

*APPLETON-WHITTELL RESEARCH RANCH*

**DIRECTOR'S REPORT 2008**



The Appleton-Whittell Research Ranch of the National Audubon Society is a collaborative effort among Audubon, Bureau of Land Management, Swift Current Land & Cattle Company, The Nature Conservancy, The Research Ranch Foundation, and U.S. Forest Service.

## MISSION

*The Appleton-Whittell Research Ranch* - a living laboratory to determine and demonstrate methods to safeguard and rehabilitate southwestern grasslands, and to assist policy makers and other citizens in the care and protection of our native ecosystems, natural resources, and quality of life.

## GOALS

- Land Stewardship– to be a premier semi-arid grassland that fosters a natural diversity of native species. *ARR must be safeguarded to insure that natural processes are not compromised by human activities. To this end, we are restoring fire to historic levels, reducing the threats from non-native species, and excluding domestic livestock, poachers, and off-road traffic.*
- Research – to understand how grasslands and related ecosystems function, and to recognize the key elements that safeguard these ecosystems. *We must effectively monitor environmental trends (weather, plant succession, animal communities, etc.) and carefully archive all findings to take full advantage of ARR as a reference site. A majority of the research projects on ARR must focus on applications that will guide human stewardship of native semi-arid grasslands.*
- Outreach and Education– to advocate for grassland ecosystems by encouraging citizens and policy makers to safeguard and rehabilitate native ecosystems throughout the region. *We must use the knowledge gained through our land management and research to help citizens and decision-makers make informed choices. We must foster cooperation and communication among professionals, officials, and citizens.*

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## Letter from the Director

*December 2008*

### *From the Director*

*For me, fiscal year 2007/2008 started off with a bang, literally, as I was thrown from a horse on July 1 and spent a bit more than a week in the hospital. My job performance for the next couple of months was less than sterling, but the rest of the staff, Dr. Chris Hass, Assistant Director, Pat Kugler, Office Manager, and Leo Gonzales, Maintenance, did an outstanding job of advancing the mission of the Ranch. They received great assistance from Heidi Ruhling, a California student who was conducting an educational internship during the summer.*

*Even with a rocky start, FY 07/08 proved to be a great year, and 08/09 looks promising as well. The monsoons have been generous; new science projects are underway, and we are able to reach out to more conservation minded folks than ever before.*

*As I look back over the time I've been privileged to live and work here at the Research Ranch, I'm grateful for so many things - for Ariel and Frank Appleton, whose vision and drive made the Research Ranch a reality; for donors and granting entities whose generous support allows the Research Ranch to continue; for the scientists whose work expands the mission of the Research Ranch; for our neighbors who generously make their land available to scientists; for our friends who continue to volunteer, advise and support the mission and goals of the Ranch; for the Audubon staff who work to protect the environment here and across the world.*

*To all of you, I say "Thank You!"*

*Linda Kennedy*

# INTRODUCTION

## June 2007 – December 2008 Director's Report

I'm often asked "What's a typical day like at the Research Ranch?" My usual answer is "I've never had a typical day!" The challenges and rewards that accompany my position as Director vary widely from year to year, day to day, even hour to hour. In this report, I hope to give you a glimpse of those challenges and rewards.

One of the big rewards is working with the staff here and at our state office.

Christine Hass, Ph.D., Assistant Director of the Research Ranch is finishing up her second year on staff, and the Ranch is benefiting from her wealth of scientific and technical expertise. Shown at right, Chris is adjusting one of the cameras she is using to study mammals.



Pat Kugler, Office Manager extraordinaire, not only keeps Chris and me on task at the office, but also helps at the MAPS stations (more about this project, later). Her husband, John, volunteers at the MAPS station, contributes beautiful line drawings for brochures, and builds bat boxes!

Leo Gonzalez does a great job building and maintaining our wildlife friendly fences, keeping our roads passable, treating invasive species and a wide range of other projects.

Sam Campana, VP and Executive Director of Audubon Arizona, and the rest of the Audubon staff in our Phoenix office are always ready to assist when we need them.





## INTERNS

There's no doubt about it, interns are one of the greatest rewards! In the summer of 2007, Heidi Ruhling, an undergraduate from California, joined us through our educational internship program. She soon became accomplished at removing birds from mist nets. David Crawford, an undergraduate from Iowa, conducted an educational internship in the summer of 2008. David, with guidance from Chris, learned to use GPS and GIS to map an invasive species.



Both students worked hard at both menial and mentally challenging tasks, and were great fun to have around!

## NEW PARTNER

Swift Current Land & Cattle Company, LLC. purchased the remaining Appleton parcels within the Research Ranch boundary, and Audubon is again managing those parcels for conservation and research. David Salisbury, President and Jennifer Russo, Director of Corporate Communications and I are checking out a windmill on their property.



## CONSERVATION AND LAND STEWARDSHIP

### RAIN

Although 2008 didn't provide as much precipitation as 2007 (13.5" compared to 17"), the rains came at just the right time both years, and the grasses of the Research Ranch look especially beautiful.

### FIRE

We had some close calls, but no wildfires during either the summer of 2007 or 2008. The Audubon-Babacomari Firewise Community was recognized nationally by the National Wildfire Coordinating Group, and we, especially Leo, spend a lot of time and energy making the building of the Research Ranch as defensible as possible. While we certainly don't want our buildings to burn, we do promote return of fire to fire adapted ecosystems, and so are working with our agency partners, BLM and USFS, to be certain that fire is returned to the Ranch as appropriate.

### CROSS-BORDER TRAFFIC

This is definitely one of the challenges – the foot traffic hasn't abated and trails criss-cross the Ranch. Along with biohazardous waste and other debris, the Ranch is threatened by warming fires left unattended, gates left open or fences cut, waterers or water systems damaged. We work closely with Border Patrol agents, who respond quickly when needed.

### WILDLIFE FRIENDLY FENCE

Leo and volunteers from Sierra Club Service Tour groups, led by Ralph Dinsman, finished replacing old, substandard fence on the Forest Service portion of the Research Ranch.



This fall the volunteers from the Sierra Club helped Leo remove some dangerous fence around one of the parcels purchased by Swift Current Land and Cattle. Now wildlife can move more freely in and onto the Research Ranch!

In conjunction with the Arizona Antelope Foundation, the USDA-NRCS and Arizona Game and Fish Department, we produced a Wildlife Friendly Fence brochure for distribution throughout the state. This brochure is also available on our website at <http://www.audubonresearchranch.org/PDFs/FenceBrochure-May2008.pdf>.



## **SOLAR PUMP SYSTEM AT TELLES TANK**

Our friends at the Department of Arizona Game and Fish came through for the Ranch yet again! The wind tower at Telles Tank was damaged beyond repair. Thanks to an emergency grant from AZGF, Telles Tank did not go dry, and wildlife have a safe, dependable source of water.

## **INVASIVE SPECIES**

This is one of the toughest challenges we face, but we're not alone. Ecosystems of the Southwest are being invaded by non-native species at a rapid rate. We're trying to hold the line on all counts – whether it be removing bullfrogs from Telles and Finley Tanks or treating hoary cress in the sacaton.

One bright spot can be seen in our efforts to reclaim a sacaton floodplain currently dominated by Bermudagrass. Thanks to a generous grant from the RIESTER Foundation, our plan to transplant sacaton into the Bermudagrass has taken a great step forward. A new pump in an existing well provides water for irrigation, and we have great hopes that we will be able to continue transplanting and nurturing sacaton.



