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Farallon Poison Paradox: The U.S. Fish and Wildlife Service's Attempt at Saving One Species While Subjecting Others to Probable Death

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Cover Page Footnote

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FARALLON POISON PARADOX: THE U.S. FISH AND WILDLIFE SERVICE'S ATTEMPT AT SAVING ONE SPECIES WHILE SUBJECTING OTHERS TO PROBABLE DEATH

Under cover of darkness, a new ashy storm petrel parent picks up small prey brought to the ocean's surface by the California current. Feeding and fledging of chicks is synchronized with the moon cycles. The blackness of night during the new moon hides the nocturnal petrel's comings and goings from its burrow, providing protection from would-be predators.¹

I. INTRODUCTION

The Ashy Storm Petrel is, like many other birds of the Farallon National Wildlife Refuge, part of a complex and diverse island ecosystem. This same ecosystem is now threatened with mass poisoning from a “conservation” plan that, ironically, centers on saving the Ashy Storm Petrel (“Petrel”).² The U.S. Fish and Wildlife Service’s (“FWS”) plan aims to eradicate all the house mice inhabiting the Farallon Refuge. The FWS believes the mice are an indirect link to the slow decline of the Petrel population. The mice attract burrowing owls, normally a migratory species, that then remain on the island because of the abundant food supply.³ Unfortunately, when the mouse population declines in the

¹ *Saving the Ashy Storm Petrel*, CTR. FOR BIOLOGICAL DIVERSITY, www.biologicaldiversity.org/species/birds/ashy_storm-petrel/index.html (last visited Nov. 28, 2011).

² See generally South Farallon Islands Nonnative Mouse Eradication Project; Farallon National Wildlife Refuge, California; Intent to Prepare an Environmental Impact Statement, 76 Fed. Reg. 20,706 (Apr. 13, 2011).

³ See U.S. FISH & WILDLIFE SERV., FARALLON NATIONAL WILDLIFE REFUGE FINAL COMPREHENSIVE CONSERVATION PLAN AND ENVIRONMENTAL ASSESSMENT 52 (2009), available at www.fws.gov/cno/docs/FNWR_CCP_FINAL.pdf.

winter, the owls begin preying on the Petrels.⁴

The FWS's plan is simple enough: to eradicate the mice is to eradicate the problem of the owls killing the Petrels.⁵ However, it is the application of this plan that threatens the entire ecosystem. The FWS proposes to load a helicopter with a highly toxic rodenticide, brodifacoum. The helicopter will then airdrop the poison over the island homes of hundreds of thousands of birds.⁶ If the plan succeeds, the FWS will rid the Farallon Refuge of the mice and with them the owls that threaten the Petrels. If the plan fails, the Petrel population will continue to shrink at the talons of the owls. However, regardless of its failure or success, the proposed method of eradication presents the possibility of both primary and secondary poisoning – often fatal – of thousands of birds.⁷ Such widespread poisoning would destroy one of the most diverse bird habitats on what has come to be known as California's Galapagos.⁸

This Comment examines the failure of the U.S. Environmental Protection Agency ("EPA") to adequately protect this country's unique wildlife from highly toxic rodenticides like brodifacoum, and particularly the EPA's broad exemption for the FWS's use of brodifacoum in island conservation. Part II explains the problem of non-native mice at the Farallon National Wildlife Refuge and the FWS's proposed plan to eradicate the mice. Additionally, this Part describes the federal legal framework that governs pesticide application and use within the United States.

Part III evaluates the EPA's narrow scope in determining to reregister brodifacoum, focusing on the EPA's decision to allow the FWS unregulated use of this highly toxic pesticide for island eradications. Additionally, Part III examines the FWS's ability to manage and carry out island eradications. Part IV discusses viable alternatives and improvements to the FWS's management of island eradications that are available for implementation in the proposed eradication on the Farallon Islands. Finally, this Comment concludes that the faultless birds should not bear the burden of a solution to a problem created by humankind. The FWS should utilize the suggested alternatives

⁴ *Id.*

⁵ See generally South Farallon Islands Nonnative Mouse Eradication Project, 76 Fed. Reg. at 20,706.

⁶ See generally *id.*

⁷ See Farallon National Wildlife Refuge, U.S. FISH & WILDLIFE SERV., www.fws.gov/refuges/profiles/index.cfm?id=81641 (last visited Jan. 16, 2012).

⁸ See Web Cam Provides Real-Time Access to National Wildlife Refuge Known as "California's Galapagos," U.S. FISH & WILDLIFE SERV., www.fws.gov/sfbayrefuges/Farallon/WebCam.htm (last visited Jan. 16, 2012).

and mitigation measures to reduce the risk of non-target poisoning of the birds of the Farallon Islands.

II. THE FARALLON NATIONAL WILDLIFE REFUGE AND THE USE OF RODENTICIDES

The Farallon National Wildlife Refuge (“Farallon Refuge”) is a group of islands located approximately thirty miles west of the Golden Gate Bridge.⁹ The Farallon Refuge spans a total of 211 acres and encompasses South Farallon Island (“SFI”), Middle Farallon, North Farallon, and Noonday Rock.¹⁰ SFI is more than half of the Refuge, encompassing approximately 120 acres.¹¹ The Farallon Refuge is a diverse island ecosystem comprised of rock habitats, a lighthouse, a few conservation research staff members, and approximately twenty-five percent of the breeding seabird population of California.¹²

Located along the Pacific Flyway, a major north-south migratory path taken by birds in North America,¹³ SFI is an ideal breeding location for wildlife off northern California’s coast. The island has rich, wildlife populations that historically exceeded half a million seabirds and tens of thousands of marine mammals.¹⁴

A. ESTABLISHING THE FARALLON NATIONAL WILDLIFE REFUGE

The FWS is the primary agency responsible for “conserv[ing], protect[ing], and enhanc[ing] fish, wildlife, and plants and their habitats for the continuing benefit of the American people.”¹⁵ The FWS also manages the National Wildlife Refuge System (“Refuge System”), which consists of more than 551 National Wildlife Refuges.¹⁶

The Refuge System incorporates the world’s largest collection of

⁹ See U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 1; see also *Farallon National Wildlife Refuge*, U.S. FISH & WILDLIFE SERV., www.fws.gov/refuges/profiles/index.cfm?id=81641 (last visited Jan. 16, 2012).

¹⁰ See U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 1.

¹¹ *Id.* at 32.

¹² *Id.* at 40.

¹³ See *Coordinated Management*, PAC. FLYWAY COUNCIL, pacificflyway.gov (last visited Nov. 28, 2011).

¹⁴ See U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 31.

¹⁵ *About the Fish and Wildlife Service*, U.S. FISH & WILDLIFE SERV., www.fws.gov/help/about_us.html (last updated Apr. 20, 2010).

¹⁶ *Id.*

lands specifically managed for conservation purposes.¹⁷ Since President Roosevelt designated the three islands of the Farallons as the Farallon National Wildlife Refuge in 1909, the Refuge System has grown to encompass more than 150 million acres.¹⁸ The Refuge System now encompasses more than 700 species of birds, 220 species of mammals, 250 reptile and amphibian species, and 200 species of fish as a result of the expansion.¹⁹ The Refuge System's mission is to manage each refuge for conservation, management, and, where appropriate, restoration of wildlife and plant resources, among other things.²⁰

The FWS tailors the management of each National Wildlife Refuge to the specific purpose for which the refuge was established²¹ and for the enjoyment of America's future generations.²² The "driving force" in developing conservation strategies is the refuge's main purpose²³ and is defined when a refuge is designated.²⁴

To protect the vast number of native seabird species of the Farallon Islands, President Theodore Roosevelt established the 24th National Wildlife Refuge in 1909 (Middle Farallon, North Farallon, and Noonday Rock).²⁵ President Roosevelt specifically noted that the purpose of the Farallon Refuge was "as a preserve and breeding ground for native birds."²⁶ The FWS is responsible for protecting these native birds from adverse effects associated with human interaction, predators, and invasive species.

Pursuant to Executive Order No. 10355, the Bureau of Land Management added SFI to the Farallon Refuge for "wildlife purpose[s]" in 1969.²⁷ In 1974, Congress established the islands as the Farallon

¹⁷ See *Welcome to the National Wildlife Refuge System*, U.S. FISH & WILDLIFE SERV., www.fws.gov/refuges/ (last updated Jan. 18, 2012).

