ANNUAL REPORT OCT 2024 - SEPT 2025

NEBRASKA COOPERATIVE FISH & WILDLIFE RESEARCH UNIT

University of Nebraska–Lincoln
School of Natural Resources
428 Hardin Hall
3310 Holdrege Street
Lincoln, Nebraska 68583-0984
Phone: (402) 472-0449
Fax: (402) 472-2946
Email: necru@unl.edu

University website: http://www.necoopunit.unl.edu
Federal website: https://www1.usgs.gov/coopunits/unit/Nebraska

Christina Perkins and Audrey VanZelfden walking to a Prarie Chicken vegetation survey point.
Photo: Malia Agee

Introduction

The Nebraska Cooperative Fish and Wildlife Research Unit (NECFWRU) is a formal partnership between the University of Nebraska–Lincoln (UNL), Nebraska Game and Parks Commission (NGPC), U.S. Geological Survey (USGS), U.S. Fish and Wildlife Service (USFWS), and the Wildlife Management Institute (WMI). The NECFWRU has a tripartite mission: technical assistance, applied research, and graduate education. The NECFWRU is one of 43 units in 41 states that compose the national Cooperative Research Unit (CRU) program. The CRU program is poised to address natural-resource issues on state, regional, and national scales. Components of the NECFWRU include three federal scientists, two state administrative assistants, and grant-funded graduate students, post-doctoral researchers, coordinators, and technicians. Also included are biologists, managers, and decision makers of government agencies, faculty members, administrators of universities and colleges, and personnel of non-governmental agencies.

Oversight on the broad direction of NECFWRU is provided by a five-member (representative from each signatory agency) coordinating committee. Oversight on safety is provided by CRU Headquarters and UNL safety committees. Oversight on publications is provided by USGS. Oversight on laboratories is provided by each scientist, though broad oversight of research is generally provided by granting agencies and university review board. Oversight on each graduate project is provided by graduate committees.

You are part of the NECFWRU. We thank you for your valuable contributions. Together, we can do great things toward conservation and management of natural resources in Nebraska and beyond.

Emma Watson, Malia Agee, and Dan Sullins (KS Coop Unit) setting up a walk-in trap at Konza Prairie, Kansas.
Photo: Sarah Sonsthagen

TABLE OF CONTENTS

NECFWRU and Students.
Photo: Alexandra Coffelt

PERSONNEL & COOPERATORS

Unit Personnel

Leaders – U.S. Geological Survey, Cooperative Research Units Program

Jonathan Spurgeon, Unit Leader
Clinton Leach, Assistant Unit Leader, Statistical Modeling
Sarah Sonsthagen, Assistant Unit Leader, Wildlife
Vacant, Assistant Unit Leader, Fisheries

Administrative Staff – University of Nebraska–Lincoln

Donna Robinson
Unit Administrative Assistant

Brad Thornton
Coordinator
Rainwater Basin Joint Venture

Shaikh Sadique Rahman
GIS Specialist I
Rainwater Basin Joint Venture

Katherine Sporcic
Unit Staff Assistant

Shannon M Smith
Coordinator
Nebraska Invasive Species Council

Logan Walters
Field Leader
Angler Survey Project

Post-Doctoral Researchers – University of Nebraska–Lincoln

Jonathan Hruska
Monarch Genomics

Shannon C F Smith
Environmental Thresholds

Erin Ulrey
Wild Turkey Ecology

Technicians – University of Nebraska–Lincoln

Jacob Bocian
Lily Bressette
Alexa Busby
Hannah Carden
Samantha Colah
Paige Eilers
Miriam Ganoung
Christina Gibbs
Jake Goldberry
Carver Hauptman
Trevor Hoffman
Cassandra Humphress
Charlie Jordan
Nicole Klosterman
Jack Knight
Annaliese Kohrell
Zachary Meister
Criston Pena
Emily Redding
Larissa Rockenbach
Kol Tafka
Anne Talbot
Olivia Tarantella
Elizabeth Weed
Paige Wimberly

Graduate Degree Candidates

University of Nebraska, School of Natural Resources

Doctor of Philosophy

Deepika Garugu
January 2023 – present

Jenna Ruoss
January 2022 – present

Rachel Rusten
August 2024 – present

Master of Science

Brett Anderson
January 2023 – May 2025

Megan Cary
August 2025 – present

Robyn Dausener
August 2023 – present

Abby May
August 2025 – present

Rhys Medcalfe
August 2024 – present

Braxton Newkirk
August 2022 – December 2024

Michael Pugh
January 2025 – present

Christopher Pullano
January 2022 – December 2024

Gabe VanEngen
January 2025 – present

Emma Watson
August 2025 – present

Jade Wawers
August 2024 – present

Zac Whaley
August 2025 – present

Nebraska Cooperative Fish & Wildlife Research Unit Students 2024.
Photo: Alexandra Coffelt

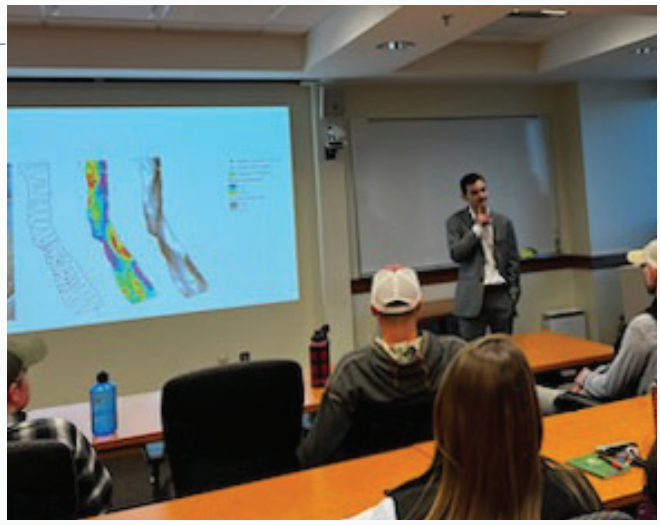
Theses and Dissertations

Braxton Newkirk, M.S., December 2024

Occupancy of Fish Species of Greatest Concervation Need and Temporal Patterns of Assemblage Occurrence in Sandhills Ecoregion, Nebraska Streams.
University of Nebraska–Lincoln, Natural Resources.
Advisor(s), Jonathan Spurgeon

Christopher Pullano, M.S., December 2024

Performance of Acoustic Telemetry and Space Use of Pallid Sturgeon in the Lower Platte River, Nebraska.
University of Nebraska–Lincoln, Natural Resources.
Advisor(s), Jonathan Spurgeon



Brett Anderson, M.S., May 2025

Assessment of Sampling Gears for Bigheaded Carp in Mid-Order Prairie Rivers in Nebraska
University of Nebraska–Lincoln, Natural Resources.
Advisor(s), Jonathan Spurgeon

Coordinating Committee Members

U.S. Geological Survey

Lisa Webb

Regional Supervisor
Cooperative Research Units Program
Columbia, MO 65211
(573) 882-2591

Nebraska Game and Parks Commission

Tim McCoy

Director
2200 N. 33rd Street
Lincoln, NE 68503–0370
(402) 471-5539

Wildlife Management Institute

Bill Moritz

Midwest Field Representative
1608 Packwood Road
Fairfield, IA 52556

University of Nebraska–Lincoln

Tiffany Heng - Moss

Vice Chancellor
Institute of Agriculture and Natural Resources
202 Agriculture Hall
Lincoln, NE 68583–0708
(402) 472-2797

U.S. Fish and Wildlife Service

Vacant

Braxton Newkirk checking water depth on the Elkhorn River, NE.
Photo: Chris Pullano

Cooperating Organizations

Alaska Department of Fish and Game
Threatened, Endangered, and Diversity Program
Arizona State University
Arkansas Game and Fish Commission
Arkansas State University
Association of Fish and Wildlife Agencies
Ball State University
Bemidji State University
California State Land Commission
Canadian Forest Service
Northern Forestry Centre
Carleton University
Colorado State University
Cooperative Research Unit Program
Alaska Cooperative Fish and Wildlife Research Unit
Arizona Cooperative Fish and Wildlife Research Unit
Georgia Cooperative Fish and Wildlife Research Unit
Idaho Cooperative Fish and Wildlife Research Unit
Indiana Cooperative Fish and Wildlife Research Unit
Iowa Cooperative Fish and Wildlife Research Unit
Kansas Cooperative Fish and Wildlife Research Unit
Oklahoma Cooperative Fish and Wildlife Research Unit
Oregon Cooperative Fish and Wildlife Research Unit
Massachusetts Cooperative Fish and Wildlife Research Unit
Mississippi Cooperative Fish and Wildlife Research Unit
Missouri Cooperative Fish and Wildlife Research Unit
South Dakota Cooperative Fish and Wildlife Research Unit
Texas Cooperative Fish and Wildlife Research Unit
New York Cooperative Fish and Wildlife Research Unit
Pennsylvania Cooperative Fish and Wildlife Research Unit
Vermont Cooperative Fish and Wildlife Research Unit
Wyoming Cooperative Fish and Wildlife Research Unit
Cornell University
Dalhousie University
Dartmouth College
Department of Environment, Food and Rural Affairs, United Kingdom
Ducks Unlimited
Eckerd College
Environment and Climate Change Canada
Canadian Wildlife Service
Fisheries and Oceans Canada
Florida Fish and Wildlife Conservation Commission
Government of Western Australia
Institute of Marine Sciences, Spain
Iowa Department of Natural Resources
Iowa State University
Kansas Department of Wildlife and Parks
Kansas State University
Leibniz-Institute of Freshwater Ecology and Inland Fisheries
Louisiana State University
Loyola University
Michigan Department of Natural Resources
Michigan State University
Minnesota Department of Natural Resources
Mississippi State University
Murdoch University, Australia
National Oceanic and Atmospheric Administration
Nebraska Department of Agriculture
Nebraska Department of Environment and Energy
Nebraska Department of Transportation
Nebraska Forest Service
Nebraska Game and Parks Commission
Nebraska Invasive Species Council
Nebraska Natural Resources Districts
Nebraska Public Power District
Nebraska Weed Control Association
Norwegian Institute for Nature Research
Ontario Ministry of Mines, Northern Development, and Natural Resources and Forestry
Oregon State University
Platte River Recovery Implementation Program
Platte River Whooping Crane Maintenance Trust
Potsdam University, Germany
Queens University, Canada
Rainwater Basin Joint Venture Partnership
Rhodes University, South Africa
Sea Duck Joint Venture
Simon Fraser University, Canada
Technical University of Denmark
Tel Aviv University, Israel
Texas A&M University

Texas Parks and Wildlife Department
The Nature Conservancy
The University of Southern Mississippi
The University of Queensland, Australia
The University of Western Australia
Trent University, Canada
Universidad Autónoma del Estado de Morelos
University of Alaska-Anchorage
University of Alaska-Fairbanks
University of Alberta
University of Arkansas at Pine Bluff
University of Calgary
University of Exeter, United Kingdom
University of Florida
University of Georgia
University of Glasgow
University of Illinois-Champaign
University of Massachusetts
University of Minnesota
    Sea Grant Program
University of Nebraska at Kearney
University of Nebraska at Omaha
University of Nebraska–Lincoln
    Animal Science Department
    Biological Systems Engineering
    Bureau of Sociological Research
    Center for Resilience in Agricultural Working Landscapes
    Daugherty Water for Food Institute
    Nebraska Water Center
    Platte Basin Timelapse
    School of Biological Sciences
    School of Natural Resources
Nebraska State Museum
University of Maryland
The University of Missouri -Columbia
University of New Brunswick
University of North Dakota
University of Santiago de Compostela, Spain
University of South Bohemia, Czech Republic
University of Tasmania, Australia
University of Technology Sydney, Australia
University of Texas at El Paso
University of Toronto, Canada
University of West Florida
University of Wisconsin-Madison
University of Wyoming
Uppsala University, Sweden
U.S. Department of Agriculture
    Animal and Plant Health Inspection Service
    Natural Resources Conservation Service
    U.S. Forest Service
    U.S. Department of Defense
U.S. Air Force
    Offutt Air Force Base
U.S. Army Corps of Engineers
National Park Service
    Denali National Park and Preserve
    Gates of the Arctic National Park and Preserve
    Homestead National Monument of America
    Kobuk Valley National Park
U.S. Fish and Wildlife Service
    Alaska Region
    Aquatic Nuisance Species Task Force
    Atlantic Region
    Marine Mammals Management
    Migratory Bird Management
    Northeast Region
    Science Applications and Migratory Bird Program
    Valentine National Wildlife Refuge
    Wildlife and Sport Fish Restoration
U.S. Geological Survey
    Alaska Science Center
    Fort Collins Science Center
    National Climate Adaptation Science Center
    Northern Prairie Wildlife Research Center
    Patuxent Wildlife Research Center
    Science Support Partnership
    Upper Midwest Environmental Sciences Center
U.S. Environmental Protection Agency
U.S. Government Accountability Office
Virginia Polytechnic Institute and State University
Wageningen University, The Netherlands
Washington Department of Natural Resources
Washington State University
Wyoming Game and Fish Department

Sylas Abarr electro fishing for Silver Carp on the Platte River.
Photo: Blake Logan

MILESTONES & HIGHLIGHTS

Acheivements

Nebraska Cooperative Fish and Wildlife Research Unit Leaders

Jonathan Spurgeon has been the NECFWR Unit Leader for a year now. Over this past year he has graduated three MS students and published four manuscripts. Jonathan continues to be an associate editor for North American Journal of Fisheries Management.

