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Unit

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2007

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# THE COMMUNICATOR

NEWS FROM THE NEBRASKA COOPERATIVE FISH & WILDLIFE RESEARCH UNIT

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Volume 3, Issue 2

September, 2007

## New Director School of Natural Resources



The School of Natural Resources (SNR) at the University of Nebraska–Lincoln conducted a lengthy search for a new director. Dr. Donald Wilhite was selected and became the new director of SNR on August 1. Dr. Wilhite was former director of the National Drought Mitigation Center. ❖

## Changes

On July 2, we said, “Good-bye,” to Chris Kelly, project coordinator for the invasive species project. Chris accepted a position as a regional supervisor with the Nebraska Department of Agriculture. Though we will miss Chris and his expertise, we congratulate him on beginning a new chapter in his career. ❖

## INSIDE THIS ISSUE

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## New Unit Logo

Last fall the Coop Unit announced a competition for designing a logo to help identify the unit. Five people submitted designs. The winning design was submitted by Nathan Ohlrich, a senior Studio Arts major at the University of Nebraska–Lincoln. (Nathan has since received his Bachelor of Fine Arts Degree in May 2007.) Nathan incorporated the Nebraska state fish (channel catfish), state bird (western meadowlark), and state mammal (white-tailed) deer into his design.



The logo will be incorporated into publications (such as this newsletter), has been printed on hats and shirts to identify unit staff and students while conducting field research and official business, and soon will be added to our Website. ❖

## Welcome!

We welcome two new graduate students, **Chad Smith** (co-advised by Kyle Hoagland, UNL Water Center, and Craig Allen) and **Aaron Alai** (advised by Allen). ❖

## Current Research

### *Amphibian Monitoring Techniques (in Relation to Wetland Qualities and the Surrounding Landscape – Rainwater Basin Region)*

**GOALS:** This pilot program monitored amphibian populations to detect changes in the presence of amphibians in Nebraska’s south-central Rainwater Basin.

The data is providing inferential insight into changes in individual species presence (or absence) and in community composition. Data collections reflect responses to restoration activities and anthropogenic landuse/landcover changes, as well as relation-

*Research continued on page 2*

Research continued from page 1

ships to existing wetland-patch network characteristics, adjacent upland landuse/landcover, and environmental contaminants originating as runoff from farm lands. Results will guide management activities in this region and serve as a model for other areas.

**CURRENT STATUS:** A manuscript was published in the February 2007 issue of the *Journal of Wildlife Management*, "Observer Bias in Anuran Call Surveys." GIS spatial analysis continues.

**GRADUATE RESEARCH ASSISTANT:** Aaron Lotz

**FUNDING:** The Nebraska Game and Parks Commission

### ***An Adaptive Management Approach for Selecting Habitat Improvement Targets in the Shortgrass Prairie Ecosystem***

**GOALS:** This collaborative project (Andrew Tyre, Craig Allen, Mike Fritz and Scott Taylor) will develop models for an adaptive resource management approach to managing shortgrass prairie ecosystems and to help direct limited restoration dollars to sites that will yield the most gain.

**CURRENT STATUS:** For the past year, we worked to develop a resource management tool that could predict the quality of restoration activities in western Nebraska shortgrass prairies. We analyzed two aerial surveys of the region, one haphazard and one systematic, which recorded locations of existing shortgrass prairie. Maps were developed of the environmental variables thought to be related to shortgrass prairie (e.g. percent of clay, soil depth, elevation, and slope). We compared a number of methods for predicting good quality prairie. To date, the sheer volume of data has prevented us from estimating true spatial prediction models across the entire region. The best models from all methods rank independent test sites correctly about 80% of the time—this is consistent with the performance of most habitat models in the literature. To know if this is good enough will require using an adaptive management approach, and monitoring the implementation of restorations over time.

