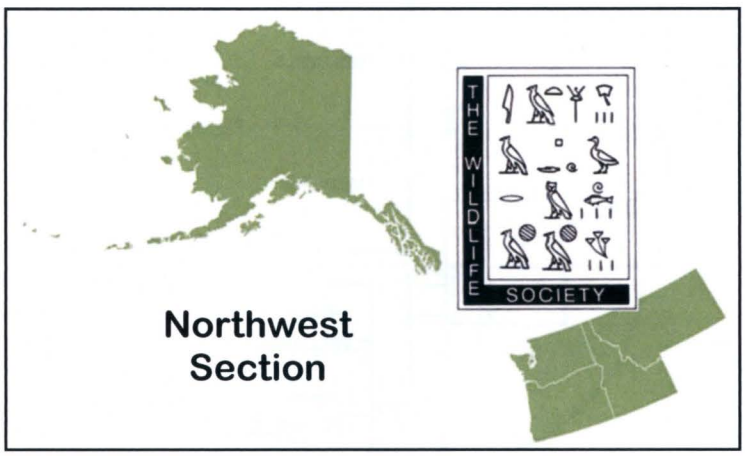
2014 Joint Meeting of the Idaho Chapter and Northwest Section of the Wildlife Society

4–6 March 2014
Boise Centre
Boise, Idaho

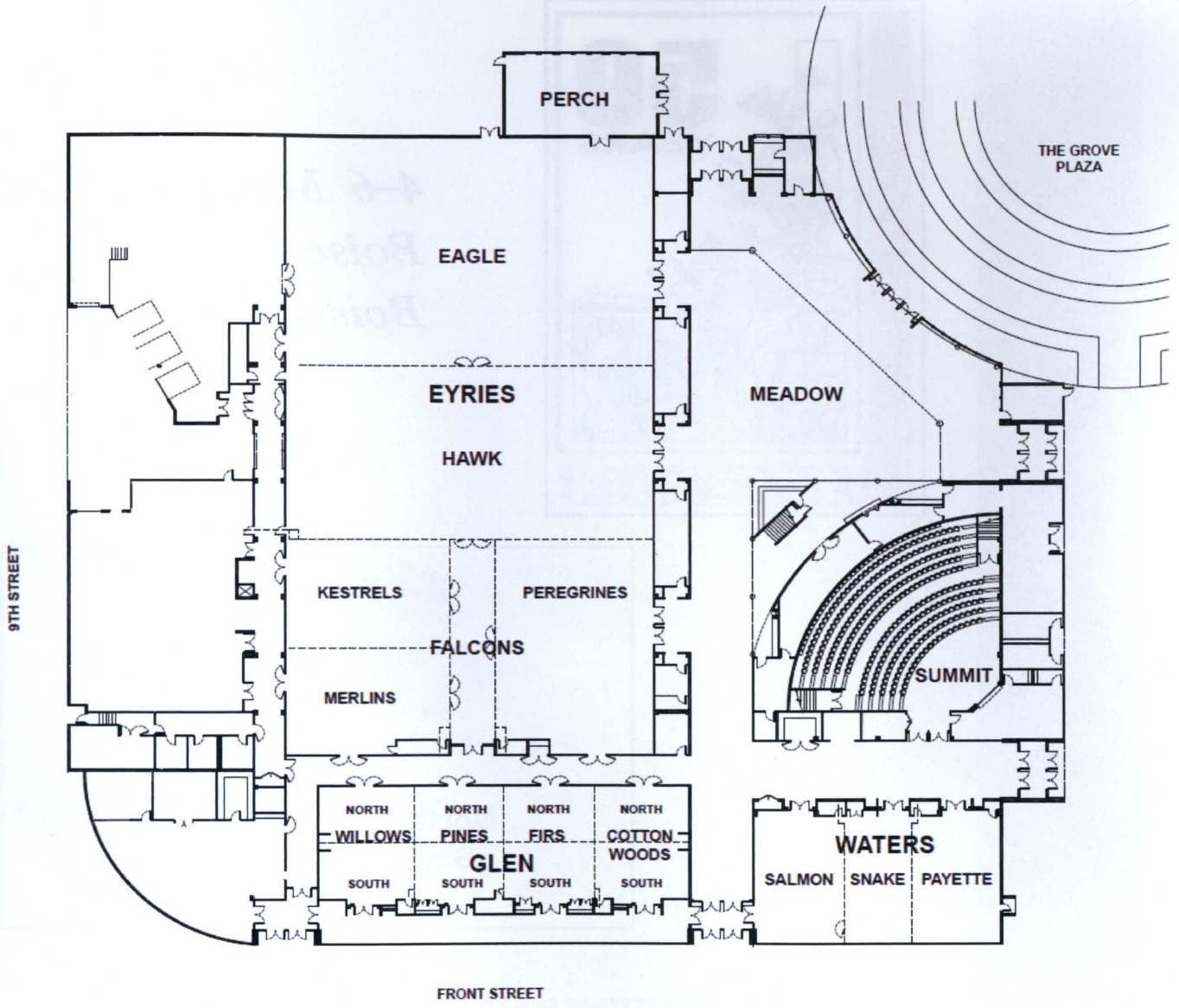


Associated Meetings and Special Session

- Idaho Bat Working Group
- Idaho Bird Conservation Partnership.
- Idaho Partners in Amphibian and Reptile Conservation
- *Special Session*—Working Together: Understanding and Leveraging Gender Differences in the Wildlife Profession

Program and Abstracts

Boise Centre Floor Plan



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Meeting Introduction and Host City

Meeting Introduction

The joint meeting of the Idaho Chapter and Northwest Section of The Wildlife Society will take place 4-6 March 2014 in Boise, Idaho. Participants are encouraged to register in advance by going to the on-line, secure registration page at the Chapter's website: http://www.ictws.org. This year's meeting offers a diverse scientific program with two plenary sessions, a special symposium, contributed oral and poster presentations, social activities and the annual business meetings of the Chapter and Section.

Host City — Boise, Idaho

Welcome to Boise!

The City of Boise is located at the western end of the Snake River Plain near the southwest edge of the Idaho Batholith. In a region dominated by a continental climate, temperatures are moderated by maritime patterns and the area owes its aridity to the rain shadow effect of the Cascades. Boise was platted in 1864 north of the Boise River, which is now flanked by an extensive Greenbelt system and numerous parks. This attracts year-round outdoor enthusiasts as well as those who enjoy more casual encounters with nature. Well-preserved historic architecture, including the Idaho Statehouse, contributes to an upbeat and inviting downtown atmosphere.

