

I. **Project Title:** Night Birds Returning. Phase 1: Eradiction of Norway Rats from Arichika Island (Phase 1)

II. **Reporting Period:** March 15, 2011 to March 15, 2012

III. **Project Narrative (this section is required for the final comprehensive report only)**

*The project narrative should identify the problems that the project has addressed, describe short- and long-term objectives and goals and how they were met, and explain the relevance of the project to enhancing habitat and/or to benefiting living marine resources, including a description of any threatened or endangered species the project will benefit.*

Non-native rats (Norway and black) were introduced in the last century by humans to Haida Gwaii, British Columbia, Canada, and have been attributed to significant declines in native species on the islands including at risk Ancient Murrelets (*Synthliboramphus antiquus*), (Golumbia 2008). For example, 27 breeding populations of seven seabird species have abandoned breeding sites or been extirpated on 13 islands where rats or raccoons are present. Today Norway and black rats have been documented on at least 20 islands on Haida Gwaii (Bertram and Nagorsen 1995; Burles 2009), and are believed responsible for the almost complete extirpation of several seabird colonies (Kaiser et al. 1997, Golumbia 2008).

In 2010, Parks Canada Agency, the Haida Nation, the Archipelago Management Board, Island Conservation, and Coastal Conservation implemented the Night Birds Returning project. The goal of this program was to restore seabird breeding habitat by eradicating introduced Norway rats from four island groups in Gwaii Haanas National Park Reserve and Haida Heritage Site. In addition to benefiting seabirds, removing Norway rats from these islands will restore ecological balance, reduce pressure on other native wildlife and allow small populations, such as that of the dusky shrews, to recover. The short-term objective of the Night Birds Returning project was to eradicate Norway rats from selected islands in Gwaii Haanas; this objective was initiated with phase I of the project which focused on the removal of rats from Arichika Island in Juan Perez Sound. Long-term objectives of this project include active and passive island ecosystem restoration. Active restoration involves bait station replenishment and monitoring for two years following phase 1 to determine if rats have been successfully eradicated, as well as installation of decoy birds and call playback devices to attract seabirds to the islands. Passive restoration includes increasing the amount of suitable seabird breeding habitat through invasive rat removal.

Arichika Island is approximately 15 hectares in size and located in southern Juan Perez Sound. Shoreline habitats of Arichika Island are exposed to ocean swell from the north and south; interior habitats are composed of cedar, spruce and hemlock forest and related understory. Historically Arichika Island supported an estimated 500 pairs each of Ancient Murrelets, Cassin's Auklet, and Fork-tailed Storm-petrels (Summers 1974; Pattison 2010). Surveys in the 1980s, however, failed to confirm any active seabird burrows. The reason for seabird decline became clear in 2006 when Norway rats were discovered on the island (D. Burles, unpub. data). However, there is recent evidence of Ancient Murrelets visiting the island possibly prospecting for potential nest sites (C. Gill pers. comm.).

The restoration of Arichika Island through invasive rat removal will encourage the recolonization of the island by Ancient Murrelets and other seabirds (using both passive and active techniques, such as call playback and decoys) and also provide an opportunity for native rodents, some of which may be endemic to the islands, to recolonize/repopulate the area. Finally, this project also resulted in increased community awareness regarding the negative impacts of invasive species such as rats not only on seabirds but on island ecosystems.

#### IV. Methodology

*Describe the methodology used to undertake on-the-ground activities during this reporting period to achieve the project goals and objectives, including the specific techniques and materials used.*

#### ERADICATION

The main method used in the Arichika Island eradication was delivery of a lethal quantity of bait containing the anticoagulant brodifacoum using bait stations. Aegis™ and Protecta™ bait stations were used during the rat eradication. Both stations had locking lids and an internal baffling system to reduce the accessibility of bait to other species. To further prevent tampering, bait stations were anchored to the ground using non-target rebar and zip ties. In situations where this was not possible (e.g. on rock islets) large rocks and branches were used to secure bait stations. The bait stations were installed in a 50 x 50 m grid over the island to ensure a sufficient quantity of bait was available to every potential rat territory on the island. This spacing interval has been used previously for successful Black rat eradications. A considerable amount of time and effort was dedicated to logistical planning and preparation for the eradication operation. These events occurred between September 2010 and immediately prior to the on-island implementation on August 17, 2011. The eradication operation was conducted in a stage-wise approach (Table 1).

**Table 1. The three main phases of the on-island eradication operation using fixed bait stations.**

Stage	Timeline	Activity
Phase 1: Primary baiting period & preliminary efficacy monitoring	0-4 weeks	Stations visited every 24-48 hours to replenish any missing bait.
Phase 2: Secondary baiting period, preliminary efficacy monitoring, & adaptive management if rats present	4 weeks-2 months	When activity at bait stations decreased or ceased, stations visited every 3-5 days to replenish any missing bait.
Phase 3: Tertiary baiting period & efficacy monitoring	2 months-24 months	Stations checked/refilled on a quarterly basis for two years post implementation to monitor for any rat activity.

