

*“Building ecosystem resilience by rehabilitating Ste Anne Marine National Park islands”. Project CEPF-114048.*

# **A Pest Management Plan for rat control and eradication, and invasive plant removal in Sainte Anne Marine National Park Islands**

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**Ministry of Environment, Energy and Climate Change**

**Club Med Seychelles (hotel Ile Sainte Anne)**

**Beachcomber hotels (hotel Ile Sainte Anne)**

**Indian Ocean Resorts (Sainte Anne)**

**Moyenne Island Foundation (Ile Moyenne)**

**Enchanted Resort (Ile Ronde)**

**Seychelles Parks and Gardens Authority**

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## Introduction

A one page summary of our project, co-funded by CEPF (Grant No. 114048), is given in Annex 1.

The general approach of this PMP and its implementation is based on the following principles:

- Promoting Integrated Pest Management;
- Establishing zonations and targets;
- Consulting stakeholders and developing synergies;
- Training and implementation monitoring.

This PMP will be focused on rodents, and to a minor extent non-native plant species.

## Grant Summary

<b>1. Grantee organization</b>	Island Biodiversity & Conservation
<b>2. Grant Title</b>	Building ecosystem resilience by rehabilitating Ste Anne Marine National Park islands
<b>3. Grant Number</b>	CEPF-114048
<b>4. Grant Amount</b>	\$279,990.12
<b>5. Proposed dates of grant</b>	1 <sup>st</sup> April 2024 - 31 December 2026
<b>6. Countries or Territories where pesticides will be applied.</b>	4 islands of the Sainte Anne Marine National Parks : Sainte Anne, Moyenne, Ronde, Longue
<b>7. Summary of the project.</b>	SAMNP has been identified as a priority Key Biodiversity Area (KBA) for its marine and terrestrial ecosystems. The selected islands are Ste Anne, Moyenne, Longue and Ronde. The main objective is to increase the resilience of the ecosystems of the four islands and the surrounding marine environment to climate change and tourism impacts for long term sustainability.

	<p>The key activities include the eradication of rats on Ronde, Moyenne and Longue Islands and localised rat control on Ste Anne; the removal of invasive plant species, the propagation and replanting of native and endemic trees, and the reintroduction of a wild population of an efficient seed disperser, the Aldabra giant tortoise on Ste Anne; the regular delittering of beaches on Ste Anne to improve turtle habitat and relocation of turtle nests vulnerable to beach erosion. The permanent establishment on Sainte Anne of a conservation team will ensure the long term application of biosecurity measures and implementation and evaluation of the conservation activities.</p> <p>These actions are expected to allow natural re-colonisation by seabirds already breeding in a neighboring rat free islet (Ile Sèche), and in small numbers on Ste Anne, the higher breeding success of sea turtles, the recovery of other endemic bird and reptile species that could be translocated later on, and the propagation of native plant species which will be sustained in the long term by tortoises natural seed dispersal and soil nitrification on Ste Anne. In the long term, coral and marine life are also expected to benefit from such rehabilitation operations.</p>
<p><b>8. Date of preparation of the pest management plan</b></p>	<p>April to May 2024</p>

Note: information on the use of rodenticides, snail poison and herbicides has been adapted from Rocamora & Henriette, 2015. Notes on Garlon 4 have been adapted from Griffiths (2015), the P.M.P of CEPF Grant project ‘Restoring Native Forest at Chamarel: Ecological Restoration & Reconnecting the Public with Nature’. Ebony Forest Ltd, Mauritius.

## Pest Management Approach

### **9. Current and anticipated pest problems relevant to the project.**

**Invasive Alien Species is the greatest threat to the preservation of native biodiversity in Seychelles and other oceanic islands.** In particular, invasive rodents (*Rattus rattus* and *Rattus norvegicus*) have been responsible for many extinctions around the world (Jones et al. 2016). African Barn Owls *Tyto alba*, originally introduced in Seychelles to control rats, are also known to predate on native species of birds and reptiles. **All invasive vertebrates, rodents, feral cats, mynas, currently present in the Mahé group have had a detrimental effect on endemic flora (by eating seeds and seedlings) and fauna (native birds but also amphibians and invertebrates) since humans colonized the Seychelles (see Rocamora & Henriette, 2015).** They still represent a major threat to the remarkable wildlife of Seychelles.

Black rats are thought to be responsible, at least partly, for the extinction of two endemic birds: the Seychelles Chestnut-flanked White-eye *Zosterops semiflava* (on Silhouette and Marianne) and the Seychelles Green Parakeet *Psittacula wardii* (on Mahé and Silhouette) by 1930 and before 1910 respectively. The rats are also a nuisance for the inhabitants of Seychelles and for tourist/visitors establishments including those from Club Med, Ile Moyenne (Teddy restaurant) and Ile Ronde (Enchanted Resort) – that regularly report incidents. Rodents are carriers of serious (and potentially deadly) diseases such as Leptospirosis and Hepatitis B that affect human health, and create very serious damage to infrastructure such as electricity and telephone cables and wires. An improved control of rats – and their eradication on the small islands of SAMNP - will help ensure the long-term survival of native species and better conditions for both native wildlife (fauna & flora), and humans (residents & visitors). However, we need to make sure that methods used to control these invasive animals (and invasive species in general) do not put at risk other native wildlife and humans.

The rehabilitation of natural habitat in Seychelles also requires the elimination of introduced invasive trees such as White Leadtree (Kasi) *Leucaena leucocephala*, Indian Laurel (*Bwa zozo*) *Litsea glutinosa*, Cocoplum (*Prin de frans*) *Chrysobalanus icaco*, White cedar *Kalis dipap*, *Tabebuia pallida*, Cinnamon *Cinnamomum verum*, Devil tree (Bwa zonn) *Alstonia macrophylla*, etc. as well as exotic creepers such as Stinking passionflower (Bonbon plim) *Passiflora foetida* or Rosary pea vine (Reglis) *Abrus precatorius*. These need also to be removed so that native plants multiplied in nursery can be replanted.

### **10. Current and proposed pest management practices.**

#### **Current pest management practices**

There are currently no rodent control established protocols in the islands of the SAMNP, except in and around the premises of Club Med hotel on Ste Anne (property leased to Beachcomber hotels). Private managers/owners simply conduct their own control around their properties by trapping and use of blocks and pellets. The latter are not always used in an appropriate manner, i.e. in bait stations protected from the rain and not accessible to non-

target species. Rat control is not regular and is mainly conducted during episodes of high infestation around houses, or whenever the presence of rats is noticed. No rat control at all is performed on Ile Longue.

Presently rat population is very high on those islands despite efforts of Moyenne, Ronde and Club med to control the situation. Club Med Seychelles has an indispensable protective grid of c.135 bait stations and as many traps in and around their property to control rats. During peaks of infestation, between 8 and 18 rats per day can be caught daily on this grid, although normal figures vary between 2 and 6 rats per day (for c. 100 trap-nights). Although an analysis done in 2011 on 50 Black rats did not find any trace of Leptospirosis, rats are using underground drains and affecting electric cables and other wiring. Moreover, outside of the hotel premises, rats are very abundant including in turtle nesting beaches and other areas of high biodiversity value that hotel clients and other persons visit – such as a small seabird colony where control stopped in 2016 after Beachcomber hotel closed, and was never resumed. Resuming and extending rat control to these areas to prevent predation and damage from rats to turtles, seabirds and other biodiversity will also contribute to reduce rat densities and decrease infestation levels around and inside the village. Moyenne Island has regularly reported high levels of infestation around the inhabited areas, contrary to Ronde Island. Rat numbers must be high on Longue Island where no control is conducted.

The removal of non-native trees is generally done by mechanical means but chemical herbicides may also be used and applied locally to prevent re-sprouting. These actions are part of a strategy to rehabilitate island ecosystems, whereby invasive species are eliminated (including introduced mammals such as rats and cats; invasive creepers and broadleaf trees), native vegetation is replanted, and some rare native species are (re-)introduced and monitored. Some spectacular results have been obtained in terms of ecosystem recovery in some Seychelles islands (see Rocamora & Henriette, 2015). On Ste Anne, a nursery was created in 2013, 1500 native saplings were produced and another 500 were bought on Mahé and planted by the previous Beachcomber hotel (current lessor of the property to Club Med) until 2016. On Moyenne, numerous native trees were planted in the past but much more remains to be done. Ile Ronde is heavily dominated by exotic species, including species brought for landscaping by the hotel, and no vegetation management has yet been conducted on Ile Longue, formerly a state prison where the construction of a touristic resort was interrupted in 2008.

### ***Proposed pest management practices***

#### **Rodents**

One key strategic objective will be to eradicate invasive rats from the three smaller rat-infested islands Moyenne (9ha), Ronde (2ha) and Longue (17ha), and to control rat abundance in several key areas for the conservation of biodiversity on Ste Anne (main turtle nesting beaches, seabird colonies and areas where young Aldabra giant tortoises will be released). Most species at risk from primary or secondary poisoning are not native (see section 12 on non-target species risks).

Rat eradication on the two smaller islands (Moyenne, Ronde) will be done with the support of the island management who will fund all rodenticides and traps, and provide the necessary manpower for the long-term implementation of measures to minimize risks of reinvasion, under the advice and supervision from IBC (we can also conduct field work if they can pay for it or provide accommodation and food for a volunteer intern).

For Sainte Anne (except Club Med area) and île Longue who do not have yet a proper management in place, the IBC team based on Sainte Anne will be more directly involved. The IBC team will use its boat to go to Longue (c.1500m of distance), as well as to Moyenne and Ronde (c.850m of distance).

On Moyenne and Ronde, the rat eradication will be conducted in 2 phases:

- During a first phase, we shall aim at eradicating rodents from Moyenne and Ronde Islands whilst minimizing the use of rodenticide, through the use of a grid of bait stations with rodenticide blocks (i.e. a bait station every 30m) refilled bi-monthly, combined with trapping (min. 40 trap-nights weekly then bi-monthly plus 20 automatic A24 traps per island). This protocol has already been used successfully by our team on Anonyme in 2022 to eradicate Black rats (and previously between 2002 to 2019 to keep the island rat free). Annex 9 shows the grid currently in place on Ile Anonyme as an example of how it will be on the SAMNP islands.
- In a second phase, if rats are still present (especially if Brown rats were present) after using this method, the classical recommended method consisting of spreading of rodenticide pellets (by hand) will be implemented. This method had to be used in 2022 by the IBC team on Anonyme to eradicate Brown rats.
- In terms of biosecurity and abatement measures to prevent reinfestation, this protocol based on the permanent presence of a bait-station grid plus regular (bi-monthly) survey trapping aims at having zero - or epsilon (very few) rats during a very limited time - on any of these islands. This is in application of the principle of early detection and rapid reaction so that they do not have time to start breeding and create a self-sustaining population. This protocol has been working well on Anonyme Island between 2002 and 2019, and again since 2022.

The eradication of rats from Ile Longue (17ha; abandoned, and with a limited management) will be undertaken during the second phase with the latter methodology. In 1996, G. Rocamora reported the presence of Brown rats on Ile Longue (Rocamora & François, 2000) but it is unclear if this species is still present there. After resort construction (abandoned since 2008) resumes and the hotel resort is completed, rats may reestablish on Longue if biosecurity protocols are not applied. Eradication will need to be repeated and financed by the developers, with the technical support of IBC, that will advise to install a protocol similar to the other small islands, i.e. with a permanent grid of bait stations and regular survey trapping.

On Ste Anne, a rat eradication would be much more difficult to implement. It is not envisageable with the above Phase one methods only, combining bait stations and live trapping, due to the large size of the island. An aerial distribution of rodenticide (using



helicopter or drones) would be required as per current knowledge practice and experience. This has been done successfully in several (high) islands of Seychelles of similar size, such as Frégate (219 ha) in 2000, and Ile du Nord (201 ha) in 2005 (a successful operation led by Gerard Rocamora under an ICS-FFEM project). The biggest challenge would be to prevent reinvasion with such a large hotel (297 rooms, plus over 300 staff resident on the island), large number of visitors and staffs daily, and the majority of the island being not under any form of management for effective biosecurity control. Instead, rat control measures through establishment of permanent grid of bait stations will be implemented in selected areas of high biodiversity interests (turtle nesting beaches and shearwater colony).

To avoid rat reinfestation on the 3 smaller islands and maintain a control of the population on Sainte Anne the bait station grids will be permanently maintained and the bait station refill monthly. Biosecurity and abatement measures will be set up on Mahé for the storage and uploading of goods, on the boat to transport them, and on the islands to unload all cargo and food transported (see Annex 10 for the protocols in place on neighbouring Anonyme Island). Biosecurity protocols were set up on Anonyme, distant from only 350m from the airport runway, by IBC and the island management since 2022. The Annex (p.376) of Rocamora & Henriette (2015) provides an example of more intensive biosecurity abatement measures. In view of the presence of a permanent grid of bait stations on each of the SAMNP islands we shall recommend and adapt a protocol similar to the one in place on Anonyme for each island.

Separate protocols sheets will be provided for the eradication, control and biosecurity in each island. These will also be inspired on the work done by IBC on Anonyme, and it will consist of bimonthly visits to refill bait stations and conduct survey trapping around the island for early detection of any rat incursion, as it is being conducted on Anonyme.

### **Non native and invasive plants**

Cutting woody weeds without the application of herbicides is often an ineffective use of labour and finances as the cut stumps of most woody species simply resprout, producing multiple stems and in some instances larger root systems harder to control. Herbicides reduce costs by extending maintenance cycles, limit soil erosion (woody stumps do not need to be uprooted), and enable difficult to control species to be targeted (Griffiths, 2015).

Herbicides used in the control of broadleaf weeds are Glyphosate (Roundup®), Picloram (Tordon®, Grazon®), Dicamba (Vanbel®, Oracle®, Vanquish®), Paraquat and Triclopyr (Garlon®, Release®). Glyphosate is a widespread and highly effective herbicide used in agriculture. Although reported to degrade rapidly and not bioaccumulate, it is however suspected to be extremely toxic to bees and other pollinators, and it has been recently proved to be carcinogenic with lab animals, and thus most probably for humans too. Paraquat and Glyphosate are the only herbicides regularly imported in Seychelles. Although our project only plans to use only micro-quantities of herbicide, we have opted for Glyphosate 480 SL, if in stock, as this is effective and less toxic than Paraquat (see label and MSS in [Annex 6 and 7](#)).

The whole tree is cut with a machete or with a chain saw as close to the ground as possible and the recommended dose of herbicide is applied to the cut stumps using a paintbrush.

Applying the herbicide to the cut stump as quickly as possible allows for a more effective treatment.

### **11. Relevant integrated pest management experience within the project area, country or region.**

Our team has a long experience of rat eradication on islands. Since 2002, Dr Rocamora has designed and lead in-the-field a dozen of rat eradications (Black rats *Rattus rattus* and Brown rats *R. norvegicus*) in Seychelles and the Western Indian Ocean, in islands ranging from 0,6ha (Pouhou, Hajangoua islets, Mayotte) to 201ha (Ile du Nord/North Island, Seychelles) (see Rocamora & Henriette 2015 - MNHN/Biotope; Rocamora 2019,). In 2002, **he designed a protocol based on a permanent grid of bait stations and monthly trapping to eradicate and maintain rat-free small islands very close to mainland and prone to rat reinvasions.** This led to the eradication of Black rats from Anonyme Island (10 ha; located at only 500m from Mahé airport, now at only 350m). Rats were successfully eradicated from Anonyme in 2002 and the island remained rat-free until 2019. Following the sale of the island and the abandonment of the rodent protocol by the new owners, the island was recolonized by both Brown rats and Black rats, and both species were again eradicated from the island in 2022 by the IBC team (Black rats were eradicated using only the grid system, but Brown rats persisted thus hand spreading of rodenticide pellets had to be used to eliminate them). We now plan to conduct the same method to eradicate rats from Moyenne, Ronde and Longue. Our team also produced two Pest Management Plans for rat control using grids of bait stations and cage-traps, one for the breeding areas of the endemic Seychelles white-eye on Mahé, and one for the plateau of Silhouette (Rocamora, 2018; Rocamora and Henriette, 2019).