**GRADUATE RESEARCH ASSISTANT:** none at this time

**POST DOC:** Naikoa Aguilar-Amuchastegui

**FUNDING:** U.S. Fish and Wildlife Service

### ***Cross-Scale Structure in Ecosystems***

**GOALS:** We are conducting a series of empirical analyses to

determine the distribution of functional groups within and across scales, the association of measures of biotic variability in vertebrates (e.g., invasions, extinctions, nomadism, migration) with discontinuities in body mass distributions, and cross-scale analyses of patterns in body mass distributions from local to hemispheric scales. This project specifically investigates cross-scale structure and its implications in ecosystems.

**CURRENT STATUS:** Analysis of Mediterranean-climate data is complete and a report is in final revision.

**GRADUATE RESEARCH ASSISTANTS:** Aaron Lotz, Don Wardwell

**FUNDING:** The James S. McDonnell Foundation—*Studying Complex Systems*

### ***Diversity and Ecological Functions***

**GOALS:** This project seeks to understand how grassland diversity affects ecological services.

**CURRENT STATUS:** The pilot year (2005) of data collection focused on pollination and herbivory, and is completed. Field research in 2006 and 2007 focused on herbivory and invasion resistance. Data collections are nearly complete with data analyses to follow.

Kristine Nemecek focused on populations of economically-significant grasshoppers and the pest control provided by predatory invertebrates from June through August 2007. She also started data collection for soil development and invasion resistance in 2006 and completed it in September 2007. Lindsey Reinartz, in her second field season, finished three samples of herbivory rate and insect sweeps. She conducted vegetation sampling of her fields and an additional herbivory sampling and observation of what insects actually visit the plants



Research continued on page 3

Welcome to the Nebraska Coop Unit newsletter! We plan to distribute our newsletter two or three times a year. Please share this newsletter with anyone you think may be interested. If you wish to be added to our distribution list, know of someone who should be included, or wish to be excluded from future mailings, contact us at [allencr@unl.edu](mailto:allencr@unl.edu) or [vegger1@unl.edu](mailto:vegger1@unl.edu).



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## OUR COOPERATORS:

U.S. Geological Survey, Department of the Interior  
University of Nebraska–Lincoln  
Institute of Agriculture and Natural Resources  
School of Natural Resources  
Nebraska Game and Parks Commission  
The Wildlife Management Institute  
U.S. Fish and Wildlife Service

*Research continued from page 2*

**GRADUATE RESEARCH ASSISTANTS:** Lindsey Reinarz (University of Nebraska at Omaha, advised by L. Wolfenbarger), and Kristine Nemecek (employee of U.S. Army Corps of Engineers)

**TECHNICIAN:** Katy Dornbos

**FUNDING:** The James S. McDonnell Foundation—*Studying Complex Systems*, and the Nebraska Game and Parks Commission. Additional collaborators include the Nature Conservancy, the University of Nebraska at Omaha, and the Natural Resources Conservation Service.

### ***Evaluation of Landowner Incentives Program (LIP) for Species at Risk***

**GOALS:** The Nebraska Game and Park Commission's Landowner Incentives Program (LIP) assists landowners with removing invasive trees. Our research is focused on evaluating the impact that tree removal has on the avian grassland community.

**CURRENT STATUS:** The third and final season of field work began in mid-May 2007. Pretreatment, base-line data were collected in 2005 which included assessment of vegetation using the Floristic

Quality Index, and an estimation of bird densities. The second season of data, collected in 2006, focused on bird response to the altered prairie conditions. The third and final season included analyses of how landscape context influences avian response to tree removal. This summer, landowners were notified of the changes in bird species and populations resulting from tree removal. Post-treatment vegetation data was collected this summer by Nebraska Game and Parks Commission staff and will be incorporated into further analysis with bird and tree densities.