Birding in and around Boise. Boise birders benefit from living at the edge of a migratory bird flyway. To the north, these feathered visitors use Idaho forests for food and cover on their arduous journeys. Numerous water bodies in the Treasure Valley support a wide variety of resident and migratory species. To the south, the Birds of Prey National Conservation Area hosts the densest populations of nesting raptors in North America within the 600-foot high walls of the Snake River Canyon. Between the Snake River and the forested mountains, birds of prey can be seen at amazing heights as they ride thermal air currents above the sagebrush-steppe. Bald eagles winter along the Boise River and heron rookeries can also be spotted in the spring. Bring your binoculars!

Snake River Birds of Prey · http://www.birdsofprey.blm.gov/index.html
The World Center for Birds of Prey · http://www.birdsofprey.blm.gov/worldctr.htm
Idaho Bird Observatory · http://www.boisestate.edu/biology/ibo/about.html
Golden Eagle Audubon Society http://www.goldeneagleaudubon.org/
Lake Lowell and Deer Flat National Wildlife Refuge · http://www.fws.gov/deerflat/

Cultural attractions. Boise offers many cultural attractions. Information is available online for the City of Boise · http://www.cityofboise.org/

Basque Museum and Cultural Center · 611 Grove Street · 343-2671
Boise Art Museum · 670 Julia Davis Dr. · 345-8330
Discovery Center of Idaho · 131 Myrtle St. · 343-9895
The Egyptian Theatre · 700 W. Main St. · 345-0454
The Flicks · cinema & café · 646 Fulton St. · 344-4222
The Idaho State Historical Museum · 610 Julia Davis Drive · 334-2120
Morrison Knudsen Nature Center (IDFG) · 600 S. Walnut · 334-2225
Zoo Boise · 355 Julia Davis Drive · 384-4260

Conference Venue

All conference activities will take place at the Boise Centre (850 W Front St., Boise, ID; Phone—(208) 336-8900; *www.boisecentre.com*). The Idaho Bat Working Group and Idaho Partners in Reptile and Amphibian Conservation meetings will be held at the Idaho Power offices (1221 W. Idaho St., Boise, ID). The second session of the Idaho Bird Conservation Partnership meeting (on Friday, March 7th) will be held at the MK Nature Center (600 S. Walnut, Boise, ID).

Registration and Logistics

Registration fees include admission to all oral sessions, symposiums, coffee breaks, social activities, and the program. In addition, fees include the banquet and a complimentary meeting gift. ICTWS is offering free registration to all university students and retirees.

Registration Fees:

$ 150	Full registration (includes symposium, social, banquet, and meeting gift)
$ Free	Retiree registration (includes symposium, social, banquet, and meeting gift)
$ Free	Student registration (includes symposium, social, banquet, and meeting gift)
$ 25	Working Together symposium ONLY
$ 35	Extra banquet ticket
$ 180	Full late registration—after February 21st
$ 30	Student and retiree late registration—after February 21st

The registration desk will be open at the following times:

Monday	3 March	4:00 pm—6:00 pm
Tuesday	4 March	7:00 am—10:00 am and 3:00 pm—4:00 pm
Wednesday	5 March	7:00 am—9:00 am and 10:00 am—12:30 pm
Thursday	6 March	7:00 am—8:00 am

Messages, job postings, and volunteer opportunities
We will set up a message and job board near the registration desk.

Idaho Chapter Executive Board/Conference Organizing Committee

Shane Roberts	Chair and President-Elect
Don Kemner	President
Quinn Shurtliff	Vice-President
Sandra Vistine-Amdor	Secretary
Laura Wolf	Treasurer
Dave Musil	Past-President

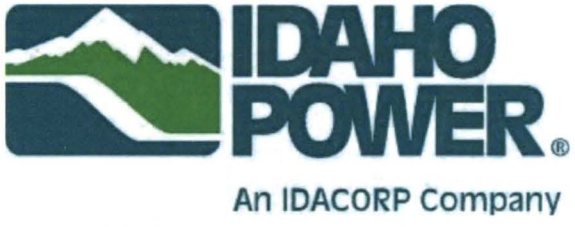
Northwest Section Executive Board

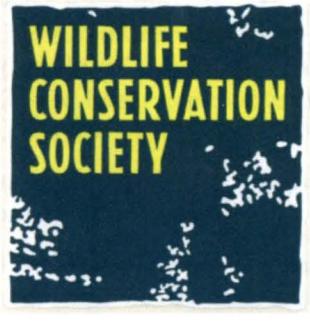
Barb Hill	President
Dave Kennedy	President-Elect
Kurt Jenkins	Vice-President
Bruce Ackerman	Secretary/Treasurer
Harriet Allen	NW Section Representative to TWS Council

Conference Contact
Shane Roberts - shane.roberts@idfg.idaho.gov; 208-881-2174

2014 Annual Meeting Sponsors

We wish to thank the Bureau of Land Management, Idaho Department of Fish and Game, U.S. Forest Service, Idaho Power, Power Engineers, Wildlife Conservation Society, and Tetra Tech for sponsoring the joint meeting of the Idaho Chapter and Northwest Section of The Wildlife Society.





2014 Annual Meeting Contributors

We would like to thank the session chairs, conference volunteers that helped with AV and other logistics, and the following organizing committee members for making this conference possible.

- Fund-Raising Committee (Colleen Moulton, Deniz Aygen, Sandy Vistine-Amdor, Katie Oelrich)
- Sponsorship Committee (Bruce Schoeberl, Don Kemner, Sandy Vistine-Amdor, Beth Waterbury, Robin Garwood, Martha Wackenhut, Greg Kaltenecker, Shane Roberts)
- Awards Committee (Jack Connelly, Tom Hemker, Jen Forbey)
- Nominations Committee (Curtis Hendricks, Dean Rose, Shane Roberts)
- Paper/poster judging coordinator (Duston Cureton) and all of the paper/poster judges

"Working Together" Special Session Sponsors

We wish to thank Boise State University; Boise State University Department of Biological Sciences; Boise State University Idaho Bird Observatory; Idaho Department of Fish and Game; Wood River Land Trust; Duke, Scanlan, and Hall PLLC; U.S. Forest Service Region 4; Intermountain West Joint Venture; Pheasants Forever-Malheur County Chapter; Idaho Chapter of the American Fisheries Society; and The Nature Conservancy for sponsoring the "Working Together" special session.

