammalian species will reach Filfla. However, they should not be neglected altogether. Cats, hedgehogs and rabbits are the most likely of these species to be introduced; with each of these posing a different biosecurity risk (Table 8).

Table 8. Non-rodent mammalian INNS

Invasive species	Impact speed	Impact severity	Likelihood of arrival	Describe the impacts of an invasion
Domestic cat *Felis catus*	Rapid	Medium - High	Low – unlikely stowaways and reluctant swimmers	Predation of adult and juvenile birds of all species breeding on Filfla. Predation of lizards. • Significant declines in productivity for all species • Loss of breeding populations of all seabirds
Algerian hedgehog *Atelerix algirus*	Moderate	Medium	Low – unlikely stowaways; can swim	Predation of eggs of all species breeding on Filfla. • Significant declines in productivity for all species • Loss of breeding populations of all seabirds
Rabbit *Oryctolagus cuniculus*	Low	Medium	Low - very unlikely stowaways and reluctant swimmers	Severe degradation of archaeology on the island subsidence through digging of burrows. Loss of vegetation

Cats

Surveillance: Camera traps deployed at key locations; visiting researchers encouraged to remain vigilant for **possible** and/ or **probable or definite** signs of cat.

Possible signs include: carcasses of adult and juvenile birds; degraded footprints; scat.

Probable or definite signs include: fresh footprints; fresh scat; clearly predated carcasses of birds (especially adult birds); sightings made by people experienced with cats; cat carcasses, cat DNA confirmed from analysis of droppings.

Incursion response:

1. Contact people listed 1-3 in Table 7
2. Set out live traps across the boulder field– check as often as possible within an 18 to 24 hour period.
3. Remove **all** live traps before leaving island. Live traps are only left in place as long as personnel are on Filfla due to welfare implications.
4. Return captured cats to mainland to be given into care of the Animal Welfare Unit
5. Continue trapping once a month until no **probable or definite** signs are encountered

Hedgehogs

Surveillance: Camera traps deployed at key locations; visiting researchers encouraged to remain vigilant for **possible** and/ or **probable or definite** signs of hedgehog.

Possible signs include: Predated eggs; droppings; degraded footprints and tracks

Probable or definite signs include: Predated eggs – definitely by hedgehog; fresh footprints or tracks; sightings made by people experienced with hedgehogs; hedgehog carcasses, hedgehog DNA confirmed from analysis of droppings

Incursion response:

1. Contact people listed 1-3 in Table 7
2. Algerian hedgehog is a protected species; a special license from ERA must be obtained before handling.
3. Set out live traps across the island –check as often as possible within an 18 to 24 hour period
4. Remove **all** live traps before leaving island. Live traps are only left in place as long as personnel are on Filfla due to welfare implications.
5. Return captured hedgehogs to mainland to be given into care of Animal Welfare Unit
6. Revisit island and continue trapping once a month until no **probable or definite** signs are encountered

Rabbits

Surveillance: Camera traps deployed at key locations; visiting researchers encouraged to remain vigilant for **possible** and/ or **probable or definite** signs of rabbit

Possible signs include: Degraded footprints or tracks; old burrows and scrapes; chew signs or signs of feeding.

Probable or definite signs include: Fresh droppings; fresh footprints or tracks; rabbit carcasses, rabbit DNA confirmed from analysis of droppings

Incursion response:

1. Contact people listed 1-3 in Table 7
2. Set out live traps across the boulder field – check as often as possible within an 18 to 24 hour period.
3. Remove **all** live traps before leaving island. Live traps are only left in place as long as personnel are on Filfla due to welfare implications.
4. Return captured rabbits to mainland to be given into care of Animal Welfare Unit.
5. Revisit island and continue trapping once a month until no **probable or definite** signs are encountered.

6.4 Equipment

Table 9. Biosecurity equipment needed for Filfla

Item	Number/amount
Reference information	
Sheets showing rodent sign (droppings, footprints etc)	4
Sheets showing marks left on wax monitoring blocks	4
Recipe sheet for wax blocks	4
Copy of SIRP Biosecurity Manual	2
Map of island with monitoring/bait/tracking tunnels etc	4
Record keeping	
Notebooks, pens, pencils etc	4 of each
Access to laptop/ tablet for entering biosecurity data	
Detection	
Wax monitoring blocks	100
Bait stations (Protecta or similar, and/ or wooden rat motels)	10
Large clear plastic boxes for storing reference and detection kit	2-4, as needed
Rodent motels	4
Incursion response/ Eradication	
Additional bait stations	To a total of 25-30
Rodenticide bait, wax block formulation (e.g. Contrac blox/Protect Wax Extruded)	10kg to be kept in case of probable or definite incursion
Flagging tape for additional monitoring points	1 roll
30cm wires for additional monitoring points	20
Trail cameras	2

