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of the House of Representatives Committee on Resources

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The National Fish and Wildlife Foundation (the Foundation) appreciates the opportunity to submit this statement for the record on the impact of invasive species on the Hawaiian Islands' native fauna and flora and potential strategies for controlling or eradicating them.

The Foundation is a private, non-profit, 501(c)3 tax-exempt organization, authorized by Congress in 1984 to conserve fish, wildlife, plants and the habitats on which they depend. We have provided funding to 6,469 projects, leveraging over $260 million in federal dollars to more than $785 million in total funding for on-the-ground conservation, conservation education, and organizational capacity-building. The Foundation promotes and supports the conservation of fish, wildlife, plants and their habitats by establishing partnerships between the public and private sectors to increase the impact of the federal funds provided by our core agency partners -- the U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, USDA-Forest Service, Bureau of Land Management, Environmental Protection Agency, and USDA-Natural Resource Conservation Service.

The Foundation's conservation investments have resulted in over 27 million acres of restored wildlife habitat and over 21,000 miles of restored streams and waterways. We have helped develop new models for private land stewardship, created new hope for countless species and built educational programs that nurture the next generation of stewards. A critical area of concern and funding for the Foundation is to help address the ever increasing threat that invasive non-native species pose to our nation's native fish, wildlife and plants. Indeed, there are already over 5000 species of non-native plants alone that are established in the United States, of which about 500 are considered to be pests that exhibit aggressive and invasive characteristics. Currently, these weed species have infested over 100 million acres and are expanding at a rate of 8 to 20 percent per year.

In response, the Foundation established, in partnership with the Bureau of Land Management and the USDA-Forest Service, the Pulling Together Initiative: Private/Public Partnership (PTI) to help implement the National Strategy on Invasive Noxious Weeds. Today, after eight years of supporting invasive species control projects, and with expanded federal partnerships including the Department of Interior, the Department of Agriculture, and the Department of Defense, the program has funded 256 projects in 39 states and 2 U.S. territories with $8.4 million in federal funds that have been matched by $16.6 million in non-federal funds, for a total of over $25 million.

The threats to native fish, wildlife and plants posed by non-native invasive species are nowhere more serious than in the Hawaiian Archipelago. The spectacular array of species that developed naturally on these isolated islands is a treasure whose fame in evolutionary biology rivals that of the Galapagos Islands which inspired Charles Darwin. Yet the diverse species found exclusively in Hawaii are being lost at an unprecedented rate – largely due to the degradation and occupation of habitat by non-native species. According to the US Geological Survey, Biological Resources Division, 53 species of birds unique to Hawaii were known historically. Of these, 21 are extinct today and 9 have not been seen in several years and are likely extinct. 20 species have populations that have been so reduced that they are federally listed as endangered; only 8 of the original 53 are considered to have robust and sustaining populations. This tragic loss of the unique birds of Hawaii is largely due to the introduction of non-native mammals which prey on them, competition from introduced non-native birds and the introduction of non-native bird diseases and their vectors such as avian malaria and the mosquito. The situation for Hawaii's plants is little better. 1,302 types of plants are known from the archipelago, of which 1,158 (89%) occur nowhere else. Today, 106 of these (8%) are extinct and 373 (29%) are considered to be at risk of extinction in the near future, in fact,

104 plant types in Hawaii have populations with fewer than 20 known individuals remaining. Hawaii has 273 plants federally listed as endangered or threatened – or 37% of the listed plants nationwide. Again, the cause of these losses and declines is largely from non-native species – introduced mammals degrade and destroy the habitats of native plants and create openings in which non-native weedy plants become established, slowing or preventing the recovery of the native flora.

