

Missouri River Least Tern & Piping Plover Research Program Objectives

Science needs for management of the Missouri River for the Federally listed least tern and piping plover include habitat quantity, habitat quality, and biological responses to habitat change. A team of scientists and support staff at Northern Prairie Wildlife Research Center is addressing these needs through six integrated field studies. Information gained from these studies will provide a scientific basis for implementation of a Biological Opinion that is targeted at preventing jeopardy to these species. These results will be useful to many agencies and organizations with management interests in the Missouri River.

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Least Tern Foraging Ecology & Productivity



This study focuses on least tern use of natural and mechanically created sandbar habitats. Principal objectives are to:

- ◆ Compare estimated nest numbers, nest survival, and reproductive success on natural and created sandbars.
- ◆ Evaluate physical habitat factors affecting nest location and survival.
- ◆ Assess foraging and prey capture rates of least terns in relation to sandbar habitats.
- ◆ Assess abundance of least tern prey in relation to created and natural sandbars.

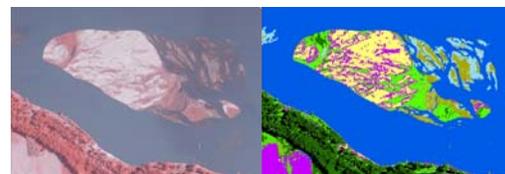
Evaluation of Tern & Plover Productivity Monitoring Procedures



Long-term monitoring of least tern and piping plover productivity requires scientifically valid and reliable monitoring procedures. This study's objectives are to:

- ◆ Assess the accuracy of existing procedures for monitoring numbers of adults, nests, and fledged young, and survival rates and fates of nests.
- ◆ Provide guidance on metrics needed to assess adult numbers and reproductive success of terns and plovers.
- ◆ Develop a standardized protocol for collecting productivity data.

Measuring & Mapping Emergent Sandbar Habitat



Accurate and efficient methods for quantifying habitat in relation to flow regime are needed. Objectives of the study are to:

- ◆ Evaluate alternative remotely sensed data sources and analysis methods.
- ◆ Develop, evaluate, and apply object-based digital image processing to quantify habitats from satellite imagery.
- ◆ Monitor temporal changes in habitat availability and spatial distribution.
- ◆ Develop models to identify habitat variables and scales that are useful for predicting nest density and success.

Monitoring Procedures for Emergent Sandbar Habitat



To detect change in a resource of management importance, it is necessary to have baseline information on abundance of those resources. In support of the Emergent Sandbar Habitat (ESH) program, this study will:

- ◆ Evaluate biological responses to ESH projects by monitoring habitat features on ESH and control sites.
- ◆ Develop a Habitat Monitoring Plan that provides guidance on appropriate metrics for measuring features of nesting habitats for piping plovers and least terns.

Piping Plover Habitat Selection on Lake Sakakawea



Declining water levels in Lake Sakakawea have provided an abundance of exposed shoreline nesting habitat for piping plovers. To understand dynamics of the reservoir and the plovers it supports, this study will:

- ◆ Examine nesting habitat selection of piping plovers at multiple spatial scales.
- ◆ Determine features that constitute quality nesting habitat on Lake Sakakawea.
- ◆ Estimate availability of preferred nesting habitat on the Lake Sakakawea shoreline.
- ◆ Predict effects of changing lake levels on abundance of plover nesting habitat.

Measuring Human Disturbance on Emergent Sandbars



Assessing type, duration, and frequency of human disturbance on emergent sandbar habitats is vital for understanding potential effects on terns and plovers, and for evaluation of protection efforts for these sensitive species and their habitats. Objectives of this study are to:

- ◆ Describe human presence associated with sandbars and adjacent river habitats used by terns and plovers.
- ◆ Relate productivity parameters (e.g., nest success) to observed indices of human presence and activities.