¹⁸ See, e.g., *National Wildlife Refuge System*, U.S. FISH & WILDLIFE SERV., www.fws.gov/refuges/about/welcome.html (last updated Oct. 28, 2011); *Welcome to the National Wildlife Refuge System*, U.S. FISH & WILDLIFE SERV., www.fws.gov/refuges/ (last updated Jan. 18, 2012).

¹⁹ See *National Wildlife Refuge System*, U.S. FISH & WILDLIFE SERV., www.fws.gov/refuges/about/welcome.html (last updated Oct. 28, 2011).

²⁰ U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 2.

²¹ 16 U.S.C.A. § 668dd (a)(3)(A) (Westlaw 2012) (stating that each refuge shall be managed to fulfill the mission of the System, as well as the specific purposes for which that refuge was established).

²² 16 U.S.C.A. § 1131(a) (Westlaw 2012).

²³ U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 11.

²⁴ *Id.*

²⁵ Exec. Order No. 1043 (Feb. 27, 1909).

²⁶ *Id.*

²⁷ See Addition of Lands to the Farallon National Wildlife Refuge, 34 Fed. Reg. 9928 (June 27, 1969); see generally Executive Order No. 10355, 17 Fed. Reg. 4831 (May 26, 1952) (delegating

Wilderness Area.²⁸ The Farallon Islands were also designated as a State Ecological Reserve and a Golden Gate Biosphere Reserve.²⁹ Both designations seek to protect and conserve California's rare plants, animals, and habitats while fostering scientific and educational research opportunities.³⁰

Throughout the world, large colonies of nesting seabirds are found on small islands³¹ similar to the Farallon Islands, which are an essential habitat to thirteen species that make up approximately thirty percent of California's nesting seabirds, approximately 250,000 individual birds.³² The Farallon Refuge contains the world's largest breeding colonies of Petrels, Brandt's cormorant, and western gull.³³ It represents the largest seabird colony in the contiguous United States.³⁴ Recognizing the importance and need for seabird conservation, the American Bird Conservatory named the Farallon Refuge a "Globally Important Bird Area" in 2001.³⁵ In addition, five seal or sea lion species breed on the

to the Secretary of Interior the authority otherwise vested in the President to withdraw or reserve lands for public purposes).

²⁸ U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 1.

²⁹ See *Wildlife on Southeast Farallon Island*, PRBO CONSERVATION SCI., www.prbo.org/cms/157 (last visited Dec. 13, 2011).

³⁰ See, e.g., Kari Lewis, *California's Ecological Reserves*, CAL. DEP'T OF FISH & GAME, www.dfg.ca.gov/lands/articles/ecores1.html (last visited Dec. 13, 2011). Sharing some goals and characteristics of the FWS's National Wildlife Refuge System, the California's Ecological Reserves are designed to "conserve areas for the protection of rare plants, animals and habitats" and to provide areas for recreation, education, and scientific research. Since the initiation of these conservation efforts in 1968, the California Department of Fish and Game ("DFG") has acquired approximately 129,000 acres. *Id.* See also *Biosphere Reserve Information, United States of America, Golden Gate*, UNITED NATIONS EDUC., SCI. & CULTURAL ORG., www.unesco.org/mabdb/br/brdir/directory/biores.asp?mode=all&code=USA+42 (last updated Dec. 11, 2002); *Biosphere Reserves—Learning Sites for Sustainable Development*, UNITED NATIONS EDUC., SCI. AND CULTURAL ORG., www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/ (last visited Jan. 16, 2012) (noting that biosphere reserves are established by various countries under UNESCO's Man and the Biosphere Programme to "promote sustainable development based on local community efforts and sound science. As places that seek to reconcile conservation of biological and cultural diversity and economic and social development through partnerships between people and nature, they are ideal to test and demonstrate innovative approaches to sustainable development from local to international scales."). Today, over 550 sites exist in nearly 115 countries around the world. *Id.*

³¹ See U.S. FISH & WILDLIFE SERV., SEABIRD CONSERVATION PLAN PACIFIC REGION 27 (2005), available at www.fws.gov/pacific/migratorybirds/PDF/Seabird%20Conservation%20Plan%20Complete.pdf.

³² See *Farallon National Wildlife Refuge*, U.S. FISH & WILDLIFE SERV., www.fws.gov/refuges/profiles/index.cfm?id=81641 (last visited Jan. 16, 2012).

³³ South Farallon Islands Nonnative Mouse Eradication Project, 76 Fed. Reg. at 20,706.

³⁴ U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 11.

³⁵ See *id.*; see also *Globally Important Bird Areas of the United States*, AMERICAN BIRD CONSERVANCY, www.abcbirds.org/abcbprograms/domestic/iba/index.html (last visited Dec. 15, 2011).

Farallon Refuge islands.³⁶ The Farallon Refuge also represents a critical habitat for several threatened and endangered species.³⁷

Furthermore, as the world's largest breeding colony of Petrels, a small seabird endemic to California, the Farallon Refuge represents a critical conservation landmark.³⁸ The Farallon Refuge's unique and rich ecosystem attracts non-breeding migratory and seasonal birds in addition to Petrels and other seabirds. Some birds stay only a matter of hours; others have been known to stay entire seasons.³⁹ The burrowing owls arrive in the fall seeking wintering habitat, a few usually remain on SFI for the entire winter due to the mouse population, which is a food source.⁴⁰ Initially attracted by the vast mouse population, overwintering burrowing owls begin preying on the Petrels when the mouse population declines in the winter and early spring.⁴¹

B. THE PROBLEM OF THE NON-NATIVE MOUSE POPULATION EXPLOSION AND THE ATTRACTION OF BURROWING OWLS

Since the early 1800s, human populations have been a constant danger to native species on the Farallon Islands. From 1807 to the 1830s, both Russians and Americans hunted marine mammals for their fur, oil, and meat.⁴² While they also hunted seabirds, the birds were not yet in any danger of extinction.⁴³ However, to provide for the rising population in the wake of California's gold rush, the locals began commercially harvesting seabird eggs in the mid-1800s.⁴⁴ This practice continued into the early 1900s. The local people took over fourteen million seabird eggs from the Farallons.⁴⁵ As a result of long-term human disturbances, the Farallon Refuge is currently closed to the public,⁴⁶ but other threats

³⁶ *Farallon National Wildlife Refuge*, U.S. FISH & WILDLIFE SERV., www.fws.gov/refuges/profiles/index.cfm?id=81641 (last visited Jan. 16, 2012).

³⁷ *See, e.g.*, U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 75; *Farallon Mammal List*, U.S. FISH & WILDLIFE SERV., www.fws.gov/sfbayrefuges/Farallon/Mammal_List.htm (last updated Nov. 30, 2011).

³⁸ *See Farallon National Wildlife Refuge*, U.S. FISH & WILDLIFE SERV., www.fws.gov/refuges/profiles/index.cfm?id=81641 (last visited Jan. 16, 2012).

³⁹ *See* U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 52.

⁴⁰ *Id.*

⁴¹ *Id.* at 43.

⁴² *See* DAVID G. AINLEY & ROBERT J. BOEKELHEIDE, SEABIRDS OF THE FARALLON ISLANDS: ECOLOGY, DYNAMICS, AND STRUCTURE OF AN UPWELLING-SYSTEM COMMUNITY 18 (1990).

⁴³ *Id.*

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ *See* U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3,

remain.

Non-native rodents now populate eighty percent of the world's island ecosystems.⁴⁷ The house mouse is one of those rodents.⁴⁸ It is likely that the mice first infiltrated the Farallon Islands in the mid-1800s at the peak of egg harvesting.⁴⁹ By the time SFI joined the Farallon Refuge in 1969, three non-native species were present on the island: feral European rabbits, cats, and the mice.⁵⁰ Currently only one remains: the mouse.⁵¹

Non-native species have been identified as the foremost threat to seabird populations within island ecosystems, commonly resulting in population declines and, in rare cases, extinction of entire species.⁵² Recently, the FWS determined that the mice are the indirect cause of the steady decline in Petrel populations.⁵³ The FWS, bound by its mandate, is now responsible for identifying strategies and goals for restoring the "historical abundance" of these seabirds.⁵⁴

To resolve the issue and return the Petrels to their historical population, the FWS has identified mouse eradication as a "critical step" in restoring the native ecosystem.⁵⁵ Eradicating the mice will stop the owls from overwintering on SFI.⁵⁶ As a direct result, the owl predation on Petrels will significantly decrease.⁵⁷ The seabirds could return to historical population numbers in the wake of the eradication program.⁵⁸

In April 2011, the FWS released a Notice of Intent ("NOI") to move forward with the South Farallon Island Nonnative Mouse Eradication

at 22.