Weather conditions on Haida Gwaii in the fall and winter pose a significant safety risk to project personnel with heavy precipitation and gale force winds a common occurrence from October until springtime. Human safety was our primary concern for this project; therefore, the eradication was implemented on August 17, 2011 on Arichika Island in order to ensure the primary and secondary baiting phases were completed before the anticipated arrival of regular inclement winter weather and to provide a contingency in case initial bait uptake was delayed (e.g. if rats took longer than anticipated to overcome neophobia towards the bait).

Bait stations were checked by field personnel on each island within 24 to 48 hours during the primary eradication phase and every three to five days during the secondary phase. The amount of bait added to stations on Arichika Island was adjusted as the eradication progressed using an adaptive management process to minimize the bait entering the environment while still maximizing the

probability of eradication success. Changes to bait application rates were based on observed bait uptake rates on each island and the influence of adverse weather events that prevented field personnel from accessing particular stations. In addition to replacing missing, chewed, or moldy blocks, the field team also replaced all bait on a weekly basis to maximize bait palatability for rats.

#### Data Collection and Analyses

Handheld field personal computers (Archer™) were used to record several data parameters during each visit to the bait stations. These parameters included:

- Observer;
- # of blocks remaining;
- # of moldy/damaged blocks;
- # of blocks added;
- Target sign;
- Non-target sign;
- Non-target species (only if there was sign);
- Station condition; and
- Action required (re-arm, deactivate station).

In addition to the use of field computers for data collection, hard copy records of bait uptake were also collected to reconcile any possible human errors or omissions that may have occurred during data entry into the field computers. The bait station data was downloaded to a SQL server database and data analyzed daily both spatially using ArcviewGIS,™ and graphically using Microsoft Excel™. Data analyses included monitoring of bait uptake at each station and for individual islands, carcass search effort, and wildlife sightings. Daily data analyses enabled real time monitoring of the eradication progress and allowed the eradication managers to react to variations in bait uptake rates on an island-by-island basis.

Reconyx PC90HO Covert Pro™ remote cameras were used on Arichika Island as a tool to monitor target and non-target activity, including bait uptake, station tampering, and general wildlife observations. Remote cameras were also installed at mitigation sites to monitor bird activity.

#### **MITIGATIVE MEASURES**

In addition to incorporating tamper-resistant bait stations, several other mitigative measures were implemented during the Arichika Island eradication in order to minimize impacts to non-target species. These measures included:

- eradication timing;
- bait colouration;
- bait application rates;
- carcass searches; and
- supplemental feeding of avian scavengers.

#### Eradication Timing

Eradication operations began on August 17, 2011 on Arichika Island which afforded a safe weather window for field operations while ensuring that the most birds had completed their breeding cycles

and/or left the islands in preparation for migration (Coastal Conservation 2011, C. Bergman pers. comm.).

#### Bait Colouration

In order to reduce the attractiveness of the bait to granivorous birds the bait blocks were dyed green, a color that is thought to be the least visible and appealing to birds (Pank 1976, Tershy and Breese 1994, Buckle 1994; Howald pers. comm.). Bait blocks were large enough in size to prevent small granivorous birds from being able to lift, transport, and wholly consume them if accessed.

#### Bait Application Rates

During the primary and secondary eradication phases the field team recorded bait uptake on the project island. This information enabled the management team to make informed decisions in regards to bait application rates in order to minimize the amount of rodenticide bait entering the environment while still ensuring eradication success.

#### Carcass Searches

During the primary and secondary eradication phases on Arichika Island, target (rat) and non-target carcass searches were conducted to reduce the probability of secondary poisoning. Two types of carcass searches, formal and non-formal, were performed by field personnel on Arichika Island consistently throughout eradication operation. Formal searches were conducted by traversing off-trail areas that were not regularly visited during the bait station checks. The searches were primarily focused on shoreline areas of the island although observers also searched the interior and looked under logs and vegetation to locate potential carcasses. Formal carcass search effort was tracked and recorded in Archer field computers. Data was uploaded to ArcviewGIS™ software and analyzed using both ArcMap™ and Microsoft Excel™.

Non-formal carcass searches were conducted during bait station checks and remote camera installation/checks by scanning the surrounding area between and in proximity to bait stations. Non-formal carcass search effort was captured in the Archer™ field PCs as the time taken/distance covered to complete bait station checks or as the time and distance taken to service remote cameras or conduct red squirrel surveys.

When a target or non-target carcass was recovered, the observer entered the species name, age class, and sex (if known), field condition of the specimen, and other relevant observations into the Archer™ field PC. Specimen identification numbers and location (latitude/longitude) of the carcass were automatically generated by the field PC. Photos to document the condition and location of the carcass were taken prior to touching or moving the carcass. Prior to handling a carcass, new chemical resistant gloves were worn to prevent contamination of the specimen. Carcasses were placed in a zip lock bag and labelled with date, specimen ID (obtained from the field PC), name of collector and species name. Specimens were then stored in a designated freezer at the field camp and then transferred to Gwaii Haanas headquarters for long term storage. Non-target specimens that are suitable for testing may be assessed for brodifacoum exposure.

#### Supplemental Feeding of Avian Scavengers

Sitka black-tailed deer carcasses were placed as a supplemental food source at strategic points of land (hereafter referred to as mitigation sites) near Arichika Island to draw Bald Eagles, Common Ravens and Northwestern Crows away from the project areas during the eradication operations. Two mitigation sites adjacent to Arichika Island were selected based on the proximity to the project island.