## **FISH BARRIER PROJECT ON O'DONNELL CREEK**

The Bureau of Reclamation (BoR) has proposed construction and/or enlargement of dams on O'Donnell Creek to protect native fish in the Canelo Cienega. We, with support from researchers, neighbors, and other non-profit conservation organizations, have argued that the sites proposed are inappropriate. BoR personnel evaluated a site we suggested as an alternative, and have agreed to bring that alternative site forward in the Environmental Assessment.

## **ENERGY CONSERVATION**

At last! We've replaced the windows in the Big Adobe, Little Adobe, Ranch House and Bunkhouse with energy efficient, dual pane, fiberglass frames. Gary Brown, of GB Glass, installed the new windows and the new, steel clad insulated doors. We know this will make the housing structures more energy efficient and will bring a degree of fire resistance to these structures that was lacking before.

## **WATER CONSERVATION**

OK, maybe I'm jumping the gun on this just a bit, but I'm really excited about a project that we'll be starting next year. The USDA-NRCS has awarded funding for a Wildlife Habitat Improvement Project – water harvesting to provide water for wildlife. Stay tuned!



# RESEARCH and SCIENCE

## APACHERIA FELLOWSHIPS AWARDED

We were very pleased to announce that two student scientists earned Apacheria Fellowships this year. Clay Nichols, an undergraduate from Eastern New Mexico University, earned his fellowship to re-survey bird diversity on oak transects established by Carl Bock and Kristen Bishop after the Ryan fire. Clay's advisor is Dr. Zach Jones, who has a long history of research here. Kelley O'Neal is working on her doctoral dissertation and used her fellowship to quantify changes in woody plant cover, map occurrence of grazing, fire and precipitation. Kelley commutes from the University of Maryland.



Clay Nichols, left, with binoculars in hand.

Kelley O'Neal's photo was captured by one of Chris' wildlife cameras at Finley Tank.



**Appleton-Whittell Christmas Bird Count Circle**

Click and drag on the map below to pan and zoom as desired.

## APPLETON-WHITTELL CHRISTMAS BIRD COUNT

The second sanctioned count was held on January 5, 2008 and was deemed a success as 120 species were noted, with a total count of 5306 individual birds sighted. The count was dedicated to Dr. Robert Whitcomb, who passed away less than a month before the count. Bob was instrumental in organizing the Appleton-Whittell CBC, and had conducted research on the Research Ranch for many years.

Robert Weisler is the compiler for the AWCBC, and information about the upcoming count is available at: [www.huachuca-audubon.org/CBC/AWCBC.php](http://www.huachuca-audubon.org/CBC/AWCBC.php).

## MAPS (Mapping Avian Productivity & Survivorship)

This year Chris managed two stations, both on BLM property. In addition to Post Dam on the Research Ranch, which she re-initiated last year, she re-started the station at Empire Gulch on the Empire Ranch. Running these two stations kept her very busy this summer and data entry has kept her busy this fall! Pat Kugler, Office Manager, helped at both stations, as did David Crawford, Intern. Several volunteers, notably John Kugler, provided essential support.

Chris and Yellow Billed Cuckoo at Empire Gulch

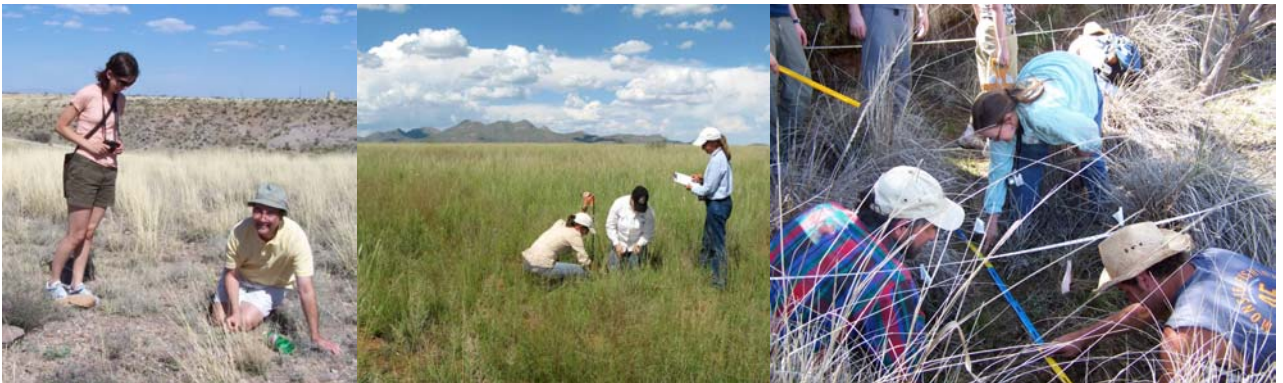


## RESEARCH HIGHLIGHTS



The Ranch hosted nearly forty separate projects during 2008 (see appendix for more detail). Examples of new projects include the two Apacheria Fellowship projects mentioned above, Glen Collins' excellent documentation of the history of the Research Ranch, David Crawford's mapping of Boer Lovegrass, and Eric Grissell's survey of parasitic wasps.

Next spring a new project will be undertaken by Dan Robinett et al., which will include establishment of monitoring transects along the Babacomari River and O'Donnell Creek. This 5-year project was funded through a grant from the Arizona Water Protection Fund.





## VEGETATION MONITORING ON ECOLOGICAL SITES

For the last two years, I haven't been able to read as many of the long-term vegetation transects as I would have liked, but this year I was able to examine all nineteen. These transects were established in 2003 and are sited in representative areas of the various Ecological Sites found on the Research Ranch. Dan Robinett, Jim Koweek (see photo), Alayna Sandford,

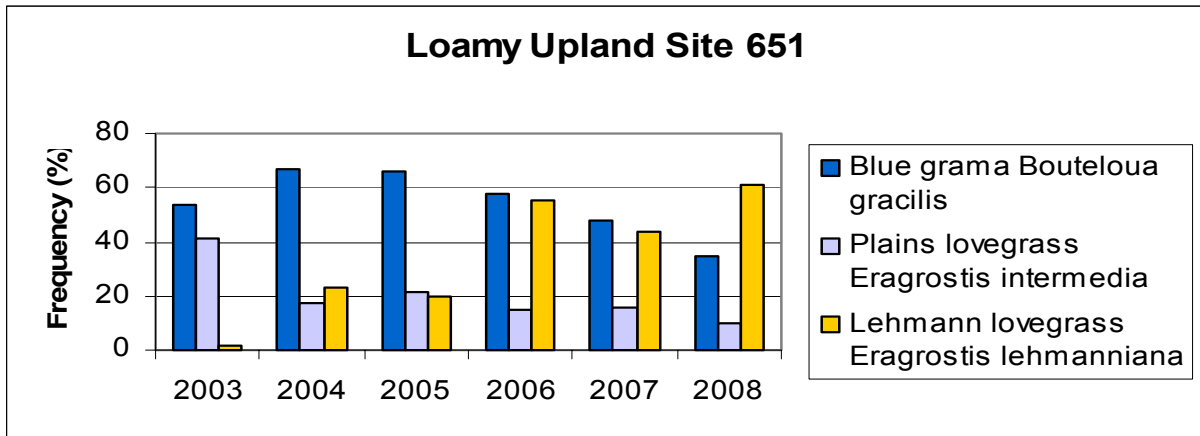


Heather Dial and Terri Wallace all volunteered to help – and even Chris recorded data for three transects!