⁴⁷ U.S. FISH & WILDLIFE SERV., SEABIRD CONSERVATION PLAN, *supra* note 31, at 40.

⁴⁸ See Gregg Howald et al., *Invasive Rodent Eradication on Islands*, 21 CONSERVATION BIOLOGY 1258, 1259 (2007), available at onlinelibrary.wiley.com/doi/10.1111/j.1523-1739.2007.00755.x/full.

⁴⁹ See U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 8-9.

⁵⁰ *Id.* at 24.

⁵¹ *See id.*

⁵² *See id.* at 40.

⁵³ *See id.* at 24; *see also* South Farallon Islands Nonnative Mouse Eradication Project, 76 Fed. Reg. at 20,706. Instead of migrating, the owls remain at the Farallon Refuge due to the abundant source of mice; however, when the mouse population dwindles, the owls turn to the Petrels as a replacement food source. *Id.*

⁵⁴ See U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 16.

⁵⁵ South Farallon Islands Nonnative Mouse Eradication Project, 76 Fed. Reg. at 20,706.

⁵⁶ See U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 86.

⁵⁷ South Farallon Islands Nonnative Mouse Eradication Project, 76 Fed. Reg. at 20,706.

⁵⁸ See U.S. FISH & WILDLIFE SERV., SEABIRD CONSERVATION PLAN, *supra* note 31, at 42.

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Project (“Project”).⁵⁹ In the NOI, the FWS identified three possible alternatives for the proposed Project: 1) No action, allowing mice to remain on SFI and maintaining the status quo; 2) Mouse eradication, with an aerial broadcast of pellets of rodenticide brodifacoum on the entire island group simultaneously; and 3) Mouse eradication, with an aerial broadcast of pellets of rodenticide brodifacoum by systematically treating different groups of the Farallon Refuge.⁶⁰ Whether the FWS attempts mouse eradication on all the islands simultaneously or at different times, the danger of saturating an entire island with brodifacoum remains. Thus far, the FWS has not identified any additional alternatives to the mouse eradication proposals in the NOI.

Following a public meeting in May 2011 and a public comment period, the FWS is currently developing a Draft Environmental Impact Statement (“DEIS”) in accordance with the National Environmental Policy Act (“NEPA”).⁶¹ The DEIS will review the environmental impacts of using brodifacoum to eliminate the mice as well as evaluate any reasonable alternatives.

C. THE LETHAL NATURE OF BRODIFACOUM

Rodenticides⁶² are the most commonly used tool in ridding islands of invasive rodent species.⁶³ In order to induce lethal toxic effects in the target species, the species must consume a specific quantity of the poison. Typically, two categories of poisons are considered in these types of projects—first- and second-generation anticoagulants. First-generation anticoagulants are less potent than second-generation.⁶⁴ As such, they require higher quantities of consumption to achieve a lethal effect. Second-generation anticoagulants are more potent; a single feeding session is usually lethal to target species.⁶⁵ However, second-generation anticoagulants also pose a greater risk of poisoning non-target species.⁶⁶

⁵⁹ South Farallon Islands Nonnative Mouse Eradication Project, 76 Fed. Reg. at 20,706.

⁶⁰ *Id.*

⁶¹ *See id.*; *see generally Stop the Dumping of Toxic Rodenticides on the Farallon Islands*, WILDCARE, www.wildcarebayarea.org/site/PageServer?pagename=TakeAction_Farallon_Islands_Rodenticides (last visited Dec. 13, 2011).

⁶² Rodenticides are anticoagulants. They cause massive internal hemorrhaging that brings on deadly results within days to one week of ingestion. *See* Howald et al., *supra* note 48, at 1261.

⁶³ Howald et al., *supra* note 48, at 1262.

⁶⁴ *Id.* at 1261.

⁶⁵ U.S. FISH AND WILDLIFE SERV., RESTORING WILDLIFE HABITAT ON RAT ISLAND, ALASKA MARITIME NATIONAL WILDLIFE REFUGE ALEUTIAN ISLANDS UNIT ENVIRONMENTAL ASSESSMENT 28 (2007), *available at* alaskamaritime.fws.gov/pdf/rat_assessment_508.pdf.

⁶⁶ *See* Howald et al., *supra* note 48.

Brodifacoum is a second-generation anticoagulant.⁶⁷

Second-generation rodenticides like brodifacoum are highly toxic to birds,⁶⁸ mammals, and aquatic organisms.⁶⁹ Even after the death of the target animal, the danger of secondary poisoning persists. “Secondary exposure to the second-generation anticoagulants is particularly problematic due to these compounds’ high toxicity and long persistence in body tissues (e.g., liver retention half-lives of greater than 300 days).”⁷⁰

Brodifacoum has been widely used for rat eradications, but mice may respond differently to the rodenticide.⁷¹ Worldwide, seventy-one percent of rodent eradication campaigns used brodifacoum.⁷² While this is an important consideration, one must note that most eradication projects have involved rat populations instead of mice.⁷³ Brodifacoum has been more successful against rat populations than mouse populations, as evidenced by the failure rate of five percent for Norway rats and nineteen percent for mice.⁷⁴ The FWS itself has recognized that mice are “less susceptible to brodifacoum than are rats.”⁷⁵ Thus, while brodifacoum has proven successful in some circumstances, it poses unacceptable dangers for the proposed mouse eradication on the Farallon Islands.

The mice must be eliminated to ensure that the Farallon Refuge continues as a diverse island ecosystem that provides essential habitat to many species of birds and animals.⁷⁶ However, the FWS’s proposed use and application method of brodifacoum may result in more harm than good.

⁶⁷ *Id.*

⁶⁸ THE ORNITHOLOGICAL COUNCIL, THE RAT ISLAND RAT ERADICATION PROJECT: A CRITICAL EVALUATION OF NONTARGET MORTALITY 2 (2010), *available at* alaska.fws.gov/ratislandreview-final.pdf.

⁶⁹ U.S. ENVTL. PROT. AGENCY, REREGISTRATION ELIGIBILITY DECISION (RED) RODENTICIDE CLUSTER 79 (1998), *available at* www.epa.gov/oppsrrd1/reregistration/REDS/2100red.pdf.

⁷⁰ U.S. ENVTL. PROT. AGENCY, RISK MITIGATION DECISION FOR TEN RODENTICIDES 7 (2008), *available at* www.regulations.gov/fdmspublic/component/main?main=DocumentDetail&d=EPA-HQ-OPP-2006-0955-0764.

⁷¹ *See* U.S. FISH & WILDLIFE SERV., RESTORING WILDLIFE HABITAT, *supra* note 65.

⁷² *See* Howald et al., *supra* note 48, at 1262.

⁷³ *See id.*

⁷⁴ *See id.* at 1264.

⁷⁵ U.S. FISH & WILDLIFE SERV., RESTORING WILDLIFE HABITAT, *supra* note 65.

⁷⁶ South Farallon Islands Nonnative Mouse Eradication Project, 76 Fed. Reg. at 20,706.

D. LEGAL FRAMEWORK GOVERNING THE USE OF RODENTICIDES

Pesticides are poisons designed to kill living organisms.⁷⁷ Since this broad category encompasses humans, animals, and plants, the EPA strives to “protect public health and the environment from risks posed by pesticides and to promote safer means of pest control.”⁷⁸ To achieve this purpose, the EPA relies on several legal frameworks that directly and indirectly govern pesticides. The primary law that regulates pesticide use is the Federal Insecticide, Fungicide, and Rodenticide Act.⁷⁹

i. *Federal Insecticide, Fungicide, and Rodenticide Act*

In an attempt to limit the fraudulent practice of pesticide mislabeling and protect the public, Congress enacted the Insecticide Act of 1910.⁸⁰ The Act mainly prohibited the manufacture, sale, and transportation of misbranded pesticides.⁸¹ Since pesticides were mainly used in agriculture, the U.S. Department of Agriculture (“USDA”) was appointed to administer pesticide regulation under the Act.⁸² However, Congress repealed the Act in 1947 after re-evaluating its sufficiency to regulate pesticides in light of an increase in pesticide development and use.⁸³ Congress replaced the Act with the first comprehensive pesticide regulation, the Federal Insecticide, Fungicide, and Rodenticide Act of 1947 (“FIFRA”).⁸⁴ The 1947 FIFRA introduced registration requirements for new pesticides; however, it focused on protecting the public, not wildlife, from dangerously toxic chemicals used primarily for agricultural purposes.⁸⁵

⁷⁷ *About Pesticides*, U.S. ENVTL. PROT. AGENCY, www.epa.gov/opp00001/about/ (last updated Nov. 4, 2011).