Mitigation sites were visited every one to three days (weather dependent) to observe and record: 1) bird species present (primarily Common Ravens, Bald Eagles and Northwestern Crows), 2) number of each species present, and 3) condition of deer carcass (e.g. 50 percent of carcass remaining). The date and time of the site visit was also recorded, as well as any other unusual observations. All data was entered into an Excel™ spreadsheet.

## **V. Results/Progress to Date (October 2010 to March 2011)**

*Describe in sufficient detail the status of the project (planning/design, implementation, monitoring, complete) in terms of progress and results achieved during the reporting period. This should include information such as the actual acreage that were restored/enhanced/protected or created to date (cumulative), and how this measurement was determined; projected acreage yet to be restored with CRP funds; miles of stream that were opened or will be opened for fish passage; lessons learned during this reporting period; challenges or potential roadblocks to future progress; and an updated timeline of remaining tasks needed to complete project.*

The eradication operation can be separated into four main stages:

**Stage 1:** Operational planning, regulatory compliance (completed during this reporting period and described below);

**Stage 2:** Eradication preparation (completed during this reporting period and described below);

**Stage 3:** Eradication implementation and efficacy monitoring (completed during this reporting period and described below) and;

**Stage 4:** Non-target species impacts and ecosystem monitoring (in progress during this reporting period, see section VI *Monitoring and Maintenance*).

### **Stage 1: Operational Planning, Regulatory Compliance & Pre-eradication Biodiversity Surveys**

#### Operational Planning

An operation plan was developed during the interim reporting period. The content of the operational plan includes Stage 2 (eradication preparation) and Stage 3 (eradication implementation), which are summarized below. Considerations are provided in the operational plan for Stage 4 (eradication confirmation), which was in progress during this reporting period.

#### Regulatory Compliance

Parks Canada Agency submitted an internal Environmental Assessment (EA) Screening Report that outlined the significance of the projects' environmental impacts and recommended mitigative measures to minimize those impacts. The EA was made available to the public on the Canadian Environmental Assessment Registry Internet Site during the planning and preparation phase of the eradication (September 2010 to July 2011). Parks Canada Agency also obtained an animal care permit internally and received project approval from the Archipelago Management Board. A non-regulatory Research Permit was also obtained for the ecosystem monitoring work associated with the eradication.

The main regulatory requirement for this project was the approval of Brodifacoum Conservation Blox™, a brodifacoum-based rodenticide, by the Federal Pest Management Regulatory Agency (PMRA) for use during the eradication. Bell Laboratories submitted a PMRA pesticide registration application for Brodifacoum Conservation Blox™ on September 8, 2010. On May 20, 2011 the PMRA approved the use of Brodifacoum Conservation Blox™ in Canada for conservation purposes.

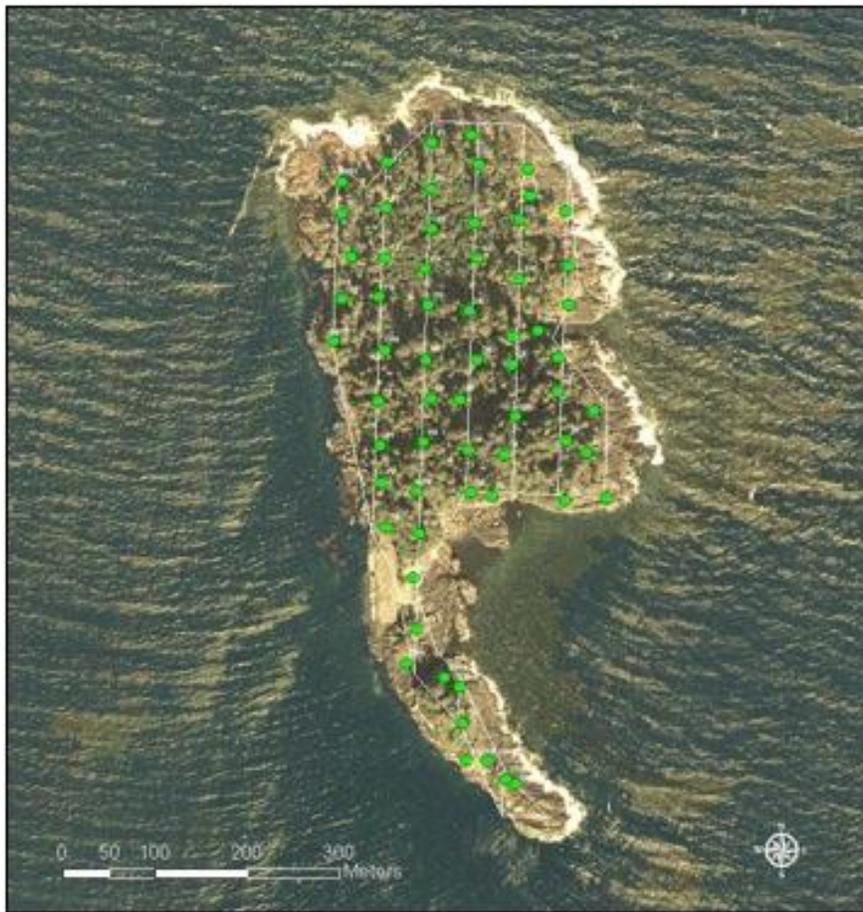
Following PMRA approval, a total of 2,207 kilograms of bait was ordered on May 27, 2011 to ensure enough bait was available for eradication implementation and monitoring phases. The bait was delivered to Gwaii Haanas headquarters on July 8, 2011 in preparation for staging at the field camp for the August 17, 2011 implementation.