BOISE STATE UNIVERSITY

Boise State University
Boise State University Department of Biological Sciences
Boise State University Idaho Bird Observatory

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Auction and Raffle Item Donors

We wish to thank the following businesses that supported the 2014 Annual Conference with auction and raffle item donations.


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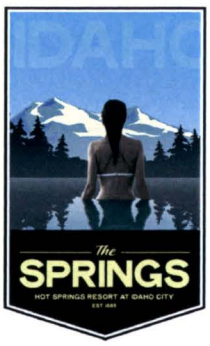
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Auction and Raffle Item Donors

We wish to thank the following individuals that supported the 2014 Annual Conference with auction and raffle item donations.

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Daryl Meints
Hollie Miyasaki
Colleen Moulton
Krista Muller
Katie Oehlrich
Pam O'Hearn
Scott Reinecker
Joel Sauder
Raleigh Sorenson
Terry Thomas
Sandy Vistine-Amdor
Beth Waterbury
Susan Werner

Program At a Glance

Monday 3 March

Time	**Location—Idaho Power, 1221 West Idaho St, Boise ID**
08:00-12:00	Idaho Bat Working Group Meeting (note location)
14:00-17:00	Idaho Partners in Amphibian and Reptile Conservation Meeting (note location)

Tuesday 4 March

Time	**Room—Summit Auditorium**	
08:00-08:10	Welcome - ICTWS President: Don Kemner	
08:10-10:30	**ICTWS Plenary Session—*ICTWS Turns 50*** Invited Speakers: Don Kemner, Marty Morache, Jay Gore, Paul Moroz, Rita Dixon, Dave Musil, Jon Haufler	
10:30-11:20	Panel Discussion	
11:20-13:10	ICTWS Business Lunch (**Room—Waters**)	
	Room—Summit Auditorium	**Room—Firs/Cottonwood**
13:10-15:10	Avian Ecology	Mammalian Ecology
15:30-17:10	To The Point Session	Habitat Management
17:30	**Fun Run (Sign-up at Registration Desk)**	
18:00	**Social and Poster Session (Room—Hawks)**	

Wednesday 5 March

Time	**Room—Summit Auditorium**	
08:00-08:10	Welcome - NW Section Representative: Harriet Allen	
08:10-11:35	**NW Section Plenary Session—*The Rise of Technology in Wildlife Science: Transforming Wildlife Conservation in the 21st Century*** Invited Speakers: Janet Rachlow, Scott Bergen, Joan Hagar, David Pilliod, Michael Schwartz, Gordon Luikart, Aaron Wirsing, Jennifer Forbey	
11:40-13:15	NW Section Business Lunch (**Room—Merlins**)	
	Room—Summit Auditorium	**Room—Firs/Cottonwood**
13:15-15:15	Wildlife Management	Landscape Ecology/Development of New Methodologies
15:35-17:15	Population Dynamics/Wildlife Law Enforcement	Genetics
18:00	**Banquet, Raffle, and Auction (Room—Falcon)**	

Thursday 6 March

Time	**Room—Glen**
08:00-12:00	**Special Session—*Working Together: Understanding and Leveraging Gender Differences in the Wildlife Profession*** Invited Speakers: Courtney Conway, Barbara Garcia, Toni Hardesty, Tom Kalous, Gretal Leibnitz, Evelyn Merrill
13:00-18:00	Idaho Bird Conservation Partnership Meeting (see page 4 for Friday meeting location)

Attendee and Presenter Information

Locations
All conference activities will be held in the Summit Auditorium, Glen (Willows, Pines, Firs, Cottonwoods), Waters (Salmon, Snake, Payette), Falcon (Kestrels, Merlins, Peregrines), or Hawk rooms of the Boise Centre. See page 4 for the location of associated meetings.

Oral Presenters
Please take note of your presentation date and time. Please note that all **general session** talks should be limited to 20 minutes total (including time for questions), whereas **To The Point** session talks should be limited to 10 minutes. Respect other speakers and your audience by staying within your scheduled time. It is extremely important that we maintain this schedule, so that attendees can move amongst sessions. For **general session** talks, a brief (5 minute) period post-presentation should be left so members of the audience can ask a few questions. Take the time to practice so your delivery fits into the scheduled interval. Check with your session chair well in advance of the start of your session to make sure that you know where the tools are that you need for your talk (e.g., remote control, laser pointer) and how to use them. This is also the time to check and see if your PowerPoint presentation (ideally saved in Microsoft Office PowerPoint Show [.pps] format) runs properly on the projector and projection computer. Presentations should be uploaded no later than the break preceding your talk.

Posters
The poster session will be held during the Social on Tuesday, March 4, in the Hawk Room. Poster displays should be set up after the afternoon session of contributed papers. T-pins to secure posters to the wall will be provided. All authors should be at their posters and prepared to discuss their work from 18:00 to 20:00 on Tuesday evening. Posters must be removed after the social.

<u>Notice to all attendees</u>: As a courtesy to all presenters, we request that you turn off your cellular phones while attending sessions and meetings.

Idaho Chapter of The Wildlife Society Awards

The **Special Recognition Award** is intended to honor any person or group who has made an outstanding contribution within the state of Idaho to wildlife conservation, management, science, conservation education, the wildlife profession or to an area of endeavor species, community, ecosystem or region. Any person or group who has made such a contribution in the last 3 years is eligible for this award.

The **Charles E. Harris Professional Wildlifer Award** honors professionals in wildlife management. It is given to demonstrate outstanding contributions to Idaho's wildlife resources as appreciated by one's peers. The award is meant to recognize outstanding professional contribution and promote public understanding of significant wildlife management accomplishments in Idaho.

Northwest Section of The Wildlife Society Awards

The **Arthur S. Einarsen Award** was established in 1966 to recognize careers of outstanding service to the wildlife profession by individuals residing in the area encompassed by the Northwest Section of The Wildlife Society. The Einarsen award is the Section's highest honor.

The **Wildlife Administrator Award** is awarded to an outstanding manager working within the area encompassed by the Northwest Section to recognize and reward excellence in the areas of wildlife program development and administration. As many wildlife professionals now fill positions that are largely administrative in nature and that encompass responsibilities for budgeting, planning, program development, program administration, and personnel management, this award is designed to recognize excellence in these areas. Individuals receiving this award have been clearly and directly responsible for improved wildlife conservation by enabling others, facilitating positive management actions, developing new programs or cooperative efforts that bring benefits to the wildlife resource, and by developing policy, law, or direction which benefits wildlife resources.

ICTWS Plenary Session Invited Speaker Biographies

Don Kemner, Current ICTWS President - Don has worked 24 years for Idaho Department of Fish and Game, primarily in wildlife habitat management and restoration and upland game and waterfowl management. Currently, Don is a Wildlife Program Coordinator for Idaho Department of Fish and Game's sage-grouse program. Don is the Intermountain West Joint Venture's Idaho State Conservation Partnership Chair, and President of the Idaho Chapter of The Wildlife Society. He has a B.S. in Wildlife Management from the University of Missouri, and a M.S. in Wildlife Management and Research from South Dakota State University.

Marty Morache, 1974 ICTWS Vice-President - Martel worked for Idaho Department of Fish and Game for 29 years as a Conservation Officer, Regional Educator, Conservation Education Program Supervisor, Ecological Program Coordinator, and State Non-game Wildlife Coordinator. His diverse background in fish and game management provides invaluable insight into the State's fish and game resources. He has a long history of active participation in the perpetuation, enhancement and preservation of outstanding fish and wildlife habitats throughout Idaho. He has been a leader in educating and informing many diverse "publics" regarding fish and wildlife values associated with major land and water classification issues.

James (Jay) Gore, 1980 ICTWS President – Jay graduated with a BS degree in wildlife management from South Dakota State University in 1963. He went on to earn a MS degree, also in wildlife management, from the University of Maine in 1965. During his 35 year career, Jay worked in a variety of management and coordinator positions for the Tennessee Fish and Game Commission, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and the USDA Forest Service. Jay served as president of the Illinois Chapter of TWS in 1975 and as president of the Idaho Chapter of TWS in 1981.

Paul Moroz, 1992 ICTWS President - Paul grew up in New Jersey between the Pine Barrens and Jersey shore, then attended the University of Idaho graduating with a Bachelors of Science degree in wildlife and fishery resources in 1975. Paul began working seasonally as a fish and wildlife biologist for the Idaho Panhandle National Forests in Avery in 1974, and then continued to enjoy a 32-year federal career spanning five national forests located in the Pacific Northwest (Mt. Baker-Snoqualmie N.F. at Verlot, Willamette N.F. at Blue River/ McKenzie Bridge, Nez Perce N.F. at Red River, Boise N.F. at Emmett, and Clearwater N.F. in Orofino). Paul transferred to the U.S. Fish and Wildlife Service in Boise in 1998 working in Endangered Species Act compliance through 2005, then transferred back to the Forest Service as Ecosystem Management Staff Officer on the Clearwater N.F. where he retired in 2007. Paul now works as an environmental consultant near Nezperce, Idaho. Paul served as treasurer for the Idaho Chapter of the Wildlife Society from 1988 to 1991, then as Chapter President from 1992-93.