**GRADUATE RESEARCH ASSISTANT:** Beth Forbus

**TECHNICIANS:** Meghan Halabisky, Ryan Rezac

**FUNDING:** The U.S. Geological Survey, and the Nebraska Game and Parks Commission

### ***Impact of White Perch on Walleye; and Predators of White Perch at Branched Oak and Pawnee Reservoirs***

**GOALS:** These companion projects are examining white perch interactions with other fishes in two similar Nebraska reservoirs having different white perch population stages (i.e., stunted and non-stunted). Food habits and diet overlap among white perch, crappie, walleye, white bass, and channel catfish are being evaluated. It is hoped that the study will result in a predator program that will control the stunted white perch population in Branched Oak Reservoir and allow current management programs to be refined for stunted white perch.

**CURRENT STATUS:** All stomach content samples collected in 2006 from potential white perch predators have been analyzed and data are being synthesized. Stable isotope analysis of stomach contents is being conducted to confirm results. The second, 2007, field season runs March through November.

**GRADUATE RESEARCH ASSISTANT:** Nate Gosch

**UNDERGRADUATE ASSISTANTS:** Landon Pierce, Jeff Stittle, and John Walrath

**FUNDING:** U.S. Geological Survey, and the Nebraska Game and Parks Commission

### ***Monitoring, Mapping and Risk Assessment for Non-Indigenous Invasive Species in Nebraska***

**GOALS:** This research project will help build a cohesive non-indigenous species biosecurity and management system in Nebraska that is integrated and relatively seamless across institutional boundaries. This project also will map the potential spread of many invasive species in Nebraska.

*Research continued on page 6*

# Graduate Student News

## Aaron Alai

*M.S. Graduate Research Assistant, Wildlife*

Aaron wants to apply his talents and course work to a project which will contribute to the scientific knowledge of invasive species. He is very interested in predicting the vulnerabilities in ecological systems which allow for invasive species to be successful. Aaron was introduced to invasive species in an ecology class as a University of Nebraska–Lincoln undergraduate. This course determined his graduate school focus. His long-term goal is to get a doctorate and become a professor at a university where he can continue to focus on research.

## Elizabeth (Beth) Forbus

*M.S. Graduate Research Assistant, Wildlife*

Two technicians (Meghan Halabisky and Ryan Rezac) assisted Beth with the third and final season of bird data collection in southeast Nebraska this summer. Beth is currently analyzing bird data with Program Distance and preparing landscape analysis using GIS and Fragstats programs. She expects to graduate in December 2007.

## Nathan (Nate) Gosch

*M.S. Graduate Research Assistant, Fisheries*

Nate is about half way through his second field season, which began in March, and has started writing results from his first field season. In December, Nate plans to present the results from his first field season at the Midwest Fish and Wildlife Conference in Madison, Wisconsin. He expects to graduate in May 2008.

## Christopher (Chris) Lewis

*Ph.D. Graduate Research Assistant, Fisheries*

Currently, Chris is partially through the first field season of his Ph.D. project: studying recruitment of walleye and white bass in southwest Nebraska irrigation reservoirs. This past spring he focused on the larval life stages of these species. Currently, he is focusing on the juvenile and adult stages.

## Aaron Lotz

*Ph.D. Graduate Research Assistant, Wildlife*

Aaron continues to work on his dissertation research, focusing on empirical analyses of body size distributions. He has completed analyses of bird and mammal communities from global

Mediterranean climate ecosystems, and will now shift his focus to the effect of changes in spatial scale on body mass distributions. He will analyze bird and mammal community body mass distributions in North and South America with assistance from Pablo Marquet (Catholic University of Chile). Aaron continues to work with amphibian monitoring data by conducting geospatial analyses.

## Dustin Martin

*M.S. Graduate Research Assistant, Fisheries*

Dustin completed his first field season this spring studying the relative importance of spawning habitats for walleye and white bass in southwest Nebraska. Acoustic telemetry, electrofishing, egg mats, and larval light traps were used to determine habitats used by walleye and white bass for spawning activity. Currently he is focusing on data analyses.