During a previous CEPF projects (2017-2019), IBC set up two small nurseries, one on Mahé (UniSey) and one on Gde Soeur, and produced and planted 500 native saplings on each island. IBC members (GR, EH, JF) have past experience (2013-2015) in using herbicide (Glyphosate) for the control of invasive broadleaf plants on Sainte Anne such as *Leucaena leucocephala* (White leadtree), *Chrysobalanus icaco* (Cocoplum) and *Litsea glutinosa* (Bwa zozo), by applying it on stumps to prevent regrowth.

### **12. Assessment of proposed or current pest management approach and recommendations for adjustment where necessary.**

**Current rat control schemes insufficient:** There are no current established rodent control protocols for the islands of the SAMNP (except in and immediately around the premises of Club Med Hotel)(see section 10).

#### **Proposed adjustments to increase efficiency in the framework of this project**

- Set up grid stations and refilled at least fortnightly. Intensive rat control through cage trapping or the use of Good Nature traps to be conducted during the eradication phase, and monthly survey trapping post-eradication to minimise risks of re-establishment of a breeding population of rats in case of rat incursions.
- Improve and keep general cleanliness, preventing access to infrastructures that may provide a shelter by trimming regularly vegetation and preventing contact between trees and buildings, and removing sources of food (or access to them) through an

efficient management of organic and green waste, which is **key** to the success of any control and eradication programmes. The quality of current waste management is insufficient and much needs to be improved in certain islands. This is what is proposed to be done during this project as an adjustment to increase the efficiency.

The proposed approach intends to minimize the impact on the environment of chemicals by using bait stations grids not easily accessible to other animals. Non-target species more at risk are mammals, and birds and reptiles to a lesser extent. However, there are no native terrestrial mammals in the Seychelles, and most ground feeding landbirds are invasive species: Common myna *Acridotheres tristis*, Madagascar turtle dove *Nesoenas picturata picturata* (hybridized with extinct Seychelles endemic race *rostrata*), Ground dove *Geopelia striata*, Madagascar fody *Foudia madagascariensis*. The invasive Barn owls *Tyto alba*, regularly observed on Ste Anne and the small islands at night, may also die from secondary poisoning following consumption of poisoned rats. Some common native species, resident Common moorhens *Gallinula chloropus* and migrant Turnstones *Arenaria interpres* can die if they ingest repeatedly rodenticide, but this should not happen if rodenticide is distributed in bait stations and in the form of blocks. During island wide eradications, when bait is spread by hand over large areas, moorhen numbers decline but since their breeding success greatly benefits from the absence of rats they recover rapidly and reach much higher densities than the original ones. The same may be seen with Seychelles skinks *Trachylepis sechellensis* (see Rocamora & Henriette, 2015; p.174). Of important note, in Ile Longue, no moorhen has been reported.

#### ***Proposed adjustments to improving animal welfare and ethics***

Trapped animals need to be euthanized in a humane way. Despite the current absence of a legislation in Seychelles for the humane treatment and euthanasia of invasive animals, non-humane methods (e.g. drowning of rats, or commercialized sticky board) should not be used, particularly in projects that receive the support of the CEPF. Humane methods to euthanize pest animals trapped alive have been proposed in Seychelles as international best practice (Rocamora & Henriette 2015). This includes for example cervical dislocation for rats, as well as concussion in a bag as done successfully in Mauritius (MWF, Ebony Forest) or on Aldabra (SIF). These methods are expected to be the only ones used by professional pest control operators to euthanize trapped animals, and should be endorsed officially when an appropriate legislation will be put into place. The same applies to IBC members and staff. Traditional methods nowadays considered non-humane such as drowning of rats or leaving them out in the sun to die from overheating will be totally banned. We plan to use A24 traps only at landing sites to help prevent recolonization. Our preliminary trials on both Ste Anne and Moyenne with 12 and 18 A24 traps respectively, have shown insufficient results to allow eradication or control, perhaps because our rat densities are already low.

**For the control and elimination of invasive plants**, our project approach intends to use alternative (mechanical) methods instead of using herbicides, which application is restricted to cut-stumps with paint-brush, something that minimizes risks of negative effects to non-target native species.

## ***Pesticide Selection and Use***

### ***13. Description of present, proposed and/or envisaged pesticide use and assessment of whether such use is in line with international good practice.***

#### **Rodenticides**

Currently used: any authorised commercial rodenticides imported and commercialised by the Seychelles Agricultural Agency outlets, and private outlets (i.e. L.G. supplies, Agri Supplies) usually containing Brodifacoum or Bromadiolone at 0.02 to 0.05g/kg but sometimes also Difethialone at 0.025g/kg, Difenacoum at 0.05g/kg or any other authorized second generation of anticoagulants, in blocks, pellets or liquids (i.e. Bromadiolone 1.0 g/l), provided in bait stations or deposited in holes or rock crevasses, used by local pest control companies and residents individually ( around their homes and properties).

Whereas any of these authorised chemicals can be used to control rodents in Seychelles, **Brodifacoum** is the most efficient rodenticide available (2<sup>nd</sup> generation anticoagulant rodenticide). Toxicity to reptiles is limited and there is no known mortality to invertebrates as these have no blood system (except possibly for snails; see references in Rocamora & Henriette, p. 223). Brodifacoum has the highest rate of success when employed to eradicate rodents, hence why we are selecting it.

Rodenticide blocks are provided in tubular bait stations 15cm above ground; where blocks are tied and cannot be taken out from the bait station (see picture in section 3 and p.229 in Rocamora & Henriette, 2015). Hence, these are not easily available to non-target species such as ground birds. These practices, which are widely used in Seychelles, are also used in other countries (Mauritius, New Zealand, Australia, etc.). They are in line with international good practices (see for example Pacific Invasive Initiative, 2011). **Herbicides** (Glyphosate 480 SL : active ingredient Glyphosate **or** Paraquat : active ingredient: Paraquat). As previously mentioned, the only two herbicides used in Seychelles are Glyphosate and Paraquat.

Glyphosate is classified as slightly hazardous (class III). Paraquat is classified as moderately hazardous (class II).

Paraquat and Glyphosate are applied only to cut stumps with a paint-brush, ring-barked trunks, or injected into tree trunks so the risks of affecting non-target organisms are minimal. As application is direct and there is no foliar spraying, there is little chance of herbicide seeping into the groundwater.

This technique has been experienced successfully in the past on various islands, including on Ste Anne (see Annex 5; Rocamora & Henriette, 2015).

We are planning to use Glyphosate, less toxic, providing it is available in shops. At present, only Paraquat is available but an order has been placed by the Government of Seychelles agricultural services. Should the Glyphosate not arrived by the time of starting operations, Paraquat will have to be used.

The Safety Data Sheets of these two herbicides are given at the following links:

Glyphosate (also in annex 7):

[https://sinon.co.th/upload/SDS\\_Glyphosate\\_480SL\\_AHF02\\_48SL11\\_for\\_SNTH20180711.pdf](https://sinon.co.th/upload/SDS_Glyphosate_480SL_AHF02_48SL11_for_SNTH20180711.pdf)

Paraquat:

[https://www.apparentag.com.au/documents/msds/66103\\_APPARENT\\_PARAQUAT\\_250\\_HE\\_RBICIDE\\_MSDS\\_1.pdf](https://www.apparentag.com.au/documents/msds/66103_APPARENT_PARAQUAT_250_HE_RBICIDE_MSDS_1.pdf)

**14. Indication of the type and quantity of pesticides to be financed by the CEPF grant (in volume and dollar value) and/or assessment of increase in pesticide use resulting from the project.**

### **Rodenticides**

For Ste Anne, CEPF will finance a total of 300 kg of Cereal rodenticide 20R brodifacoum (0,002%) PestOff Orillion for a cost of 2062.5 USD.

For Longue, CEPF will finance 975 kg of Cereal rodenticide 20R brodifacoum (0,002%) PestOff Orillion for a cost of 5280 USD.

Total quantity 1275 kg for a cost of 7342.5 USD.

### **Herbicides**

A maximum of 4 liters of Paraquat 200 or **Glyphosate 480 SL**. The cost of 1 liter is 330 SCR / liter. For 4 liter the total cost will be 100 USD.

Since this herbicide is solely to be used on cut-stumps, and to be applied diluted with paintbrush, this quantity is expected to be enough for the whole project duration (2024-2026).

### **15. Chemical, trade and common names of pesticide(s) to be used.**

Cereal rodenticide 20R brodifacoum (0,002%) PestOff Orillion

Herbicide Garlon 4: Triclopyr : 3,5,6-trichloro-2-pyridinyloxyacetic acid butoxethyl ester 61.6 %

Herbicide Paraquat or Glyphosate 480 SL.

### **16. Form(s) in which pesticide(s) will be used (e.g., pellet, block, spray).**

**Rodenticide** blocks for bait stations and pellet for hand spray (used only if bait station grids unsuccessful for eradication).

**Herbicide:** diluted at 15% to 50% in water and paint-brushed on freshly cut stumps.

**17. Specific geographic description of where the pesticide(s) will be applied: province, district, municipality, landowners [do not give names of individual persons], and map coordinates (if available); and the total area (hectares) to which the pesticide(s) will be applied.**

#### **Rodenticide**

Specific areas in Sainte Anne (Grande Anse, Anse Manon, Wedged-tailed shearwater colony site) : 10 ha

Ile Moyenne : 9 ha

Ile Ronde : 2 ha

Ile Longue : 17 ha

#### **Herbicide**

Only to be used on cut-stumps of invasive trees in specific areas of high biodiversity value on Sainte Anne (Grande Anse, Anse Manon, Wedged tailed shearwater colony site) : 10 ha

**18. Assessment of environmental, occupational and public health risks associated with the transport, storage, handling and use of the proposed products under local circumstances, and the disposal of empty containers.**

**Brodifacoum** is highly lethal [vitamin K antagonist poison](#) (2<sup>nd</sup> generation of 4-hydroxycoumarin anticoagulants) classified as 'Extremely hazardous' (Category Ia) by WHO. It inhibits the synthesis of vitamin-K-dependent clotting factors in the liver, which ultimately provokes death by internal haemorrhage (normally within 3–10 days). Its renown effectiveness, highest success rate, has made it the world's most widely used rodenticides. It is very effective for rat control and for rodent eradications on islands. Brodifacoum is used at very low levels in rat bait (0.002% or 0.005%) and is not soluble in water. It binds strongly to soils, where it will degrade slowly with pH 5.5 to pH8 under flooded conditions, and it is not taken up by plants. Brodifacoum is the main chemicals in rodenticides used around Mahé.

Anticoagulant rodenticides are considered highly toxic to humans (estimated average fatal dose for an adult man of 60 kg being about 15 mg of Brodifacoum). However, due to very low bait concentrations (usually 10 – 50 mg/kg bait), slow onset of symptoms, and the existence of a highly effective antidote (appropriately dosed Vitamine K1, to be administered for long periods), they are of relatively low hazard to humans, but higher for children, and also pets.

**Glyphosate** is being used extensively in agricultural crops to control weeds and has been controversial due to its proved carcinogenic effects on animals, and likely similar effects on humans. It is also classified as a class III pesticide (slightly hazardous) by WHO. However, there has been a debate about it being potentially carcinogenic to humans. In 2015, the WHO International Agency for Research on Cancer (IARC) classified glyphosate as "probably carcinogenic in humans" (category 2A) based on epidemiological studies, animal studies, and in vitro studies. In contrast, the European Food Safety Authority concluded that "the substance is unlikely to be genotoxic (i.e. damaging to DNA) or to pose a carcinogenic threat to humans", later clarifying that while carcinogenic glyphosate-containing formulations may

exist, studies that "look solely at the active substance glyphosate do not show this effect". In 2017, the European Chemicals Agency (ECHA) classified glyphosate as causing serious eye damage and as toxic to aquatic life but did not find evidence implicating it as a carcinogen, a mutagen, toxic to reproduction, nor toxic to specific organs (Wikipedia, 2024). **Paraquat** is classified as class II (moderately hazardous) by the WHO Recommended Classification of Pesticides. It is a highly controversial herbicide with risk of serious toxicity to organs following repeated or prolonged exposure. It will be only use if Glyphosate is not available before we start the operation.

The herbicide will be applied only to cut stumps, so the risks of affecting non-target organisms are minimal. As application is directed and there is no foliar spraying, there is little chance of herbicide seeping into the groundwater. Despite the presence of marshes nearby, the risk of herbicide contaminating waterways is low because of the very small amounts that are expected to be used, and particular care will be taken during application on stumps next to the marshes. The application of herbicide should not be done during rainfall or if there is a risk of rainfall within the next hour to avoid it being leached into the soil, affecting non-target organisms and because this water-soluble herbicide would become less effective. We will bring back as recommended the empty containers to one of the Agricultural research stations present in the country.

These rodenticides and herbicides will be stored in the Takamaka store of Club Med Seychelles maintenance department. This room has air conditioned and is permanently locked, and only the storekeeper(s) or managers have access to it. These buckets are water-proof, and very practical for transport. Storage in an air-conditioned room will prevent the palatability and toxicity of rodenticides to decrease after 6 months.

#### **19. Description of plans and results for tracking of damage to natural ecosystems and/or harm to non-target species prior to pesticide application and subsequent to pesticide application.**

The sites where the rodenticide is to be applied regularly will be visited twice per month to refill the bait stations. At the same time, observations will be conducted to detect and report any death of non-target species (particularly birds or reptiles) that may be affected by the rodenticide. A series of bird and reptile point counts (20 to 30) or transects will be conducted once a year across the islands concerned to detect any important changes that may have occurred because of the application of the rodenticide. Particular attention will be paid with numbers of ground dwelling birds such as Moorhens and turtle-dove, that are particularly sensitive as they feed on the ground from seeds or invertebrates (which could become contaminated with rodenticide).

After herbicide application, observations in the following days and weeks allow to detect impacted plants that can be readily identified by loss of leaves, wilting, bark damage and tree death. Applying herbicide with paintbrush is very unlikely to affect non-target plants affected.

**20. Prerequisites and/or measures required to reduce specific risks associated with envisaged pesticide use under the project (e.g., protective gear, training, upgrading of storage facilities, etc.).**

As detailed in the previous section, rodenticides and herbicides will be stored in an air conditioned, locked room.

Application of rodenticide is straight forward and requires only a pair of plastic gloves. Good shoes are also needed to avoid bruises and cuts and contamination by rat-transmitted diseases (such as leptospirosis and Hepatitis B). Rodenticide will be provided in bait stations in which baits are tied and cannot be taken outside.

Most of the poisoned rats will decompose in their natural habitat without being detected. Those found will be collected and buried.

Brodifacoum (the active ingredient) is toxic to many domesticated animals and pets. To reduce chances for non-target species, to be affected by rodent bait, access to bait will be limited through use of bait stations with a small entrance diameter.

With currently used anticoagulant rodenticides, Vitamine K (the antidote) can be injected or given in tablets in case of accidental ingestion by a child. Victoria Hospital can be reach within 1 hour from any part of the islands. Staff from IBC-UniSey that will be involved in this activity of refilling bait stations with rodenticides as part of the current project already have experience and will receive adequate training to obtain their certificate of capacity (see further down).

Glyphosate and Paraquat being considered to be potentially carcinogenic to humans (see previous section), hence extreme care will be taken when applying it.