Dr. Rita Dixon, 2006 ICTWS President – Rita is the State Wildlife Action Plan Coordinator for the Idaho Department of Fish and Game, where she works to conserve and manage species of greatest conservation need and the habitats they depend on. An ornithologist and population biologist by training, Rita's primary expertise lies in estimating animal abundance and survival, acoustic analysis, and setting conservation priorities. She holds a BS in Biology from the University of California, Riverside, and both a MS in Wildlife Resources, and a PhD in Natural Resources from the University of Idaho. Rita recently completed the nationally-accredited Certified Public Manager® Program. Dixon has served as president of the Idaho Chapter of The Wildlife Society and the Western Bat Working Group (where she continues to serve as a board member and colead the effort to assess the conservation status of western bats). She also cochairs the Idaho Bat Working Group, serves on the National White-nose Syndrome Disease Surveillance Working Group, and in 2012, cochaired the Association of Fish and Wildlife Agencies' Teaming With Wildlife Committee's State Wildlife Action Plan Best Practices Working Group. She is a member of the American Ornithologists' Union, the Cooper Ornithological Society, the American Society of Mammalogists, and the North American Society for Bat Research.

ICTWS Plenary Session Invited Speaker Biographies

David Musil, Current ICTWS Past-President – Dave has been a TWS member since 1984, an Idaho Chapter TWS member since 1990, and a TWS Certified Wildlife Biologist since 2000. Dave created and edited the first ICTWS webpage and was newsletter editor for several years during the early 2000s. He was elected ICTWS Vice -President (2010-2012), President (2012-2013), and now holds the Past-President executive board position (2013 -2014). Dave received his B.S. in Wildlife and Fisheries Science at South Dakota State University in 1985 and his M.S. in Wildlife Resources at the University of Idaho in 1989. He started his professional career with the Idaho Department of Fish and Game in 1989 as a land manager, then as a habitat biologist, and for the last 14 years as a senior wildlife research biologist with the Department studying upland game birds.

Dr. Jonathan Haufler, Current TWS President – Jonathan is the Executive Director of the Ecosystem Management Research Institute in Seeley Lake, Montana. Previous positions have included Professor of Wildlife Ecology at Michigan State University and Manager of Wildlife and Ecology Programs for Boise Cascade Corporation. He holds a B.S. from the University of New Hampshire, M.S. from Virginia Tech, and a Ph.D. from Colorado State University all in wildlife biology. He has been a member of The Wildlife Society for 40 years and has served in numerous capacities prior his current position as President.

NW Section Plenary Session Invited Speaker Biographies

Dr. Scott Bergen—Scott is a Senior Wildlife Research Biologist with the Idaho Department of Fish and Game. Scott obttained a Ph.D. in Forest Ecology from Oregon State University. Past work includes a NASA-funded docorate on the Land Biosphere-Atmosphere Initiative for the Brazilian Amazon Mission (Smithsonian Institution's Biological Dynamics of Fragmented Forests Project), Mellon Post-Doctoral Fellow (Mt. Holyoke College), NASA post-doctorate for identifying wildlife with-high resolution satellite imagery (Wildlife Conservation Society), a contributing author within the USGS International Polar Bear Science Team, as well as a roadie for the "Monsters of Rock World Tour" (Bill Graham Presents). Scott's present research interests are spatial ecology and characterization of landscape level processes and their enfluence on animal spatial behavior, mechanistic processes, and population level phenomena.

Dr. Jennifer Forbey—Jennifer is Assistant Professor in the Department of Biological Sciences at Boise State University. Jen received her Ph.D. from the Department of Biology at the University of Utah, and was an NSF International Research Postdoctoral fellow in Australia and New Zealand. Jen's research focuses on using chemistry, pharmacology, and physiology to understand and manage the interactions between herbivores and their environment.

Dr. Joan C. Hagar—Joan is a Research Wildlife Biologist with the U.S. Geological Survey's Forest and Rangeland Ecosystem Science Center in Corvallis, Oregon. Joan obtained her Ph.D. in Forest Ecology from Oregon State University. Her primary research interests focus on ecology and distribution of special-status species and habitats, effects of forest management on wildlife and habitats, and habitat mapping and modeling.

