

Case Study: Anacapa Island Restoration Project





Stowaway rat hitches ride aboard Coast Guard helicopter

By Jim Paulin

Fisherman staff

A rat that stowed away aboard a Coast Guard helicopter in Adak eluded capture in Dutch Harbor last month, and later perished in Kodiak.

The rat was first spotted by the flight mechanic, seated with two other Coasties in the rear of the H60 helicopter, according to co-pilot Lt. Carl Riedlin.

"What's that? I think we have a rat onboard." Nobody believed him at first," Riedlin said.

But that soon changed. "One by one, they all saw it," he said.

Riedlin personally saw the rat at the Dutch Harbor airport. The rodent was momentarily frozen in his flashlight beam, hiding behind the last piece of equipment not removed during the search. Then the rat disappeared into the floor.

"We were ready to find him, but we weren't ready to catch him," Riedlin said. "We almost had him in Dutch, but we couldn't catch him."

The helicopter crew called the Unalaska police for help. A police officer responded, but never laid an animal-handling glove on the rat.

The helicopter was returning from Adak on Dec. 28, where it stood by while the disabled 830-foot freighter Bantasa was towed into port.

Accompanying the helicopter at a higher altitude was a C-130 cargo plane, kept informed of the rat problem by radio.

Riedlin said four traps were purchased from the Alaska Commercial Co. in Unalaska, along with peanut butter and cream cheese bait. The rat died in a helicopter nose compartment trap. The rat died in a helicopter nose compartment trap the next day in Kodiak. Also found in the same compartment were chewed up

See Stowaway...

Worse than an oil spill? A rat spill

Biologists are fighting a rodent invader that's causing ecological devastation in the Arctic.



Hitchhikers





Save Our Birds
Keep Rats Off



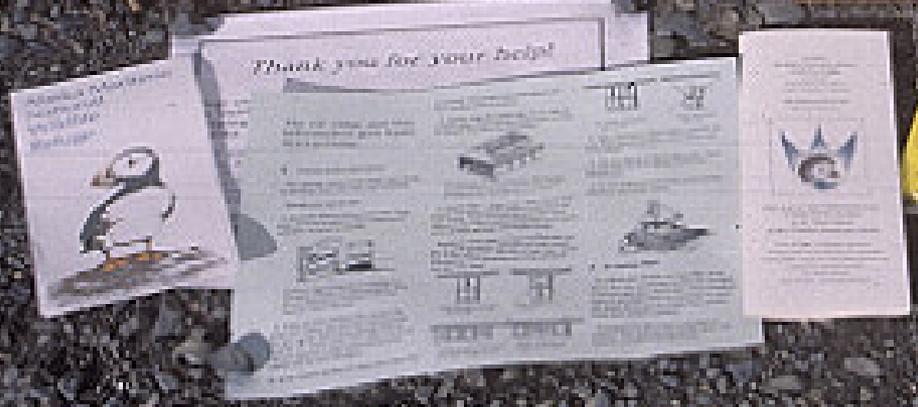
A woman wearing a wide-brimmed straw hat, sunglasses, and a light blue shirt is leaning on a large, dark stone sign. The sign is set in a field of dry, yellowish-brown grass and some green shrubs. The sign has white text that reads "MIDDLE ANACAPA CHANNEL ISLANDS NATIONAL PARK". To the right of the main text, there is a small circular emblem featuring a tree. Below the main text, the words "UNITED STATES" are partially visible.

MIDDLE ANACAPA
CHANNEL ISLANDS
NATIONAL PARK

UNITED STATES

EPA APPROVAL FOR LABELING

- *There are many pesticides available for use against introduced rodents. HOWEVER, few registered rodenticides have labels that cover use patterns needed for islands.*
- *EPA has certain labeling requirements that must be approved. Only after EPA approval and registration can the product be sold/applied.*
- *Consequently, you must find a way to make it legal to use the chemical and product that you believe to be optimal for the task at hand.*



Havoc[®] Rodenticide Bait Pack (Pellets)

Kills Rats and Mice • Second Generation Anticoagulant

Kills warfarin-resistant Norway Rats and House Mice. Rodents may consume a lethal dose in one feeding with first dead rodents appearing four or five days after treatment begins.