## Thaddeus (Thad) Miller

*M.S. Graduate Research Assistant, Wildlife*

Thad continues to progress on his research which is focused on performing risk assessments for non-indigenous invasive plants in Nebraska. Thad has built habitat suitability models for six of fifteen invasive species of interest.

In late July, 2007, Thad traveled to Bellingham, Washington, where he received hands-on training in uncertainty analysis with Dr. Wayne Landis, Western Washington University. Thad received funding from the UNL Center for Great Plains Studies that will cover part of his travel expenses.

## Kristine Nemec

*Ph.D. Graduate Research Assistant, Wildlife*



Kristine is conducting her second season, 2007, of field research on restoration plots located near Wood River, Nebraska (south central Nebraska) with the assistance of research technician, Katy Dornbos.

In June and August, Kristine and Katy collected ants, spiders, and ground beetles with pitfall traps, or test tubes filled with



*Student News continued from page 4*

environmentally-friendly antifreeze. With the help of her husband John, 240 holes were drilled into the ground for the traps at her study plots. Katy collected aboveground insects (e.g. lady beetles and grasshoppers) by swinging a canvas sweep net through the vegetation, completing 8,640 sweeps over the course of the summer. Plant species observed along transects were also recorded. The data will be used to compare ecosystem services provided by the plant and invertebrate communities in high and low diversity grassland restorations.

### **Lindsey Reinarz**

*M.S. Graduate Research Assistant, Wildlife*

During her second (2007) field season, Lindsey finished three samples of herbivory rate and insect sweeps. She conducted vegetation sampling at the field sites and also conducted one more sample of herbivory and observation of what insects actually visit the plants.

### **Chad Smith**

*Pb.D. Graduate Research Assistant, Wildlife*

Chad received a Master of Public Affairs degree in Environmental Policy and Natural Resources Management from Indiana University-Bloomington in 1996, where his research focused on land management and natural resources law. Currently, Chad is director of the Natural Resources Division for the consulting firm Headwaters Corporation. One of his research areas of interest is adaptive management.

### **Justin Williams**

*M.S. Graduate Research Assistant, Wildlife*

Justin is working to determine the potential spread and impact of non-indigenous plant species in Nebraska. First, he will conduct a qualitative species assessment to identify species that pose the greatest risk of becoming invasive in Nebraska. Next, he will produce predictive spatial models for a subset of species.

### **Sam Wilson**

*M.S. Graduate Research Assistant, Wildlife*

Sam continues to track otters on the Platte River with five otters now implanted with transmitters. The second trapping season will begin in September 2007 with a goal of fifteen otters implanted with transmitters. As nongame mammal/furbearer biologist for the Nebraska Game and Parks, Sam's work and research are tightly linked to each other. ❖

## EVENTS

### NEBRASKA INVASIVE SPECIES CONFERENCE

A conference is planned for February 7-8, 2008 in Lincoln Nebraska. Check the Web site below for further information becomes available. <http://calmit.unl.edu/invasives/>

### ANNUAL COORDINATING COMMITTEE MEETING

The next Coordinating Committee Meeting will be held November 8, 2007 in Lincoln.

## Conferences/Meetings/ Workshops

Chris Lewis, attended the *Workshop on Computational Science for Natural Resource Managers* April 11-14, 2007 in Knoxville, Tennessee.

Justin Williams and Chris Kelly attended and presented at the February 2007 Nebraska Weed Control Association Annual Conference in Kearney, Nebraska.

March 27 in Hastings, NE, Chris Kelly presented online mapping ArcIMS and also promoted the Website for the Nebraska Invasive Species Project as part of the annual spring training program for weed superintendents.

Pope presented at and attended the May 23-24, 2007 Topeka Shiner Workshop at De Soto Bend National Wildlife Refuge, IA.