The following measures should be applied when using herbicide in order to prevent risks to human health arising from unintentional direct consumption, improper application resulting in the herbicide coming into direct contact with people or wildlife, inhalation of aerial sprays:

- Application procedure should be directed on cut-stumps only (using a paintbrush), with no foliar or aerial spraying.
- Manufacturer's recommendations in terms of health and safety and application rates should be followed. This includes providing staff with vinyl gloves, gardening gloves and masks to reduce contact with the skin and inhalation, for them to be used.
- Conduct staff training about the risks of herbicide use and how to apply and handle it safely both for the environment and staff well-being.
- Label containers used for the application of herbicides and store in a locked cupboard in an area only accessible by authorized personnel.
- Keep a first aid kit near the vegetation restoration areas in the staff mess room at all times.
- A specialized nurse is on Ste Anne and medical doctors can be visited at the Victoria Hospital on Mahé 1 hour from any part of the islands in case of ingestion or contact with the eye.



- Keep a Material Safety Data Sheet for Paraquat or Glyphosate with the chemical, with instructions on what to do should the product be ingested or in case of contact with the eye.
- Herbicide application should not be performed in areas while frequented by the general public, this work will be done before (visitors will then be requested to remain on the paths) or preferably after the arrival of visitors.
- Schoolchildren that will visit the area should learn about invasive species control/eradication and the dangers associated with herbicide use during the project.

An adequate Personal Protective Equipment will be used by all staff applying herbicides to prevent breathing any particules whilst applying the mixture on stumps. No spraying of Glyphosate nor Paraquat nor any other herbicide will be conducted under our project.

**21. Basis of selection of pesticide(s) authorized for procurement under the project, taking into consideration the risks identified under Section 19, and the availability of newer and less hazardous products and techniques (e.g. bio-pesticides, traps).**

Rodenticides

There are currently no other effective ways to control rat population other than trapping or the use of chemicals, combined with mitigation methods such as a strict management of human waste so as not to provide rats with abundant sources of food (and shelter). Bio-rodenticides, i.e. rodenticides using natural chemicals produced by plants or other living organisms, do not currently exist, and biological control (using parasites, diseases provoked by bacteria, viruses and other biological agents, chemical castration or anticonceptive) are still being actively research and trialed. As in other parts of the world, potential rats predators have been introduced in certain islands of Seychelles to control rats. This is the case of Feral cats and Barn owls, but unfortunately these have had more impact on the native species that are easier preys than rats.

Trapping alone has never been shown to allow rat eradication in wet tropical islands larger than a few hectares (see DIISE database <http://diise.islandconservation.org/>). In 2005, in the small Hajangoua archipelago, Black rats were successfully eradicated with cage-traps from a small islet of 0,6ha, but trapping had to be replaced by poisoning in two other neighbouring islets of c. 3ha in view of the high densities of rats and the uncertain issue of the trapping (Rocamora & Said, 2005). The eradication of rats only using cage could have been tried on Ronde (2ha) and Moyenne (9ha). However, the grid station of rodenticide is indispensable to prevent reestablishment of rats on the islands, so we have opted for combining rodenticides in a grid of bait stations and cage-trapping, as done twice successfully on Anonyme (10ha) with Black rats.

Since the beginning of our project, we have tested the use of modern self-resetting A24 Good Nature traps, produced and commercialized from New Zealand. This automatic resetting trap uses a liquid scent (e.g. coconut) to attract rats; when a rat puts its head into the hole containing the scent, a mechanism catches the rats by the neck and kills it instantaneously, leaving it dead on the floor. In tropical climates, rats decompose in a few days only and the presence of rat remains nearby does not seem to be detrimental to the future efficiency of

the trap. Unfortunately, our trials with 12 of these traps on Ste Anne, and 18 on Moyenne have been very disappointing, resulting in few evidence only that rats were killed by this method. Following exchanges and site visits with Mr Alan Grant (IOTA), camera traps will be used to measure the exact number of rats killed by these traps without being detected. It is possible that these traps are less effective when rat densities are low.

Alternative pesticides to Brodifacoum and Bromadiolone have also being tested and used with limited success for eradication.

For control, we have tested in the past other alternative chemicals that are less toxic and remanent, such as Diphacinone or Cholecalciferol D3 (Vitamine D3, not a pesticide listed by WHO but an acute toxin to rodents). However, Cholecalciferol may induce a quick aversion on rats since its effect is fast and thus may be noticed and learned by the rats. Cholecalciferol is also very sensitive to UV radiation and rapidly breaks down at the contact of light (although reversibly). Choice of not to use Diphacinone is due to its quick degradation which prevent many rats to absorb a sufficient quantity to be lethal. Moreover, both Diphacinone or Cholecalciferol products have a very short period of effectiveness (6 months, bearing in mind it takes 2-3 months for consignments from our supplier in NZ to reach Seychelles) and they are sensitive to hot and humid tropical climates, that provokes the development of mould on the pellets after a few months, rendering the bait unpalatable to rodents. The advantage of Brodifacoum is that the molecule will more quickly accumulate in the animal's tissues, particularly their liver, until it reaches a level which prevents blood clotting and induces haemorrhage. This is particularly important in wet tropical climates where alternative natural foods available to rodents are abundant, and where rodents may only eat repeatedly small quantities of bait, before they can die. Whilst we continue to search to alternatives to Brodifacoum, we have to continue to use it unless something as effective and less remanent becomes available.

We are currently considering shifting to Bromadiolone, also an efficient rodenticide (but with a lower success rate in eradications compared to Brodifacoum; DIISE) as this would allow to avoid the development of resistance to Brodifacoum after its extensive use in Seychelles for 30-40 years. However, Bromadiolone is for the time being not on the list of pesticides authorised to be imported in Seychelles, and any importation requires a special permit. Hence, we have advised the Pesticide Board to add Bromadiolone to this list.

### ***Herbicides***

Herbicides will be applied only to cut stumps, ring-barked trunks, or injected into tree trunks so the risks of affecting non-target organisms are minimal. As application is directed and there is no foliar spraying, there is little chance of herbicide seeping into the groundwater.

*There are only 2 herbicides currently imported in Seychelles, Glyphosate and Paraquat. At the moment only Paraquat is actually available and in stock in Seychelles. A new order has been placed for the Glyphosate by the Government of Seychelles agricultural services.*

Glyphosate is being used extensively in agricultural crops to control weeds and has been controversial due to its proved carcinogenic effects on animals, and likely similar effects on

humans. It is also classified as a class III pesticide (slightly hazardous) by WHO. However, there has been a debate about it being potentially carcinogenic to humans. In 2015, the WHO International Agency for Research on Cancer (IARC) classified glyphosate as "probably carcinogenic in humans" (category 2A) based on epidemiological studies, animal studies, and in vitro studies. In contrast, the European Food Safety Authority concluded that "the substance is unlikely to be genotoxic (i.e. damaging to DNA) or to pose a carcinogenic threat to humans", later clarifying that while carcinogenic glyphosate-containing formulations may exist, studies that "look solely at the active substance glyphosate do not show this effect". In 2017, the European Chemicals Agency (ECHA) classified glyphosate as causing serious eye damage and as toxic to aquatic life but did not find evidence implicating it as a carcinogen, a mutagen, toxic to reproduction, nor toxic to specific organs (Wikipedia, 2024).

Paraquat is classified as class II (moderately hazardous) by the WHO Recommended Classification of Pesticides. Although it is presently the only herbicide available in the shop, it is a highly controversial herbicide with risk of serious toxicity to organs following repeated or prolonged exposure and it is banned in many European countries. Thus Paraquat will be only use if Glyphosate is not available before we start the operation.

**22. Name and address of source of selected pesticides [do not give names of individual persons].**

**Rodenticide**

Orillion (former Animal Control Products)

Physical address : 408 Heads Road, Whanganui 4501, New Zealand

Postal address: Postal Box 3018 Wanganui 4540

New Zealand -

[www.orillion.com](http://www.orillion.com)

**Herbicide**

Anse Boileau Research Station, Ministry of Agriculture, Climate Change and Environment

**23. Name and address of vendor of selected pesticides [do not give names of individual persons].**

**Rodenticide**

Pestoff (Animal Control Products)

PB 3018 Wanganui 4540

New Zealand -

[www.pestoff.co.nz](http://www.pestoff.co.nz)

**Herbicide**

Grande Anse Agricultural services

**24. Name and address of facility where pesticides will be stored.**

Rodenticide and herbicide will be stored in Sainte Anne island in an AC locked store under the responsibility of only the store manager.

## Policy and regulatory framework, and institutional capacity

### 25. Policies on plant/animal protection, integrated pest management, and humane treatment of animals.

Seychelles has a **Plant Protection Act (1996)** which includes a chapter on containment and eradication of pests that authorizes the use of certain approved pesticides.

The country is familiar with **Integrated Pest Management** in the field of agriculture, which consists in promoting methods that reduce indirectly the abundance of pests, and hence minimize the use of pesticides. This also applies to invasive species, and it is promoted under the **Seychelles National Biosecurity Strategy 2011-2015** and recommended as international best practice (Rocamora & Henriette, 2015). It includes promoting **preventive measures** to avoid new infestations or acting early before the invasive species spread, to minimize afterwards management efforts to control or eradicate them (and therefore the use of pesticides). Adopting best practice **mitigation measures** as accompanying measures to pest control are also a key component of a strategy to fight invasive species. In the case of rats, for example, this includes cleanliness and strict management of organic food so that it is not available to rats. This is a key pre-required condition for a successful and efficient use of rodenticides. In 2015-2016, the **Seychelles National Biosecurity Agency** was set up to coordinate efforts to combat invasive species in Seychelles, but it was later integrated in 2022 as a Department of the Ministry of Agriculture, Climate Change and Environment.

Seychelles has since 1902 a **Prevention of Cruelty to Animals Act** that was reviewed and consolidated in 2012. A Seychelles Society for the Prevention of Cruelty to Animals (SSPCA) exists since many years and works together with the Seychelles Veterinary Services, that are linked to the Seychelles Agricultural Agency and the newly formed Seychelles Biosecurity Agency.

**There is no current legislation for humane treatment of invasive animals**, although some discussions to make one are taking place. However, humane methods to euthanize pest animals trapped alive, like those available in other countries such as the EU or Australia) have been proposed as international best practice (Rocamora & Henriette 2015) (see also 1.4.4.).

### 26. Description and assessment of national capacity to develop and implement ecologically based invasive alien species control [where relevant].

Seychelles has a variety of national policies and legislation related to biosecurity and Invasive Alien Species.

#### Policy

- 'Broad Biosecurity Policy' (2011) developed between Ministry of National Resources, Ministry of Health, Ministry of Environment, Energy and Climate Change to address effects of pests, diseases and IAS to people and environment of Seychelles.
- Seychelles Biosecurity Strategy (2012).

## Legislation

- Plant Pests Act [19th June, 1925]
- Plant Protection Act [1st August, 1996]
- Animals (Diseases and Imports) Act [29th December, 1981]
- Animal and Plant Biosecurity Bill (2011),
- Animal and Plant Biosecurity Act, 2014. Supplement to Official Gazette [28th April 2014] Act 10 of 2014.

Biosecurity legislation was reinforced in 2014 to prevent new invasive species to get into the country, and in 2015 internal protocols were defined to prevent the spread of invasive species within the country and its different archipelagos and islands (Rocamora, 2015).

Seychelles has since 1996 an associated **Pesticide Control Act** that regulates the use of these pesticides. As a result, a **Pesticide Board** was formed, integrating representatives from the Ministry responsible for Agriculture, the Seychelles Agricultural Agency and Veterinary Services, the Ministry responsible for Environment, the Ministry of Health and the Public Health Agency.

Seychelles has an **extensive experience** in terms of invasive species management. The country has been controlling and tackling invasive alien plants and animals for several decades. Seychelles is known around the world for its conservation successes in the field of island conservation and restoration. These combine eradication or control of invasive alien predators and competitors (including rodents, cats, mynas and barn owls) from islands, rehabilitation of natural habitats by removing invasive plants and replanting native ones, and recovery programmes based on island translocations of threatened species to small ratfree islands. This also includes the permanent control of rats using trapping or grids of bait stations in large properties (e.g. several areas of 10 to 20ha to protect the globally threatened Seychelles White-eye on Mahé by the company Management of President's of UAE Affairs), and the control of feral cats also through trapping and poisoning on some islands to protect native biodiversity. The book 'Invasive Alien Species in Seychelles' (Rocamora & Henriette, 2015; Muséum National d'Histoire Naturelle, Paris & Biotope Editions, Mèze) details the history of invasive species management in Seychelles and the methods used to control/eradicate plants and animals. Seychelles is for example the 5<sup>th</sup> territory in the world for its number of vertebrate eradications on islands (47), and the second/third (with the USA) when only tropical islands are considered.

**Seychelles has considerable capacity in the management of invasive species**, from both local and foreign scientific and technical staff that work in the public sector (ministries or parastatal agencies including SPGA, IDC), environmental NGOs (e.g. IBC, ICS, GIF) and Public Trusts (SIF), private islands, and the numerous private pest control operators.

## **27. Description and assessment of the country's regulatory framework and institutional capacity for control of the distribution and use of pesticides.**

Seychelles is signatory to several conventions of relevance to chemicals but only some of these conventions have been implemented into our national laws. These include:

- Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (PIC), Rotterdam, 1998
- Protocol on Liability and Compensation for Damage resulting from the Transboundary Movements of Hazardous Wastes and their Disposal, 1999
- Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, 1989 - Stockholm Convention on Persistent Organic Pollutants (POPs) - (May 2002)

Seychelles has prepared and implements since 2011 a Strategic Approach to International Chemicals Management (SAICM) as part of the Inter-governmental Forum on Chemical Safety (IFCS) and the International Conference on Chemicals Management (ICCM; Dubai 2006) as a follow-up consequence of the United Nations Conference on Environment and Development held in 1992 in Rio. Seychelles has passed a **Pesticide Control Act in 1996** that established the Pesticide Board and regulates the importation, storage, transportation, use, disposal and other management issues related to pesticide use in Seychelles. This act was reviewed in 2008.

Pesticides are used in Seychelles in agriculture (plant protection), invertebrate pest control around residences, hotels, and other buildings (e.g. control of mosquitos, hairy caterpillars, cockroaches, etc.), to fight against environmentally damaging invasive animals and plants (rats, cats, mynas, creepers, etc.), and to implement biosecurity measures to prevent new invasions or reinvasions by invasive species (e.g. border control, inter-island transportation protocols for protected areas). The **Pesticide Board** updates periodically the types of pesticides that can be imported in Seychelles, defines conditions of use and proper storage, and delivers authorisations for handling and applying pesticides. Chaired by the Public Health Authority, this board also involves the Ministry of Health, the Seychelles Agricultural Agency and the Department of Environment of the Ministry of Environment, Energy and Climate Change. Each order of pesticides in Seychelles needs to be done through an import permit that needs to receive the approval of the Pesticide Board. This is now a standard automatic procedure that involves also the customs. **Only pesticides that are under an authorized list can be imported and quantities need to be justified.**

The Pesticide Board also organizes periodically information and safety training for sessions for those applying to work as pest-control officers and all other operators and staff having to deal with pesticides. It delivers a Certificate of capacity that has a validity of 3 years and needs to be renewed periodically through a refresher course. A pre-condition for any entity willing to import pesticides in Seychelles is to have a valid certificate of capacity. Pesticide operator in Seychelles include mainly pest control companies, agricultural officers and farmers, but more recently professionals working in nature conservation programs requiring the use of chemicals have also been requested to have a certificate. At IBC level, Dr Rocamora and Joseph François have many years of experience for the use of different types of rodenticide, as well as for the local application of herbicide on stumps of invasive plants.