ACTIVE INGREDIENT:

Brodifacoum -

3-[3-(4'-bromo-[1,1'-biphenyl]-4-yl) -1,2,3,4-tetrahydro-1-naphthalenyl]-4-hydroxy-

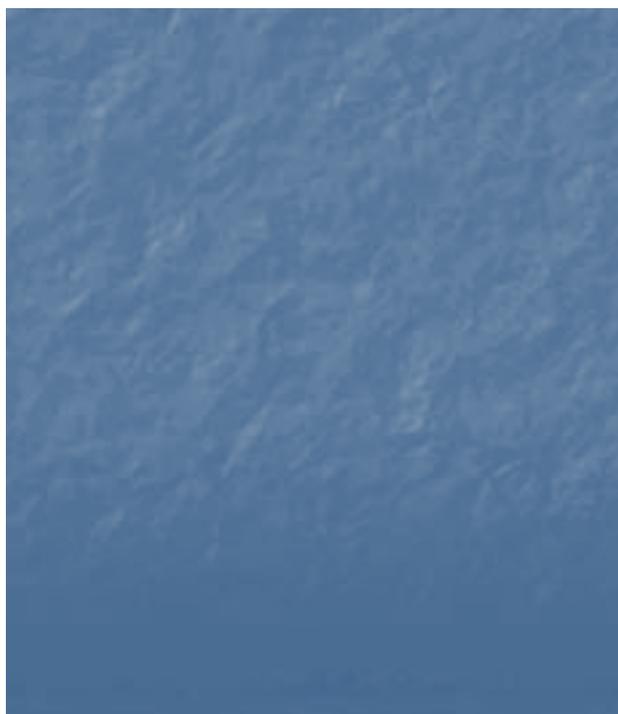
2H-1-benzopyran-2-one 0.005%

OTHER INGREDIENTS:..... 99.995%

TOTAL: 100.000%

EPA Reg. No. 100-1056-61282

EPA Est. No. 61282-WI-1



CLASSIFICATION OF PESTICIDE USE – The label is LAW

- *Uses inconsistent with the Pesticide Label - illegal to use a pesticide in a way not permitted by labeling including:*
 - Off-site
 - Improper equipment settings
 - Improper rate (lack of calibration)
 - No safety gear worn when the label says you must!
 - A pesticide may be used only on the plants, animals, or sites named in the directions for use.
 - If site is listed but pest is not, you can still use the product on site, but you have no recourse if product doesn't work.
 - You may not use higher dosages
 - You may not use higher concentrations
 - You may not use more frequent applications

TYPES OF PESTICIDE REGISTRATION UNDER FIFRA

- Federal Registration (Section 3)
- Experimental Use Permit (Section 5)
- Emergency Exemption from Registration (Section 18)
- State - Based "Special Local Needs" Registration Section 24(c)

TYPES OF PESTICIDE REGISTRATION UNDER FIFRA

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EMERGENCY EXEMPTION FROM REGISTRATION (Section 18)

- *Section 18 allows EPA to exempt Federal and State agencies if emergency conditions exist. Typically, emergency involves the introduction of a new pest; or will present significant risks to human health, threatened or endangered species, beneficial organisms, or the environment; or will cause significant economic loss.*
- *An emergency is defined as an urgent, non-routine situation that requires the use of a pesticide. Strict controls and recordkeeping are required for all emergency exemptions.*
- *An emergency may be deemed to exist when:*
 - No effective pesticide is registered AND
 - No economic or environmentally feasible alternative practices are available

EMERGENCY EXEMPTION FROM REGISTRATION (Section 18)

- *Types of Emergency Exemptions include:*
 - Specific Exemption - may be authorized to avert significant economic loss; or significant risk to endangered species, threatened species, beneficial organisms, or the environment. May be issued for one-year then must be renewed.
 - Quarantine Exemption - A quarantine exemption may be authorized in an emergency condition to control the introduction or spread of any pest. May be issued for multiple years.
 - Public Health Exemption - may be authorized to control a pest that will cause significant risk to human health.
 - Crisis Exemption - may be utilized in an emergency condition when there is not sufficient time to allow for authorization of a specific, quarantine or public health exemption.

EMERGENCY EXEMPTION FROM REGISTRATION (Section 18)

■ Advantages

- Section 18 applications usually get **relatively quick review** by EPA
- Almost **any chemical** may be used
- Agent selected may be used on **sites not on accepted label**
- Relatively **little data** support may be needed
- **No maintenance fee** is required

■ Disadvantages

- Application must be relevant to a **true emergency**
- Applicant must **document nature of emergency**
- There must be **no suitable registered alternative**
- Exemption only lasts a **short time** (specified in permit, typically one year)
- Renewal is dependent upon demonstration of continued emergency
- Any food or feed uses must be covered by existing tolerances or specially obtained time-limited tolerances

Application Process

TYPE OF EXEMPTION REQUESTED:

Specific or Quarantine

CONTACT PERSON:

Application Submitted by:

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WASO Integrated Pest Management Program

National Park Service

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QUALIFIED EXPERTS:

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QUALIFIED EXPERTS:

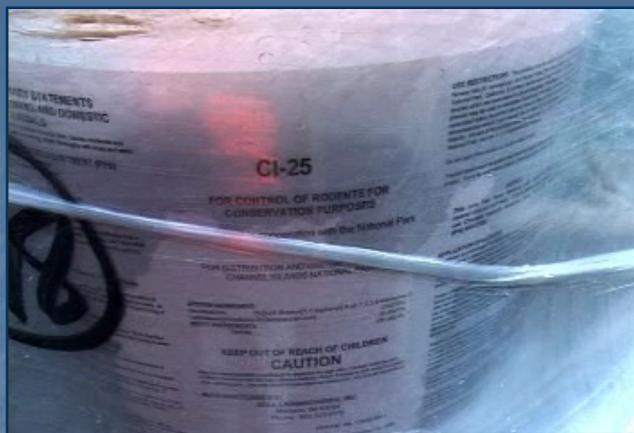
Rodenticide Application

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Application Process



DESCRIPTION OF THE PESTICIDE:

Active Ingredient:

Brodifacoum (IUPAC 3-[3-(4'-bromobiphenyl-4-yl)-1,2,3,4-tetrahydro-1-naphthyl]-4-hydroxycoumarin)

CAS No. 56073-10-0

EPA Registration Number: NA

Formulation:

See attached Confidential Statement of Formula 25 ppm Brodifacoum

Manufacturer: Bell Laboratories, Inc. 3699 Kinsman Blvd., Madison, WI, 53704 (608) 241-0202, Fax (608) 241-9631

Product Label: See Attachment 10.

Sites to be treated:

For a complete description please refer to the attached Draft EIS.

Anacapa Island (296 ha) located approximately 17.6 km west of the city of Oxnard in the Ventura County, California (Attachments 11 and 12). Anacapa Island is one of the five islands comprising Channel Islands National Park. The park is administered by the National Park Service, a division of the Department of Interior. Anacapa Island consists of 3 islets named East, Middle and West Island. Visitors are only allowed to visit East Island and with a landing permit, Frenchy's Cove on West Island. Middle and West Island are closed to the public as ecological reserves. East Anacapa Island is the smallest of the three islets (approximately 43 ha), rising 60 m from the sea. On the slightly terraced top is the lighthouse, Park Service buildings and the campground. Middle Anacapa (71 ha) rises 90 m from the sea and has a slightly terraced top. The largest islet, West Anacapa (182 ha), rises to over 285 m, and is the most topographically diverse of the three islets. Anacapa Island is predominantly volcanic in origin, composed of Miocene volcanic rock eroded by wind and waves. The islands were formed from uplifting, not volcanic activity. Fissures forming sea caves and blow holes are common, and submarine lava flows can be found on the island.