Sarah Sonsthagen has been busy since our last meeting. She has six new publications and three data releases. Sarah has grown her research program adding three grants for Prairie Chicken research, three grants for Monarch research, one grant for research on River Otters, and one grant for Deer connectivity.

Sarah has been the associate editor with Ornithological Aplications for 10 years and recently accepted the Senior Editor role. She has been nominated to be a Fellow with the American Ornithological Society based on her "exceptional and sustained contributions to ornithology and service to the society". They vote in August 2025.

Clinton Leach joined the Nebraska Cooperative Fish and Wildlife Research Unit in the Fall 2024. Clinton is establishing a research program focused on statistical modeling in fish and wildlife applications. In the last year, Clinton published one manuscript and was awarded two grants in collaboration with Sarah Sonsthagen and Jonathan Spurgeon.

Recognitions

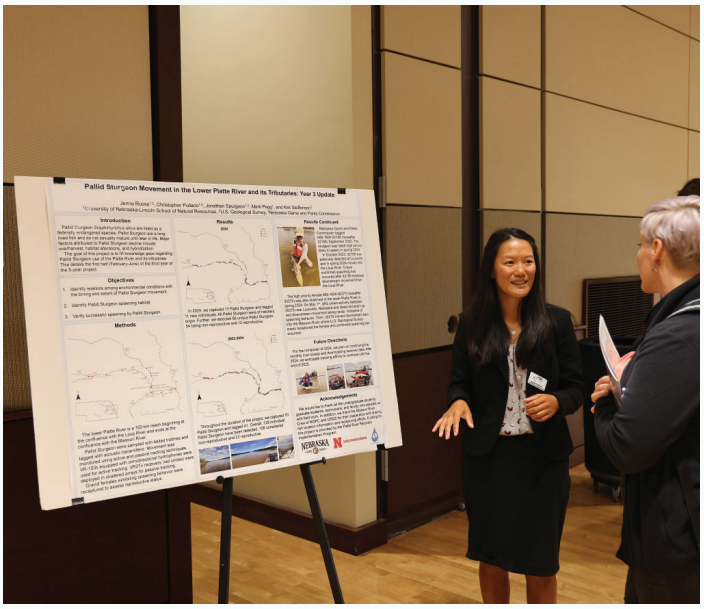
Student Awards

Jenna Ruoss Awards

Wildwood Trust Scholarship - July 2025 > Assisted with attending the 155th American Fisheries Society Annual Meeting

American Fisheries Society Student Travel Award - July 2025 > Awarded funds to attend the National American Fisheries Society Annual Meeting

Jenna Ruoss air boating on the Platte River, Nebraska.
Photo: Chris Pullano



Jenna Ruoss presenting her project poster.
Photo: Donna Robinson

Robert A. Klumb Student Travel Award - March 2025 > Awarded funds to attend the Missouri River Natural Resources Conference

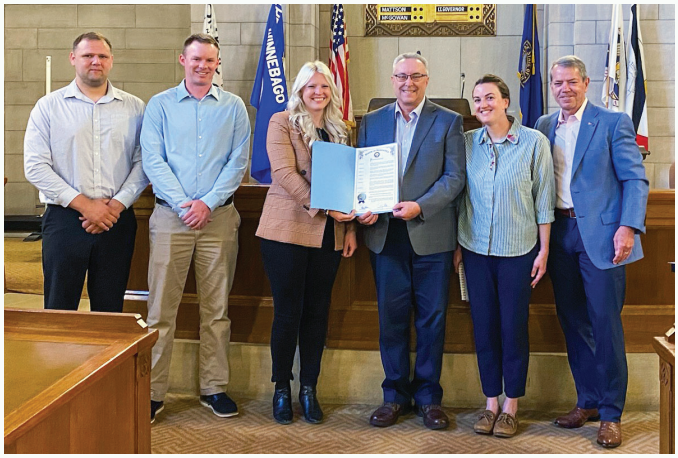
David H. & Annie E. Larrick Memorial Travel Fund - January 2025 > Assisted with attending the 85th Midwest Fish and Wildlife Conference

Best Student Presentation - Nebraska Chapter American Fisheries Society Annual Meeting in Aurora, Nebraska - February 2025

Highlights

Nebraska Invasive Species Awareness Days

Jim Pillen declares May 26-31 as Nebraska Invasive Species Awareness days during a proclamation signing ceremony March 13 at the Nebraska State Capitol.



From left are Josh Nelson, Nebraska Weed Control Association; Trevor Johnson, Nebraska Department of Agriculture; Jena Paugels, Nebraska Game and Parks Commission; Justin King, Nebraska Public Power District; Shannon Smith, Nebraska Invasive Species Council, and Govenor Jim Pillen.

Kristopher Stahr, Aquatic Invasive Species Program Manager for Nebraska Game and Parks, demonstrates how a boat is used to apply herbicide during Invasive Species Day at Pawnee Lake State Recreation Area in Lancaster County. (Left photo).

Erik, Lyra and Tammy Hubble of Lincoln look at a tennis shoe covered with zebra mussels during Invasive Species Day at Pawnee Lake State Recreation Area in Lancaster County. (Right photo).

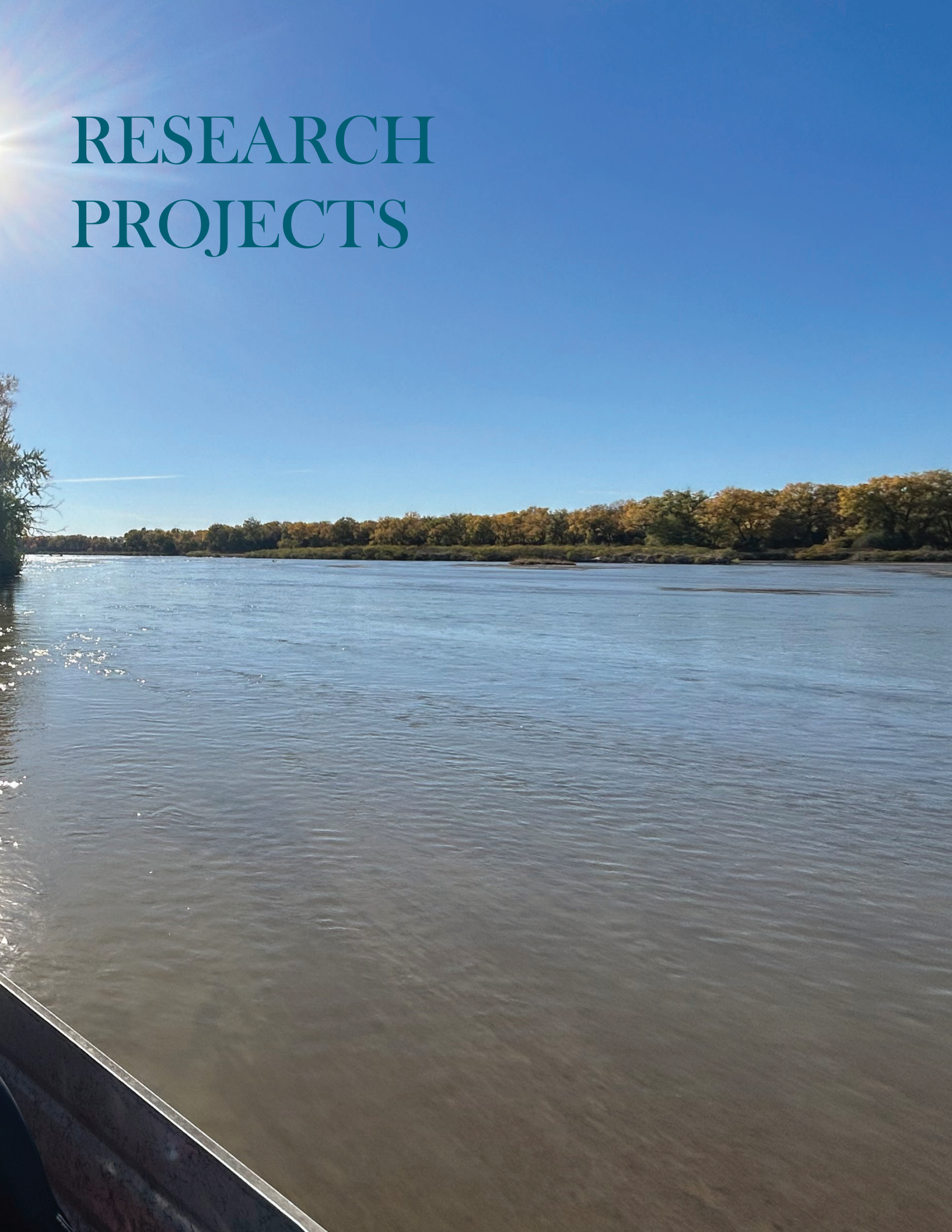
Photos: Eric Fowler, Nebraskaland Magazine and Nebraska Game and Parks Commission

Cedar removal process in Nebraska

Top photo has adult standing cedar. Middle photo is in the process of having cedar removed with piles present. Bottom photo is a beautiful sunrise in the Sandhills of Nebraska after cedar removal. Photos: Rachel Rusten

Airboat on the Platte River.
Photo: Chris Pullano

RESEARCH PROJECTS



Angler Behavior in Response to Management Actions on Nebraska Reservoirs - Part III

Principal Investigator(s): Kevin Pope, Christopher Chizinski, Mark Kaemingk
Graduate Student(s): Brandon Barlow, M.S. (2022), Olivia DaRugna, M.S. (2020), Kyle Hanson, M.S. (2023), Derek Kane, M.S. (2021), Ben Mordhorst, M.S. (August 2021 – January 2023)
Project Coordinator(s): Derek Kane (May 2021 – March 2023), Logan Walters (2024)
Duration: January 2019 – December 2024
Funding: Nebraska Game and Parks Commission
Location: Statewide Nebraska

FISHHUNT.UNL.EDU

Recreational angling is an influential factor structuring fish populations in inland systems. Given its importance and the reliance in North America on sportspersons to fund conservation activities (i.e., the North American Model of Wildlife Conservation), natural resource agencies invest substantial resources to manage angler-fish interactions to ensure long-term sustainability. Limited information exists about anglers in urban environments and their behaviors locally at smaller waterbodies. It is important for us to understand angler behavior in metropolitan areas because the landscape is becoming more urbanized.

Project goals are to understand 1) the participation patterns of anglers; 2) how participation patterns of anglers' influence fish populations and associated communities; 3) how management actions influence angler participation patterns and, in turn, fish communities; and 4) interactions and feedback mechanisms between and among angler groups and fish communities.