## **Stage 2: Eradication Preparation**

### Logistical Preparation

In 2010 crews established temporary trail networks on Arichika Island in preparation for eradication operations. Following completion of the trails, Parks Canada installed unbaited Aegis™ and Protecta™ bait stations (manufacturers: Liphatech, Inc. and Bell Labs, Inc. respectively) according to the 50 x 50 m grid spacing to weatherize the stations and allow rats to overcome rat avoidance behaviour to novel objects in their territory (known as neophobia; O'Connor and Eason 2000).

Digitized maps with assigned bait station grids and island access routes were finalized in preparation for eradication implementation (Figure 1); each of the transects was assigned a unique identifying letter (A-G) and the location of each station was marked by a unique transect-number identifier (e.g. F9), and geo-referenced so activity at each station could be monitored temporally and spatially.



**Figure 1. Bait station locations and transect lines (A-G starting from the east) on Arichika Island.**

Field staff were identified and hired during the reporting period and pre-eradication planning duties assigned to current staff. Equipment and supplies required for the eradication were identified,

purchased, and staged at Gwaii Haanas headquarters in Skidegate, BC. Equipment was then transported to the field camp on July 10, 2011 in preparation for eradication implementation.

Several precautions were taken in order to keep both camps rat-free, including setting rat snap traps and arming additional bait stations around the perimeter of the camps, ensuring that doors to food preparation and storage areas were always closed, and managing food/human waste so that it was not available to rats.

Potential boat landing sites were also evaluated for safety and suitability during the eradication operations. Suitable locations were marked with GPS and mapped.

### **Stage 3: Eradication Implementation & Efficacy Monitoring**

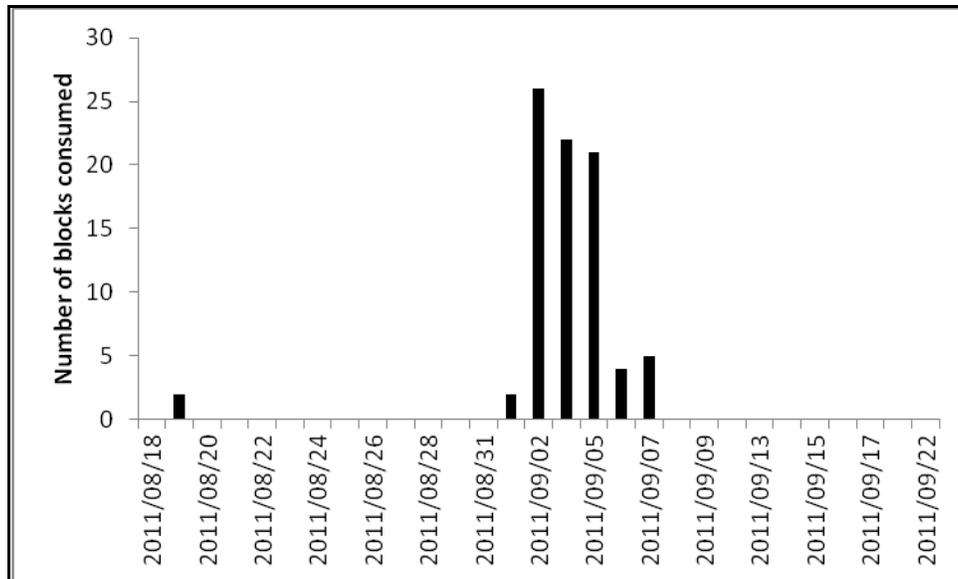
#### Eradication Implementation

During the primary baiting phase (intensive period, approximately August 17 to September 15) bait stations were armed with up to eight blocks of bait containing the rodenticide. Stations were checked every 24-48 hours to replenish bait until uptake was markedly reduced or ceased. On Arichika Island the primary baiting phase began on August 17, 2011 when bait stations were armed with four blocks of Brodifacoum Conservation Blox™. Bait in stations was refreshed on a weekly basis on Arichika Island to ensure fresh bait of the highest palatability was available to rat populations.

After bait uptake ceased or was markedly reduced (indicating approximately 99% of the rats had been eradicated), the secondary phase began. The number of rodenticide bait blocks was increased to eight per station on September 5, 2011 to account for the possibility of reduced opportunity to conduct bait station checks due to inclement weather (adaptive management). The camp was demobilized on September 27, 2011 marking the beginning of the tertiary eradication phase for Arichika Island. For the tertiary phase, each station was armed with eight rodenticide bait blocks sealed in plastic bags and pinned in place.

#### **RESULTS OF ERADICATION PHASES 1 & 2**

Stations were armed on August 17, 2011 although bait uptake did not begin until September 1, 2011 and peaked on September 2, 2011, 16 days post-eradication implementation (Figure 2). Thirty-two percent of stations on the island experienced bait uptake although the amount of bait uptake on the island varied depending on station location.



