

**Pest Management Plan, Environmental Impact Assessment,  
Environmental and Social Management Plan, and Health and  
Safety Plan**

**13<sup>th</sup> July 2023 updated 29<sup>th</sup> November 2023**

**CEPF Grant 114021**

**Indian Ocean Tortoise Alliance (IOTA)**

***Eradication of Black Rats (*Rattus rattus*) From Curieuse Island,  
Seychelles***

**Curieuse Island, Curieuse Marine National Park, Seychelles**

## **Grant Summary**

1. Grantee organization.

Indian Ocean Tortoise Alliance

2. Grant title.

Eradication of Black Rats (*Rattus rattus*) From Curieuse Island, Seychelles

3. Grant number.

CEPF-114021

4. Grant amount (US dollars).

\$149,928

5. Proposed dates of grant.

1<sup>st</sup> December 2023 to 30<sup>th</sup> November 2025.

6. Countries or territories where pesticides will be applied.

Republic of Seychelles

7. Summary of the project.

The project intends to eradicate Black rats (*Rattus rattus*) from Curieuse Island, Curieuse Marine National Park, Seychelles. An array of approximately 440 Goodnature A24 self-resetting rat traps will be the primary method of eradication, deployed using a dynamic mainland island approach, progressively eradicating from east to west. While this technology employs no toxic materials and has no rat welfare concerns, it is expected there will be small areas of the island inaccessible for trapping at the required trap density. Therefore in these areas it is intended to hand broadcast cereal block brodifacoum poison bait.

8. Date of preparation of the pest management plan.

13<sup>th</sup> July 2023

9. Describe the component of your project that has raised health and safety issues: This section should explain the activities that might cause concern about health and safety.

Transport, storage, handling and use of cereal block brodifacoum rodenticide.

**Pest Management Approach:** This section should describe the applicant's understanding of the problem, their experience with pest management issues and their proposed actions during the project. Specifically, what do you intend to do and how will you do it? The information presented should include methods of application (e.g., by hand or via aerial spraying).

10. Current and anticipated pest problems relevant to the project.

Black rats are prevalent in every habitat on the island with wide ranging consequences for the native flora and fauna, and for the human inhabitants and visitors to the island. Rat density on Curieuse has been estimated at 73/ha, with corrected trapping indices of 21–84/100 trap nights.

11. Current and proposed pest management practices.

Long-term, small scale rat control has been carried out in and around residential and public barbeque food preparation areas at Baie Laraie by Seychelles Parks and Gardens

Authority, using either cereal block or pellet brodifacoum rodenticide. This has been primarily to reduce the public health hazard and disruption caused by rats in residential and public food preparation areas. In 2023 an array of 47 Goodnature A24 self-resetting traps was installed, eliminating the use of rodenticide and reducing the density of rats to almost zero in an area of 7.5ha of Baie Laraie. The project proposes to eradicate rats from the entire island primarily using an array of A24 traps, with application of brodifacoum rodenticide in limited areas inaccessible for trapping at the required scale. Bait blocks are to be hand broadcast, attempting to achieve a distribution of one 16g cereal block every 10m. The treatment will be repeated after one week.

12. Relevant integrated pest management experience within the project area, country or region.

Project staff have carried out long-term rat control at the Global Vision International research facility at Anse St. Jose, using either cereal block or pellet brodifacoum rodenticide in bait stations, and an extensive pilot study testing the methods to be used in this project.

13. Assessment of proposed or current pest management approach and recommendations for adjustment where necessary.

The proposed eradication plan is designed to use toxin-free A24 traps wherever access for trapping is possible, so the project design already reduces use of rodenticide to the lowest level possible for the purposes of the project. Therefore no further adjustments are planned.

**Pesticide Selection and Use:** This section aims to get a comprehensive understanding of the pesticide that will be selected, why it was selected and what efforts were made to assess risk. Note that in this section the applicant will also be required to present information on the potential risk that the selected pesticide will have on non-target species.

14. Description of present, proposed and/or envisaged pesticide use and assessment of whether such use is in line with best management practices.

The proposed use of pesticide is described in Question 11. The procedures to be followed in the course of pesticide use on the project are described in Questions 11, 15, 16, 17, 18 and 21. The procedures have been developed in line with the Seychelles Pesticide Control Act and WHO Classification of Pesticides, and comply with the requirements and recommendations in those documents.

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

The maximum quantity of bait blocks estimated to be required is 620 x 16g, or a total weight of 9.92kg, at a brodifacoum concentration of 0.005%. The estimated total maximum weight of active ingredient is 0.5g. The total brodifacoum budget for the entire project is USD600 with a CEPF budget request of USD150.

16. Chemical, trade and common name of pesticide to be used.

Supa-Kill Rat Block brodifacoum 0.05g/kg.

17. Form in which pesticide will be used (e.g., pellet, spray).

Cereal block.

18. Specific geographic description of where the pesticide will be applied: name of province, district, municipality, landowners or map coordinates (if available); and the total area (hectares) to which the pesticide will be applied.

Curieuse Island, Curieuse Marine National Park, Seychelles. Owned by the Government of Seychelles and managed by the Seychelles Parks and Gardens Authority. Situated at 4°17'S 55°43'E. Rodenticide will be applied only in areas inaccessible for trapping at the required scale. It is not possible to accurately calculate the total area that will be treated prior to commencement of the project since small scale assessments will be carried out in the field on a daily basis to determine if access for trapping is possible. However, the areas identified as potentially containing a proportion of inaccessible terrain are shown below, amounting to a total of 6.2ha, and it is estimated that approximately 50% of this total area may require application of rodenticide, approximately 3.1ha.



19. 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.

The assessment of the risks associated with the proposed use of the Supa-Kill formulation has been carried out based partly on the concentration of brodifacoum. The concentration is 0.05g/kg, or 0.005%. According to the hazard tables in the WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification 2019, for Class 1a pesticides at a concentration lower than 0.05% with an active ingredient LD<sub>50</sub> of 1mg/kg body weight, a formulation is unlikely to present an acute hazard in normal use through oral ingestion. The oral LD<sub>50</sub> for brodifacoum is 0.3mg/kg, therefore concentrations of less than 0.05 x 3/10, or 0.015%, are unlikely to be acutely hazardous. The Supa-Kill formulation contains 0.005% brodifacoum, and is therefore unlikely to present an acute hazard in normal use through oral ingestion. The Supa-Kill

formulation also contains Bitrex, a bittering agent to make it unpalatable for human consumption. Dermal absorption was below detectable levels.

If the product is not adequately contained during transport to Curieuse accidental deposition could result in unintended locations. Similarly, during transport to application sites by field staff, accidental release could result in contamination of backpacks and equipment. During storage, if not properly contained accidental deposition could result.

There is no public health risk associated with the use of the product on this project since it will only be used in areas inaccessible to the public. The occupational health risks are associated with improper handling or transport, or failure to use personal protective equipment.

The environmental risks are of primary or secondary poisoning of non-target species, contamination of water bodies, and environmental persistence. Brodifacoum rodenticide is toxic to birds, mammals and fish, therefore on Curieuse the species of concern for non-target poisoning are birds and fruit bats. Fruit bats have no risk of primary or secondary poisoning. Of the bird species present on Curieuse, only native land birds which could potentially come in contact with the bait or scavenge carcasses would be of concern. The areas where rodenticide is planned to be used are exclusively inaccessible steep bare rock areas. These areas are not generally used for foraging by any land bird species therefore the risk of primary poisoning is negligible, and there are no native bird species likely to scavenge poisoned carcasses. The areas where poison may be applied are not close to any static or flowing water bodies so there is no risk of water body contamination. Brodifacoum breaks down in the environment over several months. While from an environmental standpoint it would be desirable for any rodenticide used to persist for the minimum time possible to achieve island eradication, it is of some operational benefit to have a level of persistence beyond the duration of trapping, since by definition it will not be possible to comprehensively monitor the areas where poison will be used for presence of rats. Thus some persistence will help to ensure complete eradication.

