

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Avian response to structural changes in willow dominated habitats in the Northern Range, Yellowstone National Park.

Discipline: Natural

Type of Project: Research

Funding Agency: National Park Service

Other Partners/Cooperators: Montana State University

Effective Dates: 6/1/2005 - 12/31/2008

Funding Amount: \$24,000.00

Investigators and Agency Representative:

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Project Abstract:

This "release" of willow and cottonwood coincides with the period of the presence of wolves since their reintroduction in 1995. Researchers suggest that the expansion of deciduous woody vegetation is the result of a "trophic cascade" where by predation by wolves has altered the density and foraging habitats of elk and other ungulates resulting in several changes in the ecosystem including reduced herbivory and consequential growth of deciduous woody plants.

Regardless of the cause, continued increase in willow height and possible future expansion of aerial extent of deciduous wood plants in the Northern Range may possibly lead to a number of changes in biodiversity and ecosystem function. For example, bird species richness is especially high in deciduous woodlands in the GYE and several bird species are found only in this habitat type. Willow flycatcher, common yellowthroat, veery, and northern water thrush are strongly associated with willow habitats in this region. The current dynamics on the Northern Range present a unique opportunity to better understand how the population dynamics and diversity of bird populations and communities may respond to changes in deciduous woody habitats as driven by climate or trophic cascades.

The purpose of this study is to obtain and analyze pilot data on bird species abundances and community diversity in willow habitats along a gradient in stature and aerial extent and to compare the results with those of previous studies in the extensive willow habitats that are more typical outside of the Northern Range. The results will be used as a basis for attempting to obtain funding for longer-term studies of the causes of deciduous woody plant release and the consequences for bird populations and the ecosystem services they provide.

Objectives include: 1. Determine the extent to which bird species presence and abundance and community diversity vary with the vertical stature and aerial extent of willow habitats within the Northern Range of Yellowstone National Park, 2. Compare results from this study with those of previous studies in well-developed willow habitats in the northwest portion of Greater Yellowstone, 3. Determine the extent to which bird species presence, abundance, and community diversity vary with the vertical stature and aerial extent of willow stand types (Protected, Released, Suppressed) within the Northern Range of Yellowstone National Park, and 4. Compare results from this study with those of previous studies in well-developed willow habitats in the northwest portion of Greater Yellowstone.

Outcomes with Completion Dates:

1) Hard copy/electronic report including analysis of the pilot study of bird and vegetation data collected in the field (DUE 06-01-2006).

2) M.S. thesis to be completed May 2008. Field data will be collected over 2 seasons from May - August of 2006 and 2007. A formal annual report will be submitted to Yellowstone National Park in June 2007 (interim report), and the final report in thesis format will be submitted by 1 June 2008. Deliverables will include quantitative data on bird counts by site and year, and aggregated by willow stand type. The data will be further submitted in manuscript form for publication in a peer-reviewed scientific journal.

Keywords: birds, willow, species abundance, trophic cascade, species richness, Northern Range, Yellowstone National Park, Montana State University

For Administrative Use Only:

Date Annual Report Received:

Date Final Report Received:

Publications, etc. on file: