Sandhills Stream Restoration and Native Prairie Fishes

Tevyn Pieper – Sandhills Task Force

Cassidy Wessel – Nebraska Game and Parks Commission

Chad Christiansen – US Fish and Wildlife Service

Freshwater ecosystems cover less than 1% of the earth, but host ~1/3 of all vertebrate species and 10% of all species (Strayer and Dudgeon 2010).

Populations of freshwater vertebrates have fallen at over twice the rate of land or ocean vertebrates (Grooten and Almond 2018).

Extinction rates of freshwater animals in North America (unionid mussels, crayfishes, fishes and amphibians) may be as high as 4% per decade, 5x higher than rates of any terrestrial taxa (Ricciardi and Rasmussen 1999).

Dudgeon et al 2006:

1) Overexploitation
2) Water Pollution
3) Flow Modification
4) Habitat Loss/ Degradation
5) Invasive Species

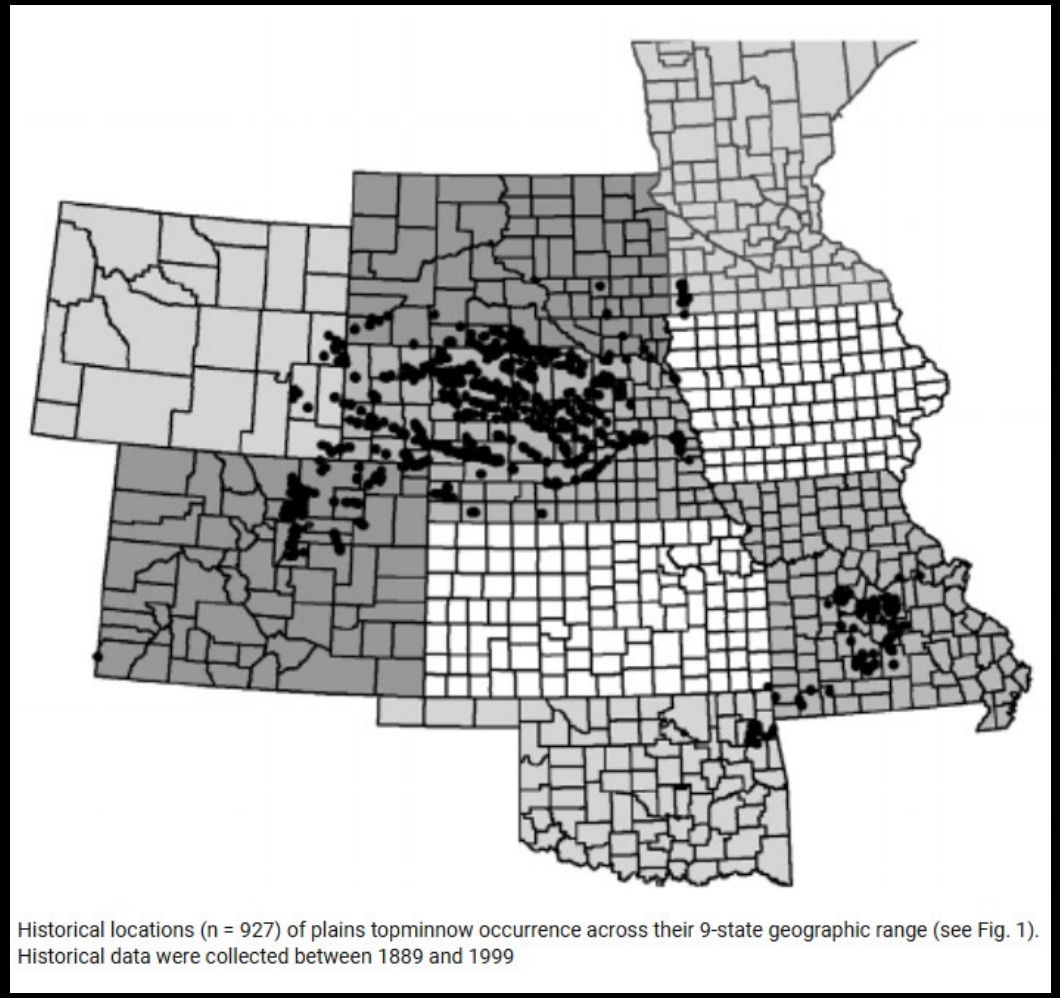
Nebraska has over 81,000 miles of streams. Over 18,000 of those miles are perennial. -NDEE

Over 1/3 of native Nebraska fishes are considered at-risk: Nebraska presumes that 78 of its 109 fish species are native. 16 (20.5%) are listed as Tier I, and 13 (16.6%) are listed as Tier II.