Empty containers with remaining residues of bait pose a similar hazard as the bait itself if not properly handled, stored and disposed of.

20. Description of plans and results for tracking of damage to and/or deaths of non-target species prior to pesticide application and after pesticide application.

It will not be possible to conduct monitoring directly within areas where brodifacoum is used, since its purpose is to eradicate rats in areas where direct access by field staff is not possible. However, trapping and intensive monitoring is to be conducted in areas immediately adjacent to selected areas, and any suspected negative effects of poison use will be recorded. If detected, assessments will be carried out to determine if any modifications to the strategy are required.

21. Pre-requisites 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.).

At all times prior to use bait blocks will be contained within sealed and labelled metal containers. Sufficient empty containers will be taken to the Seychelles Agricultural Agency at the time of purchase and used for transport to Curieuse. Only the quantity estimated to be required for a particular area will be purchased shortly prior to use to minimise the quantities being handled and stored at any time. Assessments of quantities required will be made following assessment in the field of areas judged to be inaccessible for trapping. Sealed containers will be stored in a locked room only accessible to project staff at the Ranger Station at Baie Laraie, and quantities required

in the field will be kept separate from other equipment in sealed containers during transport. Amounts of bait used will be recorded by staff members.

At all times when handling bait staff will be required to wear disposable protective gloves. After use gloves are to be washed with soap and water and disposed of in the municipal waste. Staff will be trained and assessed in all aspects of handling and use of bait according to the protocols set out here, and in the recognition of symptoms of poisoning. Any empty metal containers are to be washed with soap and water prior to being disposed of in the municipal waste. Any washed residues will remain contained within the waste water soakaway system and will break down over several months.

22. Basis of selection of pesticides authorized for procurement under the project, taking into consideration WHO and World Bank standards, the above hazards and risks, and availability of newer and less hazardous products and techniques (e.g., bio-pesticides, traps).

Supa-Kill brodifacoum blocks have been selected for several reasons. This formulation is readily available locally at the correct concentration in an ideal form for distribution, at low cost through the Seychelles Agricultural Agency. It has a well proven effectiveness through a long history of use in the Seychelles, and its mechanism of operation fits well with the project plan. Due to the small quantities proposed to be used for this project and the relatively low risks associated with locally available brodifacoum, the significant additional logistics and cost associated with researching, sourcing, procuring, shipping and importing an untested alternative would greatly outweigh the marginal benefits likely to be gained.

23. Name and address of source of selected pesticides.

Supa-Kill, 8 Derrick Road, Spartan, Kempton Park, Gauteng, South Africa.

24. Name and address of vendor of selected pesticides.

Seychelles Agricultural Agency, Amitie, Praslin, Seychelles.

25. Name and address of facility where pesticides will be stored.

Seychelles Parks and Gardens Authority, Curieuse Island, Seychelles.

**Policy, Regulatory Framework and Institutional Capacity:** This section aims to understand the institutional and legal framework under which the pesticide will be applied, with reference to the documentation and standards required under local and national law and international good practice. Where the particular pesticide is not regulated at the target site, the proponent must identify similar pesticides and the applicable regulation, international laws in neighboring countries that could apply, and international good practice. The proponent must also explain why this particular pesticide is necessary even in the absence of national laws.

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

IOTA does not have formalised policies on these issues, however all project activities are required to adhere to local and international laws and regulations, and accepted best practice.