**Figure 2. Daily amount of bait uptake from 65 stations on Arichika Island.**

Bait uptake began at stations on the northern tip of the island and spread south through stations on both (Figure 3). Thirty-two percent of stations (n=21) on Arichika Island reported bait uptake during the eradication with a total of 82 bait blocks removed (bait uptake rate of 0.1kg/ha).



**Figure 3. Cumulative bait uptake from stations on Arichika Island from August 17 to October 1, 2011.**

Bait uptake declined to zero after September 7, 2011 for the remainder of the secondary phase of eradication. Following the surge of bait uptake, remote cameras deployed at seven locations (total camera nights: 148) did not capture any rat photo events.

#### Efficacy Monitoring

Remote cameras were deployed to detect and monitor the presence and behaviour of rats and non-target species in and around the bait stations on Arichika Island. Only five rat events were recorded in more than 160 camera nights on Arichika Island, with the only rat event(s) recorded between August 30 and September 3, 2011. Cameras were deployed on three separate occasions at different station locations between August 30 and September 28, 2011. Rat activity was recorded at stations E8 (n=2) and F9 (n=3). Remote camera monitoring ended after September 28, 2011 on Arichika Island. Thirty-one small mammal traps were also deployed on Arichika Island on September 14, 2011 to determine if any rats were still present once bait uptake ceased. A total of 93 trap nights were completed between September 14 and September 17, 2011 but no rats were detected marking the beginning of the tertiary eradication phase on this island.

Based on preliminary results, it appears that rats have been eradicated from Arichika Island (15 hectares in size). However, eradication success will not be confirmed until 2 years of post-eradication monitoring have been completed with no rats observed.

### **Mitigative Measures**

A total of 160 camera nights were completed on Arichika Island during the primary and secondary eradication phases with cameras primarily focused on bait stations to assess target and non-target activity. Although remote cameras recorded some species showing passive interest in stations (e.g. deer, river otter), there was no evidence of non-target species physically tampering with bait stations.

Consistent non-target wildlife observations and apparent low non-target mortalities (reflected in the small number of carcasses recovered – refer to *Carcass Searches* section below for additional information) suggest that mitigative measures that were undertaken during the primary and secondary eradication phases effectively minimized the probability of primary, secondary, and tertiary poisoning risk. Informal wildlife sightings suggest that there was no detectable population decline of non-target species found on the project island. In contrast to the Langara Island eradication, where approximately 50% of the local Common Raven population suffered mortality from the eradication (Kaiser et al. 1997), the mitigative measures employed during the primary and secondary eradication phases appeared to have avoided impacts to the local Common Raven population (no carcasses located) as well as other native species found on the islands.

#### *Bait Station Design and Placement*

The bait station design and anchoring system was one of the main issues that led to the Common Raven mortalities during the 1995 Langara Island rat eradication on Haida Gwaii (Kaiser et. al. 1997). Although unfortunate, this discovery was useful during the planning and implementation of the Arichika Island eradication. The modified bait station design (locking and internal baffling) decreased tampering and accessibility to the bait by non-target species. Although Common Ravens and river otters did not show any interest in bait stations during primary and secondary phases of eradication, the use of rebar to anchor stations to the ground acted as a safeguard to prevent possible tampering by these species.

#### *Bait Application Rate & Coloration*

During the primary eradication phase on Arichika Island the number of bait added to each station was four blocks in order to minimize the amount of bait entering the environment while still maximizing the probability of success. Field personnel removed any bait blocks found outside the bait stations during station checks and during formal carcass searches in order to minimize exposure and primary poisoning of granivorous birds or any other susceptible non-target species.

#### *Carcass Searches*

Formal carcass searching began on the same day as eradication implementation on Arichika Island (August 17, 2011) and continued on a regular basis until the end of primary and secondary eradication phases.

Between August 17 and October 1, 2011 a total 238 kilometers (141.2 hours) on Arichika Island of formal and non-formal carcass searches were undertaken (Table 2).

**Table 2. Formal and non-formal carcass search effort in distance and time for Arichika Island.**

<b>CARCASS SEARCH TYPE</b>	<b>DISTANCE (km)</b>	<b>TIME (hrs)</b>
Formal	36.2	18.9
Non-formal	202.1	122.3
<b>TOTAL</b>	<b>238.3</b>	<b>141.2</b>

The formal and non-formal carcass searches on Arichika Island resulted in the recovery of three carcasses (two Norway rats and one Ancient Murrelet<sup>1</sup>).

Although it is likely that some carcasses were not recovered during the primary and eradication phases, formal and non-formal carcass searches were still considered an important mitigative measure to reduce the potential for secondary and tertiary poisoning of non-target species such as Common Raven.

#### *Supplemental Feeding of Avian Scavengers*

Deer were culled and placed at two mitigation sites near Arichika Island from August 17 to September 16, 2011. The large numbers of Common Ravens, Bald Eagles, and Northwestern Crows observed at the deer mitigation sites suggests that supplemental food sources are an effective means of drawing scavenging birds away from an eradication operation, thereby reducing the potential for primary, secondary, or tertiary poisonings.