4D Fragmentation

Charismatic Mini-fauna


ROWING FA
Nck County
Agronomy
FEED FAMILIES



Historical locations (n = 927) of plains topminnow occurrence across their 9-state geographic range (see Fig. 1). Historical data were collected between 1889 and 1999

Changes in range-wide distribution of plains topminnow *Fundulus sciadicus*

Chelsey A. Pasbrig[1], Keith D. Koupal[2], Steve Schainost[3], W. Wyatt Hoback[1,*]

[1]University of Nebraska at Kearney, Department of Biology, Kearney, Nebraska 68849, USA
[2]Nebraska Game and Parks Commission, District VI Office, Kearney, Nebraska 68847, USA
[3]Nebraska Game and Parks Commission, Northwest Regional Office, Alliance, Nebraska 69301, USA

SD State Board of Regents

SD State Board of Regents

SD State Board of Regents

SD State Board of Regents

SD State Board of Regents

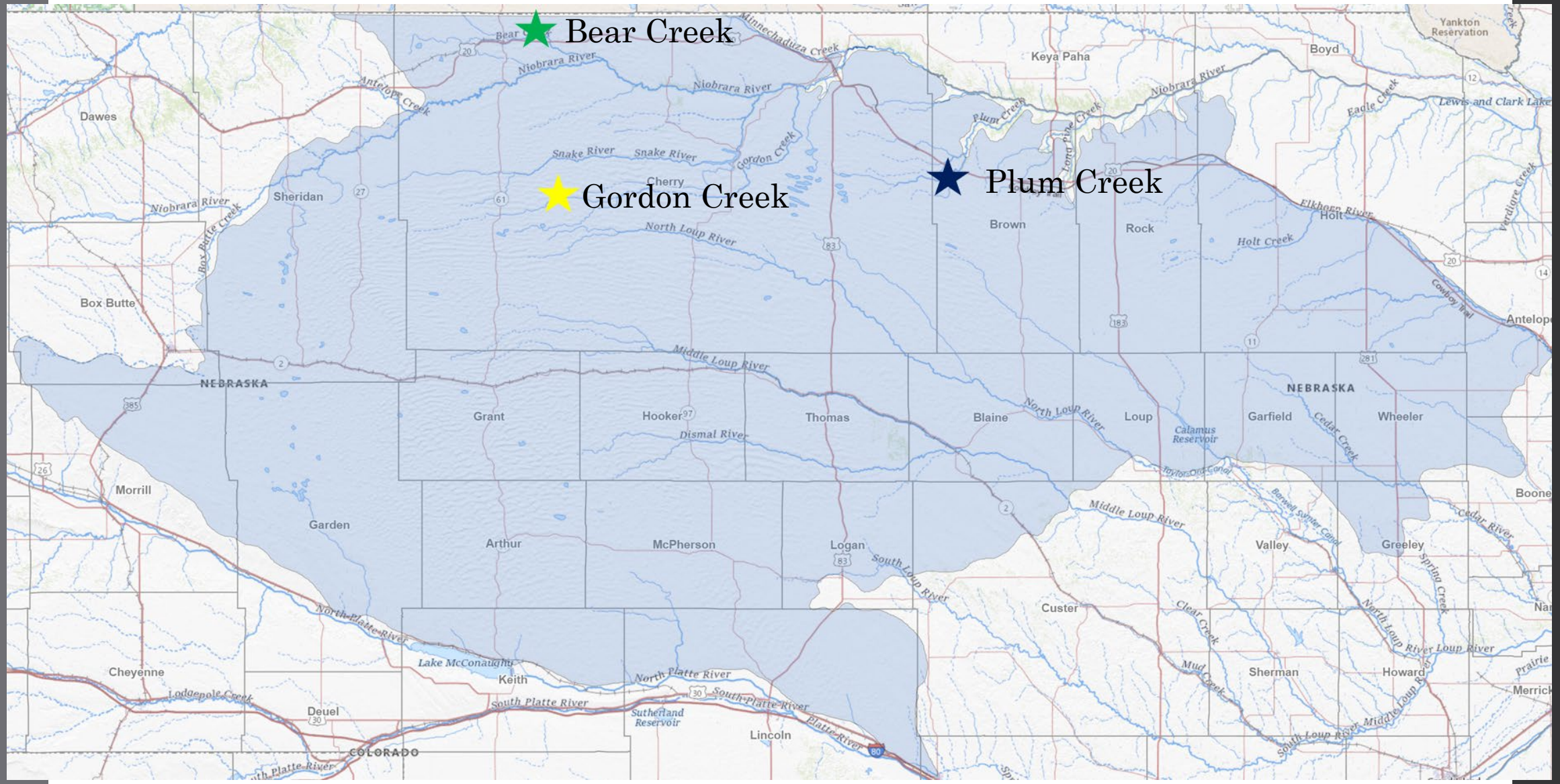