It was great to spend so much time in the field, and in general the grasses look beautiful. The monitoring is quantifying a disturbing trend, as Lehmann lovegrass, an invasive, non-native grass from South Africa, is taking over the loamy sites. Lehmann increased from 1% to 60% in some transects. Natives such as Blue Grama and Plains Lovegrass appear to be outcompeted by this aggressive species. The graph, below,

illustrates the trend on one site for these three species.

The BLM, through its Challenge Cost Share program, has agreed to fund, in part, a compilation of the state of knowledge about Lehmann Lovegrass, which may provide some management and research direction.



Native Grasses (L to R)  
 Black Grama, Crinkleawn,  
 Cane Beardstem, Vine  
 Mesquite

# OUTREACH & EDUCATION

## PROFESSIONAL CONFERENCES

Chris and I each attend professional conferences to both enhance our professional development, and to share information from the Ranch. Chris presented a paper entitled “Applications of animal tracking data” at the International Society of Professional Trackers, Carnation, WA. See photo at left.

I attended the joint meeting of the International Congress of Rangelands and International Congress of Grasslands in Hohhot, China and presented two poster papers. Abstracts from all three are included in the appendix of this report.

I was asked to be part of the Audubon contingent at the Southern Cone Grassland Symposium in Argentina this fall. A group of about 40 international participants toured the humid pampas region, learned of the issues facing this region, and discussed conservation strategies.



## SERVICE

- Ranch personnel actively participate in a number of organizations or committees, including:
- Bureau of Land Management Resource Advisory Council
  - Arizona State Parks Natural Areas Program Advisory Committee
  - Sonoita Crossroads Community Forum Board (support for SC Comp Plan)
  - Babacomari Cattle Ranch Advisory Committee
  - Sonoita Valley Planning Partnership
    - Natural Resource Team
  - Borderlands Jaguar Detection Project

## WORKSHOPS, FIELD TRIPS



Several college groups and conservation organizations spent time on the Research Ranch recently, some for an hour or so, some for several days. The unique atmosphere and facilities of the Ranch provide an excellent opportunity for professional development or personal enrichment.

Bat Conservation International, Santa Cruz NRC, USDA-NRCS, USFWS, AZGF and Audubon jointly presented a workshop: “*Livestock Water Developments & Wildlife*” that was very popular.

Although the registration was limited to 40 participants, we couldn’t turn down the extras that came – we just



pulled out more chairs and everyone scooted a bit closer. Dan Taylor of Bat Conservation International led the group of presenters as participants learned of the dangers presented by certain practices and of ways to alleviate those dangers. Agency personnel explained regulations and outlined financial assistance. Participants learned to construct and install simple escape ramps and most took one or more to use as templates or to install at home.

“*Grass Identification – 101*” was another popular topic this year, and workshops were held for the general public, Arizona Native Plant Society, and the Sierra Club Service tour. Dan Robinett, Robinett Rangeland Resources, and Jim Koweek, Arizona Revegetation and Monitoring, assisted me at one or more of these events. Participants learned basic terminology and morphology in the classroom then went to the field to put their new-found knowledge to work.



## POTLUCKS & PRESENTATIONS



This year our education program, “Potlucks and Presentations” was a resounding success! Besides sharing good food, meeting neighbors and making new friends, attendees learn about the Research Ranch and hear talks by scientists and pro-ams (professional amateurs) about a range of environmental related issues. Since our last annual report, we’ve hosted “Living Gently on the Land”, an Audubon program dedicated to assisting people living in rural

Arizona to coexist with their local environment; “The Desert at the Edge of the Tropics,” a talk on the wonders of Sonora, Mexico, where the juxtaposition of mountains, deserts, and the Sea of Cortez result in a wonderful diversity of flora and fauna (see photo, above); “Identifying and Promoting Sustainable Practices and Technologies in Southern Arizona and Northern Mexico,” an informative talk on sustainable practices such as rainwater harvesting, composting toilets, and alternative building techniques that are helping raise the quality of life in Nogales, Sonora; “Desert Chemical Defenses,” a presentation about the myriad ways in which plants defend themselves from herbivores;

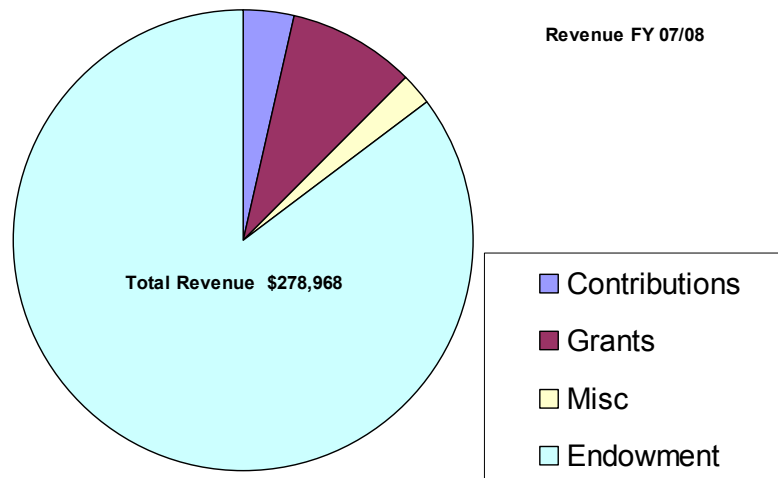
“Skunks and rabies in Arizona – should we be concerned,” a helpful talk about the four different species of skunks that inhabit southeastern Arizona and how to reduce potential exposure to rabies; “Rainwater-based Habitat Landscaping,” information on techniques to modify our landscaping to reduce water use and take advantage of our limited rainfall. This fall we hosted “Climate Change and Impact on Grasslands,” enjoyed a tour of Iceland through the eyes of a geologist and a biologist, both avid birders as well, and learned about the ecosystems of Northern China from the perspective of a rangeland specialist.

## WEBSITE UPDATED

Check out our newly designed website for upcoming events, tips on ways to “Live Gently on the Land,” brochures to print, and even some publications!

## FISCAL SITUATION

We finished Fiscal Year 06/07 with a nice surplus of \$10,446, but ran a deficit for FY 07/08 of \$1,836. We certainly don’t want to repeat that again this year, and are taking steps to reduce expenses. So far we’re doing all right, but we’ll need help from our contributors to continue to protect the grasslands through our three avenues of land management, research and outreach. The biggest share of our operating budget is distributed from our endowment, but the critical “get-ahead” difference comes from grants and contributions.



**We hope you enjoyed this report from the Ranch!**

## Appendices

### Abstracts/Papers from Hass & Kennedy

#### Applications of animal tracking data

Chris Hass, Ph.D., Appleton-Whittell Research Ranch, National Audubon Society

Collecting data from animals using sign provides a non-invasive method to learn about animal presence and behavior. But can those data also be used to estimate population numbers or trends? This talk will focus on the design and analysis of animal studies using sign as the primary method of data collection. I will focus on the limitations of sign data and how these limitations can be addressed using proper study design, analysis methods, and being careful in your conclusions. This will be an introduction to the concepts, but not a statistical presentation and no knowledge of statistics will be assumed.