⁷⁸ *Pesticides: Health and Safety*, U.S. ENVTL. PROT. AGENCY, www.epa.gov/pesticides/health/index.htm (last updated Nov. 4, 2011).

⁷⁹ *Pesticides: Compliance and Enforcement*, U.S. ENVTL. PROT. AGENCY, www.epa.gov/pesticides/enforcement/index.htm (last updated Sept. 6, 2011).

⁸⁰ Insecticide Act, ch. 191, 36 Stat. 331 (1910) (repealed 1947) (prohibiting the sale of fraudulently labeled pesticides).

⁸¹ *See generally id.*; *see also FIFRA Statute, Regulations & Enforcement*, U.S. ENVTL. PROT. AGENCY, www.epa.gov/compliance/civil/fifra/fifraenfstareq.html (last updated Sept. 15, 2011).

⁸² WILLIAM H. RODGERS, JR., *RODGERS' ENVIRONMENTAL LAW* 412 (2d ed. 1994), available at Westlaw 3 Env'tl. L. (West) § 5:3.

⁸³ Michael T. Olexa, *Pesticide Use and Impact: FIFRA and Related Regulatory Issues*, 68 N.D. L. Rev. 445 (1992).

⁸⁴ *See* 7 U.S.C.A. §§ 136-136y (Westlaw 2012); *see also* RODGERS, *supra* note 82.

⁸⁴ Olexa, *supra* note 83.

⁸⁵ RODGERS, *supra* note 82.

⁸⁵ Olexa, *supra* note 83.

In 1972, Congress amended FIFRA's scope to incorporate environmental protection through the Federal Environmental Pesticide Control Act of 1972 ("FEPCA").⁸⁶ The FEPCA amendments required pesticide registration to include evaluations that balanced a pesticide's environmental impacts and its economic benefits.⁸⁷ The FEPCA implemented detailed FIFRA registration criteria⁸⁸ and the newly created EPA took over pesticide regulation.⁸⁹

No further legislation to regulate pesticides was enacted for over a decade. Then, in 1988, Congress again amended FIFRA. This amendment required the EPA to reevaluate "each registered pesticide containing any active ingredient contained in any pesticide first registered before November 1, 1984," including the rodenticide brodifacoum.⁹⁰ FIFRA's regulation of pesticides' effect on wildlife has largely remained unchanged since the 1988 amendment.⁹¹

During reevaluation, FIFRA registration requirements allow the EPA to register a pesticide only if it determines, among others, that the pesticide will not cause "unreasonable adverse effects on the environment."⁹² As a result, the EPA has the power to regulate rodenticides whose use may significantly affect the environment. While rodenticides protect the public from disease-carrying rodents, they are also toxic to wildlife if consumed directly or ingested when preying on poisoned rodents. Brodifacoum, like any rodenticide, can cause devastating effects on local ecosystems and food chains, resulting in disaster.⁹³ Therefore, the EPA should be very careful in approving the use of brodifacoum, especially when its use could result in consumption by non-target species.

⁸⁶ See *Overview of FIFRA*, U.S. ENVTL. PROT. AGENCY, www.epa.gov/agriculture/lfra.html# (last visited Dec. 15, 2011); see also Federal Environmental Pesticide Control Act of 1972, Pub. L. No. 92-516, 86 Stat. 973 (codified at 7 U.S.C. §§ 136-136y), as amended by Pub. L. No. 93-205, 87 Stat. 903 (1973); Pub. L. No. 94-140, 89 Stat. 751 (1975); Pub. L. No. 95-396, 92 Stat. 819 (1978); Pub. L. No. 98-201, 97 Stat. 1379 (1983); and Pub. L. No. 100-202, 101 Stat. 1329 (1987).

⁸⁷ 7 U.S.C.A. § 136a (Westlaw 2012).

⁸⁸ 7 U.S.C.A. § 136a(c) (Westlaw 2012).

⁸⁹ See *Overview of FIFRA*, U.S. ENVTL. PROT. AGENCY, www.epa.gov/agriculture/lfra.html# (last updated Oct. 20, 2012).

⁹⁰ 7 U.S.C.A. § 136a-1 (Westlaw 2012).

⁹¹ See generally Food Quality Protection Act of 1996, 21 U.S.C.A. § 346a (Westlaw 2012). While FIFRA was further amended in 1996, the amendment largely focused on the agricultural sector as it imposed additional regulations regarding the amount of acceptable pesticide residue on food products.

⁹² 7 U.S.C.A. § 136a(a) (Westlaw 2012).

⁹³ See U.S. FISH & WILDLIFE SERV., SEABIRD CONSERVATION PLAN, *supra* note 31, at 43.

ii. *National Environmental Policy Act*

NEPA establishes national policy and goals for the “protection, maintenance, and enhancement of the environment.”⁹⁴ In addition to other objectives, NEPA seeks to “create and maintain conditions under which man and nature can exist in productive harmony.”⁹⁵ When a federal agency determines that its proposed action may significantly affect the environment, it must prepare an Environmental Impact Statement (“EIS”). The EIS details any impacts, alternatives, mitigating circumstances, and unavoidable adverse effects of the action.⁹⁶

NEPA’s central purpose is to fully inform agency decisionmakers on the consequences of proposed actions and ensure all relevant information, including environmental considerations, is considered prior to implementing a major project.⁹⁷ Under NEPA, an agency must evaluate the environmental impacts of its proposed action, a range of alternatives, and applicable mitigation measures.⁹⁸ Not all possible alternatives are considered within the EIS, but NEPA requires the agency to evaluate all reasonable alternatives to the proposed action.⁹⁹ Once the agency has evaluated the alternatives, it is free to choose the originally proposed action; NEPA does not “mandate [a] particular result[.]”¹⁰⁰

Eradicating the mice from SFI by saturating the island with brodifacoum may significantly affect the environment. As a result, the FWS is currently developing the DEIS.¹⁰¹ To date the FWS has considered one alternative to aerially broadcasting brodifacoum: no action.¹⁰² However, other reasonable alternatives exist. To comply with NEPA, FWS will have to adequately analyze these alternatives in the EIS.

⁹⁴ See 42 U.S.C.A. §§ 4321-4370h (Westlaw 2012); see also *National Environmental Policy Act (NEPA) Basic Information*, U.S. ENVTL. PROT. AGENCY, www.epa.gov/oecaerth/basics/nepa.html (last updated Oct. 12, 2011).

⁹⁵ 42 U.S.C.A. § 4331 (Westlaw 2012).

⁹⁶ See 42 U.S.C.A. § 4332 (Westlaw 2012).

⁹⁷ See generally 42 U.S.C.A. § 4332 (Westlaw 2012); see also *National Environmental Policy Act (NEPA) Basic Information*, U.S. ENVTL. PROT. AGENCY, www.epa.gov/compliance/basics/nepa.html (last visited Jan. 22, 2012).

⁹⁸ See 40 C.F.R. § 1505.1(e) (2012); see also 40 C.F.R. § 1505.14 (2012).

⁹⁹ See 40 C.F.R. § 1505.1(e) (2012); see also 40 C.F.R. § 1505.14 (2012).

¹⁰⁰ *Winter v. Natural Res. Def. Council, Inc.*, 555 U.S. 7, 23 (2008) (citing *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989)).

¹⁰¹ See South Farallon Islands Nonnative Mouse Eradication Project, 76 Fed. Reg. at 20,706; see generally *Stop the Dumping of Toxic Rodenticides on the Farallon Islands*, WILDCARE, www.wildcarebayarea.org/site/PageServer?pagename=TakeAction_Farallon_Islands_Rodenticides (last visited Dec. 13, 2011).