The Sarpy County aquatic-invasers group invited Kelly to give a short presentation on June 2. And on June 7, Kelly spoke at the Soil and Water Conservation Society annual meeting held at the Spring Creek Prairie Audubon Center southwest of Denton, NE.

Pope attended the instructor's orientation and training workshop for the Max McGraw Wildlife Foundation's *Conservation Leaders for Tomorrow* program in Dundee, Illinois, July 15-18, 2007. The program helps "wildlife students learn about, witness and briefly experience hunting" and its social, economic and ecological impacts. This training qualifies Pope to instruct future *Conservation Leaders for Tomorrow* courses.

Craig Allen spent most of July 2007 collaborating with Graeme Cumming at the University of Capetown in South Africa.

San Jose, California was the location of the August 2007 Ecological Society of America annual meeting which was attended by Allen. ❖

Research continued from page 3

**CURRENT STATUS:** A Web site has been developed as a centralized clearinghouse on identification, management, impact and potential spread of currently and potentially established non-indigenous species (<http://calmit.unl.edu/invasives/>). Plans are on course for hosting an invasive species conference February 7-8, 2008. A search for a new coordinator is underway to replace Chris Kelly who recently resigned to accept a permanent position with the Nebraska Department of Agriculture.

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*Plans are on course for hosting an  
invasive species conference February 7-8, 2008.*

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**GRADUATE RESEARCH ASSISTANT:** Justin Williams

**PROJECT COORDINATOR:** Chris Kelly

**FUNDING:** Nebraska Environmental Trust

### ***Productivity and Biology of Ducks Nesting in the Sandhills of Nebraska***

**GOALS:** The combination of expansive grasslands and abundant wetlands makes the Nebraska Sandhills attractive and important to nesting ducks. Annual aerial surveys counted as many as 250,000 breeding ducks in the region. Future aerial surveys are not possible. This study, managed by Larkin Powell (School of Natural Resources), intends to: 1) design and develop an annual, repeatable brood survey for estimating relative production across the Sandhills; 2) conduct the brood survey for two years and refine survey and analysis methods; 3) examine female age ratios of ducks nesting in the Sandhills; and 5) examine patterns of recaptures of male mallards south of Bassett, Nebraska.

**CURRENT STATUS:** Two pilot seasons of research were conducted south of Bassett, Nebraska, in spring and summer 2005 and 2006. The study primarily used radio-marked mallards to

study duck nesting ecology and production. Seventy-nine females were radio-marked and tracked through the nesting site. Close to 500 male mallards were captured and fitted with leg bands in 2005; nine were recaptured in 2006.

The graduate research student's first field season was during 2007. Preliminary results show continued captures of returning males to the study site. We performed brood surveys throughout the summer, and will be analyzing the data to refine survey techniques for 2008.

**GRADUATE RESEARCH ASSISTANT:** Zachary Cunningham

**FUNDING:** Nebraska Game and Parks Commission

### ***Recruitment of Walleye and White Bass in Nebraska's Southwest Irrigation Reservoirs***

**GOALS:** The reservoirs within Nebraska's Republican River watershed provide flood control and irrigation in southwest Nebraska. Fish populations in these reservoirs include walleye and white bass, and attract many anglers to the area. While white bass populations are self-sustaining within these reservoirs, walleye must be restocked annually because natural reproduction and recruitment of young are low. This project will increase our understanding of the factors affecting recruitment of walleye and white bass in irrigation reservoirs, which is vital for understanding reservoir fish ecology in semiarid regions.

**CURRENT STATUS:** Last fall (2006), 30 walleye and 30 white bass were implanted with transmitters. Fish movements were tracked this spring to identify spawning habits. Collections of larval fishes were completed this spring and collections of juvenile fishes will be completed this fall. This fall, an additional 30 walleye and 30 white bass will be implanted with transmitters to facilitate tracking during next year's spawning.