## **28. Proposed project activities to recruit and train personnel and strengthen capacity [list the number of people and what they are being trained in].**

**Gender** :The 2 or more positions to be offered by the project will be widely publicised locally (Jobo.sc) as per Seychelles legislation, and for intern positions (volunteers, students) through environment Universities (local and foreign) and NGO networks, with no gender discrimination when selecting candidates.

**A two day training session** about pesticides, how to handle, store and apply them, with a focus on safety aspects, is compulsory for all staff handling or applying pesticides. The objective of the course, delivered by the Seychelles Pesticide Board (Ministry of Health, Ministry of Agriculture, Environment and Climate Change), is to deliver **certificates of capacity** to professionals that must apply any kind of pesticides. The certificate is valid for 3 years. IBC Project coordinator Joseph François obtained his training certificate and Dr Rocamora renewed his own during a training that took place at the Seychelles Institute of Agriculture and Horticulture (SIAH) on 18 and 19/07/24. The two or more staff to be recruited under the project will also go through a similar training, as these are conducted every two months by the Pesticide Board.

See the Pesticide Training Program document and example of a certificate in *Annex 8*.

Before the start of the rat control scheme, meetings will be held in each island with island management and staff to present activities that will be conducted and ensure the application of biosecurity measures to avoid reinfestation.

IBC already has senior staff familiar with the establishment of such grids and protocols to re-fill the bait stations with rodenticide. Training will be provided to junior staff and volunteers that may also be involved and will include how to choose location for bait stations, store and handle rodenticides, and make observations with regards to possible negative impacts on non-target species. Other methods to be employed will also be demonstrated such as how to conduct rat trapping with cage-traps, how to install and maintain A24 traps. Measurements of rat abundance indices (and densities in specific areas) will also be conducted.

Training will also include :

- how to euthanise rats and other animals in a human manner, i.e. concussion, cervical dislocation and use of a CO<sub>2</sub> chamber, as per techniques described in the 'IAS in Seychelles' book (p.127 & p. 213).
- Weeding, planting techniques, nursery management, plant propagation and possibly chainsaw use.

## **29. Confirmation that the appropriate authorities were approached and that the appropriate licenses and permissions were obtained by the project.**

The Biodiversity Conservation Management section of the MACCE has been informed about our IBC-CEPF project and was sent a copy of the project document, and expressed its support.

Dr Gerard Rocamora and Joseph François attended a Pesticide training in 18-19/07/24 and informed that the project was about to start and which pesticides we would be using.

Chemicals containing Brodifacoum are already on the list of pesticides authorized for import into Seychelles (list established in 2008). However, Garlon 4 and other herbicides made of Triclopyr may only be authorized for importation upon request, which complicates significantly the procedure and will create delays of several months. We have advised the Pesticide Board to authorize the import of rodenticides Diphacinone, Bromadiolone (and Cholecalciferol not considered as a pesticide although it may be used as one) for rodent control, and of herbicide Garlon. Nevertheless, until these chemicals become easily available in Seychelles, we shall continue to use Brodifacoum as a rodenticide, and Glyphosate as herbicide on stumps.

## **Participatory preparation:**

### **30. Dates, and results of expert consultations, if necessary.**

The best practice recommendations of the book *Invasive Alien Species in Seychelles'* (Rocamora & Henriette 2015) will be adopted and little additional expert consultations if any are expected except perhaps for the setting up and use of Good Nature A24 traps.

However, in case of need, the two experts authors of this PMP, which are closely linked to the Invasive Species Specialist Group of the IUCN will have the possibility to request advice and information from their network, that include the WIO-Pacific list of IAS practitioners. Moreover, the New Zealand parastatal company Orillion, that supplies rodenticides for cutting-edge rat control and eradication operations around the world (*Pestoff* products), has technical sales advisers (Mr Bill Simmons, Mr. John Quigley) with many years of experience in the field (including in Seychelles) and may provide additional advice on rodenticides upon request.

If we had no other option than to use the herbicide Tordon (currently authorized and sold in Seychelles), we will consult other colleagues that have been using it for invasive plant control in Seychelles since several years (see for example Kaiser-Bunbury et al., 2015).

### **31. Dates, and results of consultations with local communities.**

Representatives from all islands owner/manager have been met - and will continue to be when required - consulted throughout the implementation of the PMP.

All main stakeholders were met individually in 2023 and 2024 while preparing the project. Project summary sheet were distributed to all. A board sign informing about the eradication process will be put at the entrance of each island to inform the general public and other persons visiting the island. This will include an email address and a telephone and WhatsApp number for any comments or queries anyone may have.

During the various contacts with stakeholders, a special emphasis was put on promoting the concept of grid bait station, in order to sensitize everyone to the need to reduce to the



minimum the quantity of pesticides used for the control of rats, so as to reduce risks from chemical treatments repeated regularly over the years on both native wildlife and human health. Physical trapping and mitigation measures have been promoted to reduce the level of infestation On Ste Anne, where eradication cannot be contemplated for the time being.

During implementation formal quarterly meetings will be planned between IBC staff and the stakeholders representatives, but contact will be permanent between those stakeholders and the IBC team based on Sainte Anne.

## Monitoring and evaluation

### ***32. Description of activities related to pest management that require monitoring during implementation.***

Purchase, storage and use of rodenticide as well as the way it is applied will be monitored closely by IBC members and staff. The amount purchased, the amount used, and the remaining stock will be compared periodically as part of stock-take procedures.

Basic bird, reptile and invertebrate counts will be conducted to try and monitor faunistic changes in the areas of application, together with general observations on both flora and fauna.

The abundance and density of rats will be measured before and after the application of rodenticides to evaluate the effectiveness of the recommended treatment.

### ***33. Monitoring and supervision plan, implementation responsibilities, required expertise and cost coverage.***

Consumption monitoring: number of blocks refilled in each bait station is indicated on a form by the operator for each refilling session (once to twice a month depending on site and consumption).

Stock monitoring: each rodenticide block bucket receives a unique (decreasing) number when stored so that consumption can be monitored easily. The person(s) responsible for refilling will keep a record with the Conservation Officer of the buckets/bags taken and being used.

Implementation responsibilities: this will be under the responsibility of the Conservation Officer or/and the Project Coordinator.

Cost coverage: the cost related to the purchase of pesticides and their application for Sainte Anne (except Club Med Hotel) and Longue will be covered by the project until end of 2026 and by IBC afterwards (ecotourism activities and foundation). For Moyenne and Ronde, costs are covered entirely by Moyenne Island Foundation and by the island lessor respectively.

### **34. Disclosure**

*CEPF requires that pest management plans are disclosed to affected local communities and other stakeholders prior to project implementation. Please describe the efforts you have taken to disclose this plan.*

A copy of this plan will be disclosed to Club Med Hotel, which employees and clients are the only inhabitants of Sainte Anne, to inform them about the work that IBC will be conducting outside of their properties. The same will be done with the manager of Enchanted Resort on Ile Ronde and with the manager of Ile Longue. The document will also be sent to the chairman and board members of Moyenne Island foundation and to the restaurant operating on the island, and their 7 staff will be informed individually by IBC.

At the landing point of Moyenne, Ronde and Longue, as well as on Sainte Anne project sites a board will be displayed to inform personnel and visitors alike of the control of rodent and invasive plants using both trapping and chemical methods. Two IBC phone numbers will be given for any additional information request. In the case of grievance, as indicated in the project proposal, forms will be made available and will be shared with RIT and CEPF teams.

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## Annex 1 : Project summary

### Building resilience to climate change on ecosystems and species by rehabilitating islands of Sainte Anne Marine National Park (SAMNP).



#### 1 Project summary

Island Biodiversity & Conservation Centre (IBC) is an NGO associated to the University of Seychelles. It is an initiative from members of the Seychelles scientific community grouped under the named IBC, and the University of Seychelles which provides logistical and administrative support. **IBC has obtained a grant to conduct a 2.5 year project to conduct rehabilitation activities in four selected islands of the Saint Anne Marine National Park (SAMNP).** The Critical Ecosystem Partnership Fund (CEPF) is an International Funding agency which enables civil society world-wide to protect the world's biodiversity hotspots or biologically rich ecosystems that are essential to humanity, yet highly threatened. SAMNP is a priority Key Biodiversity Area (KBA) for its marine ecosystems and the terrestrial ecosystems of the Ste Anne islands group. The selected islands are **Ste Anne, Moyenne Island National Park, Ile Longue and Ile Ronde. Our main objective is to enhance biodiversity and increase the resilience of ecosystems of the four islands and the surrounding marine environment to climate change and tourism impacts for long term sustainability.**

#### 2 Key activities and expected results

The key activities include **eradication of rats on Ronde, Moyenne and Longue Islands and localised rat control on areas of high biodiversity value on Ste Anne; the removal of invasive plant species, propagation and replanting of native and endemic trees (at least 1ha of native forest on Ste Anne), and the reintroduction on Ste Anne of a wild population of Aldabra Giant Tortoises (AGT), an efficient seed disperser.** A vegetation rehabilitation with native plant species on certain areas of Moyenne and Ronde Islands will be encouraged, to be conducted by the island managers with support from IBC, where applicable. Rat eradication and control will allow natural re-colonisation by seabirds already breeding in a neighbouring rat free islet (Ile Sèche), higher breeding success of native birds, sea turtles, tortoises, terrapins, lizards and geckos, the recovery of endemic bird and reptile species that could be translocated later, and the propagation of native plants which will be sustained by tortoises and birds through natural seed dispersal and soil nitrification. In the long term, coral and marine life are also expected to benefit by rat control and seabird recovery. **An electric/solar boat is being purchased to facilitate movements of the IBC team between the islands and to develop new forms of ecotourism.**

#### 3 Project approach and rationale

The presence of invasive rats in SAMNP prevents the establishment of thriving colonies of breeding seabirds, and of rare and threatened endemic species (birds, reptiles, invertebrates); it also affects the breeding success of turtles and impacts on the regeneration of native vegetation, making this KBA further vulnerable to climate change impacts. We plan to eradicate rats from the three smaller infested islands of the SAMNP (Moyenne, Longue, Ronde, totalling 28 ha), and put in place permanent biosecurity measures to prevent permanent re-infestation. To kick start native forest rehabilitation on Ste Anne, over 1 ha of land will be cleared from invasive alien plants and replaced by native plants, that will also be propagated on the smaller islands. This will include both broadleaf and also palm species (hill). Native palms are better adapted to dry environments, they will have a higher resilience to long droughts, expected to increase together with extreme climatic events. **The project will extend the current Ste Anne plant KBA; it will be used to train young Seychellois conservationists and showcased to educate general public, students and visitors alike. Monitoring of terrestrial biodiversity will be conducted by IBC and its partners on each island, and funded by ecotourism activities beyond this project. Support will be provided to SPGA to conduct turtle monitoring, beach cleaning and turtle nest relocation to counter negative effects of sea-level rise and beach erosion.**

#### 4 Synergies and link with local actors / initiatives

This project will interact and engage with a variety of local conservation experts, university students, community members, private sector (island owners, hotels, boat operators) and parastatals (SPGA) etc. It aims at finding long-term synergies between all these actors, and at developing new funding sources to cover the costs of conservation and educational activities, in particular **to establish a permanent conservation team based on Ste Anne** that will mainly focus on the terrestrial and coastal ecosystems of all islands of the group, **mostly funded through new forms of ecotourism, volunteership, and through the establishment of a Foundation or Trust Fund** if the idea is supported.

**Table of activities and proposed participation of stakeholders**

Activities	Duration (Y1, Y2, Y3 & beyond)	Expected source of Funding/Im- plementor	Expected in-kind contributions or potential co-financing from local partners/ stakeholders/ beneficiaries.
1 Eradicating rats from the islands of Ronde, Moyenne, Longue and set up rat control in localised high biodiversity areas of Ste Anne outside the hotel ( <i>long-term Common myna control through trapping is already conducted on the hotel premises</i> ).	Y1 & Y2	IBC-CEPF	Island management and hotel operators to assist with daily boat transportations and meals of IBC members and staff. Contributions from MINP, Ronde and Longue management to be discussed.
2 Biosecurity protocols applied on nearby Anonyme Island having prevented its recolonisation by rats for 17 years will be applied to Moyenne, Ronde and Longue. It will prevent rats to be accidentally reintroduced during construction works, tourist visits, island's operations, etc. or those swimming or drifting ashore to breed and become established.	Permanent Ongoing beyond project life	Small Island managers / IBC-CEPF	Protocol and facilities to be implemented by managers of small islands.  Includes purchase and long term maintenance of rat cage traps and automatic A24 Good nature traps and rodenticide.
3 Progressive translocation of 50-70 juvenile, subadult and adult Giant Tortoises to Ste Anne for release after two quarantines, and semi captivity for c.50 small juveniles (< 2-5 years).	Y1, Y2	Club Med + IBC-CEPF + MINP	Approval by Mr Francis Savy (Indian Ocean Resorts), assistance of Sports & Nature, and Maintenance departments, construction of small tortoise enclosure by Club Med required. Rescue and transportation of some tortoises to Ste Anne by Club Med.
4 Construction of a basic plant nursery at Ste Anne for propagation of palms and broadleaf plants from seeds (to be done both next to hotel nursery and at Grand Anse by IBC).	Y1 (start of project)	CEPF & Club Med / IBC & Club Med	Approval by Mr Francis Savy (IOR). CEPF purchase equipment, obtention of seed Club Med: in-kind assistance of maintenance workers to build the nursery (including irrigation infrastructure).
5 Installation of a fully furnished expandable container house for the permanent accommodation of IBC staff and volunteer/students on Ste Anne, that could also serve as office if required.	Y1	IBC-CEPF	Approval by Club Med. Club Med minimum assistance required with site preparation plumbing and electrical connections, grey water evacuation. IBC members and staff daily meals and boat transportation to and from Mahé to be provided by Club Med.
6 Mechanical/manual removal of exotic vegetation & undergrowth, and preparation of min. 1 ha of land for native tree plantation on Ste Anne. Smaller areas to be cleared on small islands by each island team with IBC guidance.	Y1	IBC-CEPF & Club Med;	Approval by Mr Francis Savy. In-kind assistance from Club Med Hotel for plant transportation and maintenance if possible
7 Transfer equipment and native broadleaf saplings from Ste Anne to other islands of Ste Anne group.	Y2,Y3	MINP and other Island managers	Club Med will take care of boat transportation from Mahé to Ste Anne, and the IBC boat will be used to transport plant from Ste Anne to the other islands
8 Replant palm species on Ste Anne and other saplings in the small islands of Ste Anne group	Y2,Y3	IBC, Club Med, MINP	Approval by Mr Francis Savy. Assistance with field workers by Club Med and other island management teams.
9 Provide up-keeping and maintenance of the restored areas	Ongoing beyond project life		IBC will continue to look after plantation area and plant KBA on Ste Anne in coll. with Club Med. Island managers will take care of vegetation on Moyenne, Ronde and Longue
10 Provide training to staff and students, and an education public/visitors awareness program.	Y2, Y3		To be done with Island managers

## Annex 2

### Biosecurity measures to prevent reinfestation

(Rocamora & Henriette, 2015; p. 214)

#### **Eliminate food, shelter and ways of access available to rats.**

Eliminating food and shelter available to rats is critical to prevent rat proliferation and to optimise the effectiveness of any control operation. Food, water, and shelter attract rats, facilitate their multiplication, and undermine control efforts. Well-fed females produce more offspring and alternative available food sources discourage rats from eating rodenticide and from getting into traps. Actions required include:

- Strict management of waste, with closed, solid bins preventing access to rodents.
- Removing fallen fruits from the ground.
- Removing any possible alternate food (fruits, waste, coconuts, etc.) and shelter sources, particular near human habitation (dumping sites, green waste piles, etc.) through mulching or burning. Food waste may be buried (more than 1m deep), incinerated or macerated.
- Removing food leftovers from pet's plates before night, cleaning and placing plates beyond the reach of rats. This will also prevent pet contamination by rat transmitted diseases.
- Keeping gardens and grounds adjacent to buildings clean and tidy.
- Trimming vegetation near buildings to prevent contact between branches and the roof, as these will provide an easy access to rodents.
- Closing off or filling holes that provide access to buildings, and to shelters where rats may breed.