The Coordinating Group on Alien Pest Species (CGAPS), comprised of the state and federal management and regulatory agencies (Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Hawaii Department of Transportation, Hawaii Farm Bureau Federation, Hawaii Visitors Bureau, National Park Service, U.S. Customs Service, U.S. Department of Agriculture, U.S. Fish and Wildlife Service, U.S. Geological Survey, U.S. Navy, U.S. Postal Inspection Service, U.S. Postal Service) estimates that though there are likely thousands of non-native species already established in Hawaii, 200-500 are having a severe impact on the economy, agriculture, native ecosystems and quality of life in the state. For the past five years, an average of 100 new alien plants each year have been discovered in the islands and an average of 20 new insects becomes established in the islands annually, half of which are known to be pests. Just one of these new invaders, the Formosan ground termite, alone causes nearly $150 million in damage and treatment costs annually according to CGAPS.

Strategies for addressing this serious and growing problem need to be varied and vigorous. Two that the Foundation would like to comment on here are early detection and rapid response to incipient infestations, and the establishment of native biodiversity conservation areas, or restoration sanctuaries, that are maintained as free-as-possible of non-native invasive species providing habitats in which native species can survive and thrive.

Prevention and early detection of incipient infestations by alien species is critical to slowing the loss of Hawaii's native biodiversity to non-natives, and indeed the state has one of the world's longest-standing and most comprehensive quarantine systems. CGAPS reports that the list of potentially devastating pests intercepted by this system includes the Asian longhorn beetle, biting sand flies, red fire ants, piranhas and the brown tree snake. In reference to this last species, the brown tree snake - which devastated the native biodiversity of Guam after being introduced there, the Foundation commends the Committee on its leadership to provide for the control and eradication of this species and to prevent its introduction into Hawaii and other areas of the United States through H.R. 3479, the Brown Tree Snake Control and Eradication Act of 2003.

But early detection of incipient infestations by non-native species must be followed by rapid response to eradicate their populations while small, localized and vulnerable. An example of the effectiveness of early detection and rapid response in preventing ecological disaster is provided by a Foundation funded project in California to eradicate an incipient infestation of Caulerpa taxifolia, an extremely invasive marine alga. Caulerpa was introduced to the Mediterranean off the coast of Monaco about 1984 – probably released from an aquarium. In the favorable waters and without any natural controls, the alga quickly began to spread out of control, changing the rich, diverse and colorful seas of the Mediterranean coast into mats of just this single species. By the year 2000, what started as a single population covering about 1 square yard, had expanded to cover 10,000 acres; by 2001 estimates of its coverage were as high as 30,000 acres. On June 12, 2000 an incipient infestation of Caulerpa was discovered in the Agua Hedionda Lagoon of San Diego County, California. Within two weeks divers were in the water beginning treatment and as a result there have been no signs of Caulerpa in the lagoon since 2002. The success of this early eradication was dependant on the effective collaboration of the relevant state and federal regulatory agencies who all granted emergency permits in record time, and the availability of funds to accomplish the efforts. The total cost to treat 11,000 square feet of the sea floor was $2,811,000 with funding provided by the Foundation, through the PTI program, the California Coastal Commission, The City of Carlsbad, NOAA and others. Though this was a costly effort to respond rapidly to the incipient infestation, had the effort been delayed the costs of control and the resulting economic losses would have rapidly run into hundreds of millions of dollars.

This example illustrates not only the effectiveness of rapid response to incipient infestations of non-native species, but also to its costs. State and federal agencies, charged with preventing, eradicating and controlling non-native species can rarely if ever predict costs that will be associated with rapid responses to incipient infestations. The Foundation commends the Committee for recognizing and taking leadership on addressing this issue through provisions in H.R. 2310, the Species Protection and Conservation of the Environment Act, which authorizes for five years the establishment and funding of a rapid response capability by the Secretary of the Interior to provide assistance to local and state agencies or