Appendix

Appendix 1. Biosecurity checklist to be completed by team-leaders <u>for all visits to Filfla:</u>

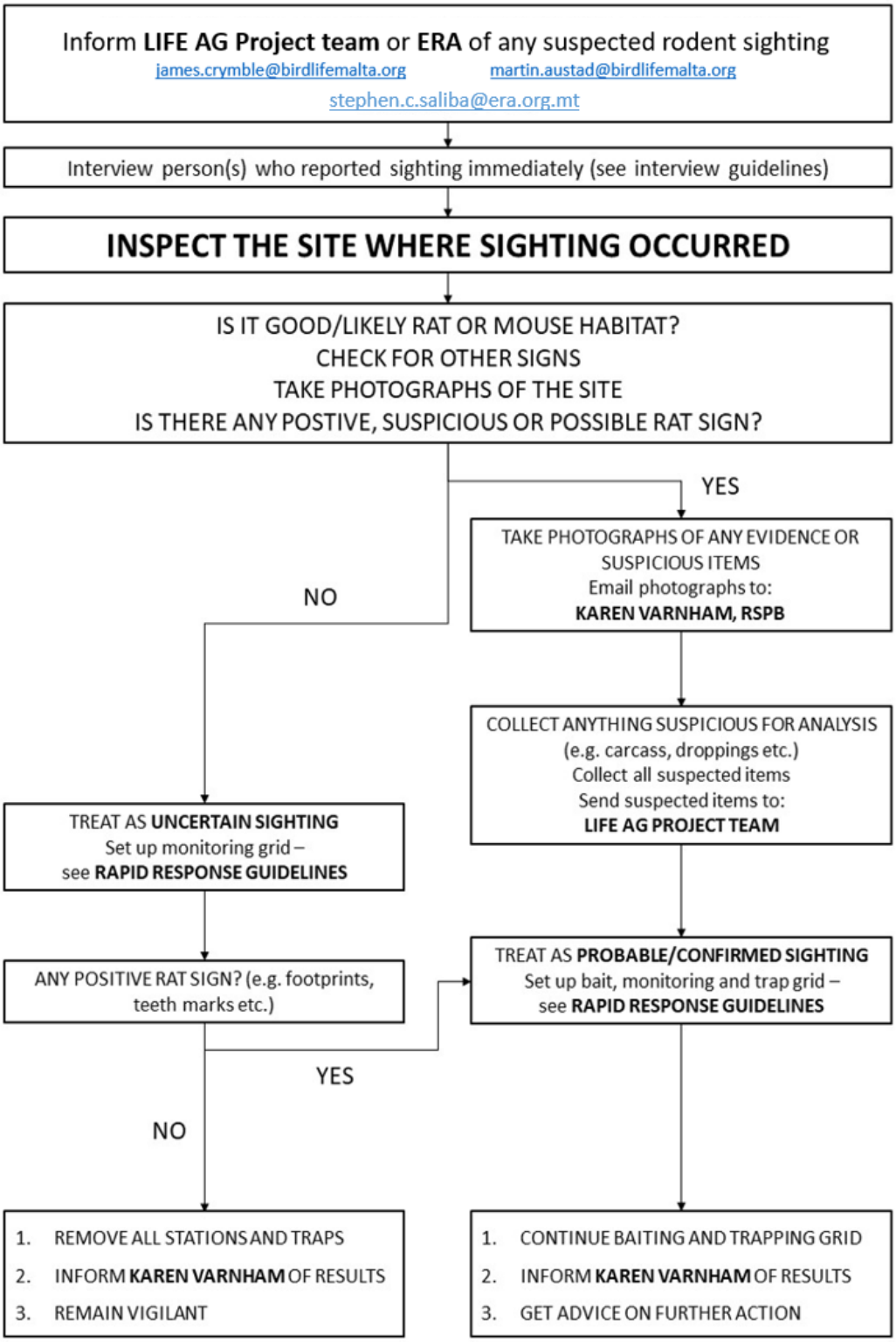
Task	Completed?
1. Have I given clear biosecurity instructions to all trip members?	Yes/No
2. Have I checked they have understood these instructions?	Yes/No
3. Have all stores and supplies (which are small enough) been packed in approved rodent-proof containers?	Yes/No
4. Itemise gear too bulky/awkward to fit into rodent-proof containers: • • Items checked immediately prior to departure	Yes/No
5. Has everything been stored in a rodent-proof room in sealed containers or re-checked immediately prior to departure?	Yes/No
6. Have I checked with every member of trip: - packs kept in rodent-free areas or checked and re-packed since? - no food held in any unsealed bags? - boots and other footwear clean and free of soil/seeds? - packs, pockets, Velcro fasteners, socks, etc. clean of weed or grass seed? - no-one in party has worked in area of known invasive plant/invertebrate infestation recently without changing/ washing gear (including shoes/bags)?	Yes/No
ANSWERS 1-6 MUST BE 'YES' BEFORE TRIP CAN PROCEED	
7. Identify any added risks of the trip: - are we leaving/ travelling at night? - are there planned stops en route where pests could enter or exit? - are we travelling on a boat with no poison rat baits or effective rodent control measures? - are any items being stored on deck or in non-rodent proof holds?	Yes/No
8. Have I addressed these concerns by identifying and implementing bespoke solutions to minimise potential risk to the islands?	Yes/No
YOUR ANSWER TO TASK 8. MUST BE 'YES' BEFORE TRIP CAN PROCEED	
In Transit to Islands: If any sign of rodent or other invasive species is detected on the boat whilst en route to your destination, DO NOT land at the destination island or any other island until the problem has been identified and remedial actions implemented in consultation with experts.	
On Arrival: - Have I re-inspected all containers for rodent entry or damage which could allow entry? - Has everything been unpacked or opened up and carefully inspected in an open area or quarantine room? - Have I instructed everyone that all organic rubbish should be taken back to the mainland and disposed of there? - If planning to go to other islands from here, have I considered and established how to apply quarantine procedures before we leave? - If on a daytrip, have I ensured only day-bags are taken, and that they have been checked as clean and been packed only on the day of departure?	Yes/No