## **VI. Monitoring and Maintenance Activities**

*Describe any monitoring and maintenance that has taken place during the reporting period and/or procedures that are being used to evaluate the relative success of the project in achieving its goals and objectives. When will monitoring results become available?*

Several remote cameras were left in place on Arichika Island following completion of the secondary eradication phase on October 1, 2011 to monitor for presence/absence of rats. In November, 2011 field crews revisited the island to conduct bait station inspections, replenish/refresh bait as necessary, and check the remote cameras for rat sign. There was no bait uptake and no rats were recorded on the remote cameras.

The stations will continue to be checked and replenished with fresh bait at three months intervals (weather dependent) for 24 months after the start of eradication to safeguard against rats that might have escaped exposure. During the monitoring stage the field teams will continue to record the activity per station during each visit, including numbers of bait blocks removed, incisor marks on blocks, insect or slug activity inside station, other evidence of non-target activity or station tampering, and condition of bait blocks.

---

<sup>1</sup> This specimen was recovered prior to eradication implementation and was therefore not related to the eradication operation.

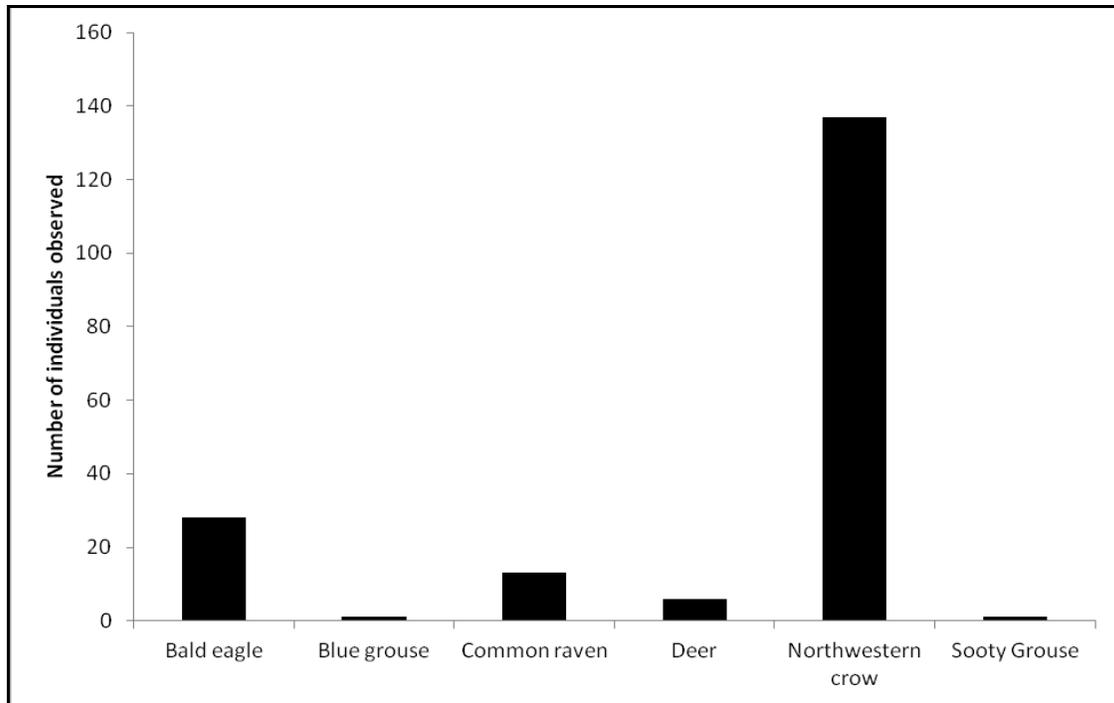
#### **Stage 4: Non-target species impacts & ecosystem monitoring**

Parks Canada conducted biodiversity and non-target surveys prior to and during eradication operations to obtain baseline data that can help evaluate the success of the management action (eradication of rats) and to understand the nature of the impacts on the island ecosystems. Non-target species abundance was measured for small mammals, songbirds, shorebirds, Bald Eagles, Common Ravens, Northwestern Crows, gulls, seals, and river otter to measure baseline population levels of these native species. These surveys will continue for at least 2 years or longer post-eradication to assess potential impacts to non-target native species. The results of the monitoring activities will be made available two years post-eradication implementation.

Pre-eradication (2010-2011) native species monitoring by Parks Canada Agency indicated that the number of native avian species observed remained relatively consistent prior to the eradication, with an actual increase in species diversity between 2010 and 2011 (Bergman 2012). Please refer to Bergman (2012) for more information.

In addition to the formal Parks Canada Agency ecological monitoring surveys summarized by Bergman (2011, 2012) and remote camera monitoring, the presence of non-target wildlife species was also passively monitored by field team members while performing bait station checks, carcass searches, and deploying remote cameras. Visual observations made by field personnel were recorded in Archer™ field PCs and included native species that were at risk of secondary poisoning such as Common Ravens, Bald Eagles, and Northwestern Crows, as well as other species found on the islands. Detections were recorded, along with any relevant notes regarding location or behaviour of individual animals. Vocalizations of species were not recorded unless the observer could confirm the species identification with visual observations. Wildlife data was downloaded and analyzed using ArcGIS™ and Microsoft Excel™. Passive wildlife monitoring was used as an adaptive management tool during primary and secondary eradication operations and will continue to complement data collected during formal biodiversity and non-target surveys conducted by Parks Canada.