¹⁰² See South Farallon Islands Nonnative Mouse Eradication Project, 76 Fed. Reg. at 20,706.

iii. *California Species of Special Concern and the Federal Endangered Species Act*

The federal Endangered Species Act (“ESA”)¹⁰³ provides for the conservation of threatened and endangered species.¹⁰⁴ It is “the most comprehensive legislation for the preservation of endangered species ever enacted by any nation.”¹⁰⁵ The ESA prohibits any federal action from “jeopardiz[ing] the continued existence of any endangered species or threatened species or result[ing] in the destruction or adverse modification of habitat of such species.”¹⁰⁶

ESA protections apply only to species designated as threatened or endangered by the FWS;¹⁰⁷ however, even species that are not yet listed, like the Petrel, still have some protections under California law. To protect native birds that are vulnerable to future extinction due to severe population decline, the California Department of Fish and Game may designate a species as a Species of Special Concern (“SSC”).¹⁰⁸ This designation is similar to ESA candidate species.¹⁰⁹ The SSC designation does not directly grant protection to at-risk species; it only marks the species as “sensitive.”¹¹⁰

State statutes do not directly protect California SSCs,¹¹¹ but designated species may still be protected under the California

¹⁰³ 16 U.S.C.A. §§ 1531–1543 (Westlaw 2012).

¹⁰⁴ See *Summary of the Endangered Species Act*, U.S. ENVTL. PROT. AGENCY, www.epa.gov/lawsregs/laws/esa.html (last updated Aug. 11, 2011).

¹⁰⁵ *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 180 (1978).

¹⁰⁶ 16 U.S.C.A. § 1536(a)(2) (Westlaw 2012).

¹⁰⁷ 16 U.S.C.A. § 1533 (Westlaw 2012).

¹⁰⁸ See CAL. DEP’T OF FISH & GAME, CALIFORNIA BIRD SPECIES OF SPECIAL CONCERN, A RANKED ASSESSMENT OF SPECIES, SUBSPECIES, AND DISTINCT POPULATIONS OF BIRDS OF IMMEDIATE CONSERVATION CONCERN IN CALIFORNIA STUDIES OF WESTERN BIRDS 5 (W. David Shuford & Thomas Gardali eds., 2008), available at www.dfg.ca.gov/wildlife/nongame/ssc/docs/bird/BSSC-Overview.pdf.

¹⁰⁹ See James E. Good & Patrick G. Mitchell, *Wildlife and Mining Operations: Mutually Compatible or Irreconcilable Differences?*, 37 ROCKY MTN. MIN. L. INST. ch. 7 (1991), available at Westlaw 37 RMMLF-INST 7. “Candidate species are plants and animals for which the [FWS] has sufficient information on their biological status and threats to propose them as endangered or threatened under the [ESA].” Designation is not warranted, however, because of other higher priority listings. While candidate species receive no statutory protection, FWS encourages the conservation and protection of these species because their designation may be warranted in the future. U.S. FISH & WILDLIFE SERV., CANDIDATE SPECIES (2011), available at www.fws.gov/endangered/esa-library/pdf/candidate_species.pdf.

¹¹⁰ See CAL. DEP’T OF FISH & GAME, *supra* note 108.

¹¹¹ *Species of Special Concern*, CAL. DEP’T OF FISH & GAME, www.dfg.ca.gov/wildlife/nongame/ssc/ (last visited Jan. 16, 2012).

Environmental Quality Act (“CEQA”)¹¹² and NEPA.¹¹³ CEQA requires agencies to disclose impacts from projects in the state. If a project has the potential to cause significant environmental impact, a lead agency must prepare an Environmental Impact Report (“EIR”) to evaluate project alternatives and determine the extent of the project’s environmental effect.¹¹⁴ If an agency determines that its project affects an endangered or threatened species, the agency must consider these effects as significant, and it must prepare an EIR.¹¹⁵ However, an agency may apply the same protection to other species such as SSCs.¹¹⁶ Similar protections are available under NEPA.¹¹⁷ Both Petrels and burrowing owls are listed as SSCs in California.¹¹⁸

III. INADEQUATE PROTECTION OF WILDLIFE AND HABITAT UNDER FIFRA

The registering of all pesticides with the EPA is mandatory.¹¹⁹ The EPA will register a pesticide if, among other considerations, the pesticide will not have “unreasonable adverse effects on the environment.”¹²⁰ In determining “unreasonable adverse effects on the environment,” the EPA balances “the economic, social, and environmental costs and benefits of the use of any pesticide.”¹²¹ The EPA may protect the environment by classifying a pesticide as registered for restricted use instead of general use.¹²² Classifying a pesticide as “restricted use” confines its use to certified applicators,¹²³ like specially trained pest-control personnel.¹²⁴

As part of the 1988 amendments to FIFRA, the EPA must reevaluate and reregister all pesticides registered before November 1, 1984.¹²⁵ The rodenticide brodifacoum was one such pesticide. Through the reregistration process, the EPA must analyze any new information and public comments in making its determination regarding a pesticide’s

¹¹² CAL. PUB. RES. CODE §§ 21000–21177 (Westlaw 2012).

¹¹³ See CAL. DEP’T OF FISH & GAME, *supra* note 108, at 44.

¹¹⁴ See CAL. CODE REGS. tit. 14, §§ 15063, 15064 (Westlaw 2012).

¹¹⁵ *Id.*

¹¹⁶ See Cal. Code Regs. Ann. § 15380(d) (Westlaw 2012).

¹¹⁷ See CAL. DEP’T OF FISH & GAME, *supra* note 108, at 44.

¹¹⁸ See generally CAL. DEP’T OF FISH & GAME, *supra* note 108, at 44.

¹¹⁹ 7 U.S.C.A. § 136a (Westlaw 2012).

¹²⁰ 7 U.S.C.A. § 136a(c)(5) (Westlaw 2012).

¹²¹ 7 U.S.C.A. § 136(bb) (Westlaw 2012).

¹²² 7 U.S.C.A. § 136a(d)(1) (Westlaw 2012).

¹²³ 7 U.S.C.A. § 136a(d)(1)(C)(ii) (Westlaw 2012).

¹²⁴ 7 U.S.C.A. § 136i (Westlaw 2012).

¹²⁵ 7 U.S.C.A. § 136a-1 (Westlaw 2012).

safety to the public and its adverse effects on the environment.¹²⁶ Once EPA review is complete, the Administrator presents the decision in a Reregistration Eligibility Decision (“RED”).¹²⁷ Registering pesticides with the EPA protects the people and the environment from toxic chemicals. However, this protection is ineffective if the EPA fails to consider the full use of the poison.

A. THE NARROW SCOPE OF BRODIFACOU M’S EVALUATION UPON REREGISTRATION

In 1997, the EPA released its RED regarding the use of ten rodenticides,¹²⁸ including brodifacoum.¹²⁹ In the pertinent part, the EPA acknowledged that brodifacoum is “highly toxic to mammals and birds.”¹³⁰ Nevertheless, the EPA determined that brodifacoum would not likely endanger wildlife species, because it was primarily used indoors and directly along the outside of buildings and walls.¹³¹ Therefore, the EPA did not expect birds “to be unduly exposed to [brodifacoum].”¹³² The EPA conceded that if the use pattern was expanded, it was highly likely that additional non-target species would be exposed.¹³³ In spite of this concession, the EPA concluded that brodifacoum would not cause “unreasonable risks to humans or the environment.”¹³⁴

The scope of the EPA’s evaluation of brodifacoum’s impacts on wildlife was too narrow. In the evaluation, the EPA noted that brodifacoum is highly toxic to wildlife species.¹³⁵ Additionally, the EPA acknowledged that second-generation anticoagulants, like brodifacoum, are more likely to “adversely affect non-target wildlife, especially birds.”¹³⁶ Nonetheless, the EPA determined that brodifacoum is not a threat to wildlife, because its use was confined to poisoning rodents around structures and households.¹³⁷ Within this narrow scope of usage, a

¹²⁶ 7 U.S.C.A. § 136a-1(d)(4)(B)(iv) (Westlaw 2012).

¹²⁷ See 7 U.S.C.A. § 136a-1(g)(2)(C) (Westlaw 2012); see generally *Reregistration of Pesticides, Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)*, U.S. ENVTL. PROT. AGENCY, www.epa.gov/agriculture/lfra.html (last updated Oct. 20, 2011).

