

## **Biosecurity Recommendations for Santa Cruz Island**

*Revised January, 2018*

The California Islands Biosecurity Working Group identifies four priority areas which are necessary to conduct a comprehensive biosecurity program:

Prevent new invasions via all major vectors

Early detection of invasives with on-island monitoring protocols

Rapid response strategies

Education programs created and disseminated

The Santa Cruz Island Biosecurity Program directs energies to each of these areas. This document describes the action plan and near-term goals for each of these activities.

### **Prevention:**

TNC, NPS and the US Navy have employed a Biosecurity Manager who is charged with inspecting gear and equipment coming out of Ventura and Port Hueneme Harbors traveling to the islands. They will make recommendations to NPS and Navy harbor staff on improving biosecurity protocols on the mainland to prevent the likelihood of introductions.

These organizations have guidelines in place describing what can be brought to SCI and under what conditions (See, California Islands Biosecurity Program, 2013).

### **Early Detection:**

#### *Camera Monitoring*

*Purpose:* Remote camera monitoring is used to detect an incipient invasive species on SCI. It is expected that some species, if detected (i.e. raccoons, cats, opossums), could be eradicated if detected. Other species (rats) are likely to be very difficult to eradicate from an island as large as SCI because of their biology and behavior. *The camera program is not designed to detect a rat invasion in time to prevent establishment.* However an eradication program is a possible course of action if rats are detected.

*Camera Program 2011-2014:* The protocol rotated 15 cameras around the island every 4-12 months, targeting areas of high food density in habitats where rats are most common on San Miguel Island (the marine environment).

*Camera Program 2018:* Due to a lack of government grant funds and increasing contractor costs, we propose to 1) rotate 4 cameras in inaccessible coastal locations checked by a contractor every 6 months; 2) establish 5 cameras in heavily used areas with memory cards replaced by SCI staff each month; 3) establish 5 cameras located on remote roads with memory cards replaced by SCI staff or researchers every 3 months (Figure 1). Memory card replacements will be coordinated and scheduled using the Ventura Office Outlook calendar, with reminders sent to TNC staff via that program. Data on these fixed cameras will be downloaded and sent to the Biosecurity Manager for review.



**Figure 1.** Recommended locations for fixed camera traps. Orange points are locations checked by TNC staff every month. Blue points are locations checked every 3 months.

### **Rapid Response**

*Compliance documents:* TNC and NPS are very concerned about the possibility of a rat spill on the northern islands. We are coordinating with FWS to determine how to gain compliance permits for a rodenticide action on the island if needed. We will work with the biosecurity manager to write and compile the pertinent biological assessments and then work with FWS and NOAA on the following documents:

- An exemption from the Bald and Golden Eagle Protection Act from FWS.
- A NOAA Sanctuary Permit – using the Anacapa rat eradication as a template.
- An Environmental Assessment (NPS is lead agency, Navy will review) which outlines our response plan.

*Rat Spill Response:* In the case that a vessel becomes grounded on or near one of the islands, a Rat Spill Kit will be deployed, given that conditions are safe to do so. Each Kit contains 4 rat bait boxes and enough rodenticide to load each box, along with safety information and materials. The bait boxes will be deployed ON the grounded vessel only, as an attempt to kill any rats that may be onboard the vessel before they reach the island via swimming or walking if close enough.

If it is known that a vessel carrying rats is shipwrecked on island, then we may decide to use rodenticides on the island within 24-48 hrs of the spill. These “conservation” rodenticides can be sourced by Island Conservation from Bell Labs. We will deploy camera traps in the affected area to try to delimit the extent of the rat spill. Those camera traps will need to be monitored regularly for at least a year. We would have to bring on a full time crew to oversee this project.

*Mid-sized Mammal Response:* Mid-sized mammals, like raccoons or cats, present a disease threat to the island fox and skunk and may harm other island natives. If these animals are detected via camera or biologist sighting, we will initiate a trapping effort in the affected area using a team of trained biologists.

## **Education**

We are working with Island Packers and NPS to improve their biosecurity education program for visitors. This includes updating information on Invasive Species and Eradication programs each year. The Biosecurity Manager will work with some visitors at IPCO prior to them leaving for the island however she will not be able to be present before every boat. She will work with the Kayak guides and CHIS Volunteer Corps to ensure these volunteers – who are present on all boats - are sending the correct messages to the public.

We are improving the Biosecurity Website experience for Island Users. We currently have Invasive Plant ID cards, a blog and geo-referenced map for sightings of new invasive species, and our California Island Biosecurity Plan on the website. We will continue to update and add content as we develop it.