Tracking 2007: Annual conference of the International Society of Professional Trackers  
October 19-21, 2007, Carnation, Washington

#### Protecting wildlife habitat on ranchettes

L. J. Kennedy, Audubon Arizona, H.C. 1 Box 44, Elgin, AZ 85611. [lkennedy@audubon.org](mailto:lkennedy@audubon.org)  
Ken Strom, Audubon Colorado, 1966 13th Street, Suite 230, Boulder, CO 80302  
Jacelyn Downey & Alison Lyon-Holloran, Audubon Wyoming, 358 N 5th Street, Unit A,  
Laramie, WY 82072  
Robert Petty, National Audubon Society, 469 N. Kootenai Creek Rd., Stevensville, MT 59870

**KEY WORDS:** Ranchette, habitat fragmentation, exurbanization

**INTRODUCTION:** Grassland habitat is rapidly being lost world-wide (White & Vanasselt 2001). In western North America, one of the primary contributors to this loss is conversion of large ranches into small ranchettes (1.5-75 acres) (*i.e.* Gori & Enguist 2003). Many ranchette owners are not aware of the impacts their new home may have on the land and its inhabitants, or what steps they can take to mitigate for those impacts.

**MATERIALS & METHODS:** Audubon, with funding from USDA-NRCS, has developed an educational program to assist newcomers and others who wish to maintain or enhance wildlife habitat on their property. On a nationwide level, country home and ranchette owners can access information through Audubon's website: <http://ranchettes.audubonathome.org/>. Three western states, Arizona, Colorado and Wyoming, are establishing pilot projects to address issues in their regions. Arizona's "Living Gently on the Land" webpages include practical tips for the ranchette owner such as how to build a wild-life friendly fence, frequently-asked-questions, a directory of resources, and guidelines for co-existing with our wild neighbors. We are working with partners to develop regional guides such as "*Rural Living in Santa Cruz Co.*" and hosting workshops to enhance and protect wildlife habitat. In Colorado, we are helping existing communities of ranchette owners organize "co-ops" among neighbors to manage their lands cooperatively for the benefit of wildlife, and are conducting on-the-ground workshops to provide guidance on how to improve land management or create a habitat stewardship committee. We have created informational materials including a 90-page guidebook entitled *Colorado Wildscapes: Bringing*

*Conservation Home.* Audubon Wyoming has been addressing fragmentation by helping landowners make healthy decisions on their properties through education. We provide landowners with practical science-based solutions in three ways, an easy to read quarterly magazine, small acreage workshops held throughout the state, and by issuing informational literature directly to owners of subdivided rural properties.

**RESULTS & DISCUSSION:** Response from ranchette owners has been gratifying and underscored the need for even more information to be compiled and made readily available. Conversion of ranches to ranchettes is continuing at a pace that threatens to outstrip our ability to reach compatible landowners.

**CONCLUSIONS:** Many ranchette owners are willing to provide or protect habitat for wildlife, once they understand the issues and have access to appropriate tools with which to develop management plans. However, continued educational efforts and increased collaboration with other NGOs, academic institutions, federal and state agencies, and other policy makers will be necessary to accomplish large scale habitat protection.

#### **REFERENCES**

- Gori, D.F. & Enquist C.A.F., 2003. An assessment of the spatial extent and condition of grassland in central and southern Arizona, southwestern New Mexico and northern Mexico. <http://www.azconservation.org>.
- White, R.P. & Vanasselt, W., 2001. Grasslands in pieces: modification and conversion take a toll. Earthtrends 2001 World Resources Institute.

International IGC-IRC 2008 Congress. June 29-July 5, 2008. Hohhot, China

## **Impacts of grazing, wildfire and drought on rodent populations in a semi-arid grassland of southwestern North America**

L. J. Kennedy, Ph.D., Appleton-Whittell Research Ranch, Audubon, H.C. 1 Box 44, Elgin, AZ. 85611; Z.F. Jones, Ph.D., Biology Dept., Station 33, Eastern New Mexico University, Portales, NM 88130; C.E. Bock, Ph.D. and J.H. Bock, Ph.D. EEB, University of Colorado, Boulder, CO 80309

**KEY WORDS:** Heteromyidae, Muridae, fire ecology

**INTRODUCTION:** Rodents are ecologically important vertebrates in semi-arid grasslands of North America, both for their effects on plant community structure and because they support a wide range of predators. Previous work has indicated the importance of both livestock grazing and wildfire to southwestern U.S. rodent populations, but little is known about their possible combined effects. A 2002 wildfire burned both grazed and ungrazed grasslands in southeastern Arizona where rodent populations were being monitored, providing an opportunity to compare rodent responses to the interactive as well as independent effects of grazing and fire.

**MATERIALS & METHODS:** The Appleton-Whittell Research Ranch is a sanctuary and research facility managed by the National Audubon Society, in the Sonoita Plain, Santa Cruz County, Arizona, USA. Ungrazed by domestic livestock since 1968, the “Madrean Mixed-grass Prairies” (Bock & Bock, 2000), of the Research Ranch are surrounded by operational cattle ranches, providing opportunity for cross-fence comparisons (Bock et al, 1984; Jones et al., 2003). The Ryan Wildfire of April 2002 encompassed nearly 15,000 hectares of semi-arid grassland, including parts of the Research Ranch and surrounding cattle ranches. Widespread drought has impacted the region since 1999, partially alleviated by above average monsoon precipitation in 2006 and 2007. Post-fire changes in rodent populations were evaluated by live-trapping (60 traps per site) on six grazed and six ungrazed sites during the summers of 2002 through 2007, and the



results were compared to earlier studies on the Research Ranch (Bock et al, 1984; Jones et al., 2003).

**RESULTS & DISCUSSION:** Prior to the wildfire of 2002, rodent communities on the Research Ranch were dominated by members of the Muridae family (i.e. deer mice, cotton rats). Representatives of the Heteromyidae family (pocket mice) were relatively common on the cattle ranches, where vegetation cover was reduced. After the Ryan Fire, when all cover was reduced, Heteromyidae dominated all trap sites. Through 2005, the murid rodents had not re-appeared in significant numbers on grazed or ungrazed sites. By 2007, composition of rodent populations was similar to conditions prior to the wildfire.

**CONCLUSIONS:** The size and completeness of the Ryan Fire, such that there were no nearby refugia from which the grass-loving rodents might re-colonize, and the drought conditions that slowed re-establishment of the more dense vegetation habitat preferred by the murid species may have contributed to the lag in re-establishment of pre-wildfire population densities and proportions.

#### **REFERENCES**

- Bock, C.E., J.H. Bock. 2000. *The view from Bald Hill: Thirty years in an Arizona grassland.* University of California Press, Berkeley.
- Bock, C.E., J.H. Bock, W.R. Kenney & V.M. Hawthorne. 1984. Response of birds, rodents, and vegetation to livestock exclosure in a semidesert grassland site. *J. Range Manage.*, 37:239-242.
- Jones, Z.F., C.E. Bock, J.H. Bock. 2003. Rodent communities in a grazed and ungrazed Arizona grassland, and a model of habitat relationships among rodents in southwestern grass/shrublands. *Am. Midl. Nat.* 149:384-394.

International IGC-IRC 2008 Congress. June 29-July 5, 2008. Hohhot, China

## Current Science/Research

### **New and Ongoing Science Projects on Appleton-Whittell Research Ranch National Audubon Society Active between Oct 1, 2007 and September 30, 2008**

#### **New (or Renewed) Projects**

##### **Recording Precipitation with Data Loggers**

AWRR Staff: Linda Kennedy, Chris Hass

Project: Install tipping gages equipped with dataloggers in key areas.

Application: Provide detailed information relevant to stream flows and changes in vegetation

*Status: Have installed 4 gages, 3 near northern boundary and 1 above Turkey Creek*

##### **Investigating the effect of livestock on the physical properties of soil in an arid grassland**

Allington, Ginger; Thomas J. Valone; Saint Louis University. St. Louis, MO.