¹²⁸ See U.S. ENVTL. PROT. AGENCY, REREGISTRATION ELIGIBILITY DECISION, *supra* note 69.

¹²⁹ *Id.*

¹³⁰ *Id.*

¹³¹ *Id.* at 80.

¹³² *Id.*

¹³³ *Id.*

¹³⁴ U.S. ENVTL. PROT. AGENCY, REREGISTRATION ELIGIBILITY DECISION, *supra* note 69 at V.

¹³⁵ *Id.* at 79-80.

¹³⁶ U.S. ENVTL. PROT. AGENCY, RISK MITIGATION DECISION, *supra* note 70, at 8.

¹³⁷ See U.S. ENVTL. PROT. AGENCY, REREGISTRATION ELIGIBILITY DECISION, *supra* note 69,

“no unreasonable risk” determination was adequate. However, if the EPA had considered the use of the same poison in outdoor settings where the rodenticide is fully accessible by wildlife, the decision would likely have been different.¹³⁸

Almost a decade after the reregistration, the EPA began reconsidering the safety of brodifacoum as a rodenticide.¹³⁹ In 2004 and 2006, the EPA’s Office of Prevention, Pesticides and Toxic Substances acknowledged the need for information on the impact of exposing wild birds to brodifacoum.¹⁴⁰ The EPA’s Rodenticide Incidents Update in 2006 identified brodifacoum-related secondary poisoning in eighty-seven percent of that year’s reported poisoned birds.¹⁴¹ In light of the incidents, the EPA acknowledged that brodifacoum is one of four rodenticides that “pose the greatest risk to wildlife.”¹⁴² Consequently, the EPA restricted the use of brodifacoum.¹⁴³ But while the EPA set restrictions on brodifacoum, it chose to give the FWS broad discretion for the use of this poison in island conservation projects.

B. EPA’S FAILURE TO ASSESS FWS’S MANAGEMENT ABILITIES OF BRODIFACOUM’S USE FOR ISLAND CONSERVATION PURPOSES

To “reduce wildlife exposures and ecological risks,” the EPA restricted all sales of brodifacoum to the public.¹⁴⁴ However, even with the identified risks, the EPA did not restrict the FWS’s use of brodifacoum for island conservation purposes.¹⁴⁵ In failing to place restrictions on the FWS’s use of this highly toxic poison, the EPA reasoned that island conservation uses of brodifacoum are “managed by the [FWS]” and performed by certified applicators for the purpose of “preventing the extinction of native plant and animal species due to rat predation.”¹⁴⁶ By giving the FWS broad discretion, the EPA inadequately assessed brodifacoum’s effect on non-target species when applied in

at 80.

¹³⁸ See *id.* (“[Brodifacoum] poses a very high hazard to any birds that consume it. If it would be used outdoors it would be a presumptive hazard to birds.”).

¹³⁹ Memorandum from Bill Erickson, Biologist, ERB 2/EFED, to Susan Lewis, Chief, Kelly Sherman, SRRD, Rodenticide Incidents Update (Nov. 15, 2006), available at www.regulations.gov/#!documentDetail;D=EPA-HQ-OPP-2006-0955-0008.

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

¹⁴² U.S. ENVTL. PROT. AGENCY, RISK MITIGATION DECISION, *supra* note 70, at 2.

¹⁴³ See generally *id.*

¹⁴⁴ See *id.* at 2.

¹⁴⁵ See *id.* at 3.

¹⁴⁶ See *id.*

island settings, as well as the FWS's management of this poison's application on islands.

When the EPA reregistered brodifacoum in 1998, it failed to consider the poison's expanded use. The EPA evaluated the impact of brodifacoum on wildlife only when used indoors and directly along the outside of buildings.¹⁴⁷ The EPA did not take into account the FWS's expected use of the rodenticide for conservation purposes—on islands, outside, and, in many cases, near water. The EPA's evaluation did not anticipate for the FWS's aerial application of brodifacoum and the exposure of non-target species.¹⁴⁸

As part of the project to eradicate the mice from the SFI, the FWS has acknowledged that the eradication of every mouse is required for the project to succeed.¹⁴⁹ However, the FWS proposes only one way of achieving this, “saturating” the island with the poison.¹⁵⁰ Such “saturation” will, without a doubt, result in non-target poisoning.¹⁵¹

The EPA did not properly analyze the FWS's use and management of brodifacoum for island conservation purposes when it allowed FWS unrestricted use of this highly toxic poison. Due to the EPA's narrow focus, it improperly evaluated brodifacoum's safety solely on its restricted use pattern when it reregistered the poison. The EPA's continued exemption of the FWS's brodifacoum use is improper. The EPA has made no statement or amendment to place restrictions on the FWS's use of this poison; it has completely ignored the FWS's well-publicized mismanagement of brodifacoum use in island settings.¹⁵² This continued disregard for the safety of birds and other wildlife has persisted despite EPA's acknowledgment of the dangers of brodifacoum.¹⁵³

¹⁴⁷ *Id.* at 80.

¹⁴⁸ Interview with Maggie Sergio, Director of WildCare Solution, WildCare (Oct. 28, 2011).

¹⁴⁹ Peter Fimrite, *Concern over Fallout of Bombing Mice with Pesticide*, S.F. CHRONICLE, Oct. 17, 2011, at A-1, available at www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2011/10/16/BADV1LH1R4.DTL&ao=2#ixzz1cQP01tVy.

¹⁵⁰ Interview with Maggie Sergio, Director of WildCare Solution, WildCare (Oct. 28, 2011).

¹⁵¹ *Id.*

¹⁵² THE ORNITHOLOGICAL COUNCIL, *supra* note 68.

¹⁵³ See U.S. ENVTL. PROT. AGENCY, RISK MITIGATION DECISION, *supra* note 70, at 2.

C. CASE STUDY: RAT ISLAND DISASTER AND THE HIGH PRICE OF FWS MISMANAGEMENT PAID BY BALD EAGLES AND WESTERN GULLS

While rodent eradications have generally proven successful in the past,¹⁵⁴ unsuccessful eradication programs are both extremely expensive and “produce results that are worse than no action at all.”¹⁵⁵ The FWS must carefully consider predator-prey relationships to properly assess the potential for secondary poisoning when attempting the proposed mouse eradication on the Farallon Islands and other future actions.¹⁵⁶

Rat Island is one of the many Aleutian Islands included in Alaska’s Maritime National Wildlife Refuge.¹⁵⁷ The island draws its name from the abundance of Norway rats, and other species, that were most likely introduced in the late 1700s following a shipwreck.¹⁵⁸ At 6,919 acres, Rat Island is nearly thirty-three times larger than the combined Farallon Islands.¹⁵⁹ Rat Island is one of the many Aleutian Islands that provide vital habitats for seabirds. Altogether, the Aleutian Islands account for twenty-six species of seabirds; most are not found anywhere else in the world.¹⁶⁰

To rid the island of rats that preyed on seabird populations and caused a significant modification of the island’s ecosystem, the FWS conducted an eradication program in 2008 similar to the proposed mouse eradication on the Farallon Islands.¹⁶¹ The FWS used an aerial broadcast of approximately forty-six tons of brodifacoum supplemented by hand application of poisoned bait in the eradication effort.¹⁶² According to the FWS’s most conservative estimates, “some gulls [were] likely to die,”¹⁶³ while no bald eagles would perish¹⁶⁴ even if exposed to brodifacoum. Actual bird mortality rates greatly exceeded the predicted deaths, and

¹⁵⁴ See Howald et al., *supra* note 48, at 1264.

¹⁵⁵ U.S. FISH & WILDLIFE SERV., SEABIRD CONSERVATION PLAN, *supra* note 31, at 43.

¹⁵⁶ See *id.*

¹⁵⁷ U.S. FISH & WILDLIFE SERV., RESTORING WILDLIFE HABITAT, *supra* note 65, at 2.

¹⁵⁸ *Id.* at 2-3 (citing L.T. BLACK, RECORD OF MARITIME DISASTERS IN RUSSIAN AMERICA, PART ONE: 1741-1799, PROCEEDINGS OF THE ALASKA MARITIME ARCHEOLOGY WORKSHOP, MAY 17-19, 1983, SITKA, AK. UNIV. OF ALASKA, ALASKA SEA GRANT REPORT NO. 83-9 (1983)).

¹⁵⁹ *Id.* at 29.