Method of Application:

The formation of the islands through uplifting has made the cliffsides of Anacapa Island extremely unstable and dangerous to climb, and thus, bait stations cannot be safely placed and maintained on the cliffsides. The cliffsides harbor the greatest density of rats and is the primary location that delivery of the rodenticide is required to ensure eradication. The placement of rodenticide into every rat's territory is critical to the success of the eradication (Attachment 13) and cliffsides need to be treated. **Therefore, broadcast application (aerial and hand broadcast) is the only alternative. Broadcast of the rodenticide bait will be carried out in all habitats across the island. A local agricultural pesticide applicator (Aspen Helicopters, see attached statement of qualifications – Attachment 9) has been identified for conducting the application. They have helicopters equipped with differential GPS units to ensure even coverage across the island.** Their experience includes aerial application of pesticides for local agricultural industry, and working offshore within the Channel Islands National Park. The pilots of Aspen Helicopters are certified pesticide applicators and are familiar with Anacapa Island. Their experience, infrastructure and knowledge of the islands make them the preferred applicator.

Rate of Application (product and a.i.): Bait will be broadcast at a **maximum rate of 15 kg of 25 ppm bait/ha or 375 mg a.i./ha.**

Maximum number of applications: We expect to significantly reduce the rat population at the above application. However, there **will likely be a requirement for a second application.** Additional applications are not anticipated, but may be required.

Total acreage (or other units) to be treated: Anacapa Island is 296 ha.

Total amount of pesticide to be used (product and a.i.):

Total amount of **product** used will not exceed 4,440 kg per application.

Total amount of **brodifacoum** applied will not exceed 0.11 kg per application.

Use season (period of time for which chemical use is requested):

The target months for the application is **November/December.** The late fall period offers the optimum time to apply the bait because endangered brown pelicans are not breeding on the island, the rats are in decline suggestive of food stress and, therefore, will eat the bait more readily, and thirdly, the onset of the rainy season will expedite the degradation of any residual bait not consumed by the target species.

Schedule of Application:

The National Park Service is required by law to comply with the National Environmental Policy Act (NEPA) and will influence, in part, when we can apply the rodenticide. An EIS (Attachments 14 and 15) is currently in draft form and is open for comment. If there are significant comments or outstanding issues, the treatment schedule may be delayed. The delay would be one year because of the time constraints – primarily because of the seabird nesting season and seasonal fluctuation of the local rat population. The proposed action is a significant conservation action for seabirds such as the Xantus' Murrelet, Ashy Storm-petrel and the Cassin's Auklet. The status of the species and pending petition for listing under the Endangered Species Act (ESA) supports the emergency action of this registration request. Thus, any delays in the project would be due to process and does not diminish the need for immediate action. If delayed, the NPS wishes to pursue protection of the local population of the Xantus' Murrelet by baiting in and around nesting habitat to ensure a "seed" population of murrelets is available to re-colonize the island once eradication is completed. The baiting of small areas of the island to protect the current nesting population of seabirds would be used as an opportunity to collect data on efficacy and evaluate potential non-target species impacts. Areas baited to protect seabirds would not be restricted to East Island, but could encompass all three islets.



Additional restrictions, user precautions, and requirements, qualifications of applicators, etc.:

See attached proposed label (Attachment 10). The NPS IPM Regional Director, **Bruce Badzik**, has been advised of this action and will oversee the application of the rodenticide (**Licensed Pesticide Applicator #2557; Agricultural Pest Control Advisor #02799**).

