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THE COMMUNICATOR

NEWS FROM THE NEBRASKA COOPERATIVE FISH & WILDLIFE RESEARCH UNIT

Volume 3, Issue 1 February 2007

Teaching and Training

This semester (Spring 2007), Craig Allen and Kevin Pope are teaching graduate-level courses at the University of Nebraska.

> Craig is teaching *Landscape Ecology* which focuses 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 is co-teaching *Managed Aquatic Systems* with Mark Pegg (UNL SNR). This course focuses on ecological processes that occur in regulated river basins and the associated problems or opportunities that arise with fishery management.

On May 22–24, 2006, Kevin Pope and Steve Chipps (South Dakota Coop Unit) teamed up to instruct the federal Motorboat Operator Certification Course (MOCC) at South Dakota State University. Six students, including Nathan Gosch from the Nebraska Unit, completed the course. The course exposed students to boat safety and maintenance, and provided hands-on training with maneuvering exercises, response to fires, and water rescue training. Kevin and Steve will team up once again to teach MOCC in April 2007. ❖

INSIDE THIS ISSUE

New Faces

This past August, **Chris Kelly** began working as the project coordinator for the *Monitoring, Mapping and Risk Assessment for Non-Indigenous Invasive Species in Nebraska* project. Chris' knowledge of invasive plants, his Web design expertise, and relationships with agriculture producers will be indispensable as he coordinates the various project activities. **Justin Williams** joined the Coop Unit in fall 2006 and is working on this same project as a graduate research assistant. He is working with plant species modeling. Justin traveled from Fort Collins, Colorado to join the Unit.

In January 2007, Ph.D. student **Christopher Lewis** and MS student **Dustin Martin** began working with Kevin Pope as graduate research assistants on the southwest reservoirs project. Chris traveled from Newfoundland, Canada—over 3,000 miles—to join the Coop Unit. Dustin's trip here was much shorter, coming from Columbia, Missouri.

Welcome, Chris, Justin, Chris, and Dustin! ❖

Congratulations!

Donald Wardwell received his M.S. in Natural Resources from the University of Nebraska–Lincoln on December 16, 2006. Don has the unique distinction of being the Coop Unit's first graduate student, and now the first to earn a graduate degree.

Christopher Lewis received a travel award to attend the April 2007 *Workshop on Computational Science for Natural Resource Managers* in Knoxville, Tennessee.

Congratulations to Donald Wardwell, Christopher Lewis and Aaron Lotz!

Aaron Lotz's first manuscript, *Observer Bias in Anuran Call Surveys,* will be published in the February issue of the *Journal of Wildlife Management*. This will be the Coop Unit's first graduate-student publication. Another benchmark has been achieved! ❖

The Changing Faces of USGS

Being the newest unit in the forty-unit USGS Cooperative Research Units (CRU) Program, the Nebraska Coop Unit is continually adapting to change. The Unit offices have been located in three buildings in slightly over two years (we're not moving any more!). New graduate research assistants continue to come on board, and research continues to expand.

The newest change took place when the U.S. Geological Survey (USGS) hired Kevin Whalen as a Field Supervisor in the USGS Cooperative Fish and Wildlife Units (CRU) Program. Kevin has responsibilities for Cooperative Fish and Wildlife Units in a number of states, including Nebraska, and he will represent USGS on the Nebraska Unit's Coordinating Committee. The unit supervisor change in Nebraska is part of the transition following Mike Van Den Avyle's announcement to retire this summer—Mike served as the first USGS representative and field supervisor for the Nebraska Unit.

Both Mike and Kevin attended Nebraska's Coordinating Committee this past November. At this time, Kevin was introduced to the Unit staff and graduate students, and also to the many cooperators who participated in the meeting.

"Welcome, Kevin Whalen!
And thank you Mike Van Den Avyle!"

According to Ken Williams, USGS CRU Chief, Kevin Whalen's responsibilities include communication with Cooperators, participation in Unit Coordinating Committee meetings, and line supervision of USGS scientists. Previously, Kevin worked in the USGS Biological Resources Discipline's Office of the Chief Scientist, and is a former CRU student. He is stationed at USGS headquarters in Reston, Virginia, and can be reached at 703-648-4062 (kwhalen@usgs.gov).

We look forward to working with Kevin. And we thank Mike for his support of the Nebraska unit during his period as Nebraska's CRU supervisor and as the USGS Coordinating Committee representative. From all of us here at Nebraska's Coop Unit, "Welcome, Kevin Whalen! And thank you, Mike Van Den Avyle!" ❖

Current Research

As the Coop Unit grows, research continues to expand as well. In addition to the following research projects, several grant proposals have been submitted and are under consideration.

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

GOALS: We developed a pilot program focused on the spatial distribution of wetlands in Nebraska's Rainwater Basin landscape. The program monitors amphibian populations in south-central Nebraska for the purpose of detecting changes in presence in this region over time. The data gathered will provide inferential insight into the presence, or absence, of amphibian species and changes in individual species presence and community composition. Data collections will record amphibian responses to restoration activities and anthropogenic landuse/landcover changes, and will also reflect the relationships to existing wetland-patch network characteristics, adjacent upland landuse/landcover, and environmental contaminants originating as runoff from adjacent farm lands. Results will guide management activities in this region and serve as a model for other areas.

CURRENT STATUS: Data collection is complete and a manuscript is currently in press. GIS spatial analysis is currently underway.

GRADUATE RESEARCH ASSISTANT: Aaron Lotz

FUNDING: The Nebraska Game and Parks Commission

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: Phase I analysis of Mediterranean-climate data is complete and a report is near completion.

GRADUATE RESEARCH ASSISTANTS: Aaron Lotz, Don Wardwell

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

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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, please contact us at allencr@unl.edu or vegger1@unl.edu.

For More Information Contact:

Nebraska Cooperative Fish & Wildlife Research Unit
University of Nebraska–Lincoln
422 Hardin Hall
Lincoln NE 68583-0984
402-472-0449, FAX 402-472-2722
http://snr.unl.edu/necoopunit/

Craig R. Allen	Kevin L. Pope	Valerie Egger
Leader	Assistant Leader	Adm. Assistant
402-472-0229	402-472-7028	402-472-0449
allencr@unl.edu	kpope2@unl.edu	vegger1@unl.edu

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

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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 outline how the models could be applied to selecting land for conservation incentive programs. Objectives are to 1) use cutting edge statistical methods to predict the potential distribution of high quality shortgrass prairie, 2) design a new survey to maximize efficient detection of temporal change in order to identify regions of greatest uncertainty, and 3) prioritize land for conservation incentives that maximize increased habitat for minimum costs.

Current Status: Preparations are being made for the initial season of field work and data collection.

Graduate Research Assistant: none at this time

Post Doc: Naikoa Aguilar

Funding: U.S. Fish and Wildlife Service

Diversity and Ecological Functions

Goals: This project seeks to understand how grassland diversity affects ecological services. The current focus is on herbivory and invasion resistance.

Current Status: The pilot year (2005) of data collection focused on pollination and herbivory, and is completed. Field research in 2006 focused on herbivory and invasion resistance.

Graduate Research Assistants: Lindsey Reinarz (University of Nebraska at Omaha, advised by L. Wolfenbarger), and Kristine Nemec (who is also an employee of the U.S. Army Corps of Engineers)

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.

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: The first field season ran from March to November 2006. All stomach content samples of potential white perch predators have been analyzed. Data are being synthesized for assessment. The second field season will run from March through November 2007.

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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

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. Landowners benefit from increased forage on pasturelands and restoration of prairie plants and wildlife, and management practices that sustain prairie and grassland communities. Our research focuses on one aspect of the program—removal of invasive trees—by evaluating the impact that tree removal has on the avian grassland community.

Current Status: The third and final season of field work will began in mid-May 2007. Pretreatment, base-line data were collected in 2005 and followed by the removal of invasive trees such as red cedar. This data included assessment of vegetation using the Floristic Quality Index, and 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 will include analyses of how landscape context influence avian response to tree removal.

Graduate Research Assistant: Beth Forbus
Technicians: Chad Brock, Lizette Peters

Funding: The 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.

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/). An invasive species conference is planned for late 2007.

An invasive species conference is planned for late 2007

Graduate Research Assistant: Justin Williams
Project Coordinator: Chris Kelly Gosch
Undergraduate Assistant: Sam Tobin

Funding: Nebraska Environmental Trust

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

Goals: The reservoirs within Nebraska's Republican River watershed were built primarily for flood control and irrigation, but also provide important fisheries for anglers in southwest Nebraska—walleye and white bass are of particular importance. Annual stockings of walleye continue to be necessary because of low natural reproduction and recruitment of young. In contrast, white bass populations are self-sustaining within these reservoirs. 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 will be tracked this spring to identify spawning habits. Additional field sampling will include collections of larval and juvenile fishes.

Graduate Research Assistants: Christopher Lewis, Dustin Martin

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 ten river otters along the big bend area of the Platte River using remote sensing (radio telemetry).

Data collected, in conjunction with the results of an ongoing river otter health and reproductive survey and results from

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Graduate Students

Elizabeth (Beth) Forbus

M.S. Graduate Research Assistant, Wildlife

Beth has collected two seasons of field data on bird densities. The third and final season of bird data will be collected this summer. All invasive trees were removed before the 2006 field season, so this will be the second season of post-treatment data. Beth is currently analyzing bird data with Program Distance and preparing landscape analysis using GIS and Fragstats programs. Post-treatment vegetation data will be collected this summer by Nebraska Game and Parks Commission staff, and will be incorporated into further analysis with bird and tree densities.

Nathan (Nate) Gosch

M.S. Graduate Research Assistant, Fisheries

Nate completed his first field season in November 2006. He has completed a substantial portion of his laboratory analysis and is now in the process of synthesizing the data. His second season of field sampling will begin sometime during March (depending on when the ice melts off the reservoirs) and continue through November.

Christopher (Chris) Lewis

Ph.D. Graduate Research Assistant, Fisheries

Chris arrived in Lincoln, Nebraska, after 3,000 miles of driving and an 8 hour ferry ride all the way from St. John's, Newfoundland. After spending the past two years working on marine fish, he is looking forward to the challenge of studying the recruitment dynamics of walleye and white bass in southwestern Nebraska irrigation reservoirs.

Currently, Chris is taking the electrofishing training course offered by USFWS, and will be taking the Motorboat Operator Certification Course.

Aaron Lotz

Ph.D. Graduate Research Assistant, Wildlife

Aaron continues to work on his dissertation research, focusing on empirical analyses of body size distributions and phenomena such as biological invasions and extinctions. He has completed analyses of bird and mammal communities from global Mediterranean climate ecosystems, and discovered that all body mass distributions analyzed were discontinuous, and invasive species often have body masses that place them near gaps in those distributions. However, species turnover resulting from invasions and extinctions in those systems did not substantially affect the distribution of function. That is, functions lost through extinctions tended to be replaced by invasions. He also continues to work with 2005 and 2006 amphibian monitoring data by conducting geospatial analyses.

Aaron is also involved in science outreach. He and other members of the School of Natural Resources (SNR) Graduate Student Association participate in the McPhee Elementary School Outreach Program. They teach science to students in grades K-5 during their after school Science Club program.

Dustin Martin

M.S. Graduate Research Assistant, Fisheries

Dustin received his B.S. in Fisheries and Wildlife from the University of Missouri-Columbia (UMC). While at UMC, Dustin studied the distribution of the blacknose shiner in western Missouri prairie streams.

His first field season with the University of Nebraska–Lincoln begins in March 2007. Dustin will examine the relative importance of spawning habitats for walleye and white bass. He will travel to southwestern Nebraska with Chris Lewis to sample adult, egg, and larval fish during the spawning and post-spawning period to determine habitat usage. Dustin is presently enrolled in the electrofishing training course by USFWS, and will be taking the Motorboat Operator Certification Course.