¹⁶⁰ *Id.* at 28 (citing D.D. GIBSON & G.V. BYRD, BIRDS OF THE ALEUTIAN ISLANDS, ALASKA, SERIES IN ORNITHOLOGY NO. 1, THE NUTTALL ORNITHOLOGICAL CLUB AND THE AMERICAN ORNITHOLOGISTS’ UNION (2007)).

¹⁶¹ See generally *id.*; see also THE ORNITHOLOGICAL COUNCIL, *supra* note 68, at 2-3.

¹⁶² THE ORNITHOLOGICAL COUNCIL, *supra* note 68.

¹⁶³ U.S. FISH & WILDLIFE SERV., RESTORING WILDLIFE HABITAT, *supra* note 65, at 89.

¹⁶⁴ *Id.* at 96.

391 birds died from the FWS's use of brodifacoum.¹⁶⁵ The principally impacted species were bald eagles and gulls.¹⁶⁶

A thorough investigation revealed that mismanagement of the eradication operations led to the death of hundreds of birds on Rat Island.¹⁶⁷ Inadequate documentation, deviations from the selected plan, and failed communication between operation teams all led to the application of excess bait.¹⁶⁸ Additionally, a lack of experience in the decisionmaking process further exacerbated the disaster.¹⁶⁹

The investigation identified that the excess bait was the primary reason for the disastrous non-target poisoning of the birds.¹⁷⁰ Gulls died of primary poisoning through ingestion of actual brodifacoum pellets and secondary poisoning from consuming poisoned rats or rat carcasses.¹⁷¹ Some gulls consumed both brodifacoum pellets and poisoned rats; the resulting brodifacoum concentration would have been lethal to any bird. Eagles mostly died of secondary poisoning from preying on the rats and gulls already poisoned by the rodenticide.¹⁷²

The poisoning of hundreds of birds through FWS mismanagement must not occur again. This means that FWS's SFI plan must be reconsidered, as the island retains ecological similarities to the predator-prey relationships on Rat Island.¹⁷³ SFI hosts the world's largest breeding colony of western gulls.¹⁷⁴ Much like the gulls on Rat Island, the gulls on SFI could ingest a deadly amount of the rodenticide. Additionally, the gulls could suffer from secondary poisoning due to consumption of mouse carcasses. Similar to the bald eagles of Rat Island, the burrowing owls of SFI are likely to prey on the poisoned mice and other poisoned species.¹⁷⁵ Since SFI presents very similar ecological conditions to Rat Island, during the preparation of the DEIS, the FWS should carefully

¹⁶⁵ THE ORNITHOLOGICAL COUNCIL, *supra* note 68.

¹⁶⁶ *Id.* The report determined that 46 bald eagles and 320 gulls died from lethal levels of brodifacoum. *Id.*

¹⁶⁷ *Id.*

¹⁶⁸ *Id.* at 51-53.

¹⁶⁹ *Id.* at 3.

¹⁷⁰ *Id.*

¹⁷¹ THE ORNITHOLOGICAL COUNCIL, *supra* note 68., at 31.

¹⁷² *Id.*

¹⁷³ Similar to the gulls and bald eagles that were poisoned from the Rat Island rat eradication, gulls, owls, and other similar species would suffer on SFI. *See generally* U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 23-24; *see also* U.S. FISH & WILDLIFE SERV., RESTORING WILDLIFE HABITAT, *supra* note 65, at 76-96.

¹⁷⁴ South Farallon Islands Nonnative Mouse Eradication Project, 76 Fed. Reg. at 20,706.

¹⁷⁵ *See generally* U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 24; *see also* U.S. FISH & WILDLIFE SERV., RESTORING WILDLIFE HABITAT, *supra* note 65, at 95-96.

consider whether brodifacoum is the best approach to mouse eradication on SFI.

SFI is much smaller than Rat Island.¹⁷⁶ However, the danger of non-target poisoning is just as likely in light of the similar ecologies of the islands. Inadequate communication, lack of expertise, insufficient documentation, and deviation from the plan could happen again. With the proposed effort to eradicate the mice on SFI, the FWS is at risk of repeating the same mistakes unless the use of brodifacoum is approached very cautiously and with the utmost care. The stakes are high—thirty percent of California’s nesting seabirds could face poisoning and possible death.¹⁷⁷

IV. PROPOSED ACTION: AVOIDING UNNECESSARY RISKS AND DISASTER IN THE WAKE OF THE RAT ISLAND ERADICATION

In 2011, only a few months after the investigation of the Rat Island disaster identified the FWS’s failed management of brodifacoum, the FWS released its proposal to eradicate the mice on the Farallon Islands.¹⁷⁸ A mere two years before unveiling its proposal for the eradication on SFI, the FWS determined in 2009 that predation by owls and western gulls did “not pose a significant threat” to the Petrels.¹⁷⁹ Citing this determination, the FWS declined a petition to list the Petrels as threatened under the ESA.¹⁸⁰ The FWS now justifies its proposed plan as a way to help the Petrels.¹⁸¹ While most stakeholders agree that the FWS must eradicate the mice, a few are seriously concerned about the dangers that brodifacoum application poses to non-target species.¹⁸²

The EPA relied on adequate management practices from the FWS

¹⁷⁶ See, e.g., U.S. FISH & WILDLIFE SERV., RESTORING WILDLIFE HABITAT, *supra* note 65, at 29; U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 32 (SFI is nearly fifty-eight times smaller than Rat Island).

¹⁷⁷ See *Farallon National Wildlife Refuge*, U.S. FISH & WILDLIFE SERV., www.fws.gov/refuges/profiles/index.cfm?id=81641 (last visited Jan. 16, 2012).

¹⁷⁸ See South Farallon Islands Nonnative Mouse Eradication Project, 76 Fed. Reg. at 20,706.

¹⁷⁹ Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Ashy Storm-Petrel as Threatened or Endangered, 74 Fed. Reg. 41,832 (Aug. 19, 2009).

¹⁸⁰ *Id.*

¹⁸¹ South Farallon Islands Nonnative Mouse Eradication Project, 76 Fed. Reg. at 20,706.

¹⁸² See, e.g., John Upton, *Voracious Mice Scramble Food Chain on California’s Farallon Islands*, N.Y. TIMES, Oct. 22, 2011, available at www.nytimes.com/2011/10/23/us/voracious-mice-scramble-food-chain-on-farallon-islands.html?_r=1; Jason Dearen, *Farallon Island Mice Pose Serious Threat To Natural Habitat*, HUFFINGTON POST, Oct. 22, 2011, www.huffingtonpost.com/2011/10/22/farallon-island-mice_n_1026459.html; *Stop the Dumping of Toxic Rodenticides on the Farallon Islands*, WILDCARE, www.wildcarebayarea.org/site/PageServer?pagename=TakeAction_Farallon_Islands_Rodenticides (last visited Dec. 13, 2011).

when it granted the FWS a broad exemption from pesticide regulation.¹⁸³ However, the disastrous October 2008 eradication on Rat Island proves that the exemption is not warranted. While the FWS may utilize professional applicators for poison distribution, its management practices are not adequate to prevent serious damage to an island ecosystem. Given the high possibility of a potential disaster and the devastating consequences for the California seabird population, the EPA should re-evaluate its exemption of the FWS's use of brodifacoum for island conservation purposes. The EPA should eliminate the exemption until the FWS can adequately demonstrate its ability to exercise proper management practices when utilizing such toxic poisons.

A. USE OF BRODIFACOUM HAS BOTH COSTS TO AND BENEFITS FOR NON-TARGET SPECIES

While the FWS has not yet released the DEIS, it is imperative that it seriously consider the impacts of brodifacoum on all species within the ecosystem. The FWS should reconsider its intended approach to "saturate" the islands and evaluate the inevitable exposure of non-target species to this highly dangerous poison.

Additionally, the FWS must consider the impact of brodifacoum on western gulls, burrowing owls, and other non-target species. While the owls only seasonally reside on the island,¹⁸⁴ over 15,000 gulls populate SFI year around.¹⁸⁵ Since the gulls prey on the mice,¹⁸⁶ the FWS must seriously evaluate the benefits of brodifacoum use, particularly in the form of aerial broadcast. As shown by the gull poisoning on Rat Island, mass gull deaths may result from the use of brodifacoum on SFI. The high probability of gulls consuming the brodifacoum bait itself, together with secondary poisoning from feeding on the poisoned mouse carcasses, means that the planned use of brodifacoum will likely result in mass gull deaths on SFI. The possible mass poisoning of gulls, owls, and other species is not an adequate trade-off to halt the decline in Petrel populations if other viable methods of reducing the mouse population exist.

