Managing the Forest and the Trees:
A Forest Management Workshop for National Wildlife Refuges

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If you could design a research project to address the most pressing forest management issue on National Wildlife Refuges (NWR) in the midwestern and northeastern U.S., what would it look like? That was the question that 39 biologists, managers, and scientists from the Midwest and Northeast Regions of the FWS struggled with for three warm August days at Big Oaks NWR in southern Indiana (2006). The meeting was planned by refuge staff from the two Regions to provide information to USGS about pressing forest management needs in hopes that USGS would initiate new adaptive management research focused on those needs. (USGS plans to issue a call for research proposals on several topics; forest management is one of the topics.) The workshop was part symposium (eight invited speakers provided updates on forest research and management) and part discussions designed to elicit specific information about forest problems and management objectives shared by refuges.

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

The workshop was preceded by a survey issued to all Refuge System stations in the Midwest and Northeastern Regions. The survey indicated that 68% of refuges responding (63 of 92 stations reporting) own forests; among those, 86% are actively managing their forests. A large proportion of those refuges (41%) manage more than 5,000 acres of forest and 65% manage more than 1000 acres. Refuges are concerned with the overall ecological integrity of their forests as well as with providing habitat for specific focal species. However, almost half (47%) consider their forests to be below average or in poor ecological condition. Clearly, the NWR System is justified in focusing effort on improving the ecological health of its forests and welcomes help from the wider scientific community.

What forest management issues do refuge staff identify as the most challenging? One major issue was a lack of information about how their forests used to function before they were heavily exploited and manipulated. This is a need common to many forest managers! Another was putting the refuge in the context of the surrounding landscape. What should our restoration targets be, based on what we know about the site conditions, how our neighbors and partners are managing their lands, and the priority species identified by both the Service and the wider conservation community? Forests are not static; they proceed through successional cycles. How do you set benchmarks for restoration in a dynamic system? Any long-term management strategies need to consider both natural and human-induced disturbances and how to work with these disturbances to support a multi-aged, diverse forest community. Another difficulty forest managers face is that they rarely live long enough to see the full results of their management actions! Therefore, forest managers need a solid scientific basis for making management decisions and they need to use models to link management actions with desired future conditions. Fortunately, society has invested heavily in silvicultural research, so a lot of information is available to guide management actions. Ferreting out the needed information from this large literature base is usually the biggest problem!

Dr. Joe Robb, project leader at Big Oaks NWR, describes invasive species problems in forests on the refuge.

The biggest potential threats to the forests are invasive species that seem to be growing in number and aggressiveness each year along with more subtle, but significant issues, like subdivision of land ownership in the northern parts of the Regions where large blocks of forest were once owned and managed by a few timber companies. The issues faced by managers of floodplain forests were somewhat unique. Forest regeneration is a serious problem in floodplain forests because of abnormal hydrological cycles often outside the control of refuge managers (rivers diked and levied for navigation or flood control).

A refuge tour and social held in the evening at Big Oaks NWR allowed workshop participants to share ideas in a relaxed atmosphere. Wayne Brininger is pointing out a Henslow's Sparrow, a high priority bird species that nests at Big Oaks NWR.

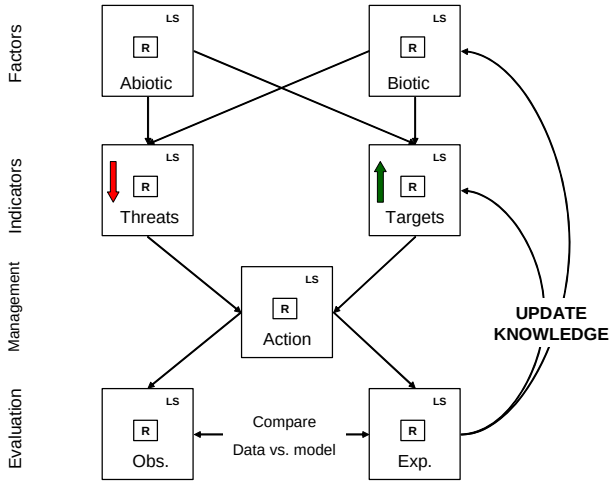
At the end of the workshop, we reviewed our three days of conversations and tried to define what type of research project would help refuges address some of the issues above. Three statements captured our main ideas. Refuges wanted a:

1. Multi-scaled, context-derived project to assess and evaluate landcover and landscape indices, providing a context for an adaptive management study addressing regeneration and invasive species.

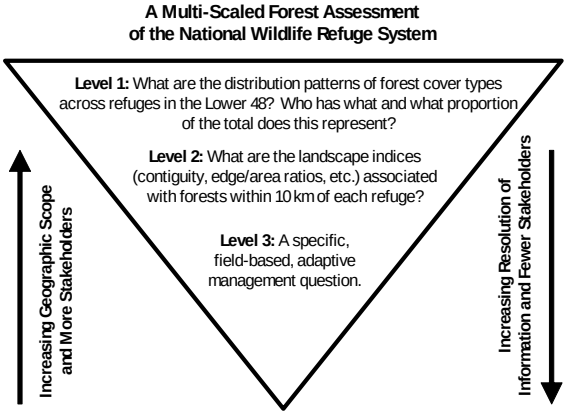
2. Process for maintaining a forest sustainability cycle to achieve ecological integrity, scaled for refuges within a landscape context.

3. Decision-support model to assess a variety of factors for conversion of open areas to desired forest condition (predictive model that leads to forest type and spatial location).

Eric Lonsdorf and Greg Corace offered conceptual models that illustrate how these comprehensive needs can be broken into elements to be worked on separately and then brought together in a synthetic framework:



Londsorf conceptual model of the elements of decision-making for setting land management objectives, at two spatial scales, landscape (LS) and refuge (R). First, map biotic and abiotic factors at the landscape and refuge scales. Then, identify threats and conservation targets at both spatial scales and model how those factors may influence them. From this analysis, several possible management actions are derived. Using adaptive management, implement the preferred action (or decision), compare observed results with expected results, and update knowledge and probabilities of success for future actions or decisions.



Corace conceptual model illustrating a multi-scaled, stepwise approach to addressing forest information needs on refuges. Levels 1 and 2 provide the context; an adaptive management project is Level 3. Level 1 and 2 information is needed first; this information will help to define Level 3 (adaptive management) research projects.

In summary, there was general agreement that just having a conversation about forest management among Refuges and between refuge managers and the scientific community was enormously helpful as a starting point for future collaboration. This was the first multi-Region, multi-disciplinary workshop ever held in the Midwest and Northeast that focused on identifying research needs for forest management on National Wildlife Refuges. We have some work to do; the first step

was clarifying the issues and building resolve within the Service and USGS to address them.

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