



Sustainable Rivers Program

Waterbird Use and Vegetative Response to Reservoir Water Management Lake Red Rock, Iowa (2021 Annual Report)

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and other cooperating organizations

Waterbird use and vegetation response to controlled reservoir water level management in Iowa

Background

The Sustainable Rivers Program (SRP), a cooperative effort between the U.S. Army Corps of Engineers and The Nature Conservancy, aims to better develop comprehensive water level management strategies for flood-control reservoirs. A main area of interest is manipulating water to benefit wildlife, especially migratory birds. Along with continuously exposing new foraging habitat, the removal of water and allowing vegetation growth on exposed mudflats is another potential benefit to migratory birds.

Beginning in July 2021 a controlled water draw-down was initiated at Red Rock Reservoir along the Des Moines River in central Iowa and a graduate research assistant (M.S.) at Iowa State University conducted waterbird and vegetation surveys to monitor responses to this strategy.

Objectives

- 1) Monitor waterbird responses to dropping water levels during fall migration.
- 2) Measure vegetation responses (species diversity, cover, etc.) to dropping water levels in late summer.
- 3) Document stop-over use to estimate residency time for Least Sandpipers (*Calidris minutilla*) during fall migration.

Waterbird surveys, vegetation data, and stopover ecology results will be combined to assess overall wildlife use and benefits of the SRP water management strategy once additional survey seasons are complete.

Field Methods

To meet these objectives, field work for this project will occur in the western reaches of the reservoir in the alluvial delta region where sediment deposition is occurring.

Waterbirds: Waterbird surveys were conducted weekly from 20 July to 23 September 2021. A single observer conducted modified, standardized surveys where all the waterbird species present and the number of individuals of each are documented in all suitable and accessible habitat in this area.

Vegetation: Vegetation monitoring took place from 22 July to 12 September 2021 (8 weeks). To measure vegetation responses there were 194 quadrats (20 x 50cm each) placed along 25 randomly located line transects in the delta region. Quadrats were added to transects weekly at the receding waterline and sampled once per week. Metrics recorded during each sample included plant species, number of stems, percent cover, seed presence, and distance from the plot to the transect starting point.

Stopover Ecology: Least Sandpipers were captured using mist nets and then fitted with a VHF transmitter to monitor stopover ecology. In addition to being tagged with a transmitter, measures of body mass, tarsus length, and wing chord were taken on each individual. These measurements will later be used to sex and characterize body condition. Tagged birds were relocated weekly by tracking them with hand-held receivers, scanning the study area every 1-2 days until they have departed.

2021 Outcomes

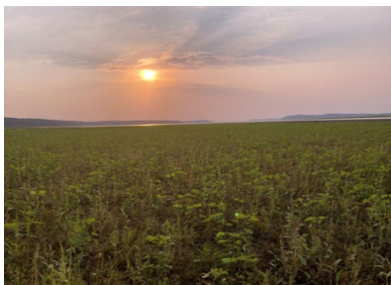
Waterbird Surveys

A total of 49 waterbird species were documented in the 14 surveys conducted during the fall 2021 migration. The most prominent sub-groups found during surveys included shorebirds (25 *spp.*) and waterfowl (9 *spp.*); and all other waterbirds totaled 15 *spp.*

On average there was 30 species (SD = 6.14) recorded on a survey, with species diversity peaking during the first week of September. There were >175,000 individuals counted across all surveys during the fall 2021 migration period. American White Pelican was the most numerous species encountered (~73,000 individuals; 41.8% of total). Pectoral Sandpiper was the most abundant shorebird species with >20,000 individuals observed across all surveys followed by the Least Sandpiper (>4,500 individuals). Unusual species found included Piping Plover, Red Knot, Ruddy Turnstone, Marbled Godwit, and Western Sandpiper.

Vegetation Surveys

Preliminary summaries of vegetation data were examined for species diversity, time needed for vegetation establishment and vegetation growth as measured by percent cover and presence of seed (Photos 1 and 2).



Photos 1 and 2. Establishment of vegetation on exposed mud flat (ISU photos).

Transects averaged 8 plant species (SD = 1.52) by the end of the survey on the mud exposed by dropping water levels. Overall, quadrats needed an average of 1.47 weeks (SD = 0.86) to have any vegetation present, and of the quadrats within the exposed section, 81 of 169 reached at least 50% vegetation cover during the study season. It took vegetation an average of 3.38 weeks (SD = 0.90) to reach 50% cover, 3.91 weeks (SD = 1.07) to reach 75% cover, and 4.43 weeks (SD = 0.96) to reach 100% cover. Lastly, out of all the vegetation that was growing on these exposed mudflats 11 species of plants came to seed. It took an average of 2.4 weeks (SD = 0.89) for the first species within a quadrat to seed and the mean time for vegetation to come to seed was 4.06 weeks (SD = 1.23).

From these preliminary summaries we see that vegetation benefits of this SRP management strategy mainly accrue 2-5 weeks post exposure; vegetation growth tends to slow by late August as the end of the growing season nears. The plant community has low diversity on these exposed mudflats but includes important wildlife foods.

Stopover Ecology

A total of 60 VHF transmitters were deployed on Least Sandpipers between 27 July and 27 August 2021 (Photos 3 and 4). Of those 60 individuals, 45 were aged as adults and 15 juveniles. Our last resight of a tagged individual was on 13 September 2021.

Future Work

All surveys conducted during the 2021 fall migration drawdown period will be repeated during a similar time frame in 2022 (assuming adequate water conditions).



Photos 3 and 4. Deployment of transmitters and tracking of shorebirds (ISU photos).