ONCE COMPLETED SEND TO STEPHEN SALIBA, ERA stephen.c.saliba@era.org.mt

Appendix 2. Third party sightings and interview guidelines

Name of person reporting sighting:		Name of person who made sighting (if different):
Contact details of person reporting sighting Email: Telephone:		Contact for person who made sighting (if different):
Date of sighting:	Date of interview:	Interviewer:
Overview of action taken		
Circumstances (circle as appropriate): Live animal Dead animal Footprints Droppings Damage Other:		
Time / conditions of sighting:		
Location of sighting – as much detail as possible:		
Any other observers? Names and contact details if known:		
Description of sighting: What did you see? Can you describe the animal? What was it doing? How long did you observe it for? How close were you to it? Have you seen mice/rats in the wild before? What makes you think it was a mouse/rat? How sure are you that it was a rat/mouse?		
Does the observer wish to be notified of the monitoring (may take up to six weeks)?		

Appendix 3. Site inspection guidelines

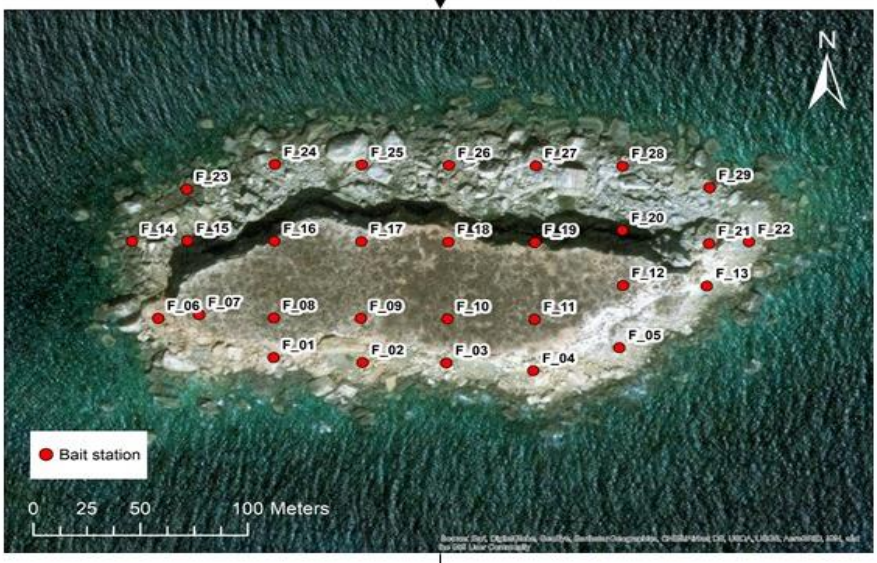


Appendix 4. Uncertain/possible sightings / evidence

Inform **KAREN VARNHAM** of outcome of interview/site inspection

SET UP MONITORING GRID:

- In addition to permanent detection devices already present, place bait stations across island
- Place one chocolate flavoured wax block and one peanut butter flavoured wax block in each station
- **Check all bait stations every three days** (conditions permitting), **then once a week for four weeks**
- Check permanent detection devices for sign of any rodent
- Enter all monitoring data into project database
- **<u>If there is any positive sign of rodent, begin baiting, monitoring and trapping grid</u>**



Any positive rodent sign? E.g. teeth marks, droppings, carcass etc.

NO

- REVIEW THE SITUATION AFTER ONE MONTH WITH EXPERT INPUT
- REMOVE NON-PERMANENT MONITORING STATIONS
- INFORM **KAREN VARNHAM** OF RESULTS
- REMAIN VIGILANT

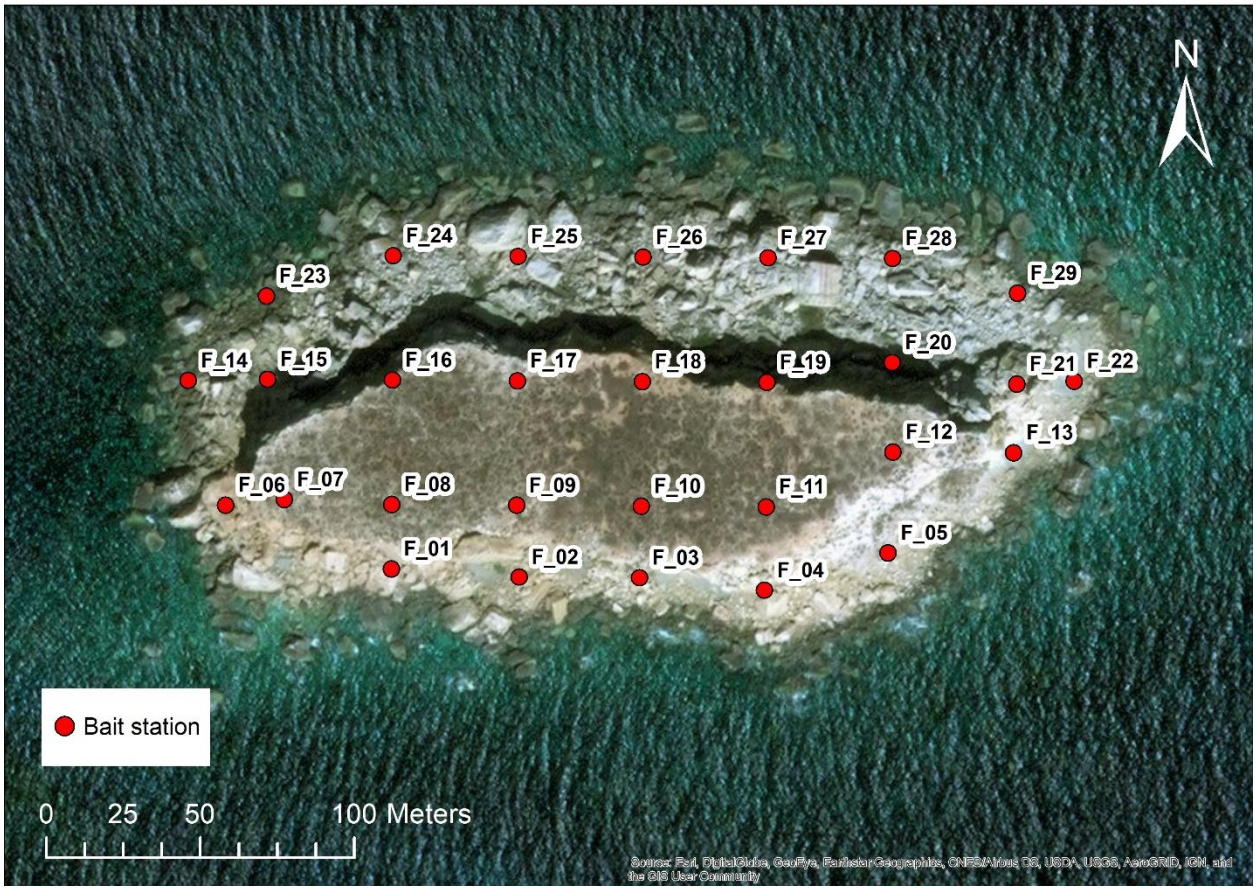
YES

- IMPLEMENT BAITING, MONITORING AND TRAPPING GRID (see guidelines for **'probable/confirmed' sighting**)
- INFORM **KAREN VARNHAM** OF RESULTS
- GET EXPERT ADVICE FOR FURTHER ACTION