SD State Board of Regents

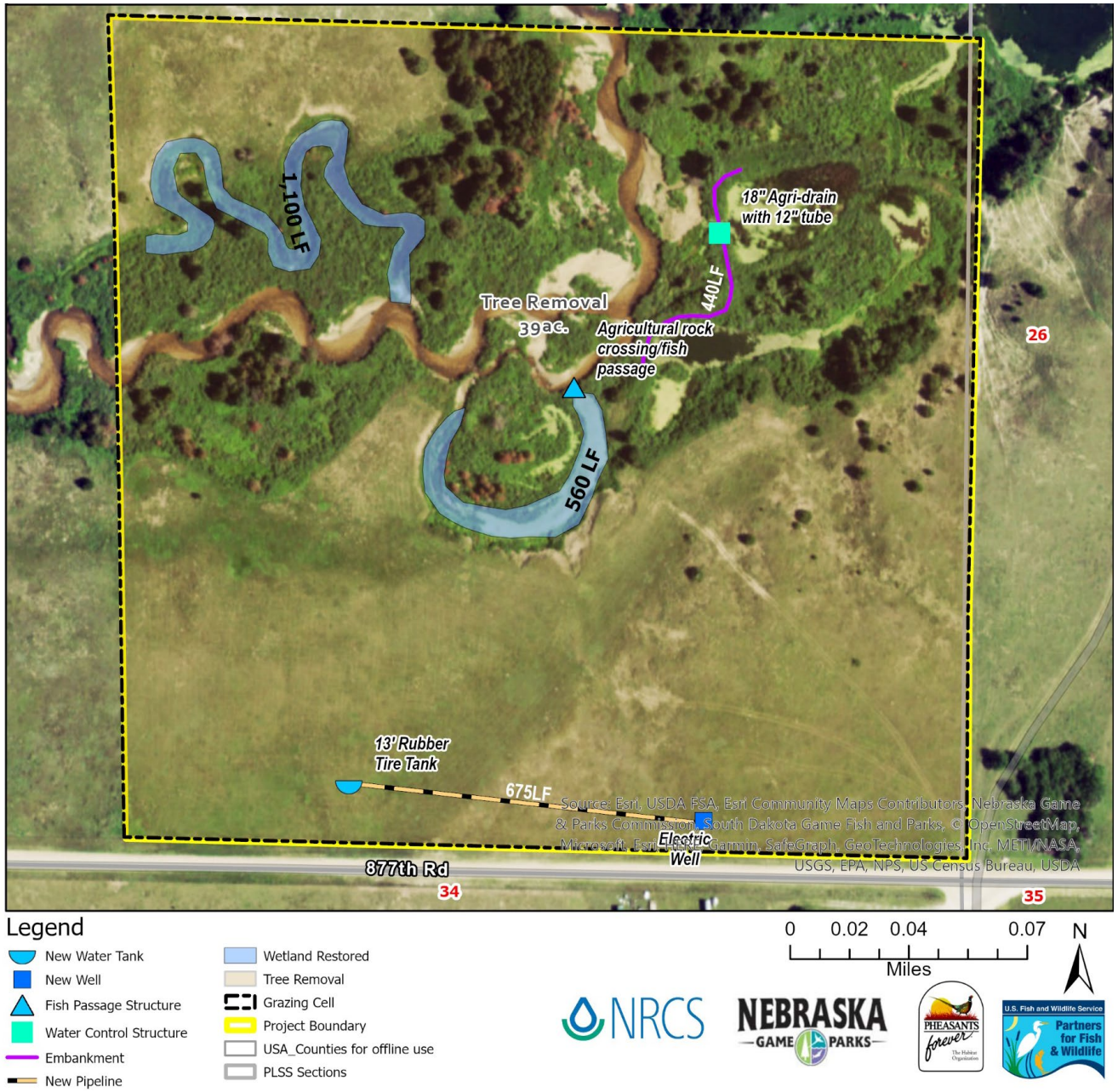

NEBRASKA
NEBRASKA
NEBRASKA

Species Reintroductions

Julie Geiser, Nebraskaland

Projects


Bear Creek
Gordon Creek
Plum Creek
Dawes
Box Butte
Sheridan
Cherry
Keya Paha
Boyd
Brown
Rock
Holt
Antelope
Grant
Hooker
Thomas
Blaine
Loup
Garfield
Wheeler
Morrill
Garden
Arthur
McPherson
Logan
Valley
Greeley
Boone
Custer
Sherman
Howard
Cheyenne
Keith
Deuel
Lincoln
Merrick
NEBRASKA
COLORADO
Niobrara River
Minnechaduza Creek
Antelope Creek
Snake River
Gordon Creek
North Loup River
Middle Loup River
Dismal River
South Loup River
Plum Creek
Long Pine Creek
Eagle Creek
Elkhorn River
Holt Creek
Cedar Creek
Spring Creek
Clear Creek
Mud Creek
North Platte River
South Platte River
Lake McConaughy
Sutherland Reservoir
Lodgepole Creek
Platte River
Calamus Reservoir
Lewis and Clark Lake
Yankton Reservation



Plum Creek

Concerns/Issues:

- Sedimentation
- Disconnected slough/oxbow
- Tree encroachment (eastern red cedar)
- No off-stream water for livestock

Landowner Objectives:

- Wildlife Habitat with ability to use livestock as a management tool

Restoration Efforts:

- Install rock-crossings
- Sediment removal
- Install Agri-drain
- Eastern Red Cedar Removal
- Provide off-stream livestock water

Plum Creek

- Shows how this reach of Plum Creek has evolved over time.

South Oxbow

- Installed low-water crossing/rock ramp
  - Allowed for Landowner to cross the south oxbow
  - Connected oxbow with active channel allowing for fish passage in/out of oxbow
  - Prevented further head cutting/draining of oxbow

- Sediment Removal
  - Increased surface water and depth
  - Provide off-stream habitat for fish
  - Improve habitat for migratory waterfowl and shorebirds.