Anacapa Island will be closed to the public during the application phase. The campground, trails and picnic areas will be inspected for bait to minimize the potential for exposure to the visiting public (See Draft EIS Chapter IV for further discussion). The eradication of rats from Anacapa Island will be a significant conservation effort for seabirds in the Southern California bight. As outlined in the Draft EIS the following actions will be implemented to prevent rats from being re-introduced to the islands.

Non-native Rodent Introduction Prevention Plan

To minimize the risk of rodent introductions to the Channel Islands, a set of standards would be implemented by the Park. The minimum proposed prevention actions, which would become the Park's prevention plan, are as follows:

- 1) Rodent-proof storage areas.
- 2) Rodent-proof containers that haul equipment and supplies to the Islands.
- 3) Control rodents at all departure points, including planes, boats, and helicopters that transport people and materials to the islands.
- 4) Inform and educate all people who visit the islands. This includes visitors, concessionaires, contractors, employees, permittees, and researchers.

Rat Detection Response Plan

Reacting to a "rat-spill" from a shipwreck or some other introduction requires a rapid response, as does any appearance of rats on Anacapa Island following eradication, or on Prince, Sutil and Santa Barbara Islands. In the event of a shipwreck the Shipwreck Response Plan is a decision pathway to implement the Rat Detection Response Plan (Appendix A of Draft EIS) – a plan to evaluate the extent of rodent introduction and implement an appropriate response. The Rat Detection Response Plan would be implemented if rats were introduced to the islands via shipment of goods or equipment.

Registered Alternative Pesticides:

There are no pesticides registered for the eradication of rats from islands. Other brodifacoum baits available are at 50 ppm brodifacoum, this application is requesting the use of 25 ppm brodifacoum. The 50 ppm brodifacoum baits have been registered with the EPA to state that they kill the target species in a “single-feeding”. The 25 ppm product we are requesting has been tested following EPA 1.203 guidelines and was successful in killing 100% of the target species, and qualifies for the “single-feeding” label (Bell Laboratories, Inc.). Therefore, a 25 ppm brodifacoum product will be successful in eradicating rats as would a 50 ppm brodifacoum product. Under field conditions, the use of a 20 ppm brodifacoum bait has been successfully used in island rat eradication projects internationally, particularly throughout New Zealand (see attachment 16). The successful use of a 20 ppm brodifacoum bait for rat eradications, combined with the laboratory data, indicates that the 25 ppm brodifacoum bait requested would have a very high probability in achieving eradication.

From a non-target species risk perspective, the use of a 25 ppm brodifacoum bait would halve the relative risk as compared to a 50 ppm brodifacoum product. The 50 ppm brodifacoum bait would have to be broadcast at a similar sowing rate as proposed for this registration – doubling the amount of active ingredient spread into the environment that we are proposing; significantly increasing the relative non-target species poisoning risk. There would be less overall risk with the use of a 25 ppm brodifacoum bait, however, the risks would still be very high for some species (e.g., birds of prey) and will be mitigated appropriately.

In conclusion, the use of a 25 ppm brodifacoum bait is sufficient to successfully eradicate introduced rats from Anacapa Island and will lower the relative non-target species risks when compared to the other 50 ppm products that are currently registered.

Alternative Control Practices:

See Draft EIS for a list of Alternatives Considered and Dismissed (page 20). To our knowledge, only brodifacoum, bromadiolone and warfarin have been used to successfully eradicate rats from islands. Warfarin has been used only on one island in Iceland, and was only successful after repeated applications after many years (Attachment 13). Brodifacoum has been used on the vast majority of islands with successful rat eradication projects (see attachment 13). There are other control practices available, including the use of the acute rodenticides and first-generation anticoagulants. However, the objective of this project is to eradicate rats from Anacapa Island, NOT control. An analysis of the other products follows:

Acute rodenticides kill rats quickly after a single feeding. However, there are two drawbacks to the use of acute rodenticides in island restoration projects. First, they are often extremely toxic to humans and there are not always effective antidotes. Second, they can induce bait shyness if animals consume a sub-lethal dose. It has been demonstrated that a maximum of 60-70% of the rodent population can be controlled with the acute rodenticides, even with pre-baiting (Dubock 1982). For these reasons acute rodenticides have not, to our knowledge, been used to eradicate rats from islands except as a supplemental rodenticide.

The first generation anticoagulants require rats to feed on the bait over a period of days to maintain a lethal concentration at the point of action and enact the anticoagulant effect. Only warfarin has been used on one occasion to eradicate rats from an island. However, on Anacapa Island, an eradication attempt was made in the 1980's with warfarin. At that time, there was no attempt made to place bait on cliffides of Anacapa and as a result, the eradication attempt failed...

This project is time limited, primarily by the presence/absence of the nesting activity of the endangered Brown Pelican (*Pelecanus occidentalis*). The Brown Pelican is an asynchronous nester and individuals are known to be nesting between January and October of each year. The Brown Pelican is an endangered species that is sensitive to disturbance during nesting. Therefore, application is restricted to a short period of time in November/December of each year. The multiple applications required by the first generation anticoagulants would not be possible.

The objective of this project is to eradicate, not control, introduced rats. There are no alternative practices available or proven to eradicate introduced rats from islands.

EFFICACY OF USE PROPOSED UNDER SECTION 18:

The objective of this project is to eradicate, therefore, 100% kill of the target species is expected. The use of a lesser concentration brodifacoum product (20 ppm) has been used successfully to eradicate rats from islands worldwide (with no permanent environmental impacts or any recorded incident with human exposure). Brodifacoum has been demonstrated to be 100% efficacious against the target species (Buckle 1994, Bell Laboratories). **Efficacy will be measured using a number of indices including radio-telemetry, live trapping, snap trapping, chew blocks, gnaw sticks with a comparison of activity before and after the application and referenced against an adjacent untreated island that has rats and will not be treated until year 2. There will be active searching/detection of the target species over a period of 2 years post application to confirm success of rat removal.**

To evaluate efficacy against the target species we propose to radio-tag a subsample of rats and evaluate their survival, and actively “search” for rats and/or rat sign. Rats will be detected using a number of techniques such as chew sticks, tracking stations, snap and live traps. Other indices may be used and will be compared against pre-activity levels. Transects will be established in areas of high and low rat activity areas.

Another indicator of eradication is the return of the nesting seabirds to Anacapa Island.

The USGS-BRD has planned a monitoring program to evaluate the status of the population of the Xantus' Murrelet and Ashy Storm-petrel on Anacapa (Attachment 7). Parameters to be investigated include: yearly estimation of populations around Anacapa using radar, use of mistnets to capture breeding seabirds on Anacapa and evaluate their breeding condition, conduct searches for active burrows and monitor nesting success. As well, the Brown Pelicans, cormorants and Western Gulls will be monitored yearly. Seabird monitoring will be conducted by USGS biologists and biologists from the National Park Service and University of California, Davis...

See Attachment 16 for successful rat eradication programs conducted with a 20 ppm brodifacoum.

EXPECTED RESIDUE LEVELS IN FOOD AND WATER:

None expected in the marine food chain. No harvesting of animal prey is allowed in the Channel Islands National Park. The island does not have a drinking water source. The island is dry for the majority of the year except during the rainy season. There are no permanent or ephemeral water supplies on the island. Water is brought in by boat and pumped into large storage tanks in an enclosed, locked building on East Island.

DISCUSSION OF RISK INFORMATION: *Description of application sites, including proximity to residential areas, aquatic systems, endangered or threatened species, habitats, soil, etc.*

Possible risks: A study of the risks to non-targets was initiated (and continues) to identify those species at risk of primary poisoning and secondary poisoning - See Draft EIS. **There are risks from secondary exposure to the rodenticide, especially birds of prey.** However, between 87-100% of rats die below ground away from scavengers, thus limiting the risk to the latent period (Howald et al. 1999; Taylor 1993). From an ecological perspective such mortality is only significant if it causes a long-term population change. The population size of most species, including birds of prey, is, in most cases, ultimately limited by habitat availability. In the long-run, removing introduced black rats from Anacapa Island should result in improved habitat for ravens, gulls, and most birds of prey since it is expected to increase the number of deer mice and small hole nesting seabirds.