Thaddeus (Thad) Miller

M.S. Graduate Research Assistant, Wildlife

Thad continues to move forward on his research that focuses on performing risk assessments for non-indigenous invasive plants in Nebraska. He continues to collect literature useful in producing species models, including habitat requirements of the invasive species of interest, and the ecological impacts that result from their invasion. The habitat data has been useful in

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guiding decisions regarding model selection. Thad has built habitat suitability models for 6 of 15 invasive species of interest. He is also constructing "impacts tables" that will be used to evaluate the ecological impacts of invasive species based on life history characteristics.

Kristine Nemec

Ph.D. Graduate Research Assistant, Wildlife

Kristine grew up in Hawaii, Illinois, and Nebraska. She earned a B.S. in Environmental Studies (1999) and an M.A. in Biology (2003) from the University of Nebraska at Omaha. Kristine's research interests are grassland restoration, invertebrate ecology, and ecosystem resilience. As an ecologist for the U.S. Army Corps of Engineers in Omaha, she writes environmental assessments and develops revegetation and monitoring plans for ecosystem restoration projects along the Missouri River. Kristine will conduct her second season of field research on restoration plots during the summer of 2007.

Lindsey Reinarz

M.S. Graduate Research Assistant, Wildlife

Lindsey's enjoys multiple aspects of biology, especially conservation biology. She really enjoys the outdoor aspect of her research. Lindsey plans to graduate with her Masters degree in May of 2008 from the University of Nebraska at Omaha, and following that, she would enjoy working in an organization like The Nature Conservancy or in a wildlife refuge setting, something very outdoors related with research and possibly an education focus as well. When she is not working on her thesis (which focuses on the relationship between diversity and ecological function), she enjoys a variety of activities: biking, snowboarding, reading, painting, learning foreign languages, camping, whitewater rafting. Prior to graduate school, Lindsey was a Spanish teacher.

Donald (Don) Wardwell

M.S. Graduate (2006), Wildlife

Don completed his Master's thesis and degree in December 2006. He is currently working on preparing and publishing several manuscripts that cover topics such as invasive species biology, avian foraging behavior, and discontinuity theory. Don, along with Lance Gunderson and Craig Allen, contributed to chapter five (*Temporal scaling in complex systems: Resonant frequencies and biotic variability)* of a book scheduled to be released March 6, 2007—*Temporal dimensions in landscape ecology*, by J. A. Bissonette and I. Storch, editors. He has also finished and submitted three manuscripts for publication:

- *A test of the cross-scale resilience model: functional richness in Mediterranean-climate ecosystems,*
- *Body mass predicts diet and habitat specialization in birds,* and
- *Variability in population abundance is associated with thresholds between scaling regimes.*

Justin Williams

M.S. Graduate Research Assistant, Wildlife

Justin is working with Chris Kelly and Craig Allen on a project funded by the Nebraska Environmental Trust 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. Secondly, 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. Sam's position as the nongame mammal/furbearer biologist at the Nebraska Game and Parks Commission is inseparable from his otter research. This research will answer questions necessary to create a river otter management plan and to include river otter management in the Nebraska Game and Parks' Natural Legacy Plan. Other wildlife interests and job roles include investigating mountain lion presence in Nebraska and feral pig elimination. ❖

EVENTS

COORDINATING COMMITTEE MEETING

The Unit's second annual Coordinating Committee Meeting was held November 28, 2006. In addition to Unit staff and students, about 35 interested cooperators and collaborators attended. Participating members of the Coordinating Committee were: Mike Van Den Avyle and Kevin Whalen (USGS), Susan Fritz standing in for John Owens (UNL), Gregg Watson (U.S. Fish and Wildlife Service), Kirk Nelson (Nebraska Game and Parks Commission) and Pat Ruble (The Wildlife Management Institute). The program included presentations by the Unit's graduate students.