Subject: Collect water infiltration and soil compaction data on grazed and ungrazed land

Application: Evidence of impacts of livestock on physical properties may assist restoration efforts at desertified sites.

*Status: Allington and Valone on site in June; Allington returned for week in August.*

Leopard frog surveys

##### **Arizona Game & Fish Dept. (AGFD): Abigail Dinsmore, Wildlife Specialist.**

Subject: Survey leopard frogs, primarily in Post Canyon area

Application: Protect native species

*Status: Survey conducted in spring, 2008, concurrent with fish surveys. None found. Discussion with Tom Jones, AGFD, regarding establishment of Safe Harbor Agreement that will cover all reintroduction efforts.*

##### **Fish Surveys**

Arizona Game & Fish Dept. (AGFD). Suzanne Ehret, Fisheries biologist.

Subject: Conduct periodic surveys of the riparian systems of the Research Ranch and neighboring properties *See also Jakle (archives) for earlier correspondence and reports.*

Application: Evaluate stability of populations of native species, recommend management actions

*Status: Conducted survey of O'Donnell in May, Post in June 2008. Report (cd- & paper) on file.*

##### **A History of the Lands in the National Audubon Society's Research Ranch Near Elgin, in Santa Cruz County, Arizona**

Collins, Glendon E., Bureau of Land Management (retired), Arizona State Trust Lands (retired). Phoenix.

Subject: Compile and document history of land transactions involving federal and state lands.

Application: Historical background relevant to land use patterns

*Status: Received, June 2008. Incorporated into library and will post on website.*

##### **Boer Lovegrass on the Research Ranch: Update 2008**

Crawford, David. AWRR Educational Internship. University of Iowa, Iowa City IA.

Subject: Use GPS and GIS to map locations of Boer Lovegrass (*Eragrostis curvula* var. *conferta*) on the Research Ranch

Application: Compare with previous work to assess trends. Provide time-specific information re spread.

*Status: Maps complete; noted substantial spread along roads on northern half of AWRR.. See also Seltzer, Geiger.*

**Survey of Appleton-Whittell Research Ranch Drainages and Ponds for the Mexican Garter Snake**

d'Orgeix, Christian, Ph.D.; Virginia State University; Petersburg, VA

Project: Survey for presence of Mexican garter snakes on AWRR (Telles tank, O'Donnell Canyon, Post Canyon), and conduct long-term study of population at Finley tank. Pledges to be very careful about causing any disturbance to water sources and vegetation. Not killing, collecting or removing any snakes.

Application: Management implications for species of special concern (AGFD), including identifying site for possible reintroductions.

*Status: d'Orgeix in residence 7 weeks, summer 2008.*

**Annotated bibliography of selected reports, publications and theses**

Dyson Ruth E.

Project: Prepare annotated list/bibliography of publications of particular interest to AWRR.

Application: Facilitate information exchange and document publications

*Status: Revised, winter of 2007/2008. New report on file, is available on website:*

<http://www.audubonresearchranch.org/PDFs/AnnotatedBibliography.pdf>

**Survey of high desert grasslands Hymenoptera**

Grissell, Eric, Sonoita, AZ

Project: Study insect diversity in southwest

Application: Significant contribution to state of knowledge, including expanding species list for AWRR.

*Status: Two Malaise traps set up in Post Canyon. Checked every 10 days, June – November.*

**The Effects of Fire and Grazing on Grassland Bird Diversity and Abundance in an Arizona Oak-Savanna**

Nichols, Clay. Eastern New Mexico University, Portales, New Mexico

Project: Re-survey bird diversity on oak transects established by Bock & Bishop after Ryan fire.

Application: Provide information, long-term, on effect of wildfire on avian diversity and abundance

*Status: Began fieldwork in Summer, 2008. Awarded Apacheria Fellowship. Zach Jones is advisor.*

**Impacts of grazing, fire and precipitation variability on woody plant cover in Chihuahuan Desert grasslands, USA**

O'Neal, Kelley. University of Maryland, College Park, MD.

Project: Quantify changes in woody plant cover, map occurrence of grazing, fire and precipitation using (in part) Landsat and MODIS satellite data

Application: Identify trends, develop methodology

*Status: Began fieldwork in summer, 2008 to groundtruth remote sensing data. Working closely with R. Marsett. Received Apacheria Fellowship.*

**Babocomari River and Tributaries – Monitoring conditions along streamside, cienega and sacaton**

Robinett, Daniel G., Robinett Rangeland Resources, Catalina, AZ; Donna Mathews, Coronado RD & D., Inc. Willcox. Linda Kennedy, AWRR., Doug Ruppel, Babacomari Ranch.

Project: Establish transects and monitor streamside conditions of Babocomari River, O'Donnell and Turkey Creek

Application: Results will enable sound management decisions to maintain and/or improve vegetation conditions on Babocomari watershed. Will have application to other desert rivers.

*Status: Sites for transects selected. Funding for 5 years monitoring received from AZ Water Protection Fund. Will begin fieldwork in spring 2009.*

**Assessing Condition of O'Donnell Creek**

Simms, Jeffrey, BLM Fish Biologist, Tucson Field Office, Nate Dietrich, BLM Hydrologist.

Project: Use Proper Functioning Condition Standards to evaluate the condition of a portion of O'Donnell Creek

Application: Environmental Assessment

*Status: Found the stretch examined to be in proper functioning condition that would not be altered if one or both dams were breached.*

## **Ongoing Projects**

### **Pupfish Monitoring**

Arizona Game & Fish Dept. (AGFD): Susanne Ehert, Native Fisheries Specialist I, Previously: Jeremy Voetz (2003) Rebecca Davidson (2001), Timmons, Weedman, Brown, Bagley, Hendrickson

Subject: Monitor and protect population of pupfish introduced into ranch stockponds and wildlife waters

Application: Conserve native species

*Status: Ongoing. Surveyed Pronghorn & Headquarters tank in spring, 2008 Report to come Received excerpt from D. Duncan (USFWS) that documents initial release of Quitobaquito pupfish in Finley Tank, see Kynard (1979) in library.*

### **Survey results for mule deer, javelina and whitetail deer on the Research Ranch**

Arizona Game & Fish Department; (AGFD) John Millican

Project: Estimate populations

Application: Analyze impacts of hunting, climate on populations

*Status: Surveys conducted annually in late fall or early winter.*

### **Survey of Gould's Turkeys near the Huachuca Mountains**

Arizona Game & Fish Dept. (AGFD): John Millican; AWRR staff: Linda Kennedy, Chris Hass, volunteers.

Project: estimate populations using standardized protocol.

Application: track success of re-introduction effort.

*Status: ongoing. Most recent survey by J & P Kugler, C. Hass. See also "Wild Turkeys at AWRR."*

### **Avian Monitoring for AWRR IBA**

Audubon staff: Tice Supplee, Audubon AZ, Linda Kennedy, AWRR.

Project: Establish transects to monitor bird species on AWRR

Application: Support IBA nomination (see also Wonkka), examine longterm trends

*Status: Established transect on East Mesa, ran 2x in 2008. Need to expand into Post, O'Donnell, Telles.*

### **Bullfrogs: Monitoring and Treatment on the Research Ranch**

AWRR Staff: Linda Kennedy

Subject: Discover and eradicate individuals within boundary of AWRR

Application: Protect native fish, reptiles and amphibians from predatory, non-native species

*Status: Continual. Monitor and remove bullfrogs prior to monsoon. Rebuilt fence around Finley Tank. 12 adults removed in May-June 2008 from Telles Tank, 1 adult from Finley Tank.*

### **Christmas Bird Count – Appleton-Whittell Circle**

AWRR staff; Robert Wessler (organizer and compiler)

Subject: Conduct bird count as per Audubon standards.

Application: Pooled data yield important information re avian populations, movement and trends.

*Status: Second CBC 1 4 2008, 120 species. Scheduled for first Saturday in 2009.*

### **Depth to groundwater on Appleton-Whittell Research Ranch**

AWRR Staff and Volunteers

Project: Monitor the depth to groundwater of the wells on AWRR.

Application: This study helps establish a water consumption baseline for the Sonoita Valley.

*Status: Ongoing. 11 wells monitored quarterly by volunteers, Sandy & Betsy Kunzer. Depths in measured wells holding steady. Now able to access Vaughn Canyon.*



### **Ecological Site Monitoring (ESM)**

AWRR Staff: Linda Kennedy

Project: Establish permanent points to monitor vegetation change. Based on Ecological Site Map (Robinett & Breckenfeld)

Application: Identify trends in vegetation change

*Status: All 19 transects read in fall, 2008. Report in preparation.*

### **Jackrabbit surveys**

AWRR Staff: Linda Kennedy and Chris Hass

Project: Monitor jackrabbit, cottontail, small mammal and herps using monthly night road surveys.

Application: Trend data to correlation with other studies ongoing on AWRR.

*Status: Survey conducted monthly since mid- 2007. Notable decline in rodents and lagomorphs by end of 2007.*

### **MAPS (Mapping Avian Productivity and Survivorship)**

AWRR Staff: Chris Hass, Linda Kennedy

Key words: breeding birds, mark-recapture, mist-netting, productivity, survivorship

Project: MAPS stations established under guidelines of continent-wide program to provide critical conservation and management information for populations of landbirds breeding within the United States and Canada. Post Canyon & Empire Gulch are two of over 500 stations. Birds are mist-netted, recorded, banded and released.

Application: Increases knowledge of landbirds breeding within the US and Canada

*Status: Hass managed MAPS at both sites. Conducted habitat assessment at Empire Gulch.*

### **Monitoring wildlife in and near the Appleton-Whittell Research Ranch using trail cameras**

AWRR Staff: Chris Hass

Project: Use trail cameras to identify and monitor various species of terrestrial wildlife.

Application: Identify habitat specific wildlife use and develop index for long-term trends.

*Status: 4-8 cameras operating on AWRR since late 2006. Have confirmed 3 new species (ringtail, Mexican opossum, Arizona gray squirrel), for Research Ranch and have received permission to install cameras on Babacomari Ranch*

### **Photo-herbarium**

AWRR Staff: Linda Kennedy

Project: Document life stages of plant species found on the Research Ranch

Application: Baseline for future research, vouchers for identification purposes

*Status: Ongoing. Potential to expand project into related area via outside funding source.*

### **Precipitation at Ecological Sites**

AWRR Staff: Linda Kennedy

Project: Establish range gages to correspond with ESM. Based on Ecological Site Map (Robinett & Breckenfeld)

Application: Correlate precipitation with changes in vegetation.

*Status: Have access to all 17 sites. Read gages 2X/yr*

### **Sacaton Rehabilitation**

AWRR Staff: Linda Kennedy.

Project: Re-establish *Sporobolus wrightii* in appropriate degraded sites.

Application: Improve wildlife habitat, bioremediation of sites dominated by exotic, invasive Bermudagrass.

*Status: Funding received to provide pump in Post Canyon (2008),transplanted 100 plants in Sept/Oct.*

### **Wild Turkeys at AWRR**

AWRR Staff: Linda Kennedy

Project: Record sightings of wild turkeys on AWRR.

Application: Document spread of sub-species reintroduced in Huachuca Mtns.

*Status: Ongoing. One turkey seen (male) in April 2008. Participated in AZ G&F field survey.*

**Response of rodents, birds, and vegetation to the Ryan Fire, Sonoita Valley, AZ -a unique opportunity to examine the ecological consequences of fire in grassland/savannas of the Arizona Borderlands**

Bock, Carl, E., Professor; University of Colorado; Boulder, CO. Linda Kennedy, AWRR  
Subject: Quantify effects of wildfire on assemblages of small mammals, birds and vegetation.  
Application: Help land managers predict response of species to large scale rangeland fire  
*Status: Field work complete. Data analysis in process. Trapped small mammals in fall of 2007 (Jones, Kennedy). Additional publication on rodents pending (Jones). Poster presentation at IGC/IRC 2008: Kennedy et al., 2008*

**Using soil moisture to assess ecosystem function following exotic lovegrass invasion in semiarid grasslands of southeastern Arizona**

Cross Anne F., Tulsa OK Alexander G. Fernald, Las Cruces, NM  
Project: Measure soil moisture under Plains lovegrass (*Eragrostis intermedia*), a native species, and Lehmann lovegrass (*E. lehmanniana*), an exotic species.  
Application: Determine whether a semiarid grassland retains its functional integrity following the invasion of an introduced, exotic grass.  
*Status: Fernald has taken charge of project. Field work ongoing each fall. Working with Tim Keefer, USDA-ARS linked site via radio to USDA base. Upload via FTP.*

**Current Distribution and Status of Slevin's Bunchgrass Lizard, *Sceloporus slevini*, in southeastern Arizona**

d'Orgeix, Christian, Virginia State University; Petersburg, VA  
Project: Survey for bunchgrass lizard. Collect tissue for DNA analysis (tip of tail – no take) to compare intrapopulation and interpopulation genetic variance.  
Application: foundation for determining genetic relatedness of different populations and effects of bottlenecks on populations  
*Status: d-Orgeix in residence 7 weeks this summer*

**Finding effective strategies for adding native diversity into heavily invaded grasslands**

Fehmi, J.S., University of Arizona  
Project: Re-introduce native plants into areas dominated by naturalized, non-native plants  
Application: Increase proportion of palatable native plants  
*Status: Final data collected Sept, 2008. Report to follow.*

**Introduction of Species Diversity into Boer Lovegrass Monocultures**

Hershdorfer, Mary and Ramona Gardner, & Heather Dial, USDA-NRCS Plant Materials Center. Tucson  
Project: Determine effectiveness of various methods to increase native biodiversity into monoculture created by non-native lovegrass.  
Application: Protect native grasslands  
*Status: Established summer 2006, results monitored in summer, fall 2007 & fall of 2008.*

**Meteorological Station**

Keefer Tim, Hydrologist, USDA-ARS; Southwest Watershed Research Center; Tucson, AZ  
Project: Station jointly owned by AWRR & USDA  
Application: Baseline information on climate available to researchers and land managers of region  
*Status: Radio-linked to USDA computer in Tucson (see also Cross/Fernald).*

**Flora of the Appleton-Whittell Research Ranch**

McLaughlin Steven P., Ph.D., Office of Arid Lands Studies, University of Arizona, Tucson AZ;  
Erika L. Geiger; School of Renewable Natural Resources, University of Arizona, Tucson AZ;  
Janice E. Bowers; U.S. Geological Survey,  
Project: Compile and maintain a flora –a complete list of all flowering plants, ferns, and conifers on the Research Ranch.  
Application: Baseline for ongoing and future research

*Status: Added several new herbarium specimens. Note to AZ Nev Aca of Science of additions to flora since publication in preparation w/Kennedy. Approx 65 additions. McLaughlin & Bowers retired and moved to CA.*

**Long-term meteorological, evaporation and carbon flux measurements**

National Oceanic & Atmospheric Administration (NOAA); Tilden P. Meyers, Ph.D.  
Meteorologist; NOAA, Oceanic and Atmospheric Research, John Hughes, NOAA, National Data Climatic Center, U.S. Climate Reference .

Subject: Establish a Climate Reference Network site – to characterize the water and carbon balance for typical ecosystem for arid southwest grasslands.

Application: These data will be used to improve the current land use models for climate change.

*Status: Site commissioned in 2004. Data available at: <http://gewex.atdd.noaa.gov/> and <http://www.ncdc.noaa.gov/oa/climate/uscrn>. Periodic visits (1-2X) yr for maintenance.*

**Research and reintroduction effort for Huachuca Water Umbel**

Titus Jonathan H., Dept. of Biology, SUNY-Fredonia, Fredonia, NY. Priscilla Titus.

Project: Transplant plugs and monitor success

Application: Protect listed species, aid in development of recovery plan for species

*Status: Monitored in 2008. HWU are thriving. One publication received, one in press.*

**Inventory of Native Plant-Feeding Insects in Arizona**

Wheeler, Alfred G., Department of Entomology, Clemson University, Clemson, SC

Project: Collect insects that feed on *Eragrostis* spp. and other plants to identify insect species, and compare species composition with collections from NM, OK and TX.

Application: Baseline information on species occurrence and host plants

*Status: Field work in May and August, 2008. Report to come.*

**Floral biology of *Penstemon dasyphyllus* and other *Penstemon* species on AWRR+**

Wilson, Paul. Department of Biology, California State University, Northridge, Project: Study the diversity of *Penstemon* flowers in terms of morphology, pollinators, nectar secretion characters, and pollen presentation characters.

Application: May aid in conservation of *Penstemon* species that are of conservation concern

*Status: Re-examined sites in April 2008. Grad student is re-invigorating and expanding project. More information to follow. Publication in press, will send.*

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## Recent Publications Received

### Publications

Received Oct 1 2007 through Sept 30, 2008

Associated with the Appleton-Whittell Research Ranch  
National Audubon Society

#### 2007

Audubon, A. (2007). The Appleton-Whittell Research Ranch, The View From Here: Border Fences. Audubon Arizona. **5**: 6.

Hass, C. (2007). Applications of animal tracking data. Abstract/presentation: Tracking 2007: Annual conference of the International Society of Professional Trackers. Oct 19-21, 2007. Carnation, Washington.

#### 2008

Audubon, A. (2008). "The Appleton-Whittell Research Ranch CAUGHT - on Film." Audubon Arizona **6**(1): 6.

Bock, C. E., Z. F. Jones, and J. H. Bock. (2008). The oasis effect: response of birds to exurban development in a southwestern savanna. Ecological Applications, **18**(5) 1093-1106.

Bridgers, N. (2008). Current Distribution and Status of Slevin's Bunchgrass Lizard at the Audubon Appleton Whittell Research Ranch. Petersburg, VA, Virginia State University, Department of Biology: 13.

Chace, J. F. (2005). "Host Use by Sympatric Cowbirds in Southeastern Arizona." The Wilson Bulletin **117**(4): 375-381.

Cole, D. (2008). Livestock device keeps wildlife from drowning. Sierra Vista Herald. Sierra Vista.

Collins, G. (2008). A history of the lands in the National Audubon Society's Research Ranch near Elgin, in Santa Cruz County, Arizona. Special Report, soon to be available at <http://www.audubonresearchranch.org>

Dyson, R. (2008). Annotated bibliography of selected publications and theses (by year).

<http://www.audubonresearchranch.org/PDFs/AnnotatedBibliography.pdf>

Echelle, A. A., D. Loftis, et al. (2007). Final Report to U.S. Fish and Wildlife Service: Pupfish Genetics: Genetic Structure of Wild and Refuge Stocks of Desert Pupfish, Oklahoma State University.

Felix, R. K., R. H. Diehl, et al. (2008). Seasonal Passerine Migratory Movements over the Arid Southwest. Birds of the US-Mexico Borderlands: Distribution, Ecology, and Conservation. C. D. Marti, J. Ruth, T. Brush and D. Krueper, Cooper Ornithological Society. **Studies in Avian Biology No. 37**: 126-137.

Goodwin, K. (2008). Kennedy receives her due recognition. Bulletin: 1.

Hershendorfer, M. and R. Garner (2008). Introduction of Native Species Diversity into Exotic Lovegrass Infestations: Year 2 2006-2007 Findings. Tucson, AZ, USDA-NRCS Tucson Plant Materials Center: 14.

Hutchinson, C. F., S. E. Marsh, et al. (2005). Establishing a Basis for Carbon Management Policy at the State Level: Carbon Dynamics at Site, Landscape, and Regional Scales for Arizona State Lands. Washington, DC, NASA Office of Earth Science: 61.

Kennedy, L.J., Z.F. Jones, C.E. Bock, J.H. Bock. (2008) Impacts of grazing, wildfire and drought on rodent populations in a semi-arid grassland of southwestern North America. Paper and poster presented. XXI International Grassland Congress and VIII International Rangeland Congress. Hohhot, China Pg 89.

Kennedy, L.J., K. Strom, J Downey, A. Lynn-Holloran, R. Petty (2008) Protecting wildlife habitat on ranchettes. Paper and poster presented. XXI International Grassland Congress and VIII International Rangeland Congress. Hohhot, China Pg 1095.



- Kynard, B. E. (1979). Final Report of Research Accomplished Under National Park Service Purchase Order No. PX-8100-7-0351 Study of Quitobaquito Pupfish--Preservation, Habitat and Population Monitoring. Tucson, AZ, University of Arizona: 14.
- Marti, C. D., J. Ruth, et al., Eds. (2008). Birds of the US-Mexico Borderlands: Distribution, Ecology, and Conservation. Cooper Ornithological Society.
- Ruth, J. M. (2008). Distribution and Abundance of Breeding Arizona Grasshopper Sparrow (*Ammodramus Savannarum Ammolegus*) in the Southwestern United States: Past, Present, and Future. Birds of US-Mexico Borderlands: Distribution, Ecology, and Conservation. C. D. Marti, J. Ruth, T. Brush and D. Krueper, Cooper Ornithological Society. **Studies in Avian Biology No. 37**: 113-124.
- Steiguer, J. E. d. (2008). "Semi-Arid Rangelands and Carbon Offset Markets: A Look at the Economic Prospects. Potentially new economic opportunities for rangeland managers." Society for Range Management **30**(2): 27-32.
- Tekiela, S. (2008). Mammals of Arizona Field Guide. Cambridge, MN, Adventure Publications.
- TRRF (2006 & 2007). Water, Conservation, and Exurban Development in Semiarid Grasslands of Southwestern North America-Impacts on Biodiversity and Ecosystem Services. Water, Conservation, and Exurban Development in Semiarid Grasslands of Southwestern North America-Impacts on Biodiversity and Ecosystems Services, Tucson, AZ and Los Altos, CA.
- Wilson, P., A. D. Wolfe, et al. (2007). "Constrained lability in floral evolution: counting convergent origins of hummingbird pollination in *Penstemon* and *Keckiella*." New Phytologist **176**: 883-890.
- Wolfe, A. D., C. P. Randle, et al. (2006). "Phylogeny, Taxonomic Affinities, and Biogeography of *Penstemon* (Plantaginaceae) Based on ITS and CPD<sub>NA</sub> Sequence." American Journal of Botany **93**(11): 000-000.