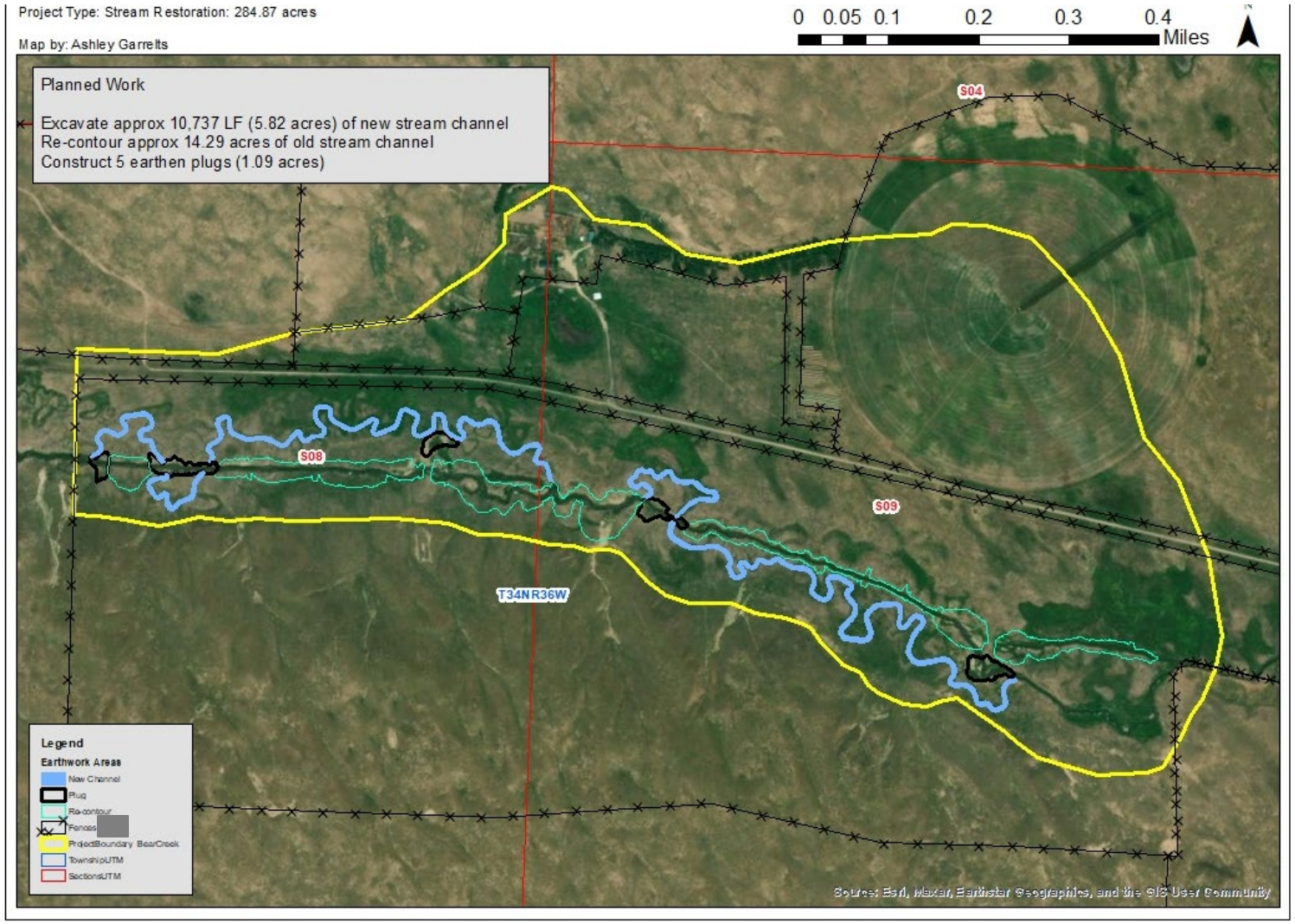
North Slough

- Installed low-water crossing/rock ramp
  - Captured higher surface water elevation in slough vs the creek
  - Connected slough with active channel allowing for fish passage in/out of
  - Serves as hard point -Preventing further head cutting/draining of slough

- Sediment/Cattail Removal
  - Increase width and depth of slough
  - Provide off-stream habitat for fish and other wetland dependent wildlife species
  - Improve habitat for migratory waterfowl and shorebirds.

Design vs Finish Project

- Provided fish access to off-stream water features
- Enhanced/Restored of off-stream water features
- Provide tools to allow future wetland and upland management



Bear Creek

Concerns/Issues:

- Historical ditching of channel
- Downcutting
- Erosion from livestock

Landowner Objectives:

- Improve wet meadow production
- Maintain one crossing for access

Restoration Efforts:

- Meander reconstruction of new stream channel
- Recontour original ditched stream channel
- Install earthen plugs

Fish Passage Concerns

- Small culverts
- Connectivity between culverts
- Erosion on banks
- Sediment

Before – Incising/Downcutting

After – Slope Recontouring

Bear Creek – After (April 2024)