nongovernmental entities for the eradication of an immediate harmful non-native species threat. Building on this base toward making this funding sustainable, and in recognition of the overwhelming need for rapid response resources in the Hawaiian Archipelago, the Foundation recommends the establishment of a Hawaiian Invasive Species Rapid Response Fund which would exist as a public/private partnership to bring together resources sufficient to address these needs over the long term. Federal, state, local and private funds would be brought together to provide a corpus for investment and from which disbursements would be made to projects for the eradication or immediate control of harmful non-native species. The fund would have oversight by the relevant federal and state regulatory agencies to provide guidance on disbursements and to assure coordinated permitting and regulation of the funded activities. Additional sources of monies could come from environmental damage assessments and settlements directed to the Fund as appropriate by policy and law. The annual need for rapid response funds in Hawaii is great. CGAPS estimates that the financial need per year to deal with the worst truly incipient infestations is $4.6 million.

Given the number of non-native species that are established in Hawaii it is impractical, and perhaps even undesirable, to contemplate control or elimination of them all from all regions. Yet, the conservation of Hawaii's native biodiversity is inconsistent with even low populations of a few of the most virulent and damaging of non-native species. To address this, the Foundation suggests the establishment of native biodiversity conservation areas, perhaps better called restoration sanctuaries, on sites identified as of the highest priority and practicality for the conservation of Hawaii's native species. These areas would be fenced to restrict the entrance of alien mammals, and once enclosed have the exiting populations of non-native mammals and plants removed. This approach has been successfully used in New Zealand, an island nation with conservation challenges very similar to those of Hawaii, where they have developed fence design and construction technology sufficient to exclude the problematic mammals currently present in Hawaii.

The biological benefits provided by these sanctuaries would include: the increase of native animals present at the sites following the elimination of non-native mammal predation and competition, the recovery of native plants to become the dominant vegetation as herbivory, disturbance and seed predation are reduced or eliminated, the reintroduction to the site of extirpated animals and plant species as a significant step toward recovery, and finally the removal of certain vectors for non-native diseases such as toxoplasmosis which is fatal to some native birds and carried by feral cats. Among the public education benefits that would accrue from these sanctuaries are: promoting a vision that invasive alien species can be controlled, that the loss of native biodiversity is not inevitable; and providing a visual comparative baseline for native Hawaiian forests, revealing the degree and extent of degradation of other forests and potentially leading to greater conservation of forest lands. Societal benefits accruing from these sanctuaries would include: the ability of native Hawaiians to gather traditional forest products in abundance and perform ritual activities in an environment free of non-native elements; increased populations of federally listed plants in these sanctuaries may reduce the need for control measures on other lands; and the sites would be a focus for scientific research on forest dynamics, evolutionary biology, ecology, etc., leading to further insights into island biology.

The costs for establishing these native biodiversity conservation areas would be high, but far less than the costs of island-wide non-native mammal eradication efforts. Costs estimates provided by the US Fish and Wildlife Service for the establishment of one of these sanctuaries, based on efforts funded through the Foundation for fencing critical bird conservation areas on the island of Hawaii, are $2.6 million for a putative site that has no permanent streams, is above the mosquito zone, has an access road, and is approximately one square mile in size. These costs include installation of pest-proof fencing using the New Zealand technology, eradication and monitoring of non-native mammals (mice, rats, mongoose, cats, dogs, cattle, sheep, goats and mouflon), invasive plant control and native plant out-planting, NEPA and ESA compliance, and infrastructure for sanctuary visitors. The number, size and location of these sanctuaries would need to be an issue of considerable study and review, but the establishment of these biodiversity conservation areas, or sanctuaries, would provide renewed hope for conservation of Hawaii's remarkable yet imperiled native biodiversity.

The Foundation appreciates the opportunity to appear before this Committee to discuss the issue of invasive species in the Hawaiian Archipelago. We would like to thank you Mr. Chairman, for your efforts to address this issue through H.R. 2310 and H.R. 3479. We look forward to continuing to work with the Committee. This concludes my remarks, I am happy to answer any questions that you may have.