Reed Canary Grass Adaptive Management

A Region 3 and Region 6 Refuge Project

Division of Biological Resources

The Region 3 Division of Biological Resources supports the National Wildlife Refuge System and Partners for Fish and Wildlife Program by providing direction and science support for biological activities related to the conservation and management of fish, wildlife, and plant resources and their habitats. The Division also provides science support for national and regional priorities coordinated by the Natural Resource Leadership Team, Landscape Conservation Cooperatives, the Regional Science Applications Office, and the Natural Resources Program Center.

Why Adaptive Management?

Invasive species challenge the efforts of the National Wildlife Refuge System to preserve native plant community habitats. Reed canary grass (RCG) is an invasive plant species that has dramatically increased in abundance. The goal of this project is to ensure that efforts to control RCG are well-informed and improve over time through the use of predictive models and a structured monitoring design. It will allow managers to *make good, defensible decisions about when, where, and how to treat RCG to maintain or restore target communities and the wildlife they support.*

FWS Region 3 and Region 6 Cooperative Project

Reed canary grass has partially or heavily invaded nearly 40,000 acres of refuge lands located in U.S. Fish and Wildlife Service Region 3 (Midwest Region) and Region 6 (Mountain-Prairie Region). Encroachment of RCG into floodplain forests and wet meadows has been observed throughout the US. Although mechanisms for its increased dominance are varied, RCG invasion is linked to increased soil nitrogen enrichment, impaired hydrology, and construction impacts to wetlands. In the Upper Mississippi River system, extreme flooding events deposit large quantities of nutrient-rich sediments on floodplains and kill nearly all of the sapling and seedling trees in many areas. Floods in the Midwestern US appear to have accelerated RCG spread in many large river floodplains throughout the Mississippi River drainage. Ten refuges were involved in a pilot project. Region 3 refuges included Winona, La Crosse and McGregor districts of the Upper Mississippi River National Wildlife and Fish Refuge, and Minnesota Valley, Port Louisa, Squaw Creek and Swan Lake National Wildlife Refuges. Cooperators from Region 6 included Tewaukan National Wildlife Refuge and Madison River and Rainwater Basin Wetland Management Districts. Investigators and Science Team members were drawn from USGS Cooperative Fish and Wildlife Research Units of Florida and Georgia, the Universities of Florida and Minnesota and the Chicago Botanic Garden.

The Question

Managers were interested in knowing, "What is the most cost-effective way to convert Reed Canary Grass dominated lands back to desirable wet meadow and flood plain forest native vegetation?"

Project Objectives

Objectives were identified jointly by the science team and cooperators: 1) Control RCG while promoting desired vegetation; 2) Use logistically and economically realistic management actions with demonstrated efficacy that can be implemented on large scales; 3) Address the key uncertainties representing common refuge management scenarios.

Project Design

We targeted wet meadow and floodplain forest ecosystems. Management units were selected that represented plant compositions ranging from RCG dominated to native species dominated. In RCG dominated meadow sites, effectiveness of vegetation eradication followed by seeding native species was compared to managing the existing vegetation to promote native species. Grass specific herbicide (fusilade) and broad spectrum herbicide (glyphosate) were used to selectively treat RCG or to eliminate all vegetation respectively.

In forest sites, after eradication of all vegetation with broad spectrum herbicide, two revegetation approaches were compared: 1) reliance on tree seedling establishment via natural seed rain from surrounding forest trees, and 2) direct seeding with appropriate native tree species.

Project Protocols

Long term monitoring protocols were developed to retain a high level of accuracy from data collected with reasonable field effort. In spring, only RCG stem density is monitored. Monitoring at peak vegetation (August) requires recording cover categories of plant guilds and RCG stem density. At forested sites we also record tree numbers and track whether plots have greater or less than 50 % native herbaceous cover. Treatment protocols are based on routine management practices, and include herbicide application and broadcast seeding for forest and meadow sites.

Decision Support Tool

The current state of management units is determined by vegetation cover and nitrogen level, and in forests, distance from forested edge. The probability of transitioning to an improved state (more native species, or more trees) is determined through competing models for all possible management actions. This information is used to generate recommendations for each management unit.

Data Management and User Interface

The Reed Canary Grass Adaptive Management Project is housed on a DOI accessible Fish and Wildlife SharePoint site. All relevant protocol and guidance documents are housed on SharePoint as well as project final reports, records and publications. Field data collected in 2013 will be entered via a web-based portal directly into an access database housed on SharePoint and linked to the decision tool. Action recommendations for each management unit will be disseminated to participants through the RCGAM SharePoint site.

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