

Supporting the Natives, Defeating Invaders: An Invasive Species Management Workshop for National Wildlife Refuges

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Refuge managers are constantly balancing a multitude of responsibilities, but setting priorities for managing invasive species is especially difficult. On many refuges, battling invasive species can consume a majority of the operational resources devoted to supporting healthy habitats for fish, wildlife, and other high priority species. How can Refuge managers get 'ahead of the curve' in the battle to defeat invasive species on their lands? What are their most pressing needs for help from the scientific community? What tools will help managers do their jobs better?



Small group exercises were used to elicit information from Refuge staff about their invasive species research needs.

Those were the questions that 33 biologists, managers, and scientists from the Midwest, Northeast, and Southeast Regions of the FWS recently addressed when they met in March at John Heinz at Tinicum NWR in Philadelphia. The meeting was planned by refuge staff and the Regional and National Invasive Species Coordinators to provide information to the scientific community, especially the U.S. Geological Survey (USGS), about pressing invasive species research needs on Refuges.

The workshop was part symposium (eight invited speakers provided updates on invasive species tools and resources) and part discussions and small group exercises. Refuge biologists were heavily represented and several USGS and academic scientists also attended. Through its National Wildlife Refuge Cooperative Research Program (RCRP), the USGS periodically solicits requests for proposals (RFPs) from its scientists to study management problems faced by refuges. The workshop was designed to prepare for the next RFP.

Prior to the workshop, a survey was issued to all Refuge System stations in the Midwest and Northeastern Regions to assess their priorities and needs with regard to invasive species. Eighty-five percent of stations (105 of 123 stations reporting) manage invasive species; among those, 69% rank invasive plant control as a high or very high priority.

The top five criteria (in rank order) stations use to rank invasive plant species for control are: 1) species that threaten habitats or resources of concern, 2) species with a high likelihood of control or eradication, 3) new invaders, 4) most infested locations on the station, and 5) species treated historically. Effort on the station is allocated (in rank order) to: 1) early detection of new, aggressive invaders, 2) treatment of known invaders, 3) evaluating effectiveness of past control efforts, 4) researching treatment methods, 5) mapping distributions, and 6) risk analysis of potential invaders.

There were Regional differences in the progress of mapping of invasive plants. Fourteen percent of Region 5 stations have completed mapping their invasive plants; no stations in Region 3 have completed mapping and only 7% are over 50% completed. Monitoring the effectiveness of past treatments is a high priority for refuges; 83% of stations conduct some type of effectiveness monitoring, but 72% are concerned that their monitoring is inadequate, mainly due to lack of resources.



Dr. Ron Hiebert (left), National Park Service, shared his experience with a decision support tool he developed, the Alien Plant Ranking System (APRS). This tool is available for refuges to employ in ranking invasive species for management.

The highest priority technical and research needs identified by refuges with regard to invasive plants were (in rank order): 1) assistance with inventory and mapping, 2) synopsis of best management practices (BMPs), 3) research to identify BMPs for specific problem species, 4) decision tools to help prioritize effort, 5) a database to assess and track management actions, and 6) monitoring protocols.

Workshop participants decided their highest need from the science community is help in developing a structured, adaptive management approach to supporting healthy, native plant communities, taking into consideration the impact of invasive species. The focus is on supporting ecosystem processes in the face of a stressor, rather than on single-invasive-species

control. Refuges could benefit from an adaptive management case study focused on a specific habitat type (forests, grasslands, shrublands, wetlands, salt marsh, etc.) found in multiple Regions and on multiple refuges. The type of habitat is flexible; there is a pressing need for this work in all types of habitats.

The first step is to assess the problem by modeling a particular ecosystem (forests, grasslands, shrublands, wetlands, salt marsh etc.). Included within the model will be the natural processes that shape the ecosystem, time frames, human impacts, habitat management manipulations, and other influences. Critical components of the model will be how invasive species are expected to respond to management of the ecosystem and the key uncertainties. The model should incorporate invasive species impacts to refuge resource objectives, invasive problems that may naturally occur, and invasive problems that may be exacerbated or solved through management interventions.



Workshop participants scored invasive plants on their refuge using the Alien Plant Ranking System and considered how the ranking compares to their current management priorities.

The model should help managers make decisions about management actions. The key uncertainties about how the system will respond to different management decisions will be identified and developed into alternative hypotheses. The model inputs are the management actions available to managers; the outputs are outcomes relevant to management objectives. Finally, monitoring should be designed to update the model so that it becomes successively better at guiding future management decisions.



Informal sharing was an important benefit of meeting together in a workshop setting. We took a break and visited the overlook at John Heinz at Tinicum NWR.

There are several existing decision support tools available to managers, including an early detection system (designed by USGS) and an invasive plant ranking system (in use by the National Park Service). Refuges want to take advantage of these resources by incorporating them into a refuge-scale adaptive, decision-making framework, if possible.



Refuge, USGS, and University participants shared their questions and ideas about needed invasive species research.

The primary product of this work will be a habitat-focused model of ecosystem process that predicts responses to management actions to sustain or restore a healthy ecosystem while controlling invasives. Additional products include a monitoring plan designed to update the model based on how study areas on multiple refuges actually do respond, a database to manage the monitoring data collected at multiple refuges, and a process for summarizing the data for purposes of updating the decision model and sharing information among refuges.

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