The project currently has eight study components.

1. Omaha Angler Survey.
2. Omaha Angler Effort.
3. Omaha Recreation Survey.
4. Understanding Variation of Recreational Angler Effort.
5. Recreational Use of Valentine National Wildlife Refuge.
6. Lake McConaughy Angler Survey.
7. Ogallala.
8. Economic valuation of recreational fishing.

Sunrise on Platte river near Silvercreek, NE.
Photo: Blake Logan

Assess Reference Condition of Small-Mammal Dynamics and Genetic Variation Prior to Ambler Road Development and Ongoing Climate Change

Principal Investigator(s): Sarah Sonsthagen, Shawn Crimmins (Indiana Fish and Wildlife Research Unit), Melanie Flamme (National Parks Service)
Graduate Student(s): Sarah Swanson, Ph.D. (University of Alaska-Fairbanks)
Duration: August 2024 – September 2028
Funding: U.S. Geological Survey
Location: Alaska

A northern red-backed vole, a common small mammal of interior Alaska. Photo: Sarah Swanson

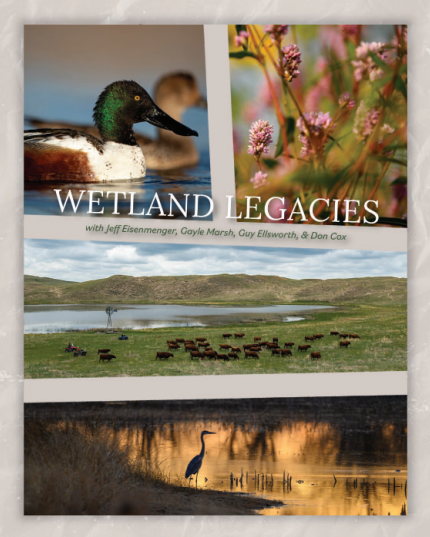
Small mammals play a vital role in boreal and Arctic ecosystems in Alaska. As local and resident, keystone species in food webs with quick generation times and small home ranges, small mammals are sensitive bioindicators of local disturbance, including climate change and development. In Denali National Park, small mammals have been studied for 30 years (1992-2022) as part of the Central Alaska Network Long-Term Monitoring program. Over the years, rain, snow, and growing season temperatures were strongly associated with variation in plant primary productivity. Both vole and hare abundance cycles showed a four-fold change in amplitude (peak) that corresponded to long-term changes in primary productivity. As environmental change continues to affect temperatures, primary productivity and growing season, we can expect changes in small-mammal population movements, ranges and cycles that may drastically influence boreal and Arctic ecosystems.

Our project will compare reference condition data - genetic diversity, genetic structure - as well as population demographic data among Denali, Gates of the Arctic, and Kobuk Valley national parks. The results from this project will allow National Park Service to evaluate effects of road development on small mammals along the Ambler Road corridor by establishing baseline data and comparative research through the inclusion of Denali National Park–already impacted by development. These data are central for comparative research and informed dialogue with industry to establish pre-development mitigation strategies by providing pre-development snapshot of population status preceding future ecosystem change and development.

Sarah Swanson Graduate Student with the Alaska Coop Unit. Photo: Sarah Sonsthagen

Connecting Nebraskans to Wetland Resources and Experiences (Video Project)

Principal Investigator(s): Jonathan Spurgeon
Producer and Project Manager: Mariah Lundgren
Producer(s): Ethan Freese, Grant Reiner
Duration: March 2024 –June 2025
Funding: Natural Resources Conservastion Service, Nebraska Game and Parks Commission, Ducks Unlimited
Location: Statewide Nebraska
PLATTEBASINTIMELAPSE.COM



Wetland easements provide habitat for migratory waterfowl and other wetland dependent wildlife, including threatened and endangered species; improve water quality by filtering sediments and chemicals; reduce flooding; recharge groundwater; protect biological diversity; and provide opportunities for educational, scientific and limited recreational activities.

Wetland Reserve Easements (WRE) are a component of the Agricultural Conservation Easement Program (ACEP). Formerly known as WRP, Wetland Reserve Easements is a voluntary program to help private and tribal landowners restore, protect, and enhance wetlands on private property. It is an opportunity for landowners to receive financial incentives to restore wetlands that have been converted to agricultural production or have been altered by multiple flood events.

The goal of this project is to educate landowners who have altered or drained wetlands, including problem wet areas, about the options they have available to them. These two films focus on overall land stewardship and highlight how wetlands provide benefits to landowners and surrounding communities. These films detail the program while highlighting success stories from a diverse group of individuals and are digestible for anyone interested in learning more about the WRE program, land stewardship, and the beauty and importance of Nebraska's wetlands.

Platte Basin Timelapse team members, Mariah Lundgren, Ethan Freese, and Grant Reiner, created two films: one providing an overview of the WRE program in Nebraska, its benefits, how to enroll, and why wetlands matter; the second film highlights WRE program success stories featuring farmers, businessmen, and landowners. Both films can be viewed at https://plattebasintimelapse.com/films/.

Wetland Legacies | WRE Program

This film follows three wetland experts who give an overview of the WRE program in Nebraska. It also features stunning cinematography showcasing the beauty, diversity, and importance of wetlands in Nebraska.

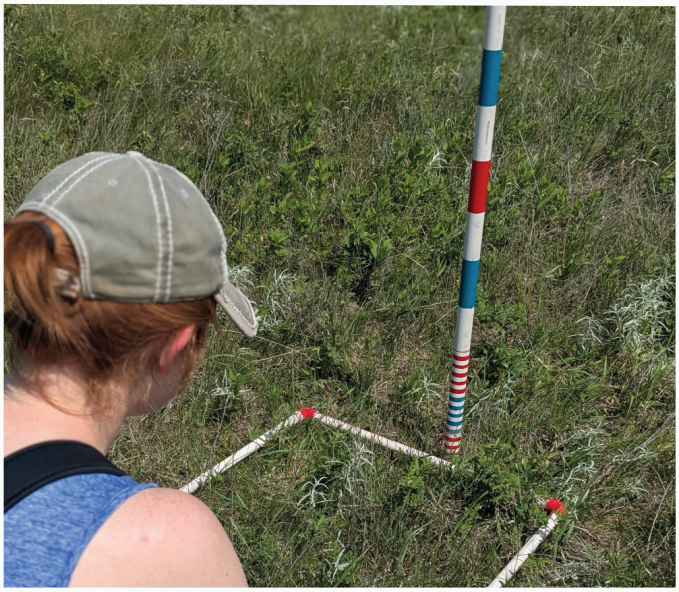
Wetland Legacies | Landowner

This film features four stories of Nebraska landowners who have successfully enrolled in the program and restored a wetland on their property. It also highlights the beauty and diversity of wetlands, as well as the benefits they provide to landowners and surrounding communities.

Effects of Woody Encroachment and Management on Grasslands of Nebraska's Sandhills

Principal Investigator(s): Sarah Sonsthagen, Andy Bishop (U.S. Fish and Wildlife Service)
Graduate Student(s): Rachel Rusten, Ph.D.
Duration: August 2023 – July 2028
Funding: U.S. Geological Survey
Location: Sandhills, Nebraska

Loss of grassland habitat to woody encroachment is widespread and ongoing in Nebraska's Sandhills. Woody encroachment has been identified as the most severe threat affecting grassland-obligate breeding birds, as these species do not appear to use encroached areas. As grassland bird species are experiencing the sharpest declines of avifauna guilds, evaluations of tolerance levels to woody encroachment of grasslands will provide valuable information to guide conservation and restoration efforts.



Miriam Ganoug collecting vegetation data.
Photo: Rachel Rusten

Through our research we aim to (1) evaluate the response of grassland birds to eastern red cedar removal, (2) evaluate changes in grassland bird communities and abundance among grassland patches at different stages of successional change, (3) inform best management practices to provide guidance on eastern red cedar removal and management, and (4) develop a monitoring protype to evaluate grassland bird response to woody cover management. We are partnering with U.S. Fish and Wildlife Service, Rainwater Basin Joint Venture, Nebraska Game and Parks Commission, Natural Resources Conservation Service, and University of Nebraska-Lincoln.

Paige Wimberly conducting avian surveys at sunrise Sandhills, NE.
Photo: Rachel Rusten

Evaluating Reproduction, Harvest, Timing of Season, Connectivity and Spatial Ecology of Wild Turkeys in Nebraska

Principal Investigator(s): Sarah Sonsthagen, Andrew Little, Mark Vrtiska, Michael Chamberlain (University of Georgia)
Graduate Student(s): Robyn Dausener, M.S., Surya Deepika Garugu, Ph.D., Rhys Medcalfe, M.S.
Postdoctoral Researcher: Erin Ulrey
Duration: August 2022 – December 2026
Funding: Nebraska Game and Parks Commission,
Location: Western Nebraska

Wild turkeys are an important game species in Nebraska and across the United States of America. Managers and hunters have reported declines in the number of wild turkeys in Nebraska, similar to declines in other states and regions. Though specific causes of the declines have not been identified, most populations have reported low productivity (e.g., nest success, brood survival), but other causes also may exist. To reverse this decline, state wildlife agencies have reduced wild turkey bag limits and prioritized habitat management efforts to increase recruitment and adult female survival in the breeding season. These efforts have slowed wild turkey population declines across the country, but populations continue to decrease in certain areas, suggesting there are other site-specific factors affecting growth rates (e.g., landcover availability, brood and hen survival). Knowledge of ecology and population dynamics at local scales is needed to understand the causes of decline and inform conservation efforts in statewide and nationwide efforts to reduce (and ultimately reverse) current population trends.

We are applying a multifaceted approach to examine the ecology and population dynamics of wild turkeys in Nebraska and specifically aim to: (1) estimate annual reproductive parameters, (2) determine space use and habitat selection of males and females, (3) examine the influence of habitat patch connectivity on effective dispersal (gene flow), (4) estimate survival and harvest rates, (5) evaluate the influence of male social status on patterns of parentage in clutches, and (6) describe gobbling activity. We are partnering with University of Georgia, Nebraska Game and Parks Commission, and Nebraska Chapter of The National Wild Turkey Federation for field data collection.

Anne Talbot, Teagan Sandstedt, Annaliese Kohrell, and Criston Pena surveying nests. Photo: Robyn Dausener

Evaluating Spatial Distribution and Composition of Mesopredator Communities in Western Nebraska

Principal Investigator(s): Sarah Sonsthagen, Andrew Little, Mark Vrtiska, Adam Ahlers (Kansas State University), Michael Chamberlain (University of Georgia)
Graduate Student(s): Jade Wawers, M.S.
Duration: May 2024 – July 2027
Funding: Nebraska Game and Parks Commission, National Wild Turkey Federation
Location: Western Nebraska

Mesopredators are important components of animal and plant communities and play a role in maintaining ecosystem function and health. Not only does the presence of predators on the landscape have a strong influence on prey density and vital rates, mesopredator composition has cascading effects on species and ecosystem processes. Within Nebraska, scant data are available describing predator composition, occurrence and distribution. Given the influence mesopredators have on species, data on predator communities are needed to address knowledge gaps regarding population dynamics and ultimately inform management strategies for both predator and harvested species.

Jade Wawers setting stakes near Wauneta, NE.
Photo: Robyn Dausener

Madison Lutes setting cameras around Wauneta, NE.
Photo: Jocelyn Hernandez

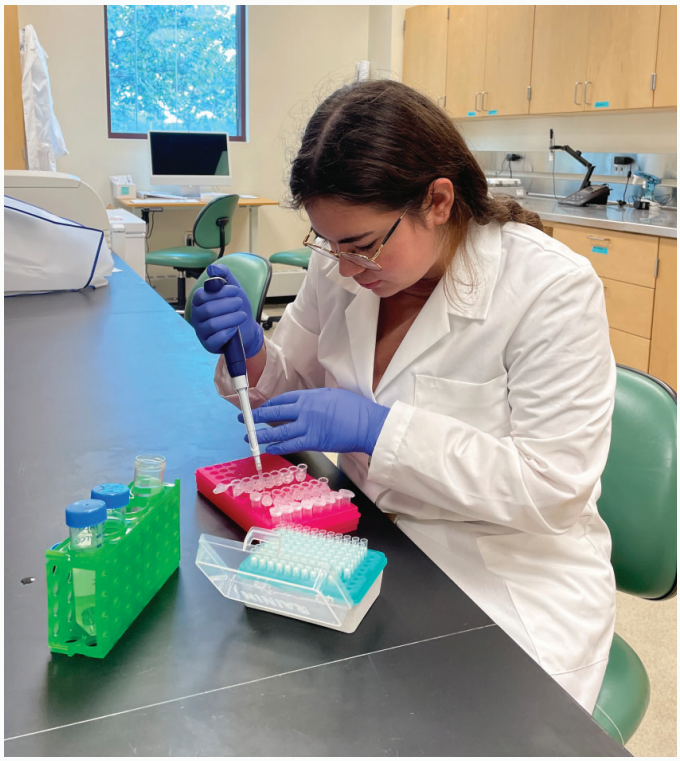
Our project will investigate how predator presence and community composition in Nebraska vary in relation to landscape features, land cover types, and other vegetation characteristics. Information on landscape features, land cover types, and vegetation characteristics used by predator species will be provided to inform decisions regarding habitat management. Further the project will provide baseline data to evaluate if any changes in habitat management practices have measurable effects on predator species occurrence, distribution, and composition.

Evaluating the Genetic Implications of Translocation Efforts and Recolonization of River Otters in Nebraska

Principal Investigator(s): Sarah Sonsthagen
Graduate Student(s): Megan Cary, M.S.
Duration: May 2025 – August 2028
Funding: Nebraska Game and Parks Commission
Location: Nebraska

River otters were once common in Nebraska, occupying major rivers throughout the state, though were extirpated by the early-1900s. Nebraska Game and Parks Commission (NGPC) began a reintroduction effort of river otters in 1986. By 1991, NGPC had released 159 river otters at seven sites (20-30 individuals/site) in five of the major river basins across the state and otters have recolonized much of their historical distribution. The successful reintroduction of river otters in Nebraska led to the removal of river otters from the state threatened list in 2020 and the implementation of a regulated harvest season on river otters in 2021.

Although river otters have recolonized much of their previous range, the restoration of genetic diversity of river otters is dependent on the genetic diversity of translocated individuals (founders) and their reproductive success. It is exceedingly difficult to ascertain survival and reproductive success of reintroduced individuals and intensive study of these parameters via telemetry and marking offspring was not attempted during the reintroduction. In addition, founder groups are often isolated and experience demographic and environmental stochasticity, which can further reduce genetic diversity through genetic drift and ultimately future population resiliency and health. Each of the reintroduction sites in Nebraska are somewhat isolated geographically and used similarly small releases (20-30 otters). Populations have expanded since, but the degree of connectivity is unknown. As part of NGPC management goal to maintain resilient, healthy, and socially acceptable river otter populations, our aim is to evaluate genetic variability to infer population health of river otters in Nebraska.



Megan Cary collecting genetic data..
Photo: Abby May

Have Population Size Fluctuations Influenced the Genomic Diversity in Monarchs?

Principal Investigator(s): Sarah Sonsthagen, Jessica Petersen, Rob Wilson
Post-Doctoral Researcher: Jonathan Hruska
Duration: July 2024 - June 2027
Funding: U.S. Geological Survey, Nebraska Game and Parks Commission
Location: Great Plains

Post-Doctoral Researcher:
Jonathan (Jack) Hruska

North American monarch butterflies are a charismatic pollinator, in part, because of their unique long-distance migration and formation of large clusters of individuals at winter roosting sites. Through monitoring at roost sites, marked declines in monarch numbers were detected. The eastern population segment of monarchs that winters in Mexico declined by 90% with the western population segment estimated to have declined by 95% since the late 1990s. Further, eastern and western segments of monarchs are genetically differentiated, indicating the two regions are demographically isolated. The marked declines experienced by monarchs across North America prompted concerns about the persistence of the unique behavioral segments of the species and capacity of the species to respond to current and emerging threats.

The effective population size (and thereby retention of genomic diversity) of species underlies a populations' capacity to adapt and respond to changes in the environment in both current and future conditions. Dramatic reductions in census sizes not only reduce the capacity of populations to retain genomic diversity but also reductions allow for the expression of deleterious mutations that are present in the population at low frequency, which can further erode the viability of populations in decline. Evaluation of the impact that the decline has on the effective population size of monarchs, therefore, is needed to inform resiliency and population persistence forecasts under projected future conditions.

By analyzing whole genomes from Monarch butterflies, we will evaluate temporal changes in genomic diversity through leveraging museum collections and assaying samples collected prior to the 1930s, mid-1900s to 1990s (pre-current decline) and current samples. We partnered with Monarch Watch and numerous museums to obtain samples.

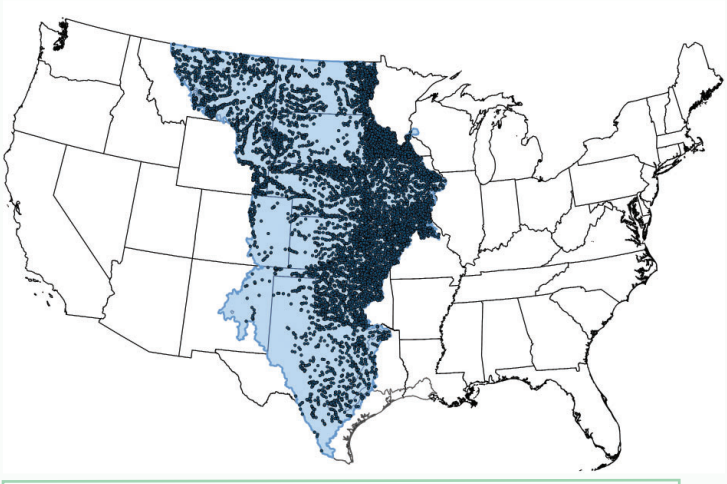
Monarch Butterfly museum specimens sequenced in our study, with some samples dating to prior to the 1900s.

Influence of Environmental Thresholds on Trajectories of Freshwater Assemblages with Implications for Building Climate Resilience Across Prairie Landscapes

Principal Investigator(s): Jonathan Spurgeon
Post-Doctoral Researcher: Shannon C. F. Smith
Duration: October 2024 – September 2029
Funding: U.S. Geological Survey, North Central Climate Adaptation Science Center
Location: Great Plains

Post-Doctoral Researcher:
Shannon C. F. Smith

Land use, geomorphic change, and fragmentation threaten prairie stream biodiversity and ecosystem function through changes in flow, temperature, and connectivity. Climate change will exacerbate these changes and likely lead to further shifts in species composition and biodiversity loss. Conservation and management actions needed to counter shifts in species composition and biodiversity loss depend on identifying environmental thresholds (i.e., tipping points) after which undesirable state shifts occur. Yet, identifying systematic environmental thresholds across freshwater ecosystems remains elusive despite the recognition that reaching thresholds may lead to trajectories with irreversible changes. The substantial climatic gradient across the Great Plains Prairie Ecoregion provides an ideal setting to evaluate environmental threshold responses in freshwater streams. Further, prairie streams are embedded within a matrix of diverse land use and geomorphic conditions. A region-wide perspective will thus allow natural resource management agencies to learn from and anticipate change based on current spatial variation in, for example, the rate and magnitude of agricultural conversion to urban land use, or upper thermal limits of organisms from south to north, across the study area. management and conservation actions (e.g., provide environmental flow allocations) that facilitate species persistence. Specifically, we propose to:



Map showing the Great Plains, USA (shaded area) with fish survey locations used in this study (points).

1) Aggregate and quantify the spatial and temporal landscape of environmental gradients, including temperature, precipitation, and land use and characterize spatial and temporal patterns of aquatic assemblage diversity,

2) identify threshold responses in aquatic assemblage structure to environmental gradients, and

3) identify and aggregate data to support management actions that resist reaching thresholds, direct community trajectories, or accept change and promote tracking of aquatic assemblages to climate shifts.

Influence of Conservation Reserve Program on Population Structure, Demography, and Space Use by Greater Prairie-Chicken in Kansas and Nebraska

Principal Investigator(s): Sarah Sonsthagen, Daniel Sullins, David Haukos (Kansas Cooperative Fish and Wildlife Research Unit)
Graduate Student(s): Emma Watson, M.S., Zac Whaley, M.S. Malia Agee, M.S. (Kansas Unit), Ryan Giordanelli, M.S. (Kansas Unit), Katherine Travis, Ph.D. (Kansas Unit)
Duration: October 2024 – September 2028
Funding: U.S. Department of Agriculture, Nebraska Game and Parks Commission, Kansas Department of Wildlife and Parks, and U.S. Geological Survey
Location: Nebraska and Kansas

The U.S. Department of Agriculture, Conservation Reserve Program (CRP) is considered the most effective large-scale conservation effort affecting wildlife species in the United States. In the Great Plains, 4.18 million acres of CRP occurs in Kansas and Nebraska, potentially affecting a large number of wildlife species, including many grassland species that may rely on these landscapes for persistence and resilience to dynamic environments. Few studies have assessed the response of the greater prairie-chicken to the establishment of CRP, a species which has lost much of its historical range and is in decline. Kansas and Nebraska support the majority of extant greater prairie-chickens, though populations face multiple threats which may limit movement among remnant populations. The presence and type of CRP is likely influencing habitat use, movements, and demography for greater prairie-chicken populations in Kansas and Nebraska. Overall, the few data on the influence of CRP on greater prairie chickens is likely hindering strategic conservation decisions and development of sound management practices. Further, the relative influence of type of CRP and applied Conservation Practices are unknown.

Samantha Colah and Zach Meister measuring a Prairie Chicken. Photo: Sarah Sonsthagen

The Kansas and Nebraska Cooperative Fish and Wildlife Research Units are partnering with USDA Farm Services Agency and Natural Resources Conservation Service, Kansas Department of Wildlife and Parks, and Nebraska Game and Parks Commission. The project will hierarchically evaluate the influence of CRP on greater prairie-chicken populations through the analysis of movement, vegetation, and genomic data sets and produce science that will form management actions on CRP enrollment as well as the species in the region.

Our objectives are:

(1) Compare greater prairie-chicken population demography, habitat use, and movements between landscapes lacking CRP and those with available fields of CRP,

(2) Determine the response of greater prairie-chickens to CRP type,

(3) Evaluate the relative effects of Conservation Practices on use of CRP by greater prairie-chickens, and

(4) Assess the ecological function of CRP fields in the facilitation of movements, including dispersal, and landscape levels of genetic diversity.

Invasive carp movement and habitat use in Nebraska interior rivers

Principal Investigator(s): Jonathan Spurgeon
Graduate Student(s): Gabe VanEngen, M.S.
Duration: January 2025 – May 2027
Funding: Nebraska Game and Parks Commisssion
Location: Southeast Nebraska

Invasive carp pose threats to native fish assemblages and the ecosystem services of river and lake environments. Specifically, Silver Carp and Bighead Carp are a major concern given their ability to compete with native fishes for food resources as well as their ability to reach substantial densities, degrading recreational opportunities. Information pertaining to movement is needed to inform management actions including removal and gain a better understanding of population persistence and distributions across the landscape. Evidence of movement by invasive carp is limited in many prairie streams. In Nebraska, currently no information exists regarding the extent of movement and residency times of invasive carp in interior rivers. This project is in collaboration with the Nebraska Game and Parks Commission. Information from this project will inform targeted management actions including establishment of monitoring stations as well as targeted removal efforts where movement into and out of locations is limited.

Gabe VanEngen tagging Smallmouth Buffalo. Photos: Jenna Ruoss

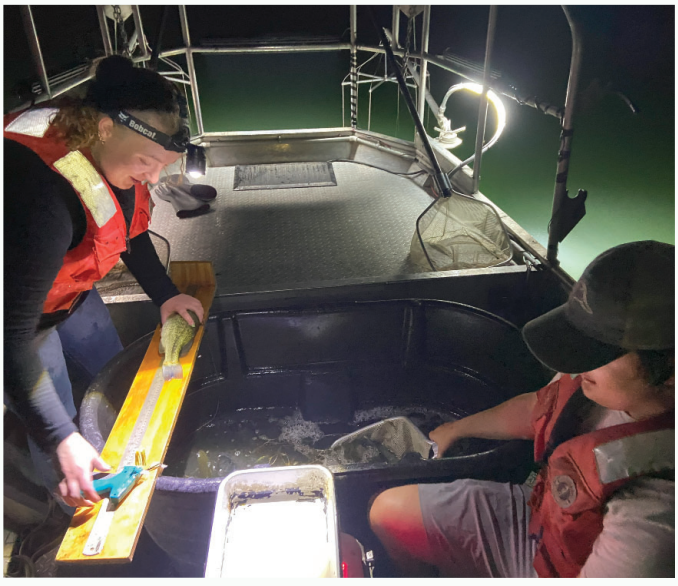
Gabe VanEngen releasing a Smallmouth Buffalo on Salt Creek, NE. Photo: Jenna Ruoss

Implementation of Protected Slot Limits to Manage Largemouth Bass among Southeast Nebraska Waterbodies

Principal Investigator(s): Jonathan Spurgeon
Graduate Student(s): Mike Pugh, M.S.
Duration: January 2025 – May 2027
Funding: Nebraska Game and Parks Commisssion
Location: Southeast Nebraska

Harvest regulations including implementation of size restrictions are a cornerstone of freshwater fish population management. Size restrictions are meant to direct harvest by anglers to desired length ranges of a fish population in efforts to alter the length distribution and meet management objectives. Common types of size restrictions used are minimum length limits, maximum length limits, and protected-slot length limits. Nevertheless, a core need for size restrictions to meet management objectives is the propensity of angler groups to harvest.

Largemouth Bass is a popular sportfish in North America and is predominately managed through restricting sizes and number available to harvest. Harvest regulations have been extensively evaluated and have had mixed results at meeting intended management objectives. A major shift in angler attitudes regarding Largemouth Bass harvest resulting in a harvest averse mindset has been suggested as an impediment to using size restrictions. Further, characteristics of Largemouth Bass populations may influence effectiveness of size restrictions in altering size structure (e.g., slow growth).



Lily Bresette and Logan Walters measuring Largemouth Bass at night.
Photo: Mike Pugh

Size restrictions to direct harvest at components of Largemouth Bass populations may benefit from understanding both population characteristics and exploitation levels. Size-based restrictions of harvest may be most applicable when angler exploitation and individual growth rates of Largemouth Bass are high. Without adequate levels of angler harvest, sized-based restrictions may fail to meet management targets for Largemouth Bass populations. Further, without adequate growth rates, Largemouth Bass may not reach sizes subjected to harvest. As such, information regarding population characteristics (abundance, somatic growth, etc.,) and levels of angler harvest are needed predict effectiveness of changes in size restrictions as a management tool. Therefore, the objectives of this study include 1) evaluate baseline population parameters including abundance, survival, growth, size structure, and condition indices of Largemouth Bass populations in southeast Nebraska reservoirs, 2) estimate the propensity of anglers to harvest Largemouth Bass in southeast Nebraska reservoirs, and 3) predict changes in population size structure and abundance of Largemouth Bass in southeast Nebraska reservoirs following the implementation of a protected slot limit of 15 to 18 inches.

Multi-scale Habitat Needs of At-Risk Fishes in Nebraska

Principal Investigator(s): Jonathan Spurgeon, Thad Huenemann
Graduate Student(s): Joseph Spooner, M.S. (2023), Braxton Newkirk, M.S. (2024), Connor Hart M.S. (2024)
Duration: August 2022 – February 2025
Funding: Nebraska Game and Parks Commission
Location: Sandhills Ecoregion

The distribution and abundance of prairie-river fishes is maintained through demographic processes that occur over multiple scales embedded within a habitat matrix. Degradation of the habitat matrix in rivers, however, can limit completion of demographic processes (e.g., recruitment and movement) that may exacerbate the time for recolonization or permanently reduce their distribution and abundance. A major limitation exists, however, due to a lack of understanding of fish-habitat relationships at multiple spatial and temporal scales for many SGCN. A prominent question that remains unanswered is what habitat features at different spatial scales promote the presence of a species? This research is being conducted with support from and in collaboration with the Nebraska Game and Parks Commission. This study will set the stage for future work assessing fish-habitat relations by identifying locations most likely to contain species of interest. Benefits from this study may also feed data into the Nebraska Conservation and Environmental Review Tool (CERT), commonly used as a review for proposed projects and potential impacts within areas of at-risk species presence.

To date, graduate-student led research has focused on quantifying the population demographic responses to land-use disturbance including channelization of wet-meadow streams and the ability of currently defined conservation areas to encompass the habitat heterogeneity found across Nebraska. On-going research is evaluating the distribution and prevalence of at-risk stream fishes throughout the Niobrara and Elkhorn rivers within the Sandhills Ecoregion, Nebraska. The ability to quantitatively establish prevalence of at-risk species can serve as a baseline for assessing future changes within an ever-changing landscape and evaluate directed management actions aimed to improve habitat.

Braxton Newkirk habitat measuring on North Fork Elkhorn River. Photo: Ella Humphrey

Nebraska Invasive Species Council Coordination and Technical Assistance to Prevent, Detect, and Control Nonnative Invasive Species Effects on State Resources

Principal Investigator(s): Jonathan Spurgeon
Project Coordinator(s): Shannon M. Smith
Duration: January 2020 – December 2025
Funding: Nebraska Game and Parks Commission
Location: Statewide Nebraska
NEINVASIVES.COM

Project Coordinator Shanon M. Smith

Nonnative invasive species cause significant economic and ecological damage by driving biodiversity loss and reducing ecosystem diversity. They also threaten human health, agriculture, forestry, water resources, and wildlife. Human activities, such as e-commerce, travel, trade, and land-use changes, accelerate their introduction and spread, often without immediate control measures. Prevention is the most cost-effective strategy, avoiding the intensive efforts needed to manage established populations.

The Nebraska Invasive Species Council (NISC) works to minimize invasive species impacts on Nebraska's economy and environment by: (1) recommending action to minimize the effects of harmful invasive species on Nebraska's citizens to promote the economic and environmental well-being of the state; (2) developing and periodically updating a statewide adaptive management plan for invasive species; (3) serving as a forum for discussion, identification, and understanding of invasive species issues; (4) facilitating the communication, cooperation, and coordination of local, state, federal, private, and nongovernmental entities for the prevention, control, and management of invasive species; (5) assisting with public outreach and awareness of invasive species issues; and (6) providing information to Nebraska's Legislature for decision-making, planning, and coordination of invasive species management and prevention.

The NISC is composed of 26 members from over 16 entities statewide, meeting monthly to address invasive species issues. The council coordinator provides technical support and enhances early detection, prevention, and control efforts.

In October 2024, the NISC released its 2024–2027 Adaptive Management Plan, prioritizing statewide coordination, legislative advising, and public outreach.

The NISC re-launched its website, NEinvasives.com, on a new platform in January 2025. Since then, the council has begun updating its invasive species list, currently with 36 aquatic and 89 terrestrial threats, and continues to add new species profiles weekly.

In 2025, NISC began Nebraska Invasive Species Awareness Week (NE-ISAW), May 26–30, following a May 13 proclamation signing ceremony by Governor Jim Pillen. The week highlighted the economic and environmental impacts of invasive species and promoted prevention efforts. Events included daily webinars from The Nature Conservancy, Don't Let It Loose, and the Nebraska Game and Parks Commission on invasive weeds, pet release pathways, and zebra mussels. The week concluded with Know Your Nebraska Invasive Day on May 31 at Pawnee State Recreation Area, where over 75 attendees participated in activities such as kayaking, fishing, vegetation survey demos, boat inspection games, and guided hikes.

The NISC remains committed to building awareness around invasive species issues, encouraging every Nebraskan to become part of the solution to protect our state's resources.

Pallid Sturgeon Biology in the Platte River and its Tributaries

Principal Investigator(s): Mark Pegg, Kirk Steffensen, Jonathan Spurgeon
Graduate Student(s): Christopher Pullano, M.S., Jenna Ruoss, Ph.D.
Duration: January 2022 – December 2026
Funding: Platte River Recovery Implementation Program
Location: Lower Platte River, Nebraska

Pallid Sturgeon *"Scaphirhynchus albus"* is a federally endangered fish first listed in 1990. Pallid Sturgeon was historically believed to be uncommon within its range of the Missouri and Mississippi rivers and other major tributaries such as the Platte, Yellowstone, and Kansas rivers. Rivers that historically were occupied by Pallid Sturgeon were characterized as large, swift, turbid, braided, and free flowing. Habitat alterations such as channelization and impoundments have been suggested as major contributors to the decline of Pallid Sturgeon as contemporary conditions no longer align with the life-history needs of the species. Of particular concern is the near or complete loss of spawning and recruitment habitat for the species.

Current recovery efforts for Pallid Sturgeon in the Missouri River basin have largely focused on the mainstem and typically included obtaining information on population dynamics assessments (e.g., population estimates, movement, survival, etc.), habitat modification (e.g., creating interception and rearing zones), and propagation (e.g., stocking hatchery reared individuals). However, there are substantial gaps in knowledge regarding Pallid Sturgeon use of tributaries to the mainstem Missouri River including how and when Pallid Sturgeon use these tributaries, what initiates their use (e.g., environmental cues), and is successful spawning occurring. These knowledge gaps are the impetus for this project. Pallid Sturgeon has been documented using tributaries across their distribution in the upper and lower Missouri River basins. Seasonal presence and spawning by Pallid Sturgeon within tributaries is thought to coincide with hydrologic and temperature regimes. Of particular interest is the prevalence of spawning and recruitment of Pallid Sturgeon within tributaries.

Efforts reported here were part of a project initiated in July 2021 as part of the Platte River Recovery Implementation Program's (PRRIP) ESA compliance contributions related to the federally endangered Pallid Sturgeon in the lower portion of the Platte River, Nebraska. This 5-year study was initially intended to provide information pertaining to known knowledge gaps about environmental correlates of Pallid Sturgeon use, spawning habitat, and reproduction and recruitment in the lower Platte River and its tributaries. The original objectives were to:

1. Identify relations among environmental conditions (i.e., river discharge and temperature) with the timing and extent of Pallid Sturgeon movement into and within the lower Platte River and its tributaries.

2. Identify Pallid Sturgeon spawning habitat in the lower Platte River and its tributaries.

3. Verify successful spawning by Pallid Sturgeon in the Platte River and/or its tributaries.

4. Provide Pallid Sturgeon genetic samples for further population and hybridization assessment (in collaboration with Southern Illinois University's parallel project).

Jenna Ruoss releasing a Pallid Sturgeon on Platte River. Photo: Chris Pullano

Rainwater Basin Joint Venture Science

Principal Investigator(s): Jonathan Spurgeon, Kevin Pope, Andy Bishop (Rainwater Basin Joint Venture Partnership)
Science Coodinator: Brad Thornton
GIS Specialist: Shaikh (Sadique) Rahman
Duration: October 2014 – December 2026
Funding: U.S. Fish and Wildlife Service, Nebraska Game and Parks Commission
Location: Statewide Nebraska
RWBJV.ORG

The mission of the Rainwater Basin Joint Venture is to build and facilitate partnerships that work to advance habitat conservation for millions of migratory birds using strategies based on sound science in Nebraska's mixed-grass prairie region. The Management Board of the Rainwater Basin Joint Venture is committed to implementing the U.S. Fish and Wildlife Service's Strategic Habitat Conservation framework. This science-based model requires a commitment of resources to develop a strong biological foundation for delivering conservation planning and designing research and monitoring efforts. In partial fulfillment of this commitment, a Science Coordinator position and a GIS Specialist position are housed at the University of Nebraska-Lincoln. Brad Thornton has served as the Science Coordinator since February 2024, and Sadique Rahman has served as the GIS Specialist since May 2024. Both positions work with the Rainwater Basin Joint Venture science team to develop models and decision support tools that help identify areas where conservation is most likely to benefit migratory birds and other wildlife.