## **Appendix: Detection Tools – Summary and Recommendations written Nov 2014**

### **Remotely triggered cameras:**

#### *Strengths-*

- Cameras don't require the animals to do anything outside of its normal behavior
- There is a date stamp on any detection
- Captures more than one species
- Little maintenance required compared to other methods
- A number of studies report cameras finding new species in areas where they are not previously known (Dajun et al., Env. Manage. 2006), or finding the most species compared with other methods (Foresman and Pearson, J. of Wildlife Manage., 1998)
- Arrays of camera traps can be used to calculate native species density (Gerber et al., Oryx, 2010)
- Time to deploy in the field is similar to hair snares and track plates

#### *Weaknesses –*

- Unclear photos may instigate costly response to verify sighting
- Costly (camera, batteries needing to be replaced)

#### *Probability of detection compared to other methods – High*

- Obtains more detections than hair snares and track plates, less than detection dog (Harrison, Wildlife. Soc. Bull., 2006)
- In one study 75-86% of known species were recorded (Tobler et al., Animal Cons., 2008)

#### *Certainty of detection compared to other methods –High*

- Results considered to be less open to interpretation than track surveys (Glen and Dickman, Wildlife Research, 2003) and genetic analysis of hair (Vine et al., Wildlife Research., 2009) when follicles were not removed

*Overall efficiency – High*

- Generally considered in the literature to be the most efficient means of collecting data, compared with track plates, and hair snares (Claridge et al., Australian Mammology 2009, Foresman and Pearson, J. of Wildlife Manage., 1998, Harrison et al. 2002, Silverira et al. 2003, Gompper et al., Wildlife Soc. Bull., 2006, O'Connell et al. 2006, Vine et al., Wildlife Research., 2009)

Summary of this method:

<http://books.google.com/books?hl=en&lr=&id=BYnTI87OwAAC&oi=fnd&pg=PA110&dq=remotely+triggered+camera+detection+rare+species&ots=GWpxeP1j00&sig=GdcXi-J1Vsv8XOw2YpQZPqNZ1i8#v=onepage&q&f=false>

**Detection dog:**

*Strengths –*

- Considered to be the most effective tool in detection of rare species (Harrison, Wildlife. Soc. Bull., 2006, Long et al., Wildlife Management, 2007)
- False positives are rare
- Dogs can work in steep terrain

*Weaknesses*

- Detection probability depends on the species, or dog and its training (from 27%-100% detection rate, given known presence)
- Dog must consistently work with one or two trainers to ensure effective surveys
- Some studies report that dogs should only be trained to detect 1-3 species
- Most expensive tool and must be maintained constantly (about 55k per month for well-trained dog and trainer)

*Probability of detection compared to other methods – High*

- One survey found probability of detection ranges from 40-95% depending on species (Long et al., Wildlife Management, 2007)
- Another survey found a difference in dogs, dogs detected 57-100% of animal signs, depending on the dog (Riendel-Thompson, Wildlife Soc. Bull., 2006)

*Certainty of detection compared to other methods –High*

- Most studies report that dogs do not report false positives (Riendel-Thompson, Wildlife Soc. Bull., 2006)

*Overall efficiently* – High

- Very efficient if the constraints in training can be met.

### **Recommendations:**

**Remotely triggered cameras:** We recommend the continued use of cameras around the island to search for invasive species. Additional testing should be completed to ensure that we're happy with the performance of the cameras. Due to an increase in the price of checking and rotating the cameras, some cameras may become fixed at likely introduction points and will be checked by TNC staff.

*Purpose:* To capture rats or other animals after they arrive on the island. Due to the long interval between camera checks, we do not expect to catch a rat infestation before it spreads to a large area. Response is likely limited to removal of larger animals.

*Camera use in our long-term Invasives Detection Protocol:* The price of helicopter use has doubled, meaning our existing program now costs 40k rather than 20k. We need to consider other ways of putting out and checking cameras, including off of roads, or by boat landings. We could also cut helo costs by fixing remote cameras in the best location, rather than moving them around the island every 4 months.

**Chew cards and hair snares:** May be recommended if they are effective and can be checked every 1-3 days.

*Purpose:* If checked every 1-3 days they could constitute an early detection tool for *rattus*. Only really useful to verify a sighting, not for initial early detection.

*Additional Testing:* More computer research and field testing is needed before we'd recommend these for use. If testing results are promising we may recommend that TNC staff, volunteers or NPS staff use these techniques in built areas or intertidal. Field testing will be conducted by May 2015 and then further recommendations and a protocol will be made to TNC staff.

**Detection dog:** Recommended for use on the mainland checking boats, as part of our inter-island biosecurity. Due to the cost and up-keep required, it is not recommended for the island unless we need to verify the extent and a confirmed population, or search for individuals after an eradication attempt.

**Track plates:** Not recommended because they must be checked very frequently in order to retain data on visitation.

**Intertidal monitoring:** Possibly could be integrated into volunteer trips. Volunteers on the island for 1 wk could check beaches for rat middens and set out chew cards, do ranch activities for a few days, then pick them up.