#### **Eliminate rats before they reach sensitive areas**

- Create a buffer zone where rats are eliminated before they reach the sensitive areas you want to exclude them from. Do not just place lines of traps or bait stations immediately adjacent to the buildings (or bird nests) that you want to protect. This will not be sufficient. It is essential to also conduct control 25 to 100m away in the surrounding vegetation. Traps or bait stations immediately near sensitive areas should only serve as a last resort protection and may not even be required in an effective control programme.
- Alternate control techniques (trapping/poisoning) to eliminate individuals that have either learned to avoid traps or are insufficiently attracted by rodenticide when other food sources are abundant.

#### **Conduct rat control permanently around bin sites and other potential hotspots of infestation.**

- Pay special attention to sites that attract rats in search of shelter and food. This includes bin sites, areas around kitchens, and also areas where green waste has accumulated.
- Checking and refilling bait stations every two weeks at these sites is the easiest recommended method but trapping can also be used in conjunction at regular intervals.

## Annex 3

### Protocol for trapping of rodents (Rocamora & Henriette, 2015)

#### Trapping (p. 200)

- Make sure that traps are stable and well placed in order to reduce the chances of traps being set off prematurely. Brown rats are particularly wary, easily frightened and able to learn from a bad experience, and therefore more likely to become 'trap-shy'. Hence trapping alone is not recommended for eradication as it generally fails to eliminate all individuals.
- Coconut (fresh or roasted) appears to be the most practical and efficient bait for rat trapping in Seychelles. Change bait every day for all traps so all keep similar chances of catching a rodent.

#### Rodent trapping (p.216)

- Traps are usually placed in lines, at a fixed distance from each other (usually 15 to 25m for control purposes), with one or two traps per point (see also Index-trapping section).
- Insofar as possible, place traps in the shade and/or check them early morning before the sun is too harsh so that non-target species (and trapped rats) are not affected by the heat of the day.
- Cage traps (live-traps) present no risks for non-target species and are generally very effective when properly baited. However, captured target animals must be properly euthanized
- Grilled (roasted) coconut appears to be the most practical and preferred bait traditionally used in Seychelles, but fresh (non-grilled) coconut is also effective. However, there is no clear evidence that rats prefer it roasted, this has yet to be scientifically tested.
- Sherman traps (or the similar Elliott traps) are foldable and ideal for situations in which large numbers of traps are needed, as they occupy very little space. However, they are less effective than cage traps.
- Bait can be changed systematically every night or simply when its attractiveness has been reduced by rain, mould, heat or partial consumption by invertebrates.
- Avoid placing traps in open areas (e.g. on bare ground or mowed grass at a distance of several meters from vegetation). Instead place them where rodents can approach while remaining relatively hidden: near a rock, at the bottom of a tree, along a wall etc.
- Remove vegetation, dead leaves, etc. in the immediate vicinity (i.e., within c. 30cm of the trap) so that it does not interfere with the closing mechanism.
- Make sure that traps are stable and do not shift position when pressure is applied to any of the corners as such movement can traumatise a rat. Some rats are easily frightened and can become trap-shy after a bad experience.
- When both rats and mice are present, or you do not know which of the two are present, you should set traps for both species at each site.
- Trapping can be used to complement anticoagulant rodenticides thereby reducing the amount of chemicals needed. Traps may also catch individuals that are not sufficiently attracted to rodenticide bait.



### **Index-trapping (adapted from Cunningham & Moors 1996) (p.218)**

- Index-trapping is used to calculate an index of abundance in order to compare the density of rodents at different islands, sites or habitats, or in different seasons at the same site.
- Set traps (usually 20 to 30) along a line at a fixed distance. Traps can be laid out in pairs with 1m between each of the pair. Traps are checked the following morning, then rebaited and reset in the afternoon for the next night.
- For each trap, record if sprung or unsprung (closed/open), whether bait has been eaten or is still present (bait gone/bait OK), and if a rat/rodent or another animal has been captured. For example: Site 1. Trap 1: Closed, bait gone; Trap 2: 1 rat / Site 2: Trap 1: 1 Hermit crab; Trap 2 Open, bait OK; etc.
- You can calculate:
  - the **uncorrected index**  $I_{UN}$  = total number of rats caught divided by the total number of uncorrected trap-nights (number of traps x number of nights they have been in activity, irrespective of whether some were found closed, open, with or without bait left) x 100 (expressed as the number of captures per 100 trap-nights).
  - a **corrected index**  $I_{COR}$  = number of rats per corrected trap-night x 100 (recommended) using Cunningham & Moors (1996) method taking into account the traps that have been set off during the night (whether empty or occupied by a rat or another animal).
  - a **simplified index**  $I_S$  = total number of rats caught divided by total number of traps that either caught a rat or were found open (excludes traps that closed with nothing inside, or traps that caught another animal) x 100.

*Corrected number of trap-nights = total number of trap-nights – ½ (number of traps having captured a rat or another animal + number of closed empty traps).*

This correction is based on the assumption that sprung (closed) traps have remained unsprung and capable of catching a rodent during half of the night on average. No correction is done for unsprung traps with the bait removed as they were still theoretically capable of catching a rodent. Example: 50 traps set during 3 nights that caught 7 rats, plus 13 sprung, empty traps. Total No. of trap-nights: 50 x 3 = 150. No. of trap-nights lost: (7+13)/2 = 10. Corrected No. of trap-nights = 150-10=140.  $I_{COR} = 7 \times 100 / 140 = 5.0$  captures per 100 trap-nights. By comparison  $I_{UN} = 4.7$  and  $I_S = 5.1$

- Index lines are usually run for several nights, or until no rats are caught (as during an eradication). A minimum of 100 corrected trap-nights in each habitat is recommended.
- Bait type should never be changed when conducting index trapping, so that all results are directly comparable regardless of site or season.
- Setting 2 traps at each site, at c. 1m from each other, is recommended by some authors, as this increases the potential capture rate (particularly useful in high density areas where 100% of traps may catch 1 or more rats if only one trap is placed at each site). However, the habitat area surveyed is then divided by two compared to one trap per site with the same number of traps.
- Recommended distance between trapping sites is 25m (max. 50m) but shorter distances (e.g. 15m) may be chosen in areas with very high densities if only one trap is placed per site.

## Annex 4

### Protocol for the chemical control of rodents

(Rocamora & Henriette, 2015)

#### Permanent rodent control over large areas through a grid of bait stations (p.215)

- Permanent grids of bait-stations spaced at 40-50m and baited with wax coated cereal bait blocks are effective for rodent control and can reduce rat abundances up to 95%. Such grids have been functioning on Mahé since 2006 (Seychelles white-eye sites at Barbarons and La Upper Misère; 40 to 60 bait stations at each site) and Ste Anne (in and around the properties of the Ste Anne Resort & Spa since 2011; c.140 bait stations). At La Misère Village-Souvenir-Grand Anse Forestry station, 3 grids totalling of c.100 bait-stations installed in 2011-12 will be made functional again.
- Permanent grids of bait stations may be efficient to create 'biological islands' or 'mainland islands' where rodents are controlled over large areas, as is the case in other countries to protect relictual passerine populations from introduced predatory species (e.g. New Zealand; Mauritius).
- Refilling of bait stations is conducted every 2 to 4 weeks depending on consumption.
- Permanent traps baited with coconut are used to check rat abundance and further increase the efficiency of the bait station grid (140 traps on Ste Anne set up and checked 6 days a week).

#### Bait stations (p.220)

- Bait stations are used to distribute rodenticides and protect bait from weather conditions. They come in a variety of shapes and materials (see in Rocamora & Henriette, p. 229). Some are available commercially, but effective ones can also be home-made using PVC pipes (e.g. models used by ICS, or MAAF in Mauritius, or Novacoil pipes in New Zealand).
- Do not position bait stations in the open, but rather close to a wall, a tree or vegetation cover. Clean them regularly if they become dirty or smelly to ensure that they remain attractive to rats; and keep vegetation cleared within c. 30cm of them.
- Do not use too strong toxic poisons that will kill rats too quickly as this is likely to create an immediate aversion and wariness among rats to any sort of bait. It normally takes 3 to 4 days for a rat to die after eating a lethal dose of anticoagulant, so they do not associate consumption of rodenticide with danger. Acute toxins should be used very carefully and never continuously.
- Wax blocks can remain attractive and palatable to rodents for 2 to 4 weeks in the granitic islands depending on weather conditions (exceptionally up to 6 to 8 weeks during dry periods or in the drier outer islands).
- Refilling can be done every two to four weeks depending on consumption.
- Bait station grids baited with wax rodenticide blocks or pellets can also be used for eradication. On Anonyme Island (10ha), Black rats were eradicated in 2003 with a 35m grid of 66 stations kept permanently to prevent rats swimming ashore from Mahé (500m away) to become re-established.

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- In bait stations, that are refilled once to twice a month depending on consumption, we shall alternate Brodifacoum and Cholecalciferol baits every one or two months.

### ***Hand spreading***

- Hand spreading of Brodifacoum rodenticide is to be used for rat eradication only if the use of bait station grids have not been successful as it could be the case with brown rats or to control rats during high infestations that occur in particular hot-spots (particularly during the dry seasons), or to protect a small colony of seabirds.

## **Annex 5: Protocol for the chemical control of cut stumps (Rocamora & Henriette, 2015)**

Cutting woody weeds without the application of herbicides is often an ineffective use of labour and finances as the cut stumps of most woody species simply resprout, producing multiple stems and in some instances larger root systems harder to control. Herbicides reduce costs by extending maintenance cycles, limit soil erosion (woody stumps do not need to be uprooted), and enable difficult to control species to be targeted (Griffiths, 2015).

Although our project only plans to use only micro-quantities of herbicide, we have opted for Garlon 4, which appears to be much less dangerous than Glyphosate

The whole tree is cut with a machete or with chain saw as close to the ground as possible and the recommended dose of herbicide is applied to the cut stumps using a paintbrush (or a sprayer, something we do not use). Applying the herbicide to the cut stump as quickly as possible allows for a more effective treatment. A tracer dye can be incorporated into the herbicide solution to ensure treatment of the entire cut stump and of all individual stumps.

The application of herbicide should not be done during rainfall or if there is a risk of rainfall within the next hour to avoid it being leached into the soil, affecting non-target organisms and because this water-soluble herbicide would become less effective. It is recommended to bring back empty containers to the Agricultural research stations present in the country.

- Cut the stems at 10 cm above the ground.
- Treat the cut stem by applying the recommended dosage of the herbicide and leave the plant to die.
- Cover the treated stems with plastic bags to avoid leakage of product onto the ground.

## Annex 6: Pestoff rodent bait 20R and Blocks 20ppm labels



# PEST OFF!

*Deadly effective*

## RODENT BLOCKS

NET WEIGHT 20kg

**HARMFUL SUBSTANCE • ECOTOXIC**

**KEEP OUT OF REACH OF CHILDREN • READ ATTACHED LABEL CAREFULLY BEFORE USE**

For pests and rodents for controlling rodents. Contains 0.02% of brodifacoum. Blocks of a cereal concentrate bait. Store in original container. Apply only to areas that need to be baited. Do not eat or drink products and animals either.

Registered product to be used for:

**RODENT BAIT**

Registered & manufactured by:

**Manitok Ltd**  
402 Hume Road  
Whangarei, NZ  
[www.pestoff.co.nz](http://www.pestoff.co.nz)

Developed by:

**Manitok Ltd**  
402 Hume Road  
Whangarei, NZ  
[www.pestoff.co.nz](http://www.pestoff.co.nz)

MSD CLASSIFICATION:

**MSD CLASSIFICATION**  
For animals enter MSD  
[www.msd.co.nz](http://www.msd.co.nz)

Approved manufacturer:

**Manitok Ltd**  
402 Hume Road  
Whangarei, NZ  
[www.pestoff.co.nz](http://www.pestoff.co.nz)



6 400047 000024

HARMFUL. KEEP OUT OF REACH OF CHILDREN. ECOTOXIC

HSNO CLASSES  
6.9B, 9.1D

**PEST  
OFF!**  
Deadly Effective



*[Signature]*

## PESTOFF RODENT BAIT 20R

Bait for the control or eradication of rodents on non-stocked off-shore islands or for use in accordance with the Operating Plan approved for this product.

Contains 0.02 g/kg brodifacoum in the form of a pellet bait.

### PRECAUTIONS

**Harmful substance.** Repeated oral exposure may cause toxin to accumulate in internal organs and may affect the clotting ability of the blood. Wear gloves when handling open containers or baits. Do not breathe dust.  
**Toxic to terrestrial vertebrates.** Take measures to prevent domestic animals and pets being exposed to the toxin either through eating baits or through eating the carcasses of poisoned animals.  
**Storage:** Store in original container, tightly closed and away from feed or foodstuffs. Keep out of reach of children and domestic animals. Do not store in direct or diffused sunlight. Avoid cyclic heating and cooling which may cause condensation to form on the inner bag wall and cause accelerated bait degradation.  
**Handling:** Wear overalls and rubber or PVC gloves when laying pellets. When handling this product in open bags particularly around aircraft, avoid inhalation of bait dust by wearing an appropriate dust mask. Avoid contact by mouth and do not smoke, drink or eat while using. Wash hands and exposed skin areas before meals, smoking and after any contact. Prevent access to baits by children, pets and domestic animals. Avoid pollution of any water supply with chemical or used container. Any dead rodents found should be buried.  
**Residue Warning:** Brodifacoum, the active ingredient is a potent second generation anticoagulant poison which can accumulate particularly in the liver, kidneys and fat of poisoned animals. Do not feed rodents killed with brodifacoum baits to dogs or cats.

### EMERGENCY MANAGEMENT

**First Aid:** Brodifacoum is an anti-coagulant toxin. In the event of this product being swallowed, seek medical advice. Do not induce vomiting. The symptoms of anti-coagulant poisoning may take several days to appear. Symptoms may include pale gums, passing of blood in urine or faeces, and the appearance of bruising. Always seek medical advice in the event of suspected human poisoning.  
**Treatment of domestic animals accidentally poisoned:** Vitamin K<sub>1</sub> is an effective antidote against accidental poisoning of domestic animals by Pestoff Rodent Bait 20R. Veterinarians are familiar with the information on Vitamin K<sub>1</sub> therapy and should be consulted.  
**Spillage:** In the event of a spill, isolate the spill area and take all practicable steps to manage any harmful effects of a spillage including preventing baits from entering streams or waterways. Scoop spilled baits into secure containers. Recover any undamaged bait for later use by placing in appropriately labelled containers and dispose of spoiled bait as directed below. Use a broom to collect fine material and wash down the spill area with copious water only after all spilled bait has been removed.  
**Disposal:** Product which is surplus or spoiled should be disposed of by burying with other organic material on the active tip face of an appropriately managed landfill or buried within the biologically active layer of soil elsewhere within a secure area. Ensure that a good covering of earth is applied over the bait immediately to prevent access by scavenging birds. Alternatively, burn unwanted bait material in a suitably constructed and appropriately located incinerator and bury any residues as above. Treating the baits through a sewage oxidation facility or other chemical treatment facility is also an acceptable means of disposing of unwanted bait material. Dispose of empty containers by burning if conditions, especially wind direction permit, otherwise bury in an approved landfill. Do not use empty container for any other purpose.