Brad helps monitor, evaluate, and communicate the outcomes of ongoing and past habitat conservation projects, collaborating with researchers from various federal and state agencies and non-governmental organizations. He continues to work with University of Nebraska-Lincoln faculty and students, and U.S. Geological Survey scientists at the Central Plains Water Science Center to develop an integrated hydrologic model for the northern High Plains aquifer, combining land use, groundwater quality and quantity data. In addition, Brad has worked with the Nebraska Game and Parks Commission, the U.S. Fish and Wildlife Service, and Pheasants Forever to prepare statewide prairie grouse abundance models for review. This project combines the prairie grouse models with woody encroachment trajectories and management costs to estimate the return-on-investment for conservation investments. Other projects include the development of the Playa Wetland Restoration Guide v1.0 and analysis of spring migration waterfowl counts in the Rainwater Basin.

Science Cordinator Brad Thornton and GIS Specialist Sadique Rahman

Sadique provides additional GIS capacity and support to the Nebraska Game and Parks Commission in conjunction with the goals of the Rainwater Basin Joint Venture. He works with Nebraska Game and Parks Commission and other Joint Venture partner to update and maintain a spatial database for project tracking and outcome monitoring. This database, in addition to other geospatial datasets, can be used to prioritize conservation investments or create targeted mailing lists to landowners who might qualify for conservation programs.

Both Brad and Sadique have supported the Cooperative Research Unit, collaborating with research scientist Sarah Sonsthagen, and PhD student Rachel Rusten in preparation for the second field season for the Sandhills grassland bird study. They compiled management tracking history for eastern redcedar management and provided maps of survey sites and points.

Sampling Efficiency Assessment for Silver Carp and Bighead Carp in Nebraska Mid-Order Streams and Rivers

Principal Investigator(s): Jonathan Spurgeon, Mark Pegg, Kirk Steffensen
Graduate Student(s): Brett Anderson, M.S.
Duration: January 2023 – March 2025
Funding: Nebraska Game and Parks Commission
Location: Lower Platte River, Nebraska

Currently, eDNA is being used to investigate the distribution of invasive carp among lotic systems in Nebraska. However, attempts to verify eDNA results via live-fish collection have seen limited success due in part to limited understanding of life-stage specific habitat use within prairie systems and the sampling methods to collect individuals effectively among different habitat types. Therefore, the study objectives of this project were to: (1) investigate sampling methods (i.e., towed trawls, various net configurations, and different electrofishing methods, etc.) that can effectively sample the invasive carp population, and (2) devise a sampling protocol for use in prairie systems that can target different life-stages of invasive carp populations. Such a protocol can be used to inform information gaps based on desired management objectives including documenting presence, assessing demographic rates, and/or eradication efforts. We employed multiple gear-types including trawls, nets, and tow-barge electrofishing. Sampling efforts occurred in the spring, summer, and fall starting in 2023 and continuing into 2024. We focused on sampling efforts in mid-order prairie streams and rivers that are tributaries to the Missouri River and the Platte River in Nebraska. Streams and systems may include the Blue River, Nemaha Rivers, and Papillion Creek, along the Missouri River. Streams and systems may include the Salt Creek, Elkhorn River, Shell Creek, and Loup River along the Platte River. We used the information from eDNA results to direct sampling to locations with both positive and negative results for presence of invasive carp. Lower reaches of these systems were accessible by boats using traditional sampling gears. We sampled river and streams reach higher in the watersheds where traditional methods were not easily employed.

Marshall Stuart and Sylas Abarr setting nets. Photo: Brett Anderson

Amelia Zimmerman with a paddlefish on the Little Nemaha River. Photo: Brett Anderson

State-Wide Connectivity of Deer and Other Big Game in Nebraska

Principal Investigator(s): Clinton Leach, Sarah Sonsthagen, Jonathan Spurgeon
Graduate Student(s): Abby May, M.S.
Postdoctoral Researcher: TBD
Duration: April 2025 – August 2028
Funding: Nebraska Game and Parks Commission
Location: Nebraska Statewide

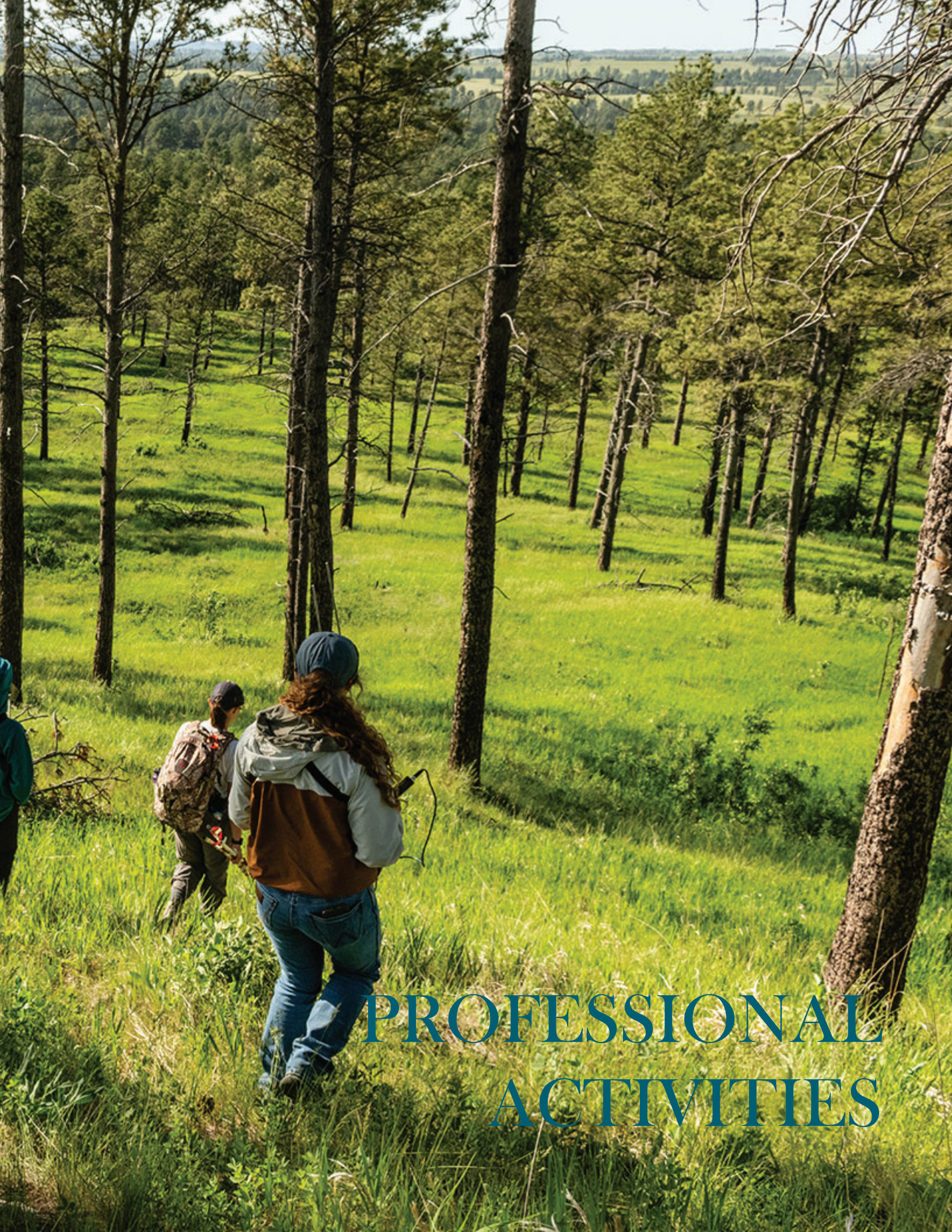
Abby May processing deer samples.
Photo: Megan Cary

The ability of wildlife to move across the landscape, either as part of their annual cycle to exploit different habitats at critical life stages or in response to ecosystem change and resource availability, is fundamental to population viability and health. Landscape features, such as roads, fences, and agriculture may impede movement, thereby disrupting migration corridors that link areas important at different stages in the annual cycle and (or) sundering areas that were once connected. Disruption of migration routes or reduction of dispersal opportunities can increase extirpation risk beyond the effects of habitat loss alone. The perception of what constitutes a barrier to movement varies among species, populations, and individuals, as migration and dispersal depend not only on capabilities and propensity but also upon behavioral decisions made by individuals. Multi-species approaches that assess movement of individuals across the landscape are needed to identify shared features that impede or facilitate movement as single species approaches may fail to capture the influence of topographies, habitats, and landscape structures on the overall connectivity of wildlife.

Nebraska provides a complex mosaic of habitats for large game species to navigate. Although the movement ecology of these species has been studied individually, relatively little is known about the extent to which these species share common corridors or barriers to movement. We aim to address this information need through comparative movement analysis across multiple large game species in western Nebraska as well as a state-wide assessment of genomic connectivity in mule deer and white-tailed deer. We will develop statistical methods to synthesize existing telemetry data with novel genetic data derived from existing tissue samples for six big game species (wild turkey, mule deer, white-tailed deer, elk, pronghorn, and bighorn sheep).

Sunrise on Pine Ridge Chadron, NE.
Photo: Jade Wawers

Jade Wawers, Catrina Johnson, Stephanie Roscoe, and Deepika Garugu.
Photo: Justin Hagg, Nebraskaland Magazine



PROFESSIONAL ACTIVITIES

Teaching

Jonathan Spurgeon

Spring 2025: NRES 803, Ecological Statistics

Model-based inference for ecological data, generalized linear and additive models, mixed models, survival analysis, multi-model inference and information theoretic model selection, and study design.

T/R 10-11:50, co-taught by Clinton Leach

Sarah Sonsthagen

Spring 2025: NRES 880G - Applications of Genomics in Wildlife and Fisheries Conservation

Introduction to genomic methods and analyses applied in peer-reviewed journals, emphasizes approaches to collect and analyze genomic data, including the assumptions and limitations of each approach, summarize principles underlying the genetics of natural populations, explain intra-individual, intra-population, among population, among species and community genetic/genomic approaches as it relates to conservation practices, and design a study that applies genomic approaches to inform conservation actions.

T/R 2-3:15

Clinton Leach

Spring 2025: NRES 803, Ecological Statistics

Model-based inference for ecological data, generalized linear and additive models, mixed models, survival analysis, multi-model inference and information theoretic model selection, and study design.

T/R 10-11:50, co-taught by Jonathan Spurgeon

Sunset on Salt Creek, Nebraska.
Photo: Blake Logan

Graduate Committee Service

Jonathan Spurgeon

Nolan Miller, MS, University of Arkansas at Pine Bluff

Travis Moore, MS, University of Nebraska-Lincoln

Shannon Smith, PhD, Virginia Institute of Marine Sciences

Sarah Sonsthagen

Malia Agee, MS, Kansas State University

Sarah Beres, PhD, Biological Sciences, University of Nebraska-Lincoln

Angela Brierly, PhD, Biological Sciences, University of Nebraska-Lincoln

Baylie Fadool, MS, School of Natural Resources, University of Nebraska-Lincoln

Ryan Giordanelli, MS, Kansas State University

Maddy Griep, MS, School of Natural Resources, University of Nebraska-Lincoln

Tiffany Hegdahl, PhD, Animal Sciences, University of Nebraska-Lincoln

Vinita Kavki, PhD, University of Arkansas

Jennifer Murray, MS, University of Nebraska-Omaha

Patrick Nshizirungu, PhD, Biological Sciences, University of Nebraska-Lincoln

Jackie Olexa, MS, Kansas State University

Megan Soldatke, MS, School of Natural Resources, University of Nebraska-Lincoln

Sarah Swanson, PhD, University of Alaska Fairbanks

Brandy Williams, PhD, Biological Sciences, University of Nebraska-Lincoln

Clinton Leach

Ava Britton, MS, School of Natural Resources, University of Nebraska-Lincoln

Deepika Garugu, PhD, School of Natural Resources, University of Nebraska-Lincoln

Jenna Ruoss, PhD, School of Natural Resources, University of Nebraska-Lincoln

Jade Wawers, MS, School of Natural Resources, University of Nebraska-Lincoln

Professional and Faculty Service

Jonathan Spurgeon

- Associate Editor, North American Journal of Fisheries Management
- Member, UNL School of Natural Resources, Graduate Course Organization Committee
- Member, University of Nebraska Prairie Streams Working Group
- Member, U.S. Geological Survey Prairie Streams and Fishes Research Initiative
- Applied Ecology Program Area Leader, SNR, UNL

Sarah Sonsthagen

- Senior Editor, Ornithological Applications
- Associate Editor, Frontiers in Conservation Science
- Associate Editor, Ornithological Applications (until April 2025)
- Member, Rainwater Basin Joint Venture, Conservation Planning Workgroup
- Member, UNL School of Natural Resources, Graduate Committee
- Member, UNL School of Natural Resources, Graduate Course Organization Committee
- Reviewer, Wilson Ornithological Society Research Grants

Clinton Leach

- Member, UNL School of Natural Resources, Graduate Committee
- Member, UNL School of Natural Resources, Social Committee

Training Assistance, Workshops, and Outreach Activities

Jonathan Spurgeon

- Instructor, Over-the-Water training course, Lincoln, NE
- Instructor, Motorboat Operators Certification Course, Lincoln, NE

Sarah Sonsthagen

- Mentor, Conservation Genomic Laboratory Techniques, and technical support, School of Natural Resources
- Organizer, ATV/UTV training course, Lincoln, NE

Team Building

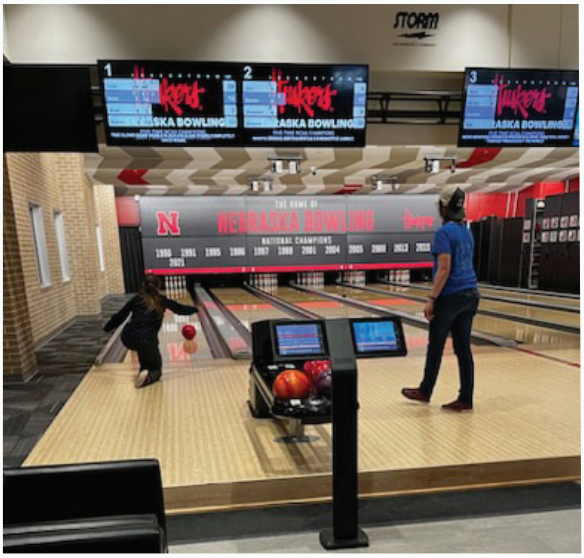
NECFWRU Bowling at East Campus Union

Nebraska Coop Unit took time out of their busy schedlues to come together for some fun in bowling. Leaders, collaborators, staff, and students came to enjoy time together at UNL East Campus Union bowling alley. (Photos: Donna Robinson)

Clint Leach & Rachel Rusten bowl while Rob Wilson, Katie Sporcic, Sarah Sonsthagen, & Deepika Garugu watch on.

Brad Thornton & Shannon Smith enjoying the bowling.

Clint Leach, Sarah Sonsthagen, and Bailey Arnold's turn to bowl.



Katie Sporcic and Rachel Rusten showing their bowling skills.

Presentations

32st Wildlife Society Conference

Medcalfe, R., A. Little, M. Vrtiska, S. Sonsthagen, and M. Chamberlain. 2025. Factors Affecting Wild Turkey (*Meleagris gallopavo*) Survival in Agrarian Landscapes of Western Nebraska. The Wildlife Society Conference, Edmonton, Alberta. October 2025.

North American Arctic Goose Conference

McQuillen, A. D., S. A. Sonsthagen, J. L. Dooley, J. O. Leafloor, F. B. Baldwin, S. Rohwer, C. S. Wood, and R. E. Wilson. 2025. Genomic patterns of introgression and hybridization in light geese. North American Arctic Goose Conference, Saskatoon, Saskatchewan. October 2025.

Prairie Grouse Technical Council Meeting

Bocian, J., E. Watson, S. A. Sonsthagen, D. S. Sullins, and D. A. Haukos. 2025. Characteristics of lek landscapes and spatial extent of breeding relative to leks among CRP and Non-CRP landscapes in Kansas and Nebraska. Prairie Grouse Technical Council Meeting, Valentine, Nebraska. September 2025.

Hoffman, T., R. Giordanelli, S. A. Sonsthagen, D. S. Sullins, and D. A. Haukos. 2025. Big movements provide big opportunities to understand greater prairie-chicken population connectivity among landscapes of varying CRP composition. Prairie Grouse Technical Council Meeting, Valentine, Nebraska. September 2025.

Sucharski, R., M. Agee, S. A. Sonsthagen, D. S. Sullins, and D. A. Haukos. 2025. Evaluating Nest to lek distances among CRP and non-CRP landscapes in Nebraska and Kansas. Prairie Grouse Technical Council Meeting, Valentine, Nebraska. September 2025.

Travis, K. A., Z. B. Whaley, S. A. Sonsthagen, D. S. Sullins, and D. A. Haukos. 2025. Why did the Prairie Chicken cross the road? Genomics and species distribution of fragmented populations of Tympanuchus cupido in the Central Great Plains. Prairie Grouse Technical Council Meeting, Valentine, Nebraska. September 2025.

Sonsthagen, S. A., D. S. Sullins, M. Agee, R. Giordanelli, K. Travis, E. Watson, Z. Whaley, and D. A. Haukos. 2025. Influence of the Conservation Reserve Program on Population Structure, Demography, and Space Use by Greater Prairie-Chickens in Kansas and Nebraska. Prairie Grouse Technical Council Meeting, Valentine, Nebraska. September 2025.

155th Annual American Fisheries Society

Ruoss, J., C. Pullano, M. Pegg, J. Spurgeon, and K. Steffensen. 2025. Between the Currents: Pallid Sturgeon Habitat in a Missouri River Tributary. 155th American Fisheries Society Annual Meeting, San Antonio, Texas. August 2025.

Ecological Society of America

Garugu, S. D., and S. A. Sonsthagen. 2025. Identification of landscape features that may facilitate or impeded gene flow among habitat patches within Wild Turkeys in Nebraska and Kansas. The Ecological Society of America, Annual Meeting, Baltimore, Maryland. August 2025.

America's Grasslands Conference

Rusten, R., and S. Sonsthagen. 2025. Has Eastern Redcedar removal impacted the Sandhills Grassland Bird Community? America's Grasslands Conference, Kearney, Nebraska. June 2025.

104th American Society of Mammalogists

Olexa, J. W., S. A. Sonsthagen, Z. Cordes, A. A. Ahlers, and A. G. Hope. 2025. A squirrely storey: phylogeography and conservation genetics of southern flying squirrels (*Glaucomys volans*) in Kansas. The 104th Annual Meeting, American Society of Mammalogists, West Lafayette, Indiana. June 2025.

World Evironmental and Water Resources Congress

Admiraal, D. R., Wood, K. Shirmahi, S. Karki, M. Pegg, and J. Spurgeon. 2025. Predicting carp egg transport based on HDF outputs from HEC-RAS 2D. 2025 World Environmental and Water Resources Congress, Anchorage, Alaska. May 2025.

Annual UCARE Research Symposia

McQuillen, A. D., S. A. Sonsthagen, J. L. Dooley, J. O. Leafloor, F. B. Baldwin, S. Rohwer, C. S. Wood, and R. E. Wilson. 2025. Genomic Patterns of Introgression and Hybridization in Light Geese. Annual UCARE Research Symposia, University of Nebraska. April 2025.

Arnold, B. R., S. A. Sonsthagen, J. Reakoff, A. Busby, C. P. Barger, and R. E. Wilson. 2025. Temporal and Spatial Variance, Not Genetic Diversity, Explains Nematode Infection Status in Spruce Grouse. Annual UCARE Research Symposia, University of Nebraska. April 2025.

Missouri River Natural Resources Conference

Ruoss, J., C. Pullano, M. Pegg, J. Spurgeon, and K. Steffensen. Is Your Turn Signal On? Assessing Environmental Migration Cues for Pallid Sturgeon for a Missouri River tributary. Missouri River Natural Resources Conference, Columbia, Missouri. March 2025.

Middle Basin Pallid Sturgeon Workgroup

Ruoss, J., C. Pullano, J. Spurgeon, M. Pegg, and K. Steffensen. 2025. Pallid Sturgeon Biology in the Lower Platte River and its Tributaries – 2025 Update. Middle Basin Pallid Sturgeon Workgroup Meeting. February 2025.

Nebraska Chapter American Fisheries Society

Ruoss, J., C. R. Pullano, M. Pegg, J. Spurgeon, and K. Steffensen. 2025. Navigating the currents: investigating environmental cues for Pallid Sturgeon immigration and emigration for a Missouri River tributary. Nebraska Chapter of the American Fisheries Society Annual Meeting, Aurora, Nebraska. February 2025.

Plant and Animal Genome Confernence

Sosa, M., P. Lavretsky, S. A. Sonsthagen, R. E. Wilson, and J. E. Mohl. 2025. Comparative Genomics Among Sea Ducks Reveals Ancestral Hybridization Resulting in Both Extensive Gene Flow and Hybrid Speciation. Plant and Animal Genome Conference. January 2025.

85th Midwest Fish and Wildlife Conference

Williams, J., L. Webb, and J. Spurgeon. 2025. River-Floodplain Connectivity: Effects on Ecological Communities in Restored Wetlands along the Lower Missouri River, Midwest Fish & Wildlife Conference, St. Louis, Missouri. January 2025.

Anderson, B., and J. Spurgeon. 2025. An assessment of sampling gears for adult invasive carp in mid-order rivers of Nebraska. Midwest Fish and Wildlife Conference. St. Louis, Missouri. January 2025.

Ruoss, J., C. Pullano, J. Spurgeon, M. Pegg, and K. Steffensen. 2025. Navigating the Currents: Investigating Environmental Cues for Pallid Sturgeon Immigration and Emigration for a Missouri River Tributary. 85th Midwest Fish and Wildlife Conference, St. Louis, Missouri. January 2025.

AGU24

Koch, C. W., S. A. Sonsthagen, L. W. Cooper, J. M. Grebmeier, A. E. Riddle-Berntsen, and R. S. Cornman. 2024. DNA metabarcoding reveals diatom-rich diets and presence of toxic algae in Pacific Arctic clams. AGU, Washington, D.C. December 2024.

33rd Annual Meeting Boreal Parners in Flight

Armstrong, M., R. E. Wilson, and S. A. Sonsthagen. 2024. Signatures of hybridization between the Boreal and Gray-headed Chickadee. 33rd Annual Meeting of Boreal Partners in Flight, Anchorage, Alaska. December 2024.

Sonsthagen, S. A., and R. E. Wilson. 2024. Migratory Connectivity within the Rusty Blackbird. 33rd Annual Meeting of Boreal Partners in Flight, Anchorage, Alaska. December 2024.

50th Southeastern Fishes Council

Morris, K., D. L. Lynch, M. Cole, J. J. Spurgeon, and S. Lochmann. 2024. Paleback Darter occupancy and habitat use in main-channel and off-channel areas of Lick Creek in the Ouachita Mountain ecoregion in west-central Arkansas. Annual Meeting of Southeastern Fishes Council. Little Rock, Arkansas. November 2024.

