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INVASIVE AND EXOTIC SPECIES IN NATIONAL WILDLIFE REFUGE WILDERNESS AREAS



Keywords: control programs, exotic species, invasive species, monitoring, National Wildlife Refuges, U.S. Fish and Wildlife Service, wilderness areas

Background & Management Issues: In recent years, exotic species' invasions throughout North America have greatly impacted native species, ecosystem processes, the economy, and human health. As a result, the U.S. Fish and Wildlife Service (USFWS) made the monitoring and management of invasive species a high priority. To investigate their status and management in wilderness, the Aldo Leopold Wilderness Research Institute surveyed USFWS wilderness areas for invasive and exotic species. Wilderness areas were targeted because they are important refuges for native species and serve as ecological reference points for non-wilderness lands.

Project Objectives:

To assess the current status and management of invasive plants and exotic animals and pathogens in FWS wilderness areas.

To create an Internet-accessible database for use by managers to obtain information from other managers addressing similar issues.

Project Description: In 2001, USFWS Refuges containing designated wilderness were surveyed. Survey respondents provided a list of all

invasive plants and exotic animals and pathogens known to occur in their wilderness and answered questions about monitoring, control efforts, and the perceived problem severity.

Results: The survey response rate was 97% (68 of 70 wilderness areas). Altogether, invasive and exotic species occurred within USFWS wilderness in 201 instances. When asked to identify the species of "greatest concern," respondents listed 95 occurrences.

When asked to rate the problem severity, respondents considered exotic animals to be a significant problem ("one of the top 10 management priorities") in 22 wilderness areas. Respondents deemed invasive plants a significant problem in 12 wilderness areas and exotic pathogens a significant problem in only one wilderness.

In the lower 48 states, three USFWS Regions reported higher numbers of invasive plants and exotic animals than the other Regions: Region 2 (Southwest), Region 4 (Southeast), and Region 6 (Mountain-Prairie). Many of the reported species are known to alter ecosystem structure and function. In Alaska, exotic animals were of particular concern in 10 wilderness areas within the Alaska Maritime National Wildlife Refuge where introduced foxes and rats threaten island bird populations.

Refuge personnel did not routinely conduct systematic surveys for invasive and exotic species within wilderness (within 19% of the wilderness areas for plants, 18% for animals, and 10% for pathogens), but instead relied on casual observations or best guesses for their information. Respondents commonly cited a lack of staff, funding, or both as a barrier to implementation of monitoring and management programs.

Control programs were being conducted in 19 wilderness areas for invasive plants, in 15 for exotic animals, and in two for exotic pathogens. For plants, 17 of the control efforts involved either chemical use or release of biological control agents. Despite the potential of unintended, adverse effects from these measures and the completion of environmental analyses in some cases, a minimum tool analysis had been completed in only three cases.

Management Implications:

- ❖ Several of the reported invasive plant species (e.g., saltcedar, cheatgrass, Brazilian pepper, Chinese tallow) have the potential to greatly alter ecosystem structure and function. In addition, several of the reported exotic animal species (foxes and rats on islands, feral burros, feral hogs) can impact native wildlife and vegetation. Therefore, control efforts within USFWS wilderness may be deemed necessary to maintain natural conditions.
- ❖ The Wilderness Act requires that wilderness be “untrammeled” (i.e., free from human manipulation). Thus, managers may need to carefully consider the minimum tool, structure, or equipment necessary to achieve wilderness management objectives. A formal minimum tool decision analysis could be incorporated into future environmental analyses conducted for wilderness control efforts.
- ❖ Wilderness areas within the same USFWS Regions often reported similar invasive species and management issues. Therefore, further dialogue among managers within Regions may facilitate prevention and control efforts.
- ❖ Many USFWS wilderness areas are small and relatively isolated, making the prevention, control, and eradication of invasive exotic species a feasible objective. Indeed, several successful eradication and prevention programs were reported by survey respondents. For example, some invasive plant species had been eradicated from two island wilderness areas in Florida, the J. N. “Ding” Darling and Florida Keys Wildernesses. A common trait of successful programs was the involvement of other federal, state, and local agencies as well as local communities.
- ❖ Many respondents reported that a lack of funding and staff made it difficult to adequately manage invasive and exotic species, both within and outside of wilderness. Given these limitations, strategies could be developed to most efficiently utilize existing personnel. All refuge personnel (including non-biologists) could be trained to identify and note the location of invasive exotic species when working in the field. For example, National Park Service and U.S. Forest Service backcountry rangers sometimes record the location of invasive plants and/or remove small infestations using the proper methods for each species. Ultimately, however, efforts to increase biological staffing on the refuges may be needed.
- ❖ The USFWS is developing a monitoring protocol for use throughout the National Wildlife Refuge System. The protocol could be designed to allow for the comparison of invasive and exotic species’ distributions within and outside of wilderness.

Publications / Products:

- ❖ Tempel, Douglas; Cilimburg, Amy; Wright, Vita. 2003. The status and management of invasive species in National Wildlife Refuge wilderness areas. Missoula, MT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Aldo Leopold Wilderness Research Institute. [Read it here!](#)



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