### DIRECTIONS FOR USE

To achieve eradication, it is very important to apply baits across the entire treatment area and to manage successfully all possible sources of re-invasion. Apply baits in bait stations, by hand broadcasting or by aerial sowing. Two bait applications, each of approximately 8 kg - 15 kg per hectare, will usually be sufficient to achieve eradication but higher application rates and/or further applications may be required depending on the species and density of animals targeted, the presence of non-target bait consumers and the nature of the terrain. The second bait application is typically 10 or more days after the first, but may be sooner if a period of prolonged bait availability is sought or where weather or other factors limit the baiting period. Pre-feeding is not required when using Pestoff Rodent Bait 20R.

### LEGAL OBLIGATIONS

**Sale:** This product may be supplied only to the Department of Conservation or to authorised persons appointed and operating in accordance with the Operating Plan approved for this product.  
**Limitations on Use:** Operating Plan 63 entitled Aerial and Hand Broadcast Application of Pestoff Rodent Bait 20R for the Intended Eradication of Rodents from Specified Areas of New Zealand has been approved for this product and every person (other than a person authorised by the Department of Conservation) when they are using this product must, at all times, follow the Operating Plan. Persons authorised by the Department of Conservation must only use this product (a) on off-shore islands where no livestock are present at any time or (b) in accordance with the Operating Plan referred to above. Any person who, when using this product, knowingly fails to follow the above conditions, commits an offence and may be liable to prosecution.  
**Signage:** If baits are applied in areas to which the public has right of access, it is a legal requirement that signs must be posted to notify the public that this product has been applied in the area. Signs must state that brodifacoum has been used, that feral animals may contain residues and that they should not be taken for food. Signs must remain for a period of 12 months after the last application of bait. This product must only be used as specified in the label.

### GENERAL INFORMATION

**Shelf life:** The shelf life of this product may vary according to the suitability of storage conditions. As a guide, it is recommended that the product be used within 3 months of date of manufacture as studies have shown that the palatability of bait may progressively decline after that time. Any product held after the expiry date shown on the bag should be disposed of according to label directions.  
**Livestock:** It is important to prevent access to baits by domestic livestock and pets. Stock must be kept off the treatment area until baits have been washed out by rain, removed or destroyed. Dogs and cats are at risk from scavenging poisoned animal carcasses and pet owners in the immediate vicinity should be notified of this risk. Collect poisoned animal carcasses where practicable for burning or burying at least 500 mm below ground, otherwise limit access to the treatment area until poisoned animal carcasses are unlikely to be eaten or to contain residues.  
**Conditions of sale:** As no control can be exercised over the methods or conditions under which this product is used, no responsibility or claim, other than those required by statute, will be accepted for any damage or injury whatsoever arising from the storage, handling, application, use or disposal of this product.  
**Transport information:** This product does not trigger a Dangerous Goods Classification and may be transported by road, rail, sea or air without the need for placarding or Dangerous Goods documentation.

Registered to and Manufactured by:  
Animal Control Products Limited - Trading as ORILLION  
408 Heads Road, Whanganui 4501, New Zealand. Ph 64 (0)6 344 5302  
For safety data sheet go to <http://www.pestoff.co.nz>

Registered pursuant to the ACVM Act 1997, No. V009014  
See <http://www.foodsafety.govt.nz> for conditions of registration

NET CONTENTS  
**25 kg**

Pack No.:  
SO No. & Mfg. date:  
Size:  
Expiry Date:  
Batch No.:

EPA APPROVAL CODE  
HSR001612

WQ SEP2020



orillion

### DIRECTIONS FOR USE

**Mice:** Place 50-100 pellets or a single block into a Pestoff Mouse Bait Station (or similar bait station) and place bait stations in areas used by mice but out of reach of non-target animals, children and wildlife. Mice are attracted to sheltered, warm areas near or under refrigerators, stoves, hot water cylinders and cupboards. Check bait stations and replenish product daily until baits cease to be eaten. Repeat periodically to check any re-infestation.

**Rats:** Place 1-2 cups of pellets or 4 to 8 blocks into a Pestoff Dead Rat Cage (or similar bait station) and place bait stations in areas used by rats but out of reach of non-target animals, children and wildlife. Rats have poor eyesight and use fixed objects, such as runways along walls and banks for navigation. Place bait stations on these runways or near burrows. Check bait stations and replenish pellets or blocks daily until baits cease to be eaten. Repeat periodically to check any re-infestation.

**Residue Warning:** Brodifacoum, the active ingredient, is a potent second generation anticoagulant poison which can accumulate particularly in the liver, kidneys and fat of poisoned animals. Do not feed rodents killed with brodifacoum baits to dogs or cats.

**Legal obligations:** These products must only be used in bait stations. If product is applied in areas to which the public has right of access, it is a legal requirement that signs must be posted to notify the public that this product has been applied in the area. Signs must remain for a period of 12 months after product has been removed or destroyed. This product must only be used as specified in the label.

**Shelf life:** The shelf life of this product may vary according to the suitability of storage conditions. Any product held after the expiry date shown on container should be disposed of according to label directions.

**Livestock:** It is important to prevent access to blocks and baits by domestic livestock and pets. Stock must be kept off the treatment area until the product has been removed or destroyed. Dogs and cats are at risk from scavenging poisoned animal carcasses and pet owners in the immediate vicinity should be notified of this risk. Collect poisoned animal carcasses where practicable for burning or burying at least 900mm below ground, otherwise limit access to the treatment area until poisoned animal carcasses are unlikely to be eaten or to contain residues.

**Maintenance compound status:** Pestoff Rodent Blocks are approved as a maintenance compound Type C. They are also MPI recognised for use in dairy processing under the conditions that they:

1. must not be used in areas accessible to food producing animals,
2. must be used in a suitable bait station and
3. may only be used in manufacturing environments in accordance with a documented pest programme.

**Conditions of sale:** As no control can be exercised over the methods or conditions under which this product is used, no responsibility or claim, other than those required by statute, will be accepted for any damage or injury whatsoever arising from the storage, handling, application, use or disposal of this product.

**PEST OFF!**

Distributed by Bell-Booth Limited  
15 Tiki Place, Palmerston North, New Zealand  
FREEPHONE 0800 80 90 91

For safety data sheet go to:  
<http://www.pestoff.co.nz>

Registered pursuant to the ACVM Act 1997  
No. V005099 (Pestoff Rodent Blocks)  
No. V005137 (Pestoff Rodent Pellets)  
See: <http://www.foodsafety.govt.nz>  
for registration conditions.

Registered to and manufactured by  
Animal Control Products Ltd  
408 Heads Road, Whanganui, New Zealand

### PESTOFF® RODENT PELLETS & PESTOFF® RODENT BLOCKS

Harmful. Keep out of reach of children. Ecotoxic

HSNO CLASSES 6.9B, 9.1D

Baits in pellet or block form for use

in bait stations for controlling rodents.

Active ingredient: 0.02g/kg brodifacoum

#### PRECAUTIONS

**Handling:** Repeated oral exposure may cause toxin to accumulate in internal organs and may affect the clotting ability of the blood. Wear impervious gloves when handling the product or open containers. Do not eat, drink or smoke when using the product or handling open containers. Remove protective clothing and wash hands and exposed skin thoroughly before meals and after any contact. Do not breathe dust from these products.

**Toxic to terrestrial vertebrates:** Take measures to prevent domestic animals and pets being exposed to the toxin either through eating the product or through eating the carcasses of poisoned animals. Apply these products in bait stations only.

**Storage:** Do not store in direct sunlight. Store in original container, tightly closed and away from feed or foodstuffs. Keep out of reach of children and domestic animals.

#### EMERGENCY MANAGEMENT

**Symptoms of Poisoning:** No symptoms may be apparent for several days if poisoning has occurred. Symptoms may include pale gums, passing of blood in urine or faeces, and the appearance of bruising.

**First Aid:** If poisoning is suspected DO NOT induce vomiting. Call a doctor or emergency physician at your nearest hospital. For further advice contact National Poisons Centre 0800 POISONS (Phone 0800 764 766).

**Treatment of domestic animals accidentally poisoned:** Vitamin K1 is an effective antidote against accidental poisoning of domestic animals by brodifacoum (the active ingredient). Veterinarians are familiar with the information on Vitamin K1 therapy and should be consulted.

**Spillage:** In the event of a spill, isolate the spill area and take all practicable steps to manage any harmful effects of a spillage including preventing product from entering streams or waterways. Scoop spilled product into secure containers. Recover any undamaged product for later use by placing in appropriately labelled containers and dispose of spoiled product as directed below. Use a broom to collect fine material and wash down the spill area with copious water only after all spilled product has been removed.

**Disposal:** Product which is surplus or spoiled should be disposed of by burying with other organic material on the active tip face of an appropriately managed landfill or buried within the biologically active layer of soil elsewhere within a secure area. Ensure that a good covering of earth is applied immediately to prevent access by scavenging birds. Alternatively, burn unwanted product in a suitably constructed and appropriately located incinerator (if permitted) and bury any residues as above. Treating the product through a sewage oxidation facility or other chemical treatment facility is also an acceptable means of disposing of unwanted bait material. Dispose of empty container at a landfill. Do not use the empty container for any other purpose.

WJS:ACP JULY 2015

GLUE HERE

GLUE HERE

IMPORTANT  
PRODUCT INFORMATION

**PEST OFF!**  
Deadly effective

PLEASE READ BEFORE USE

Open along here

Size 65mm high x 305mm wide



Green - Pantone 7724 C

Red - Pantone 200 C

*Handwritten signature*



# Annex 7: Material Safety Sheets (Pestoff Rodent bait 20 R & Blocks and Glyphosate)



## SAFETY DATA SHEET

### PESTOFF RODENT BAIT 20R

Orillion (The trading name of Animal Control Products Ltd.)  
408 Heads Road, Wanganui 4501, New Zealand  
+64 6 34 4 5302 or +64 21 919 624

ACVM:	V009014
HSNO:	HSR001612
UN:	3026
CAS:	56073-10-0
Active:	0.002% Brodifacoum
Proper Shipping Name:	NA
Class:	6.9
Packing Group:	Below PG III
Hazchem:	NA
Marine Pollutant:	Yes

## 1. IDENTIFICATION OF THE SUBSTANCE AND MANUFACTURER

### 1.1 Product identifier

**Trade Name** Pestoff Rodent Bait 20R

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Cereal based pellets for rodent control.

### 1.3 Details of the supplier of the safety data sheet

**Company** Orillion, 408 Heads Road, Wanganui 4501, New Zealand.  
(Orillion is the trading name of Animal Control Products Ltd.)  
**Telephone** +64 6 344 5302 or +64 21 919 624  
**Email address** enquiries@orillion.com

### 1.4 Emergency telephone number

**National Emergency Contact number** 111  
**NZ National Poisons Information Service** 0800 764 766

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

**6.9B** Specific target organ toxicity - single exposure Category 2  
Specific target organ toxicity - repeated exposure Category 2  
**9.1D** Designed for biocidal action  
**CAS Registry number of active ingredient:** 56073-10-0

### 2.2 Label Elements

**Hazard Pictogram:**



**Signal word** Warning

### Precautionary Statements

#### Hazard Statements:

**H373** May cause damage to organs through prolonged or repeated exposure.  
**H413** May cause long lasting harmful effects to aquatic life

#### Precautionary Statements:

**P103b** Read Label before use.  
**P260** Do not breath dust  
**P273** Avoid release to the environment  
**P314** Get medical advice/attention if you feel unwell.

#### Storage:

**P405** Store locked up

#### Disposal:

**P501** Dispose of contents/container in accordance with label directions.

### 2.3 Other Hazards

No data



### 3. COMPOSITION / INFORMATION ON INGREDIENTS

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#### 3.1 Substances

Contains no substances of concern other than the active ingredient.

#### 3.2 Mixtures

Chemical Nature:	Brodifacoum 20ppm
Component	C <sub>10</sub> H <sub>20</sub> O <sub>2</sub> Br
CAS Number	56073-10-0
Concentration (% w/w)	0.002%
Classification EU	3026
Other non-Hazardous ingredients *	Cereals, sugars, waxes and binders

\* do not affect the hazardous classifications of the substance.

### 4. FIRST AID MEASURES

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#### Ingestion:

In the event of ingestion, do not induce vomiting. Consult a physician and provide an estimation of the amount of product ingested. In the case of very small amounts of product (< 10 grams) being taken, no symptoms may develop but larger amounts may affect blood clotting times. A physician can assess this and provide Vitamin K1 therapy, as necessary.

#### Eye Contact:

Wash eyes with water.

#### Skin Contact:

Wash exposed area thoroughly with soap and water, then rinse.

#### Contaminated Clothing:

Remove contaminated clothing and wash before re-use. Wear gloves and overalls when handling baits. Do not eat, drink, or smoke. Clothing and gloves should be decontaminated by washing in hot soapy water.

#### SYMPTOMS OF POISONING:

##### Early Symptoms:

No symptoms may be apparent for several days if poisoning has occurred. Can kill if swallowed in large quantities. Nausea and vomiting may occur soon after ingestion.

##### Later Symptoms:

The active constituent (Brodifacoum) is an anticoagulant chemical, which if taken by humans, domestic animals, or pets, will reduce the clotting power of the blood. In some cases, effects from exposure may be delayed for several days or may not be evident unless checked by a physician. Typical overt symptoms of poisoning include bleeding gums, increased tendency to bruising, blood in urine and faeces and excessive bleeding from minor cuts.

##### Severe Symptoms:

Haemorrhagic shock, coma and death may follow in cases of severe poisoning.

**As the symptoms of poisoning will be delayed for several days, always seek medical advice if poisoning is suspected.**

### 5. FIRE FIGHTING MEASURES

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The product contains no toxic emissions as vapours, gases, or odours.

The principle hazard route is via ingestion.

#### Suitable extinguishing Media:

Water fog, fine water spray, foam or as appropriate to surrounding materials.

#### Unsuitable extinguishing Media:

None identified.

### 6. ACCIDENTAL RELEASE MEASURES

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#### Personal precautions, protective equipment and emergency procedures:

Wear personal protective equipment.

See protective measures under points 7 and 8.

#### Methods and materials for containment and clean up:

In the event of major spills, isolate the spill area and take all practicable steps to manage any harmful effects of a spillage including preventing baits from entering streams or waterways. Scoop spilled baits into secure containers. Recover any undamaged bait for later use by placing in appropriately labelled containers and dispose of spoiled bait as directed in the disposal section below. Use a broom to collect fine material and wash down the spill area with copious water only after all spilled bait has been removed.

**Environmental Considerations:**

Consider possible hazards arising from irrigating spill sites. Brodifacoum is not water soluble but fine bait material may pose a risk to people, pets, livestock, wildlife, and fish.

**7. HANDLING AND STORAGE****Precautions for safe handling:**

When handling open containers or baits, wear latex or rubber gloves. When loading aircraft or working in windy conditions, wear overalls, goggles, and a dust mask as protection against dust entering the eyes or mouth. Do not eat, drink, or smoke when using the product or handling open containers. Wash protective clothing and equipment after use. Remove the outer layer of clothing and wash hands and exposed skin thoroughly before meals and after any contact.

**Conditions for safe storage, including any incompatibilities:**

Store in original container, tightly closed, under lock and key and away from feed or foodstuffs. Keep out of reach of children, pets, and livestock.

**Incompatible Materials:**

None identified.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION****Occupational Exposure Limits:**

Not Applicable (not assigned)

**Engineering Measures:**

Decontamination is through microbial decomposition in a biologically active medium.

**Personal Protection Equipment:**

Operators using or handling the product in open containers must wear gloves. Do not smoke, drink, or eat while handling the product. When working around aircraft, wear a suitable dust mask to prevent inhalation of airborne particles.