Conferences, Meetings, Workshops

Unit staff and students are often on the road collaborating with colleagues, exploring new opportunities, sharing research, and learning about new models and scientific findings.

Chris Lewis will attend an April 2007 workshop in Knoxville, TN, *Workshop on Computational Science for Natural Resource Managers*. Topics include spatial data and modeling, scenario analysis for policy decisions, GIS for dynamic problems, and wildlife disease management.

Aaron Lotz will attend the February 23, 2007 *Women in Science IX Conference* banquet for high school women (juniors and seniors) who are interested in science. He and others from the SNR will answer any questions they may have, tell them about our projects, our paths after high school

Justin Williams and Chris Kelly attended the annual Nebraska Weed Control Association Conference February 19–22 in Kearney, Nebraska.

Craig Allen and Aaron Lotz attended the 12th Annual Informational Seminar of the Rainwater Basin Joint Venture on February 13, 2007 in Hastings, Nebraska.

The January 2007 American Fisheries Society Tri-State Joint Chapter Meeting was held in Council Bluffs, Iowa. Attendees were Kevin Pope, Nate Gosch, Chris Lewis and Dustin Martin. Gosch presented a research poster.

Craig Allen, Kevin Pope, Beth Forbus, Nate Gosch, Chris Kelly, Kristine Nemec, Lindsey Reinarz and Don Wardwell attended the 67th Midwest Fish and Wildlife Conference on December 3–6, 2006 in Omaha, Nebraska. Allen was a member of the conference planning committee. Kelly instructed a workshop on non-indigenous species promoting proper management of aquatic invaders. Gosch presented a poster. Kristine and Lindsey each gave research presentations.

Kevin Pope sponsored five UNL students (two graduate and three undergraduate) who participated in the October *Conservation Leaders for Tomorrow* program offered by the Max McGraw Wildlife Foundation in Illinois. According to the Foundation, this intensive four-day program helps students "learn about, witness and briefly experience hunting, including its social, economic and ecological values." Currently, over half of university students graduating with wildlife degrees have little or no exposure to hunting.

Craig Allen and Don Wardwell traveled to Stockholm, Sweden, in October 2006 to collaborate with other scientists on discontinuities in complex systems.

In August 2006, Aaron Lotz traveled to Utah where he and other students were split into groups of six and asked to define a pressing environmental problem. Each group then developed a study plan to solve the issue and finished with a written proposal. Additional information can be found in the September 21, 2006 issue of *Nature* on pages 265–267: Environmental science: a testing experience.

In September 2006, Kevin Pope attended the annual meeting of the American Fisheries Society in Lake Placid, NY. Following the meeting, he participated in the federal U.S. Geological Survey Research Grade Evaluation Panel, also in Lake Placid.

The 91st Annual Meeting of The Ecological Society of America was held August 6–11, 2006 in Memphis, Tennessee. It was attended by Craig Allen and Don Wardwell who gave two research presentations.

Craig Allen, Chris Kelly and Thad Miller attended the *Threats to Nebraska Rivers—Invasive Plants Conference* in Kearney, Nebraska, August 2006.

This past June, Kevin Pope attended the annual Fisheries Management Section meeting of the Nebraska Game and Parks Commission in Burwell, Nebraska, giving a presentation and discussing potential research projects. ❖

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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: In October 2006, five otters were captured on and near the Platte River (a core component of the species' distribution in Nebraska) and implanted with motion and mortality sensing transmitters. During the approximately one-year long monitoring portion of the pilot project, data will be collected on daily and seasonal movements, home range, habitat use, survival, response to hydrological changes in the Platte, and relationship to abundance data from the bridge surveys.

GRADUATE RESEARCH ASSISTANT: Sam Wilson (also NGPC)

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 conducts spatially-based risk analyses for species and communities identified as at-risk. It 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: Data sets have been developed from published literature and from communication with scientists in five countries, and analysis is underway.

GRADUATE RESEARCH ASSISTANT: Aaron Lotz

FUNDING: U.S. Geological Survey ❖

Our Mission

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

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

P*rovide technical assistance to cooperators*