Entomological Society of America

Hruska, J., J. Petersen, R. Wilson, W. Thogmartin, and S. Sonsthagen. 2025. Temporal genomics of the monarch butterfly (*Danaus plexippus*): an assessment of genetic diversity in response to population size decline. Entomological Society of America, Annual Meeting. November 2024.

31st Wildlife Society Conference

Rusten, R., and S. A. Sonsthagen. 2024. Has Eastern Redcedar Removal Improved Grassland Bird Communities in the Sandhills Ecoregion? The Wildlife Society 31st Annual Conference, Baltimore, Maryland. October 2024.

142nd American Ornithological Society

Wilson, R. E., S. A. Sonsthagen, C. R. Ely, B. A. Nolet, D. Heard, M. van der Sluijs, R. J. M. Nuitjen, and D. Solovyeva. 2024. Spatial genomic structure in Tundra Swans: a circumpolar perspective for population delineation. The 142nd annual meeting of the American Ornithological Society, Estes Park, Colorado. October 2024.

Sonsthagen, S. A., R. E. Wilson, R. J. Harrigan, R. Corman, and S. L. Talbot. 2024. Life in the cold: Adaptation to the Arctic of Alaska Galliformes. The 142nd annual meeting of the American Ornithological Society Meeting, Estes Park, Colorado. October 2024.

American Genetics Association Symposium

Garugu, S. D., and S. A. Sonsthagen. 2024. Does habitat configuration influence patterns of genetic diversity in Wild Turkeys? American Genetics Association Presidental Symposium, Tahoe, California. October 2024.

Wawers, J., and S. A. Sonsthagen. 2024. Development of a metagenomics approach to evaluate what is eating ground-nesting bird eggs in western Nebraska. American Genetics Association Presidental Symposium, Tahoe, California. October 2024.

Gabe VanEngen offloading detections from receiver near Leshara, NE. Photo: Jake Goldsberry

Data Releases

Sonsthagen, S. A., R. E. Wilson, M. R. Armstrong, J. A. Johnson, T. L. Booms, C. F. Gesmundo, Z. M. Pohlen, and P. B. Leonard. 2025. Genomic data from Gray-headed Chickadee and Boreal Chickadee: U.S. Geological Survey data release, https://doi.org/10.5066/P14VRAFK

Sonsthagen, S. A., R. E. Wilson, B. J. Pierson, K. G. Sage, S. L. Talbot, D. V. Derksen, and D. H. Ward. 2024. Brant (*Branta bernicla*) Genetic Data from North America, Europe, and Asia: U.S. Geological Survey data release, https://doi.org/10.5066/P96G9LAJ

Sonsthagen, S. A., R. E. Wilson, A. E. Riddle-Berntsen, S. M. Matsuoka, J. A. Johnson, and D. W. Demarest, 2025. Development of Single Nucleotide Polymorphisms (SNPs) in Rusty Blackbirds (*Euphagus carolinus*) for migratory connectivity assessment. 2025: U.S. Geological Survey data release, https://doi.org/10.5066/P1WQKUS9

Peer-Reviewed Publications

2025

Althoff, A. L., J. L. Kinschuh, D. K. Owens, J. J. Spurgeon, J. N. Stevens, and S. E. Lochmann. 2025. Movements and habitat use of Silver Carp in the Arkansas and White River. Journal of Fish and Wildlife Management, https://doi.org/10.3996/JFWM-23-066

Armstrong, M. R., R. E. Wilson, J. A. Johnson, T. L. Booms, C. F. Gesmundo, Z. M. Pohlen, P. B. Leonard, and S. A. Sonsthagen. 2025. Hybridization and asymmetrical introgression between the vulnerable Gray-headed Chickadee and a more abundant congener, the Boreal Chickadee: Implications for conservation. Ecology and Evolution, 15, 7. doi.org/10.1002/ece3.71673

Hartman, M. L., K. M. Morris, J. J. Spurgeon, and S. E. Lochmann. 2025 Multi-scale habitat characteristics influence Paleback Darter occupancy and detection probability. Transactions of the American Fisheries Society.

Hladik, M. L., D. W. Kolpin, M. D. De Parsia, D. D. Snow, S. Bartelt-Hunt, B. Densmore, L. E. Hubbard, D. L. Rus, J. J. Spurgeon, B. G. Perrotta, K. A. Kidd, J. M. Kraus, C. E. Givens, C. J. Kotalik, D. M. Walters. 2025 Pesticide concentrations in multiple physical and biological stream matrices are impacted by a bioenergy production facility receiving pesticide coated corn seeds. Environmental Toxicology and Chemistry.

Koch, C. W., S. A. Sonsthagen, L. W. Cooper, J. M. Grebmeier, A. E. Riddle-Berntsen, and R. S. Cornman. 2025. Prevalence of pelagic diatoms and harmful algae in tellinid bivalve diets during record low sea ice in the Pacific Arctic determined by DNA metabarcoding. Frontiers in Marine Science, 12, doi.org/10.3389/fmars.2025.1480327

Miller, B. T., B. C. Neely, C. J. Chance-Ossowski , M. J. Waters, V. Salazar, L. K. Kowalewski, N. W. Kramer, S. A. Lundgren, and J. J. Spurgeon. 2025. Population characteristics and detection of Flathead Catfish in small Kansas impoundments. Journal of Fish and Wildlife Management, https://doi.org/10.3996/JFWM-23-057

Sonsthagen, S. and J. Spurgeon. 2025 Ecosystems in Bathke (ed.) Understanding and assessing climate change: implications for Nebraska. University of Nebraska Press

Wilson, R. E., S. A. Sonsthagen, A. J. Walsh, and A. D. Fox. 2025. Adoption of non-related goslings and intergenerational parental care among Greenland White-fronted Geese *Anser albifrons flavirostris*. Ibis, doi.org/10.1111/ibi.13427

Nebraska Coopertive Fish and Wildlife Research Unit 2024 Annual meeting Poster presentation. Photo: Donna Robinson

2024

Barshinger, C. E., M. A. Eggleton, and J. J. Spurgeon. 2024. Use of otolith microchemistry to determine natal origin for silver carp *Hypophthalmichthys molitrix* in the lower Mississippi River basin. Biological Invasions. 26:3091-3106

Lachance Linklater, E., S. A. Sonsthagen, G. J. Robertson, L. Colston-Nepali, F. Vigfúsdóttir, and V. L. Friesen. 2024. Reduced representation sequencing reveals weak genetic differentiation between Canadian and European *Larus hyperboreus* (Glaucous Gull). Ornithological Applications, 126:1–11. doi. org/10.1093/ornithapp/duae037

Leach, C. B., B. P. Weitzman, J. L. Bodkin, D. Esler, G. G. Esslinger, K. A. Kloecker, D. H. Monson, J. N. Womble, and M. B. Hooten. 2024. The dynamics of sea otter prey selection under population growth and expansion. Ecosphere, 15(2): e70084. https://doi.org/10.1002/ecs2.70084

Mapes, C. C., J. Falkowski, G. P. Setliff, K. Gallagher, J. P. Ruoss, L. Mortensen, E. Hinkle, R. Beard, and R. Hilger. 2024. Bees nesting in insect galls and a description of a novel nesting site for *Megachile montivaga* Cresson, 1878 (Hymenoptera: Megachilidae) in goldenrod ball galls of *Solidago altissima* L. The Pan-Pacific Entomologist, 100(4): 384-393.

Rosenfield, R. N., S. A. Sonsthagen, W. E. Stout, T. G. Driscoll, A. C. Stewart, P. N. Frater, and S. L. Talbot. 2024. Combined high rates of alternative breeding strategies unexpectedly found among populations of a solitary nesting raptor. Ecology and Evolution, 14:e70190.

Sonsthagen, S. A., R. E. Wilson, R. Turner, M. J. Fortin, G. Gilchrist, and V. Friesen. 2024. Wintering grounds leave their mark: where birds winter influences genomic structure in Arctic nesting common eiders. Conservation Genetics, 6:89–101. doi.org/10.1007/s10592-024-01654-2

Spooner, J., and J. Spurgeon. 2024. Retention of p-Chip microtransponders and post-tagging survival of small-bodied stream fishes. North American Journal of Fisheries Management. 44:799-811

Stevens, J. N., C. E. Barshinger, J. J. Spurgeon, M. A. Eggleton, and S. E. Lochmann. 2024. Comparison of two otolith processing methods for Silver Carp age estimation. Journal of the Southeastern Association of Fish and Wildlife Agencies. 11:36-44

Sweet, A. D., R. Wilson, J. Reakoff, S. Sonsthagen, C. Hurst, and S. Pirro. 2024. The Complete Genome Sequence of Splendidofilaria pectoralis (Onchocercidae, Rhabditida, Chromadorea, Nematoda). Biodiversity Genomes, doi: 10.56179/001c.126786

Wilson, R. E., S. W. Boyd, S. A. Sonsthagen, D. H. Ward, P. Clausen, K. M. Dickson, B. S. Ebbinge, G. A. Gudmundsson, G. K. Sage, J. R. Rearick, D. V. Derksen, and S. L. Talbot. 2024. Where east meets west: phylogeography of the high Arctic North American brant goose. Ecology and Evolution,14: e11245. doi. org/10.1002/ece3.11245

Grand Vision

Our nation's fish and wildlife species face increasingly complex threats and challenges. Ensuring a healthy future for these species and resources benefits all Americans, contributing to the abundance of our food supply, the well-being of diverse cultures and communities, and the future of biodiverse ecosystems. The Nebraska Cooperative Fish and Wildlife Research Unit plays a critical role in making that future possible.

Evolving Challenges Demand Evolving Insights

We advance knowledge and understanding through cutting-edge, interdisciplinary science.

Complex Challenges Call for Collaboration

We work closely with a wide range of partners, build mutually beneficial and respectful relationships, and connect diverse stakeholders with one another.

Informed Decision-making Requires Accurate Data

We provide timely information and innovative tools to partners in all aspects of ecosystems stewardship, from the conservation and sustainable use of crucial fisheries and wildlife to the recovery of imperiled species.

Wise Conservation Needs Trust

We conduct and provide unbiased, policy-neutral scientific research for use in determining management policy and practice.

Through the 21st century and beyond, the Nebraska Cooperative Fish and Wildlife Research Unit will use our expertise, state-of-the-art equipment and facilities, and unique association with the Nebraska Game and Parks Commission, the University of Nebraska–Lincoln, the U.S. Geological Survey, the U.S. Fish and Wildlife Service, and the Wildlife Management Institute (and many other stakeholders) to deliver the targeted research and foundational scientific advancements needed to conserve fish and wildlife species in a changing world.

Jenna Ruoss with recently spawned female pallid sturgeon on Lower Platte River.
Photo: Chris Pullano

PROGRAM DIRECTION

Endorsed by the NECFWRU Executive Coordinating Committee, September 2020

The Nebraska Cooperative Fish and Wildlife Research Unit (NECFWRU) is committed to developing future natural resource managers and researchers through graduate education, doing innovative and novel research that is interdisciplinary and cross-boundary in support of the North American Model of Wildlife Conservation, and enhancing cooperator capabilities through technical assistance on state-of-the-art science practices.

Teaching within NECFWRU includes formal classes, small groups, and one-on-one interactions, and emphasizes active-learning approaches that empower students to take responsibility for their life-long educational journey.

Research within NECFWRU addresses the expressed information needs of the citizens of Nebraska and the United States of America, especially to better understand natural systems and how socioecological processes are altered by disturbances and management actions.

Assistance within NECFWRU occurs frequently in both informal and formal settings and is meant to provide advice and training on cooperator needs including discussions of their science questions, study-design considerations, and training.

The diversity of landscapes and subsequent diverse fish-and-wildlife resources in Nebraska requires NECFWRU to champion a broad focus for graduate education, applied research, and technical assistance. Fishery and wildlife management, landscape ecology, and social and ecological resilience will be emphasized, with intent of complementing and strengthening existing foci of land-grant universities, state and federal natural resource agencies, and non-government organizations centered on natural resources.

Willow Creek on Lawn Lake Ranch, western Nebraska.
Photo: Braxton Newkirk