Wildlife sightings during passive monitoring on Arichika Island were minimal; therefore, data was only compiled into total observations of each species (Figure 4).



**Figure 4. Wildlife individuals observed on Arichika Island during primary and secondary phases of eradication.**

Based on field observations and remote camera footage, preliminary results indicate that the number of local, native wildlife sighted remained relatively constant throughout primary and secondary eradication phases Arichika Island. Minor daily/weekly fluctuations in observations are likely attributed to observer efficiency as well as the frequency of time spent on the island and weather conditions, which can affect the level of wildlife activity (e.g. rainfall). Although anecdotal, these observations suggest that the eradication operations did not cause any significant impact to local native wildlife populations as evidenced by on-going sightings of high risk species such as Bald Eagles, Common Ravens, and Northwestern Crows.

The consistency of anecdotal wildlife observations throughout the primary and secondary eradication phases also suggests that the mitigative measures implemented to minimize impacts to non-target species during the eradication operations (i.e., carcass searching, supplemental feeding, and remote camera monitoring) were effective. However, the long term ecosystem monitoring conducted by Parks Canada Agency (e.g. Bergman 2012) will provide more concrete data to assess ecosystem response to the eradication operations (both positive and negative).

The monitoring phase of the eradication will continue for two years (October 2014) post implementation. The project will be considered successful if rats are not present on the island after this time period. Continued monitoring of the island ecosystem to assess recovery or changes to populations of native species will take place regularly after the eradication campaign is completed by Parks Canada.

## **VII. Community Involvement**

*Describe community support and any public involvement in the project that has occurred during the reporting period, including the specific roles of volunteers in project activities.*

This project employed a large number of local individuals (85% were from Haida Gwaii) and as a result there was a significant sense of 'ownership' of this project both by individuals directly involved in the planning, coordination, and implementation of it, as well as members of the community with indirect connections to the project. Project staff became well known in the small community of Queen Charlotte City, near Parks Canada's headquarters and kept the public updated on the progress of the eradication. The project was very well received at the community level.

## **VIII. Outreach Activities**

*Describe any outreach or educational activities (e.g. training, brochures, videos, press releases or public events) related to the project that has occurred during the reporting period.*

To date this project has attracted significant press coverage. Several newspaper and magazine articles were published (Globe and Mail, MacLean's Magazine, Epoch Times, Queen Charlotte Observer) and at least four radio interviews by the Canadian Broadcast Corporation (CBC) were completed. Furthermore several other articles are currently being written by reporters for Explore Magazine, Canadian Geographic and other online magazines. In addition to the media coverage, the results of the project were presented at the 2012 Pacific Seabird Group meeting in Hawaii and also at the February 26, 2012 National Invasive Species Conference in Ottawa, Ontario, Canada. A third presentation is planned for the North American Ornithological Conference in Vancouver, British Columbia in August 2012.

Links to news stories regarding the project:

International League of Conservation Photographers (<http://www.ilcp.com/projects/haida-gwaii-tim?tab=2&subtab=0>)

National Geographic Daily News ([http://newswatch.nationalgeographic.com/2011/11/22/restoring-the-balance%E2%80%93restoration-of-hope\\_](http://newswatch.nationalgeographic.com/2011/11/22/restoring-the-balance%E2%80%93restoration-of-hope_))

NOAA Restoration Centre (<http://usresponserestoration.wordpress.com/2011/11/08/gwaii-luckenbach-galapagos-of-the-north>)

CBC news (<http://www.cbc.ca/news/canada/british-columbia/story/2011/08/24/bc-rat-eradication-haida-gwaii.html>)

CBC Daybreak North\* (<http://www.cbc.ca/daybreaknorth/interviews/2011/08/23/rats-being-eradicated-from-haida-gwaii-to-preserve-rare-sea-bird>)

\*Note: there were two CBC interviews given. One by Laurie Wein of Parks Canada and one by Gregg Howald of Island Conservation.

Invasive Plant Council of BC (<http://www.invasiveplantcouncilbc.ca/invasive-species-in-the-news/rats-threatening-haida-gwaii-targeted-for-eradication>)

The Tye (<http://thetye.ca/Life/2011/11/24/Rat-Hunters>)

Macleans Magazine (<http://www2.macleans.ca/2011/09/13/rat-race>)

The Epoch Times (<http://www.theepochtimes.com/n2/canada/rat-eradication-underway-on-bc-islands-61020.html>)

Huffington post ([http://www.huffingtonpost.com/2011/11/27/haida-gwaii-islands-conservation\\_n\\_1113597.html?ref=canada#s498728](http://www.huffingtonpost.com/2011/11/27/haida-gwaii-islands-conservation_n_1113597.html?ref=canada#s498728))

#### **IX. Supporting Materials**

*Please include any supporting materials relating to the project, such as articles/news clippings, project photographs (before, during, and after--high resolution images on CD ROM are appreciated), project maps, related web sites, and evidence of NOAA Community-based Restoration Program support (e.g. photographs of signs at project sites, funding credit on outreach materials, press releases with complete program name, etc.)*

#### **X. Funding Information (Cash and In-kind)**

1. Itemized Budget table (similar to example below) showing expenses incurred during the reporting period, for both NOAA funds and matching contributions, as follows. Budget categories should correspond to those described in the approved proposal.

Budget Category (e.g. personnel, supplies, contractual, etc.)	NOAA Funds	Matching Contributions	Total Expense	Nature (cash or in-kind) and Source of Match
Expenses				
Project Services	\$6229.51		\$6229.51	
Field Work	\$36360.67	\$11506.35	\$36360.67	In-kind (bait), Bell Laboratories
Travel	\$22398.43		\$22398.43	
Role Equipment Usage	\$14494.80		\$14494.80	
Personnel Costs	\$44774.58		\$44774.58	
Professional Services	\$11114.86		\$11114.86	
Occupancy Expense	\$8887.02		\$8887.02	
Total Expense	\$144,259.87		\$144,259.87	
Allocated G&A	\$18,017.81		\$18,017.81	
Total Expenses	\$162,277.68		\$162,277.68	

2. Budget Narrative: Briefly describe expenditures by category and explain any differences between actual and scheduled expenditures. Include documentation of volunteer hours and in-kind donations.

Budget categories match those in the proposed budget. Amounts per category varied with higher amounts than anticipated in Travel due to extra required field site visits.

**CONTACT INFORMATION**

Contact Name: Gregg Howald  
Contact Title: North American Regional Director  
Organization (Grantee): Island Conservation  
Street Address: 100 Shaffer Drive  
City: Santa Cruz State: CA Zip: 95060  
Phone: (831) 359-4787 Fax:  
E-mail: Gregg.howald@islandconservarion.org  
Organization website (if applicable): www.islandconservation.org

**PROJECT INFORMATION**

Project Title: Phase 1: Eradiction of Norway Rats from Arichika Island  
Project Award Number: 2008-0073-051 Project Reporting Period: March 15, 2011 to March 15, 2012  
Project Location  
City: Skidegate  
County: Canada State: British Columbia Zip Code: V0T1S0  
Congressional District(s):  
Landmark (e.g. road intersection, beach): Gwaii Haanas National Park Reserve and Haida Heritage Site  
Land Ownership (check one): Public:  Private:  Both:   
Geographic Coordinates (in decimal degrees, if readily available)  
Longitude (X-coord): 52° 28' 18" Are there multiple project sites for this award?\* Yes  No   
Latitude (Y-coord): 131° 20' 28"  
River Basin:  
Geographic Identifier (e.g. Chesapeake Bay): Arichika Island  
Project Start Date: June 2010 Project End Date: December 2014  
Project Volunteers  
Number of Volunteers: 0 Volunteer Hours: 0

\* If multiple project sites are part of the same award, please duplicate this form and submit required information for each site

**Brief Project Description (1-2 sentences) describing project and what it hopes to accomplish:**

The project will address the demise of seabird colonies on Arichika Island, and in particular Ancient Murrelet nesting colonies, which are of international ecological significance. The ultimate goal is the restoration of ecological processes, including seabird nesting colonies, through the removal of rats from Arichika Island (Phase 1).

**List of Project Partners and their contributions (e.g. cash, in-kind, goods and services, etc.)**

Parks Canada: \$1 million in cash (primarily), in-kind support, and equipment/supplies  
Coastal Conservation: \$10,000 in-kind support

**If permits are required, please list the permits pending and those acquired to date:**

No permits were required because the project was carried out by a Federal organization on federal lands.

---

**RESTORATION INFORMATION- Please complete this section to the best of your ability. Information below will be confirmed via site visit or phone call by NOAA staff before the close-out of an award.**

List the habitat type(s) and acres restored/enhanced/protected or created to date (cumulative) and remainder to be restored/enhanced/protected or created (projected) with CRP funds by the end date of the award. If the project restores fish passage, list the stream miles opened upstream and downstream for fish access. Actual and Projected columns should add up to the total(s) for acreage to be restored with CRP funds indicated in the approved proposal.

<b>Habitat Type</b> (e.g. tidal wetland, oyster reef, mangrove)	<b>Actual Acres Restored</b> (To date-cumulative)	<b>Projected Acres</b> (i.e. Remainder to be restored with CRP funds by award end date)	<b>Actual Stream Miles Opened for Fish Access</b>	<b>Projected Stream Miles Opened for Fish Access</b> (i.e. Remainder to be restored with CRP funds by award end date)
Island ecosystem	0	15	0	0

**What indirect benefits resulted from this project? (e.g. improved water quality, increased awareness/stewardship):**

The restoration seabird colonies on Arichika Island will help to reverse the indirect negative impacts on the entire island ecosystem by restoring the nutrient exchange cycle between marine and terrestrial environments (seabirds depositing guano and prey remains at nesting areas on an island). Furthermore, the eradication of rats will allow native rodents, some of which may be endemic to the islands, to recolonize/repopulate the area. Finally, this project also resulted in an increased community awareness regarding the negative impacts of invasive species such as rats not only on seabirds but on island ecosystems.



requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.

The information collected will be reviewed for compliance with the NOAA Section 515 Guidelines established in response to the Treasury and General Government Appropriations Act, and certified before dissemination.