**9. PHYSICAL AND CHEMICAL PROPERTIES****Form / Colour / Odour:**

Pellets have a solid cylindrical form, are dyed blue or green and may have an odour of cinnamon, fruit flavouring or chocolate.

Property:	Specification:
Physical State:	Solid
Appearance:	Cylindrical blocks
Odour:	Cinnamon, fruit, or chocolate
Odour Threshold:	Not relevant
pH:	Not determined
Melting point/range:	Not relevant
Boiling point/range:	Not relevant
Flash Point:	No Data Available
Evaporation rate:	No Data Available
Flammability:	No Data Available
Upper/lower flammability or explosive limits:	No Data Available
Vapour Pressure: Not relevant	Not relevant
Vapour density: Not relevant	Not relevant
Relative Density: No Data Available	No Data Available
Water Solubility:	Brodifacoum is not water soluble.
Lipid Solubility:	No Data Available
Partition coefficient (N-octanol/water):	No Data Available
Auto-ignition Temperature:	No Data Available
Decomposition Temperature:	No Data Available
Viscosity:	No Data Available

**10. STABILITY AND REACTIVITY**

Brodifacoum cereal based pellets are stable and non-reactive under normal storage and use conditions.

## 11. TOXICOLOGICAL INFORMATION

The baits present a very low hazard to operators unless taken orally.

### Toxicity Data for the Active Ingredient - Various Species \*

Species (Oral) LD50	LD50- active
White Laboratory Rat	0.26 mg/kg B/W
Brush-tailed possum	0.8 mg/kg B/W
Dog	3.56mg/kg B/W
Cat	25.0 mg/kg B/W
Mouse	0.4mg/kg B/W

## 12. ECOLOGICAL INFORMATION

Use the products only for the purpose indicated and, in the manner, prescribed by the product label.

Brodifacoum may persist for many months in the fatty tissue, liver, and kidneys of sub-lethally poisoned animals. Mortally poisoned animals may present a secondary poisoning risk to carnivorous birds and mammals. Tertiary poisoning risks for example when feral pigs eat poisoned possums and are subsequently taken and eaten by pig hunters. Take steps to mitigate any potential non-target exposure by wildlife, domestic animals, or humans. Studies have shown that brodifacoum concentrations will decline within decaying carcasses.

Improper disposal of unwanted pesticide is unlawful. If wastes cannot be disposed of according to label instructions contact your local Regional Council hazardous waste advisor for guidance

## 13. DISPOSAL CONSIDERATIONS

Product which is surplus or spoiled should be disposed of by burying with other organic material on the active tip face of an appropriately managed landfill or buried within the biologically active layer of soil elsewhere within a secure area. Ensure that a good covering of earth is applied over the bait immediately to prevent access by scavenging birds. Avoid deep disposal.

Alternatively, burn unwanted bait material in a suitably constructed and appropriately located incinerator and bury any residues as above. As the smoke and fumes produced by burning is irritating and potentially harmful, ensure wind does not carry smoke plume towards populated areas.

## 14. TRANSPORT INFORMATION

Not classified Dangerous Goods as toxicity falls below Packing Group III threshold

Maximum transport quantity when for use as tools of trade:

No Limits

## 15. REGULATORY INFORMATION

Registered Pesticides: PESTOFF Brodifacoum Possum Bait - V009014

HSNO Approval HSR001612

## 16. OTHER INFORMATION

### Special Precautions & Other Comments

Do not use poisoned or contaminated animals for food or feed.

This product is toxic to most wildlife. Birds and mammals feeding on carcasses of contaminated animals may be killed. Take measures to minimise the chance of baits entering any body of water. Apply the product only as specified by its label directs.

Where practicable, exposed bodies of all poisoned animals should be collected and destroyed by complete burning or deep burial at a landfill approved for hazardous wastes.

### CONSULT NEAREST POISON CONTROL CENTER FOR CURRENT INFORMATION

All information contained in this data sheet is as accurate and up to date as possible. Since Orillon cannot anticipate or control the conditions under which this information may be used, each user should review the information in the specific context of the intended application.

Revised by: JVQ

Date of revision: MAY 2024



## SAFETY DATA SHEET

## PESTOFF RODENT BLOCKS 20PPM

Orillion (The trading name of Animal Control Products Ltd.)  
408 Heads Road, Whanganui 4501, New Zealand  
+64 6 34 4 5302 or +64 21 919 624

ACVM:	V005099
HSNO:	HSR001612
UN:	3026
CAS:	56073-10-0
Active:	0.002% Brodifacoum
Proper Shipping Name:	NA
Class:	6.9
Packing Group:	Below PG III
Hazchem:	NA
Marine Pollutant:	Yes

**1. IDENTIFICATION OF THE SUBSTANCE AND MANUFACTURER****1.1 Product identifier**

**Trade Name** Pestoff Rodent Blocks

**1.2 Relevant identified uses of the substance or mixture and uses advised against**

Cereal based blocks for rodent control.

**1.3 Details of the supplier of the safety data sheet**

**Company** Orillion, 408 Heads Road, Whanganui 4501, New Zealand.  
(Orillion is the trading name of Animal Control Products Ltd.)

**Telephone** +64 6 344 5302 or +64 21 919 624

**Email address** enquiries@orillion.com

**1.4 Emergency telephone number**

**National Emergency Contact number** 111

**NZ National Poisons Information Service** 0800 764 766

**2. HAZARDS IDENTIFICATION****2.1 Classification of the substance or mixture**

**6.9B** Specific target organ toxicity - single exposure Category 2  
Specific target organ toxicity - repeated exposure Category 2

**9.1D** Designed for biocidal action

**CAS Registry number of active ingredient:** 56073-10-0

**2.2 Label Elements**

**Hazard Pictogram:**



**Signal word** Warning

**Precautionary Statements**

**Hazard Statements:**

**H373** May cause damage to organs through prolonged or repeated exposure

**H413** May cause long lasting harmful effects to aquatic life

**Precautionary Statements:**

**P103b** Read label before use

**P260** Do not breath dust

**P273** Avoid release to the environment

**P314** Get medical advice/attention if you feel unwell

**Storage:**

**P405** Store locked up

**Disposal:**

**P501** Dispose of contents/container in accordance with label directions

**2.3 Other Hazards**

No data

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

---

#### 3.1 Substances

Contains no substances of concern other than the active ingredient.

#### 3.2 Mixtures

Chemical Nature:	Brodifacoum 20ppm
Component	C <sub>12</sub> H <sub>22</sub> O <sub>2</sub> Br
CAS Number	56073-10-0
Concentration (% w/w)	0.002%
Classification EU	3025
Other non-Hazardous Ingredients *	Cereals, sugars, waxes and binders

\* do not affect the hazardous classifications of the substance

### 4. FIRST AID MEASURES

---

#### Ingestion:

In the event of ingestion, do not induce vomiting. Consult a physician and provide an estimation of the amount of product ingested. In the case of very small amounts of product (< 10 grams) being taken, no symptoms may develop but larger amounts may affect blood clotting times. A physician can assess this and provide Vitamin K1 therapy, as necessary.

#### Eye Contact:

Wash eyes with water.

#### Skin Contact:

Wash exposed area thoroughly with soap and water, then rinse.

#### Contaminated Clothing:

Remove contaminated clothing and wash before re-use. Wear gloves and overalls when handling baits. Do not eat, drink, or smoke. Clothing and gloves should be decontaminated by washing in hot soapy water.

#### SYMPTOMS OF POISONING:

##### Early Symptoms:

No symptoms may be apparent for several days if poisoning has occurred. Can kill if swallowed in large quantities. Nausea and vomiting may occur soon after ingestion.

##### Later Symptoms:

The active constituent (Brodifacoum) is an anticoagulant chemical, which if taken by humans, domestic animals, or pets, will reduce the clotting power of the blood. In some cases, effects from exposure may be delayed for several days or may not be evident unless checked by a physician. Typical overt symptoms of poisoning include bleeding gums, increased tendency to bruising, blood in urine and faeces and excessive bleeding from minor cuts.

##### Severe Symptoms:

Haemorrhagic shock, coma and death may follow in cases of severe poisoning.

As the symptoms of poisoning will be delayed for several days, always seek medical advice if poisoning is suspected.

### 5. FIRE FIGHTING MEASURES

---

The product contains no toxic emissions as vapours, gases, or odours.

The principle hazard route is via ingestion.

#### Suitable extinguishing Media:

Water fog, fine water spray, foam or as appropriate to surrounding materials.

#### Unsuitable extinguishing Media:

None identified.

### 6. ACCIDENTAL RELEASE MEASURES

---

#### Personal precautions, protective equipment and emergency procedures:

Wear personal protective equipment.

See protective measures under points 7 and 8.

#### Methods and materials for containment and clean up:

In the event of major spills, isolate the spill area and take all practicable steps to manage any harmful effects of a spillage including preventing blocks from entering streams or waterways. Scoop spilled blocks into secure containers. Recover any undamaged blocks for later use by placing in appropriately labelled containers and dispose of spoiled blocks as directed in the disposal section below. Use a broom to collect fine material and wash down the spill area with copious water only after all spilled bait has been removed.

**Environmental Considerations:**

Consider possible hazards arising from irrigating spill sites. Brodifacoum is not water soluble but fine bait material may pose a risk to people, pets, livestock, wildlife, and fish.

**7. HANDLING AND STORAGE****Precautions for safe handling:**

When handling open containers or baits, wear latex or rubber gloves. Do not eat, drink, or smoke when using the product or handling open containers. Wash protective clothing and equipment after use. Remove the outer layer of clothing and wash hands and exposed skin thoroughly before meals and after any contact.

**Conditions for safe storage, including any incompatibilities:**

Store in original container, tightly closed, under lock and key and away from feed or foodstuffs. Keep out of reach of children, pets, and livestock.

**Incompatible Materials:**

None identified.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION****Occupational Exposure Limits:**

Not Applicable (not assigned)

**Engineering Measures:**

Decontamination is through microbial decomposition in a biologically active medium.

**Personal Protection Equipment:**

Operators using or handling the product in open containers must wear gloves. Do not smoke, drink, or eat while handling the product.

**9. PHYSICAL AND CHEMICAL PROPERTIES****Form / Colour / Odour:**

Blocks have a solid square form, are dyed blue or green and may have an odour of cinnamon, fruit flavouring or chocolate.

Property:	Specification:
Physical State:	Solid
Appearance:	Solid blocks
Odour:	Chocolate
Odour Threshold:	Not relevant
pH:	Water at pH 5.2 = 0.00
	Water at pH 7.4 = 0.38
	Water at pH 9.3 = 1.00
	Toluene 0.72
	Acetone 2.30
	Methanol 0.27
Melting point/range:	Not relevant
Boiling point/range:	Not relevant
Flash Point:	No data available
Evaporation rate:	No data available
Flammability:	No data available
Upper/lower flammability or explosive limits:	No data available
Vapour Pressure:	Not relevant
Vapour density:	Not relevant
Relative Density:	No data available
Water Solubility:	Brodifacoum is not water soluble
Lipid Solubility:	No data available
Partition coefficient (N-octanol/water):	No data available
Auto-ignition Temperature:	No data available
Decomposition Temperature:	No data available
Viscosity:	No data available

## 10. STABILITY AND REACTIVITY

Brodifacoum cereal based blocks are stable and non-reactive under normal storage and use conditions.

## 11. TOXICOLOGICAL INFORMATION

The blocks present a very low hazard to operators unless taken orally.

### Toxicity Data for the Active Ingredient - Various Species \*

Species (Oral) LD50	LD50 active
White Laboratory Rat	0.26 mg/kg B/W
Brush tailed possum	0.8 mg/kg B/W
Dog	3.56 mg/kg B/W
Cat	25.0 mg/kg B/W
Mouse	0.4 mg/kg B/W

## 12. ECOLOGICAL INFORMATION

Use the products only for the purpose indicated and, in the manner, prescribed by the product label.

Brodifacoum may persist for many months in the fatty tissue, liver, and kidneys of sub-lethally poisoned animals. Mortally poisoned animals may present a secondary poisoning risk to carnivorous birds and mammals. Tertiary poisoning risks for example when feral pigs eat poisoned possums and are subsequently taken and eaten by pig hunters. Take steps to mitigate any potential non-target exposure by wildlife, domestic animals, or humans. Studies have shown that brodifacoum concentrations will decline within decaying carcasses.

Improper disposal of unwanted pesticide is unlawful. If wastes cannot be disposed of according to label instructions contact your local Regional Council hazardous waste advisor for guidance

## 13. DISPOSAL CONSIDERATIONS

Product which is surplus or spoiled should be disposed of by burying with other organic material on the active tip face of an appropriately managed landfill or buried within the biologically active layer of soil elsewhere within a secure area. Ensure that a good covering of earth is applied over the blocks immediately to prevent access by scavenging birds. Avoid deep disposal.

Alternatively, burn unwanted blocks material in a suitably constructed and appropriately located incinerator and bury any residues as above. As the smoke and fumes produced by burning is irritating and potentially harmful, ensure wind does not carry smoke plume towards populated areas.

## 14. TRANSPORT INFORMATION

Not classified Dangerous Goods as toxicity falls below Packing Group III threshold

Maximum transport quantity when for use as tools of trade:

No Limits

## 15. REGULATORY INFORMATION

Registered Pesticides: PESTOFF Brodifacoum Possum Bait - V005099

HSNO Approval HSR001612

## 16. OTHER INFORMATION

### Special Precautions & Other Comments

Do not use poisoned or contaminated animals for food or feed.

This product is toxic to most wildlife. Birds and mammals feeding on carcasses of contaminated animals may be killed. Take measures to minimise the chance of blocks entering any body of water. Apply the product only as specified by its label directs.

Where practicable, exposed bodies of all poisoned animals should be collected and destroyed by complete burning or deep burial at a landfill approved for hazardous wastes.

### CONSULT NEAREST POISON CONTROL CENTER FOR CURRENT INFORMATION

All information contained in this data sheet is as accurate and up to date as possible. Since Orillon cannot anticipate or control the conditions under which this information may be used, each user should review the information in the specific context of the intended application.

Revised by: JVQ

Date of revision: MAY 2024

## Chemical Safety Data Sheet MSDS / SDS

## Glyphosate

Revision Date:2024-07-27 Revision Number:1

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

## Product identifier

Product name	Glyphosate
CBnumber	CB7680517
CAS	1071-83-6
ENECS Number	213-997-4
Synonyms	GLYPHOSATE,Total

## Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	For R&D use only. Not for medicinal, household or other use.
Uses advised against	none

## Company Identification

Company	Chemicalbook
Address	Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing
Telephone	400-158-6606

## SECTION 2: Hazards identification

## GHS Label elements, including precautionary statements

Symbol(GHS)



Signal word Danger

## Precautionary statements

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P391 Collect spillage. Hazardous to the aquatic environment

P501 Dispose of contents/container to.....

## Hazard statements

H318 Causes serious eye damage

H411 Toxic to aquatic life with long lasting effects

## Disposal



## SECTION 3: Composition/information on ingredients

### Substance

Product name	Glyphosate
Synonyms	GLYPHOSATE, Total
CAS	1071-83-6
EC number	213-997-4
MF	C3H8NO5P
MW	169.07

## SECTION 4: First aid measures

### Description of first aid measures

#### General advice

Show this material safety data sheet to the doctor in attendance.

#### If inhaled

After inhalation: fresh air.

#### In case of skin contact

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

#### In case of eye contact

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

#### If swallowed

After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

### Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

### Indication of any immediate medical attention and special treatment needed

No data available

### Notes to physician

No data available

## SECTION 5: Firefighting measures

### Extinguishing media

#### Suitable extinguishing media

Water Foam Carbon dioxide (CO<sub>2</sub>) Dry powder

#### Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

#### Special hazards arising from the substance or mixture

Carbon oxides Nitrogen oxides (NOx) Oxides of phosphorus Combustible.