Date	Recorder: name/contact details	Incident description	Response/Action taken	Outcome	Additional information

Appendix 5. Biosecurity log

Appendix 6. Map of bait station locations for incursion response



Appendix 7. Rodent identification

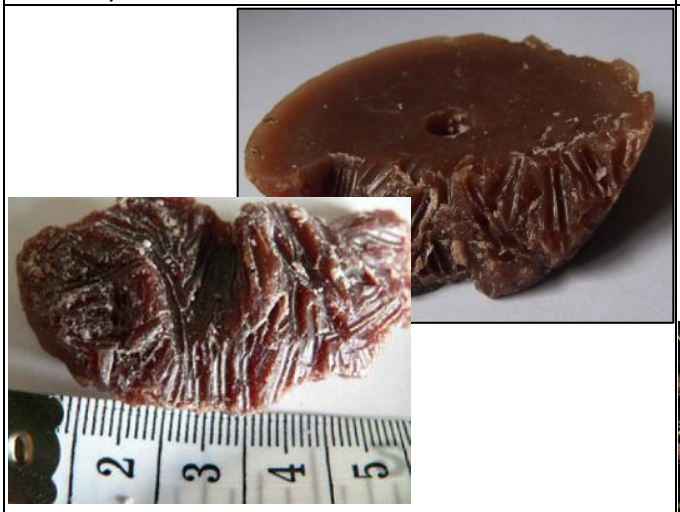
General appearance

	Brown Rat ***Rattus norvegicus***	**Black Rat** ***Rattus rattus***	**House mouse** ***Mus musculus***
Tail	Heavy short tail: no longer than head-body Pale underside	Long scaly tail ≤ 250mm: no shorter than head-body Uniform colour	Long tail, 50-100mm: similar to head-body length Uniform colour
Ears	Small ears: do not cover eyes 14-22mm Obvious hairs extend beyond edge of ear	Large ears: cover eyes when pulled down 19-26mm Fine hairs do not extend beyond edge of ear	Large, round ears 12-15mm
Hind feet	Pale 30-42mm long	Dark, hairy 28-38mm long	Small, thin, grey 15-19mm long
Body & head-body length	Long, stout body Up to 275mm	Long, slender body Up to 230mm	Slender body 70-100mm
Average weight	450g (can be up to 600g)	Up to 350g	10-25g
Colouration	Brown back with long, dark guard hairs Pale grey belly	**Three colour morphs** ***rattus:*** black back, dark grey belly ***alexandrinus:*** brown back, pale grey belly ***frugivorous:*** brown back, white or cream belly	Dull brownish grey back Grey, brown or white belly
Nipples	12	10-12, usually 10	10-12

Droppings

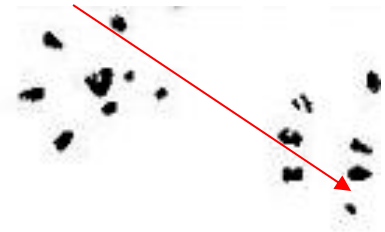
Brown rat	Black rat	House mouse
-13-19mm long, -3-4mm thick -Rounded ends, one end may go to a point (as pictured) -Likely to contain fur -Often located in latrines along tracks, at feeding sites and on prominent rocks	-7-14mm long -3-4mm thick -Tapered ends -Often slightly curved -Likely to contain fur	-4-8mm long -2mm thick -Small and thin -A bit like grains of rice -Strong smell of ammonia.
		

Teeth marks

Black rat / Brown rat	Mouse
• Marks consist of two parallel grooves • 1mm wide per groove (2mm per mark) • 'Messy' eaters – chew in all directions	• Marks consist of two parallel grooves • 0.5mm wide per groove (1mm per mark) • 'Neat' eaters – often chew around the edge
	 

Rodent teeth marks (All photos © WMIL

Footprints

Black rat	Brown rat	House mouse
4 toes on front feet, 5 on rear 28-34mm long Split in central pad on hind feet	4 toes on front feet, 5 on rear 30-42mm long Solid central pad on hind feet	4 toes on front feet, 5 on rear 15-23mm long.
 (not to scale)