September 2023


October 2023

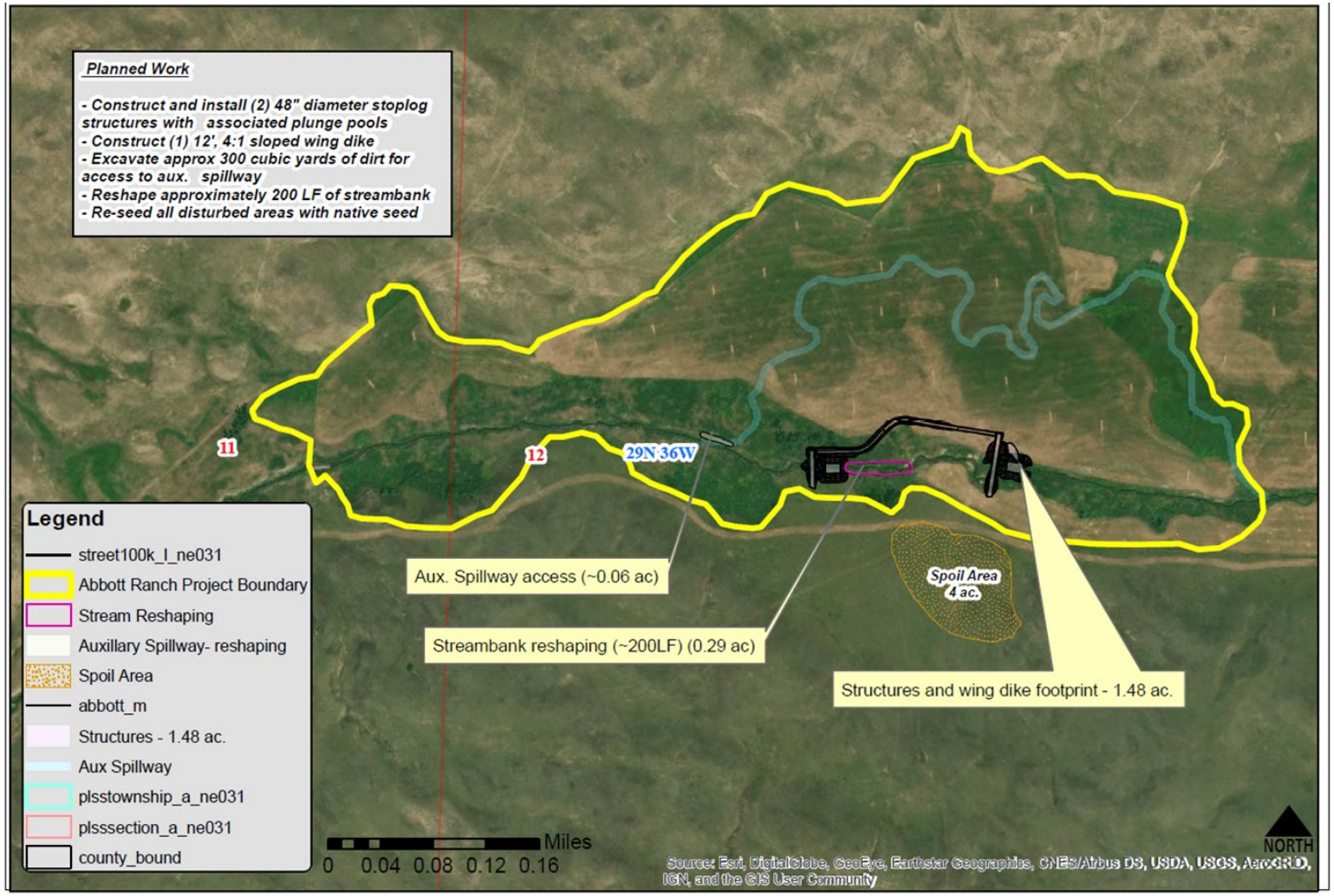

May 2024

September 2024


October 2024


Before
After

Gordon Creek



Concerns/Issues:

- Downcutting and incision

Landowner Objectives:

- Improve wet meadow production
- Stream crossing

Restoration Efforts:

- Install stop-log structures with a wing dike
- Excavate auxiliary spillway
- Reshape incised streambank

Stop-Log Riser Tube Structures

Upstream Structure

Downstream Structure

Gordon Creek – After


Before
After

Photo Credits

- Chad Christiansen – US Fish and Wildlife Service
- Ashley Garrelts – Sandhills Task Force
- Tevyn Pieper – Sandhills Task Force
- Casey Campbell – Ducks Unlimited
- Platte Basin Timelapse
- South Dakota State Board of Regents
- Cassidy Wessel – Nebraska Game & Parks

Contact Info

Tevyn Pieper, Projects Coordinator Sandhills Task Force

tevyn@sandhillstaskforce.org

308-225-3737

Cassidy Wessel, Wildlife Biologist Nebraska Game and Parks Commission

cassidy.wessel@nebraska.gov

402-360-1957

Chad Christiansen, USFWS PFW Biologist

chad_christiansen@fws.gov

402-322-0805