Brian Walton of the University of California Predatory Bird Research Group made two observations relevant to the population effects of predatory bird mortality on Anacapa Island. First, the birds of prey on Anacapa Island that may consume poisoned rats and deer mice are all habitat-limited (B. Walton pers. comm.). Second, most of these birds of prey, as well as ravens are killed in the vicinity of Least Tern (*Sterna antillarum*) breeding colonies in an ongoing effort to protect this endangered species from predation. The ongoing nature of predatory bird control around Least Tern colonies suggests that any decrease in predatory birds due to the rat eradication campaign will be temporary and insignificant. We recognize that the birds of prey on Anacapa Island are at risk of secondary poisoning. **However, the long term benefit of the removal of rats from the island will greatly outweigh the short term costs through the loss of a few individual birds (see mitigation measures).**

The endangered Brown Pelican is at a very low to nil risk of exposure to brodifacoum because it forages in the marine environment and will not pick up any residual bait pellets.

Proposals to mitigate risks:

- Applications will be made under the direct supervision of NPS certified applicators.
- Island will be closed to the public during application.
- Applications will be limited to a time of year when there are no birds breeding on the island and migratory species have moved off the island for the winter.
- Visitors and Park employees will be notified through signage both on island and on the mainland.
- Application is anticipated as a “one-time” use, thus limiting the window of exposure to a short period of time (as compared to bait stations which are required to be armed for up to 2 years for successful eradications, thus increasing the temporal risk of exposure).
- The bait will be formulated with a green dye, colors which birds are less attracted to.**
- The size of the pellets will decrease the chance for small Passerines to pick up the bait.**
- Application will take place just prior to the onset of the rainy season to ensure any unconsumed bait is degraded over the rainy season,
- Under field conditions, 87-100 % of radio-tagged rats have been shown to die below ground after anticoagulant poisoning, thus limiting potential secondary poisoning of scavengers.
- Deer mouse populations are protected through captive breeding either on or off island. The conservation of genetic diversity is the of utmost concern and has been subject to recent study. The results have provided the necessary information to plan an effective mitigation strategy.
- Target and Non-Target carcass searching will be conducted where feasible. All non-target carcasses found will be collected for cause of death determination. All target carcasses will be collected and disposed of as appropriate under label directions.
- The National Park Service will attempt to mitigate birds of prey through: live trap and removal, and/or supplemental feeding and/or or discourage use of any treated habitat.

Warning

Keep A Rat Free Ship!



Protect Your Health

Rats, mice, and their fleas can **transmit diseases**, including the plague, salmonellosis, leptospirosis, trichinosis, and rat bite fever. Rodents also cause **unsanitary conditions** by leaving about 50 droppings each day and by spreading urine to mark territory. They usually die and rot in cramped, dark places producing bad odors which are difficult to remove.



Protect Your Ship and Cargo

Rodents **cause fires** by chewing on electrical wires. Their front teeth grow continuously so they must chew to keep them short and sharp. They will chew on almost anything. They also create hydraulic leaks, shred materials for nests, and eat and contaminate food.



Protect our Environment

Exotic rodents pose threats to the environment, particularly to Alaska's islands. If introduced to new areas, they destroy habitat, kill wildlife, and may infect wildlife with diseases.

Don't let your ship carry rodents to new places where they could get off in freight, gear, garbage, or by shipwreck.

Qualifying vessels may get a free rodent prevention kit
Harbor Master's Office

This program funded by the National Fish & Wildlife Foundation in cooperation with the U.S. Fish and Wildlife Service, The Nature Conservancy, and the communities of St. Paul and St. George of the Pribilof Islands.



QUESTIONS?