27. Description and assessment of national capacity to develop and implement ecologically based AIS control.

The proposed project represents a significant advance in ecologically sound AIS control through its use of primarily A24 traps, and eliminating the requirement for large

quantities of poison bait. All previous Seychelles island rat eradications to date have used island-wide application of poison bait, however short-term or small scale AIS control using snap traps or A24 traps has been carried out in localised areas.

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

Pesticide import, export, distribution, transport, storage and use in the Seychelles is regulated by the Pesticide Control Act Chapter 164A Act 14 1996. The Act is administered by the Pesticide Board which meets every two months. Brodifacoum is listed in Section E of Schedule 1 as a registered pesticide and is regulated by the Act. There are no formal requirements for non-commercial pesticide use, therefore use of brodifacoum is permitted for the purposes of this project, subject to adherence to the other requirements of the Act. Relevant clauses stipulate that pesticides may not be transported in a vehicle with food, should be stored in a leak-proof container above ground level in a locked room with appropriate signage, and any quantity must be accompanied by a label or information sheet with prescribed information, including details of the product, directions for use, safety precautions, symptoms of poisoning, and first aid measures.

29. Proposed project activities to train personnel and strengthen capacity (list # of people and what they are being trained in).

Four field staff will be employed on the project, and will be trained in the safe handling and use of brodifacoum. Employees will be required to read and understand this Pest Management Plan, the Pesticide Control Act, and the WHO Classification of Pesticides, and their understanding of the requirements will be assessed prior to handling any pesticide.

30. Confirmation that the appropriate authorities were approached (who and when) and that the appropriate licenses and permissions were obtained by the project.

The details of the project have been developed in collaboration with the Seychelles Parks and Gardens Authority, the responsible authority managing Curieuse Island. Their permission has been granted for the project and they will be supporting it.

**Consultation:** This section aims to outline the range of informed consultations that the grantee has had both with experts, to optimize the potential for success, and with stakeholders, particularly local communities, who are potentially affected by the use of pesticides (by proximity, by the use of certain areas for free-ranging livestock or non-timber forest product collection, etc.).

31. Plans for, dates and results of expert consultations, if necessary.

None deemed to be necessary.

32. Plans for, dates and results of consultations with local communities.

Rodenticide will only be applied in areas of the island where access by members of the public is not permitted, and only in areas not accessible by experienced fieldworkers, so there will be no risk of contact with rodenticide by any members of the local community. Therefore community consultation is deemed to be unnecessary.

33. Disclosure: CEPF requires that safeguard documents are disclosed to affected local communities and stakeholders prior to project implementation. Please describe efforts to disclose this impact assessment and environmental management plan and provide dates.

Once approved, this document will be shared with the Seychelles Parks and Gardens Authority, the responsible authority managing Curieuse Island. No community members or other stakeholders will be affected by the use of rodenticide on this project.

**Monitoring and Evaluation:** This section aims to outline what steps the proponent will take to monitor and evaluate the purchase, storage, application and effects of the pesticide in the target area.

34. Description of activities related to pest management that require monitoring during implementation.

A log sheet will be maintained to record quantities of pesticide purchased and added to the storage inventory or removed for application. Unused quantities will be logged and returned to storage at the end of each field session. During intensive eradication monitoring any potential signs of adverse effects of brodifacoum will be monitored. Any personnel involved in the handling or use of brodifacoum will be constantly monitored for any signs of exposure.

35. Monitoring and supervision plan, implementation responsibilities, required expertise and cost coverage.

Field staff will be responsible for accurate logging of quantities of rodenticide added to or removed from the inventory, and the Project Leader will periodically conduct checks to ensure quantities in storage reflect logged quantities. The Project Leader will periodically assess field staff in their handling and application of pesticide and their compliance with the requirements set out in this document. No costs additional to the project budget will be incurred in implementing the safety aspects of this Pest Management Plan, since implementation consists only of procedural and training elements.

**Grievance mechanism:** Please refer to the full proposal for details on the grievance mechanism.