## **Workshops, Presentations and Field Trips**

### **Presentations, Educational Programs and Field Trips Appleton-Whittell Research Ranch of the National Audubon Society\* October 1, 2007 through September 30, 2008**

#### **Field Trips and Educational Programs**

- Kennedy, Linda. October 1-5, 2007. Sierra Club Service Tour, Presentations: "Grassland Ecology" and "Grass Identification."
- Kennedy, Linda. October 17, 2007. Field trip by Sierra Club Grazing Committee. Presentation included: Introduction to Research Ranch, grassland ecology, threats to ecosystem, working with ranching neighbors, research across fencelines.
- Kennedy, Linda. October 19-22, 2007. Field trip by Mammalogy Class from Eastern New Mexico University. Presentations: "Introduction to Research Ranch," and "Grassland Ecology"
- McCain, Emil. October 20, 2007. Presentation "Borderlands Jaguar Detection" Mammalogy Class from Eastern New Mexico University.
- Kennedy, Linda. January 29, 2008. Field Trip: Tucson Audubon Society. Introduction to Research Ranch, Grassland Ecology.
- Kennedy, Linda. February 15, 2008. Field Trip: Vegetation Management Class, University of Arizona. Introduction to Research Ranch, Management Aspects of Grassland Research Station.
- Hass, Chris. March 7-8, 2008. Field Trip: Natural History and Ecology of Southwest Class from Prescott College. Presentation: "An introduction to white-nosed coatis, Arizona's most curious beast."
- Kennedy, Linda. March 26-27, 2008. Field Trip: Vegetation of the Southwest Class from SUNY-Fredonia. Presentation: "Research Ranch and Invasive Species"
- Kennedy, Linda. April 20, 2008. Field Trip: Tucson Audubon Society. "Introduction to the Research Ranch and Grassland Ecology."
- Kennedy, Linda. May 5-7, 2008. Field Trip: Plant Ecology Class from Colorado College. Presentation: "Introduction to the Research Ranch"
- Kennedy, L & C. Hass. July 25, 2008. Field Trip: Brophy Family from Babacomari Ranch. "Research challenges in southwestern grasslands," and "Using remote cameras to study wildlife."
- Hass, Chris. July 30, 2008. Field Trip: Society of Soil Scientists. "Introduction to the Research Ranch."
- Kennedy, Linda. September 28-29, 2008. Sierra Club Service Tour. Presentations: "Grassland Ecology and the Research Ranch" and "Grass Identification".
- Taylor, Dan, S. Tuttle. June 10, 2008. Educational program, "Ecology of Bats"

#### **Off-site presentations**

- Hass, Chris. October 19-21, 2007. Presentation: "Applications of animal tracking data." Tracking 2007: Annual conference of the International Society of Professional Trackers. Carnation Washington.
- Kennedy, Linda. October 27, 2007. Booth at 2007 Roundup & Open House on Empire Ranch. "Glorious Grasses."
- Kennedy, L.J., Z.F. Jones, C.E. Bock, J.H. Bock. July 1, 2008. Poster presentation: "Impacts of grazing, wildfire and drought on rodent populations in a semi-arid grassland of southwestern North America." XXI International Grassland Congress and VIII International Rangeland Congress. Hohhot, China.
- Kennedy, L.J., K. Strom, J Downey, A. Lynn-Holloran, R. Petty. July 4, 2008. Poster presentation: "Protecting wildlife habitat on ranchettes." XXI International Grassland Congress and VIII International Rangeland Congress. Hohhot, China

Hass, Chris. August 9, 2008. Presentation: "Coatis, Arizona's most curious beast," SouthWest Wings Festival. Sierra Vista, AZ.

### **Potlucks and Presentations**

Wilson, Michael. October 28, 2007. Potluck and Presentation Educational Series: "The desert at the edge of the tropics."

Diane Austin. February 24, 2008. Potlucks and Presentations Educational Series. "Sustainable issues in Santa Cruz County."

Wilson, Michael. March 30, 2008. Potlucks and Presentations Educational Series. "Desert Chemical Defenses."

Hass, Chris. April 20, 2008. Potlucks and Presentations Educational Series. "Skunks & Rabies in Arizona - should we be concerned?"

Kroesen, Kendall. May 18, 2008. Potlucks and Presentations Educational Series. "Techniques for capturing and using rainwater."

Kennedy, Linda. September 13, 2008. Potlucks and Presentations Educational Series: "Grassland ecology."

### **Workshops**

Taylor, Dan, L. Kennedy, K. Egen, K. Randall, D Buecher. June 10, 2008. Workshop: "Livestock Water Developments & Wildlife"

Kennedy, Linda, D. Robinett, J. Koweek. September 13, 2008. Workshop: "Grass identification 101."

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## Financial Report

### NATIONAL AUDUBON SOCIETY, INC. STATEMENT OF ACTIVITIES – RESEARCH RANCH AND CHANGES IN SURPLUS FUND

	<u>2008</u>	<u>2007</u>
<b>Revenue</b>		
Contributions	\$ 9,914	\$ 25,899
Grants		9,017
Sales - Net	415	2,762
Rentals	5,452	1,330
Pooled Invest Inc-Approp	238,187	217,741
Gain/Loss Non-Pooled		(1)
Assets Released from Restrictions	25,000	25,000
<b>Total Revenue</b>	<u>278,968</u>	<u>281,748</u>
<b>Expenses</b>		
Salaries & Fringe	190,378	185,902
Relocation Expense	-	601
Travel	741	1,552
Vehicle Operations	2,155	2,754
Meetings	-	250
Staff Training	1,024	789
Postage-General	400	531
Bank Fees	78	73
Consultant Fees	450	-
Auditing	5,590	-
Background Check	-	51
Gas & Electricity	5,389	5,604
Building Maintenance	8,649	8,811
Office Maintenance	-	465
Telephone	5,406	4,697
Insurance	9,681	10,040
Equipment Rental - General	-	8
Maintenance-General	115	5,756
Maintenance-Road	394	893
Maintenance-Vehicles	4,945	1,925
Equip. Maintenance Contract	364	296
Office Supplies	2,837	2,782
Household Supplies	555	260
Education Materials	(206)	175
Office Machinery	399	-
Computer Equipment	855	399
Computer Supplies	-	135
Computer Software	551	101
Research Equipment	3,066	661
Photographic Supplies	124	338
Farm Supplies	2,540	6,811
Animal Care	-	45
Postage/Shipping	-	4
Promotional Printing	-	200
License, Permit & Registrations	100	97
Dues & Subscriptions	493	114
Support Services Allocation	30,086	24,754
Depreciation	3,645	3,428
<b>Total Expenses</b>	<u>280,804</u>	<u>271,302</u>
<b>NET SURPLUS ADDED TO PRIOR YEAR SURPLUSES</b>	<u>\$ (1,836)</u>	<u>\$ 10,446</u>
<b>Surplus beginning of year</b>	\$ 66,509	\$ 48,529
Investment income on surplus fund	(656)	7,534
Current year surplus (Deficit)	<u>(1,836)</u>	<u>10,446</u>
<b>Surplus end of year</b>	<u>\$ 64,017</u>	<u>\$ 66,509</u>