**GRADUATE RESEARCH ASSISTANTS:** Christopher Lewis, Dustin Martin

Research continued on page 7

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## ***Our Mission***

*Train graduate students for professional careers in natural resources research and management*

*Conduct research that will create new information useful for management of natural resources*

*Provide technical assistance to cooperators*

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**FUNDING:** Nebraska Game and Parks Commission

### ***River Otter Home Range and Habitats Use Pilot Study***

**GOALS:** This project will collect home range and habitat use information on approximately fifteen river otters along the big bend area of the Platte River using radio telemetry. Data collected, in conjunction with the results of an ongoing river otter health and reproductive survey and results from NGPC's annual otter bridge survey, will help to close existing information gaps and contribute to the creation of the Nebraska River Otter Management Plan and the Statewide Comprehensive Conservation Plan.

**CURRENT STATUS:** Tracking of the five river otters implanted with telemetry last fall continues. The two females set up natal dens this spring and are presently moving about again, presumably with young. One elusive otter was tracked about eighty miles downstream. Preparations are underway for trapping and implanting ten more river otters this fall.

**GRADUATE RESEARCH ASSISTANT:** Sam Wilson (employee of Nebraska Game and Parks Commission)

**TECHNICIAN:** Kent Fricke

**FUNDING:** Nebraska Game and Parks Commission, with support from the Folsom Children's Zoo

### ***Spatial Risk Assessment of Invasive Species Impacts on Native Species in Nebraska***

**GOALS:** This project is focused on assessing the risks that native Nebraska species face from non-native invasive species. Products will include spatial models of stressors and targets, models of spatial overlap, hazard indices, and relative risk indices for each target.

**CURRENT STATUS:** Stressors (invasive species on the Nebraska Watch List) have been identified, and we have acquired the spatial data for rare and endangered species and plant communities from the Nebraska Game and Parks Commission Nebraska Legacy Project. After distribution models are built, we will determine the area of spatial overlap between invasive species and target rare species and communities. That value will be combined with a hazard index in order to develop an overall relative risk assessment value.

**GRADUATE RESEARCH ASSISTANT:** Thad Miller

**FUNDING:** The Nebraska Game and Parks Commission, and the U.S. Geological Survey

### ***Understanding Invasions and Extinctions***

**GOALS:** Compared to other continental areas, Mediterranean regions have been invaded by a large number of non-indigenous organisms, including vertebrates. Concomitant with invasions, declines and extinctions have transformed the faunas of Mediterranean ecoregions. Our project objectives are to 1) compare the vertebrate body mass structures of Mediterranean-climate ecosystems, and 2) examine the effects of invasions and extinctions in Mediterranean-climate ecosystems on body mass structure and alpha, beta and gamma diversity.

**CURRENT STATUS:** Analysis is complete and a report is in final revision.

**GRADUATE RESEARCH ASSISTANT:** Aaron Lotz

**FUNDING:** U.S. Geological Survey ❖

### ***Awards & Recognitions***

On May 17, 2007, Chris Lewis was awarded the title of Fellow of the School of Graduate Studies from Memorial University (Newfoundland, Canada) for his efforts during his M.S. program. This award recognizes outstanding achievement and pursuit of excellence throughout a graduate program.

Administrative Assistant Valerie Egger was the recipient of the Spring 2007 Staff Recognition Award from the UNL School of Natural Resources (SNR). School Director Mark Kuzila presented the award to Valerie during the staff field trip April 25, 2007. ❖



### ***Teaching: Spring 2007***

Craig Allen taught *Landscape Ecology* which focused on the investigation of spatial heterogeneity and pattern—how to characterize patterns, how they develop and change through time, and the implications for populations, communities, and ecosystem processes.

Kevin Pope co-taught *Managed Aquatic Systems* with Mark Pegg (UNL SNR). The course focused on ecological processes that occur in regulated river basins, and the associated problems and opportunities that arise with fishery management. ❖