¹⁸³ See U.S. ENVTL. PROT. AGENCY, RISK MITIGATION DECISION, *supra* note 70, at 3. The primary reason for the exemption identified by the EPA in its Risk Mitigation Decision was the Service's management and use of certified applicators. *Id.*

¹⁸⁴ See U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 23.

¹⁸⁵ *Id.* at 46.

¹⁸⁶ *Id.* at 43.

B. VIABLE ALTERNATIVES TO BRODIFACOU M EXIST

The FWS must consider the available reasonable alternatives to brodifacoum for the proposed eradication on the Farallon Islands.¹⁸⁷ One such alternative is diphacinone. Agencies have successfully used this first-generation rodenticide in multiple island conservation campaigns.¹⁸⁸ While first-generation anticoagulants are less potent at the initial poisoning, they pose a reduced danger of secondary poisoning to non-target species.¹⁸⁹

Diphacinone is “similar to brodifacoum in toxicology and pathology. However, it is virtually non-toxic to birds.”¹⁹⁰ Brodifacoum and diphacinone both delay the onset of the poisoning to reduce the risk of bait shyness.¹⁹¹ While brodifacoum may be more lethal and efficient, diphacinone provides the type of alternative needed for a sensitive project like the proposed mouse eradication at the Farallon Refuge.

C. SAFER APPLICATION METHODS OF BRODIFACOU M AND MITIGATION MEASURES SHOULD BE USED

In the event that the FWS determines that the only viable solution is the use of brodifacoum, it should implement critical strategies to reduce non-target poisoning. First, the FWS should protect non-target species by implementing mitigation measures. The FWS can reduce the possibility of non-target poisoning by capturing and transporting burrowing owls before the application of the rodenticide. Additionally, the FWS should develop a program for collecting poisoned rodents. Collection will limit the possibility of non-target poisoning by reducing the number of poisoned carcasses available for consumption by the at-risk species. This

¹⁸⁷ See 40 C.F.R. § 1505.1(e) (2012); see also 40 C.F.R. § 1505.14 (2012).

¹⁸⁸ See Howald et al., *supra* note 48, at 1262; see also C. Josh Donlan et al., *Evaluating Alternative Rodenticides for Island Conservation: Roof Rat Eradication from the San Jorge Islands, Mexico*, 114 BIOLOGICAL CONSERVATION 29 (2003), available at www.advancedconservation.org/storage/library/donlan_et_al_2003a.pdf. Diphacinone was used in comparison with brodifacoum for eradicating rats from islands in the northern Gulf of California, Mexico. While the islands were smaller than SFI, the eradications were successful, “suggesting that the less toxic diphacinone and cholecalciferol may be useful alternatives to brodifacoum for some island eradication programs.” *Id.*

¹⁸⁹ See Howald et al., *supra* note 48, at 1261.

¹⁹⁰ C. Josh Donlan et al., *supra* note 188.

¹⁹¹ *Id.* at 32; see Howald et al., *supra* note 48, at 1261. Bait shyness is the amount of time it takes for the target species to determine that the bait is responsible for the effects of the poison. Bait shyness is one of the most important characteristics of rodenticide bait; ideally the bait can persist long enough to be consumed by the target species while short enough to minimize non-target accessibility. *Id.*

is particularly important because of brodifacoum's "high toxicity and long persistence in body tissues."¹⁹²

In addition to mitigation measures, the FWS should refrain from utilizing the proposed aerial broadcast method of distribution. By utilizing a combined approach of bait stations and hand broadcasting, the FWS can achieve success and significantly reduce the threat of another Rat Island disaster.¹⁹³ While aerial broadcast is more efficient, it poses a greater danger to non-target species than more conventional methods, like the bait stations and hand broadcasting. Hand broadcasting, although slower, remains an effective method of eradication that limits the risk of secondary poisoning by reducing the availability of excess poison bait. Despite the drawbacks, many small island rat and mouse eradication efforts still employ hand broadcasting, while aerial broadcasting is usually reserved for larger islands.¹⁹⁴ Furthermore, bait stations reduce the potential of non-target poisoning by limiting direct exposure to brodifacoum. Since direct exposure to brodifacoum is the primary concern for western gull poisoning,¹⁹⁵ bait stations should be used, as they would effectively limit the birds' access to the poison. This method of eradication accounts for over fifty percent of all successful rodent eradication campaigns on islands.¹⁹⁶ Utilizing bait stations and hand broadcasting is the safest and most cost-effective approach available to the FWS.¹⁹⁷

V. CONCLUSION

Brodifacoum is highly toxic and "pose[s] the greatest risk to wildlife."¹⁹⁸ While the FWS has used it on several occasions for island conservation projects, it remains highly dangerous. The Rat Island disaster is a critical example of the danger that birds face from this highly toxic poison. Hundreds of birds, including dozens of bald eagles,

¹⁹² U.S. ENVTL. PROT. AGENCY, RISK MITIGATION DECISION, *supra* note 70 (noting that brodifacoum has been known to persist in the liver for more than 600 days after consumption).

¹⁹³ See THE ORNITHOLOGICAL COUNCIL, *supra* note 68.

¹⁹⁴ See Howald et al., *supra* note 48, at 1262-64 (noting that in a fifty-five-year survey of island eradication practices, the average island area where hand broadcasting was utilized was 51 acres, while for aerial broadcasting, the average island area was 2165 acres); see also U.S. FISH & WILDLIFE SERV., COMPREHENSIVE CONSERVATION PLAN, *supra* note 3, at 32 (stating that the Farallon Refuge spans a total of 211 acres, and SFI encompasses approximately 120 acres).

¹⁹⁵ THE ORNITHOLOGICAL COUNCIL, *supra* note 68, at 31 (stating that in gulls, the primary route of brodifacoum exposure was from ingesting the poison pellets directly).

¹⁹⁶ See Howald et al., *supra* note 48, at 1263.

¹⁹⁷ *Id.*

¹⁹⁸ U.S. ENVTL. PROT. AGENCY, RISK MITIGATION DECISION, *supra* note 70, at 2.

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could have been spared if the EPA had revoked the FWS's unrestricted use of brodifacoum. Now, the Farallon Islands face the same fate if the FWS goes forward with its initial proposal to use brodifacoum.

Even after banning the sale of brodifacoum to the public and setting specific restrictions for certified applicators, the EPA failed to restrict the FWS's use of brodifacoum.¹⁹⁹ Instead, the EPA granted broad discretion to the FWS for the poison's use. The primary reason for the EPA's lack of oversight was the FWS's supposedly adequate management practices and conservation goals. However, the Rat Island disaster has conclusively proven that the FWS needs EPA oversight or prescribed management practices.

Heedless of prior failures, the FWS proposes to saturate an entire set of the Farallon Islands with this highly toxic poison. The FWS must consider who will bear the risk of the proposed action in determining its approach and preferred alternatives. The agency has presented two main options to deal with the growing danger to the Petrels: 1) saturating SFI in brodifacoum via aerial broadcasting, and 2) no action.²⁰⁰ However, other reasonable alternatives exist. The FWS should consider these alternatives. While diphacinone may not be as efficient at island eradications as brodifacoum, it is proven effective.²⁰¹ The danger of non-target poisoning on SFI necessitates considering this alternative poison. Furthermore, safer rodenticide application methods are viable alternatives to the FWS's proposed aerial broadcast. A combination of bait stations and hand broadcasting, although less efficient, may significantly reduce the likelihood of lethal bird poisoning.²⁰² If the FWS resorts to using brodifacoum, especially through aerial broadcast, gulls, owls, and other species will bear the risk and the injury of its actions. The public cannot allow hundreds, maybe thousands, of birds to perish while the EPA stands idly by and watches another disaster unfold.

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¹⁹⁹ See *id.* at 2-3.

²⁰⁰ South Farallon Islands Nonnative Mouse Eradication Project, 76 Fed. Reg. at 20,706.

²⁰¹ See generally C. Josh Donlan et al., *supra* note 188.

²⁰² See THE ORNITHOLOGICAL COUNCIL, *supra* note 68.

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