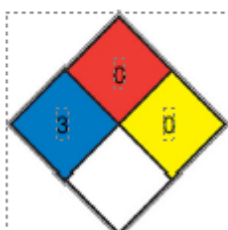
Development of hazardous combustion gases or vapours possible in the event of fire.

#### Advice for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

#### NFPA 704



**HEALTH** 3 Short exposure could cause serious temporary or moderate residual injury (e.g. [liquid hydrogen](#), [sulfuric acid](#), [calcium hypochlorite](#), [hexafluorosilicic acid](#))

**FIRE** 0 Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand. Materials that will not burn in air when exposed to a temperature of 820 °C (1,500 °F) for a period of 5 minutes. (e.g. Carbon tetrachloride)

**REACT** 0 Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium, [N<sub>2</sub>](#))

**SPEC:**  
**HAZ:**

## SECTION 6: Accidental release measures

#### Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid inhalation of dusts. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

For personal protection see section 8.

#### Environmental precautions

Do not let product enter drains.

#### Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

### Reference to other sections

For disposal see section 13.

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## SECTION 7: Handling and storage

### Precautions for safe handling

For precautions see section 2.2.

### Conditions for safe storage, including any incompatibilities

### Storage conditions

Tightly closed. Dry.

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## SECTION 8: Exposure controls/personal protection

### control parameter

#### Hazard composition and occupational exposure limits

Does not contain substances with occupational exposure limits.

### Exposure controls

#### Appropriate engineering controls

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

#### Personal protective equipment

##### Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

##### Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

##### Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm Break through time: 480 min

Material tested:KCL 741 Dermatril? L

Splash contact Material: Nitrile rubber

Minimum layer thickness: 0.11 mm Break through time: 480 min

Material tested:KCL 741 Dermatril? L

##### Body Protection

protective clothing

##### Respiratory protection

required when dusts are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other

Chemical Book

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accompanying standards relating to the used respiratory protection system;

Control of environmental exposure

Do not let product enter drains.

## SECTION 9: Physical and chemical properties

### Information on basic physicochemical properties

Appearance	solid
Odour	No data available
Odour Threshold	No data available
pH	2.5 at 10 g/l at 20 °C
Melting point/freezing point	Melting point/range: 230 °C - dec.
Initial boiling point and boiling range	165.8±55.0 °C(Predicted)
Flash point	230°C
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Upper/lower flammability or explosive limits	No data available
Vapour pressure	No data available
Vapour density	No data available
Relative density	No data available
Water solubility	No data available
Partition coefficient: n-octanol/water	No data available
Autoignition temperature	No data available
Decomposition temperature	230 °C
Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: No data available
Explosive properties	No data available
Oxidizing properties	No data available

### Other safety information

No data available

## SECTION 10: Stability and reactivity

### Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) ;

### Possibility of hazardous reactions

No data available

### Conditions to avoid

no information available

#### Incompatible materials

Strong oxidizing agents, Metals, Bases

#### Hazardous decomposition products

In the event of fire: see section 5

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## SECTION 11: Toxicological information

### Information on toxicological effects

#### Acute toxicity

LD50 Oral - Rat - 4,873 mg/kg

Remarks: Behavioral:Convulsions or effect on seizure threshold. Lungs, Thorax, or Respiration:Respiratory stimulation,

Nutritional and Gross Metabolic:Changes in:Body temperature increase. Inhalation

LD50 Dermal - Rabbit - 2,000 mg/kg

#### Skin corrosion/irritation

No data available

#### Serious eye damage/eye irritation

No data available

#### Respiratory or skin sensitization

No data available

#### Germ cell mutagenicity

No data available

#### Carcinogenicity

No data available

#### Reproductive toxicity

No data available

#### Specific target organ toxicity - single exposure

No data available

#### Specific target organ toxicity - repeated exposure

No data available

#### Aspiration hazard

No data available

#### Toxicity

LD50 in rats, mice (mg/kg): 4873, 1568 orally (Bababunmi)

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## SECTION 12: Ecological information

### Toxicity

#### Toxicity to fish

LC50 - *Oncorhynchus mykiss* (rainbow trout) - 1.1 mg/l - 96.0 h mortality NOEC - *Oncorhynchus mykiss* (rainbow trout) - 1.500 mg/l

Chemical Book

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- 96.0 h

Toxicity to daphnia EC50 - Daphnia magna (Water flea) - 2.95 mg/l - 48 h  
and other aquatic invertebrates

#### **Persistence and degradability**

No data available

#### **Bioaccumulative potential**

No data available

#### **Mobility in soil**

No data available

#### **Results of PBT and vPvB assessment**

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

#### **Other adverse effects**

No data available

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## **SECTION 13: Disposal considerations**

### **Waste treatment methods**

#### **Incompatibilities**

Compounds of the carboxyl group react with all bases, both inorganic and organic (i.e., amines) releasing substantial heat, water, and a salt that may be harmful. Incompatible with arsenic compounds (releases hydrogen cyanide gas), diazo compounds, dithio carbamates, isocyanates, mercaptans, nitrides, sulfides, thio sulfates, and dithionites.

#### **Product**

Offer surplus and non-recyclable solutions to a licensed disposal company;

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## **SECTION 14: Transport information**

### **UN number**

ADR/RID: 3077 IMDG: 3077 IATA-DGR: 3077

### **UN proper shipping name**

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (N-  
(Phosphonomethyl)glycine)

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (N-  
(Phosphonomethyl)glycine)

IATA-DGR: Environmentally hazardous substance, solid, n.o.s. (N- (Phosphonomethyl)glycine)

**Transport hazard class(es)**

ADR/RID: 9 IMDG: 9 IATA-DGR: 9

**Packaging group**

ADR/RID: III IMDG: III IATA-DGR: III

**Environmental hazards**

ADR/RID: yes IMDG Marine pollutant: yes IATA-DGR: yes

**Special precautions for user****Incompatible materials**

Strong oxidizing agents, Metals, Bases

**Further information**

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids. Packages smaller than or equal to 5 kg / L , not dangerous goods of Class 9

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**SECTION 15: Regulatory information****Safety, health and environmental regulations/legislation specific for the substance or mixture****Regulations on the Safety Management of Hazardous Chemicals**China Catalog of Hazardous chemicals 2015:Not Listed. website: <https://www.mem.gov.cn/>**Measures for Environmental Management of New Chemical Substances**Chinese Chemical Inventory of Existing Chemical Substances (China IECSC):Listed. website: <https://www.mee.gov.cn/>Philippines Inventory of Chemicals and Chemical Substances (PICCS):Listed. website: <https://emb.gov.ph/>

EC Inventory:Listed.

New Zealand Inventory of Chemicals (NZIC):Listed. website: <https://www.epa.govt.nz/>Korea Existing Chemicals List (KECL):Listed. website: <http://ncis.nier.go.kr>European Inventory of Existing Commercial Chemical Substances (EINECS):Listed. website: <https://echa.europa.eu/>United States Toxic Substances Control Act (TSCA) Inventory:Not Listed. website: <https://www.epa.gov/>Vietnam National Chemical Inventory:Listed. website: <https://chemicaldata.gov.vn/>

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**SECTION 16: Other information****Abbreviations and acronyms**

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

### References

- [1] CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- [2] ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- [3] ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>
- [4] eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: [http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)
- [5] ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- [6] Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- [7] HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- [8] IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- [9] PCS - The International Chemical Safety Cards (ICSC), website: <http://www.lo.org/dyn/icsc/showcard.home>
- [10] Sigma-Aldrich, website: <https://www.sigmaaldrich.com/>

### Other Information

Sodium, potassium and amine salts are readily soluble in water. Carrier solvents used in commercial formulations may change physical and toxicological properties.

#### Disclaimer:

The information in this MSDS is only applicable to the specified product, unless otherwise specified, it is not applicable to the mixture of this product and other substances. This MSDS only provides information on the safety of the product for those who have received the appropriate professional training for the user of the product. Users of this MSDS must make independent judgments on the applicability of this SDS. The authors of this MSDS will not be held responsible for any harm caused by the use of this MSDS.



## Annex 8: Pesticide agreement (18-19.07.24)



Seychelles Institute of Agriculture and Horticulture  
Grand-Anse Mahe  
P.O. Box 48, Mont Fleuri, Republic of Seychelles  
Tel: 4371290/4371273

Email Address: [minesiah1@gmail.com](mailto:minesiah1@gmail.com)

Please address all correspondence to the Director



### RE: PESTICIDE TRAINING AGREEMENT

An agreement made this .....15th.....day of...July 2024.....  
between Seychelles Institute of Agriculture and Horticulture and Island Biodiversity and Conservation, an  
NGO associated to and based at the University of Seychelles.....

(Company/Organisation/Participant).

- Fee per person is SR1500.00 for 2 days.
- The training start from 8.30am to 1.45pm. (Tea Break 30 mins & Lunch 45 mins)
- Refreshment and lunch will be provided, subjected to chosen option/package. (At SIAH- refreshment, snacks and lunch include, other locations, organisations will cater for food and beverages)
- Payment should be made at least 5 working days in advance before the start of the training date. Cheque to be drawn on Government of Seychelles.
- Upon completion Certificate of Competence will be awarded to the participant or funding organization.
- Minimum participants 10
- Maximum participants 12
- **N.B:** For training conducted outside of the organization, the training fee will vary related to services, resources, courier fees, materials being provided.

Note that the certificate is valid for three years.

If agreed to the terms and conditions above, please endorse the form.

Participant Name: -GERARD ROCAMORA-----

Organization/Company Name: Island Biodiversity Conservation; also active under Island Nature as private consultant-----

Organization /Company Manager: Gerard ROCAMORA Science Director and Chair-----

Date: -15/07/24-----

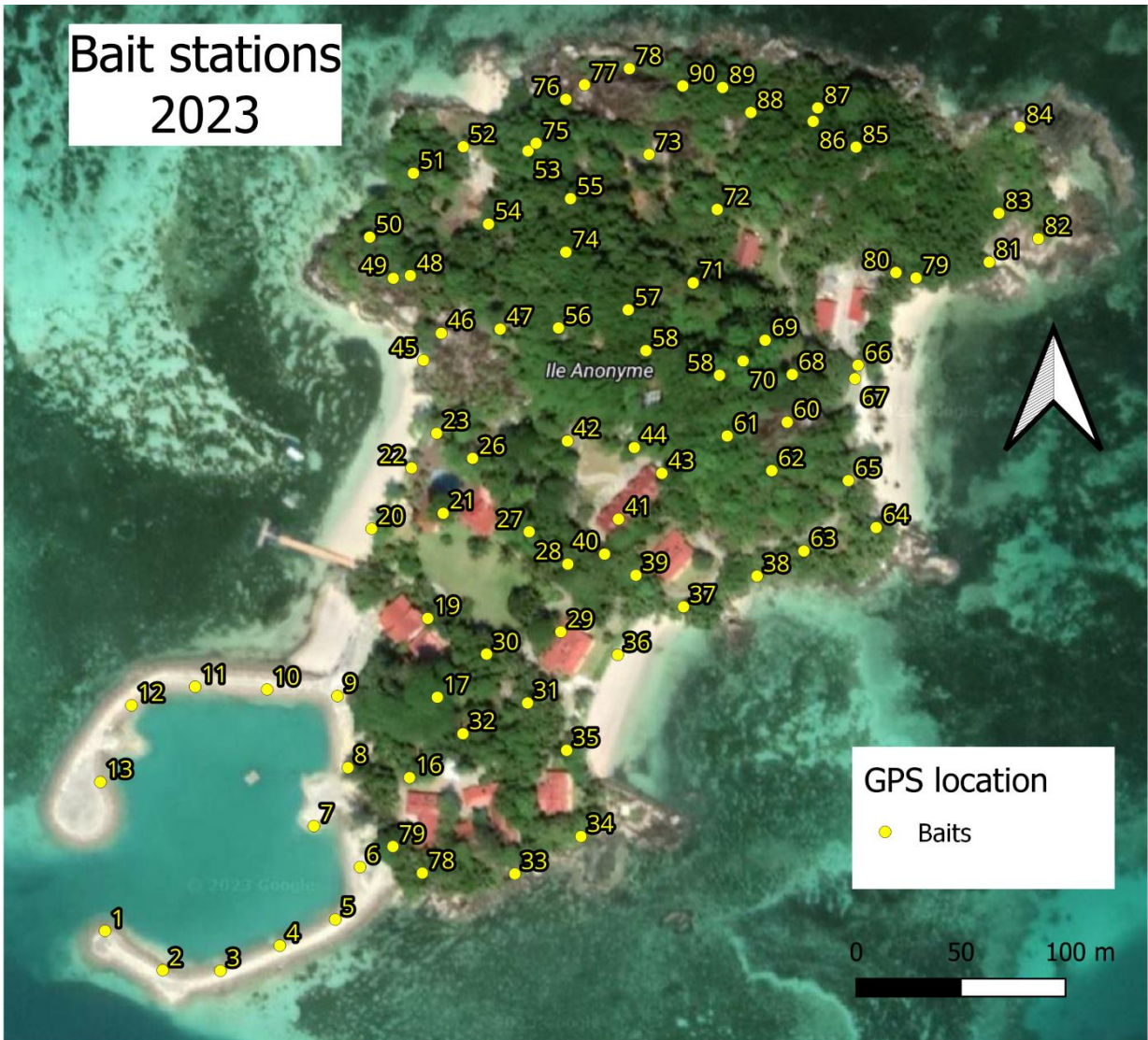
Official Stamp of  
your Organisation

(no official stamp)

Thank you for your cooperation.

Maryanne Marie (Ms)  
Director SIAH

## Annex 9 (Grid of bait stations used on Anonyme)



## **Annex 10**

### **RAT PRECAUTION AND CONTINGENCY MEASURES FOR ANONYME ISLAND.**

Anonyme is only 500 meters from Mahé, rats are abundant along the rocky shores of the 'comblage' and therefore natural or accidental rat colonisation is likely to occur at some point. This is why a grid of 65 Protecta Bait Stations with rat poison has to be maintained permanently on the island and a number of additional precautions taken to minimize the risk of recolonisation by rats.

The following precautions should be taken at all times:

1. Rat poison should be ordered well in advance and a minimum stock of 30 kg always kept on the island so that the island never runs short of rat poison and that there is always rat poison in the bait stations.
2. All bait stations should be checked every 2-3 weeks and contain a minimum of 2 blocks of rodent bait in good condition, especially those closest to the island shores. After a month or so, rodent bait may rot and should be changed.
3. A minimum of 2 bait stations with poison should be permanently kept at the pier on Mahé to keep rat densities low where the island boat comes
4. A bait station with a kill trap should be placed in each of the island boats
5. Every month, c. 30-40 live rattraps should be set up around the island to check for the presence of rats.
6. No material (boxes, food, etc.) that need to be brought to Anonyme should be left for prolonged periods at the pier or in the garage on Mahé to avoid rats getting in there.
7. All material brought to the island should be carefully inspected for rats or other invasive species (e.g. Blood dragon) prior to be embarked and brought to the island. Whenever possible, packages should be preferably sealed and opened in a closed room with a Protecta boxes and kill traps.
8. Every new staff should be made aware of the above precautions (points 6 and 7) to prevent reinfestation by rats.

In case of rat invasion:

If rats are detected on the island:

- 1) The quantity of rat poison in bait stations should be increased to 6 blocks per station in the area where rats have been detected, and a minimum of 3 blocks per station elsewhere, until three months after the last rat has been caught.
- 2) 1-2 weeks of intensive rat trapping (c.minimum 100 night x traps) should be conducted around the area to help reduce as quick as possible the quantity of rats that may be present.