Dr. Gordon Luikart- Gordon is Associate Professor of Conservation Ecology at the University of Montana's Flathead Lake Biological Station. Gordon received his Ph.D. in Organismal Biology and Ecology from the University of Montana and was a Fulbright Scholar at La Trobe University in Australia. Gordon's primary research interests are in ecology, evolution, population genetics and conservation biology.

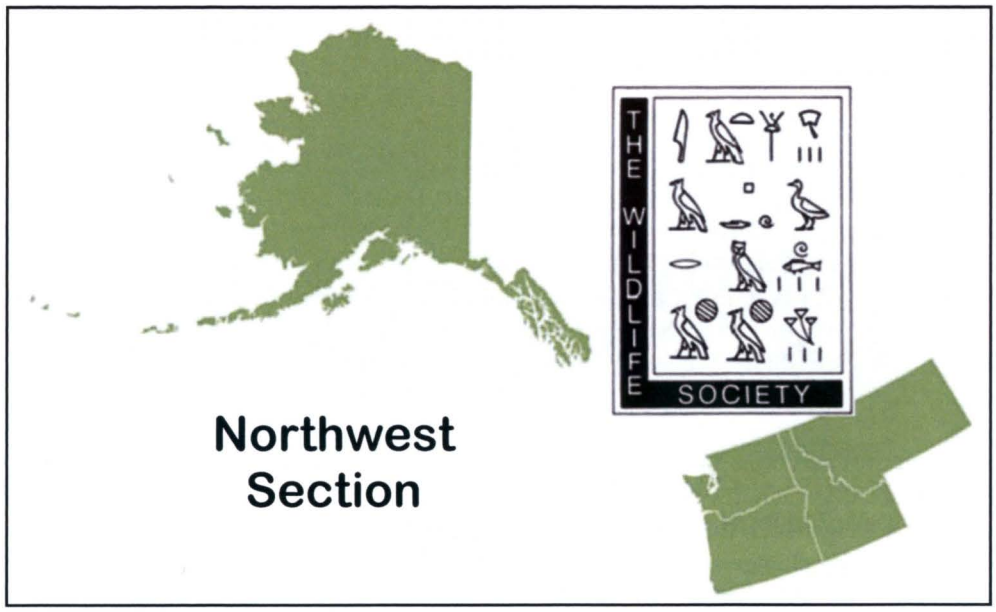
Dr. David S. Pilliod – David is a Research Ecologist with the U.S. Geological Survey's Forest and Rangeland Ecosystem Science Center in Boise, Idaho. After receiving his Ph.D. in Ecology from Idaho State University, David worked as a post-doc for the Aldo Leopold Wilderness Research Institute and Rocky Mountain Research Station and then as an Assistant Professor in the Department of Biological Sciences at California Polytechnic State University. His current research focuses on factors influencing wildlife population dynamics, community structure, and species distributions. David is particularly interested in applications of long-term monitoring data.

Dr. Janet Rachlow—Janet is Associate Professor in the Department of Fish & Wildlife Sciences at the University of Idaho. She received a Ph.D. in Ecology, Evolution and Conservation Biology from the University of Nevada, Reno. Together with her students and collaborators, Janet's research addresses questions about habitat relationships and responses of wildlife to habitat changes.

Dr. Michael K. Schwartz—Michael has been Conservation Genetics Team Leader at the U.S. Forest Service's Rocky Mountain Research Station since he received his doctorate in wildlife biology from the University of Montana's School of Forestry in 2001. He received a Presidential Early Career Award in Science and Engineering, and is an adjunct faculty member of the University of Montana's College of Forestry and Conservation. Dr. Schwartz has spent the past five years focusing on the fields of population, conservation, and landscape genetics. He seeks to provide practical answers to natural resource problems, combining field work and lab work. His work falls into four general topics: conservation genetics, genetic monitoring, landscape genetics, and the ecology of threatened and endangered species.

NW Section Plenary Session Invited Speaker Biographies

Dr. Aaron J. Wirsing—Aaron is Assistant Professor in the University of Washington's School of Environmental and Forest Sciences in Seattle. Aaron received his Ph.D. in Biological Science from Simon Fraser University, and completed post-doctoral work in the Department of Biological Sciences at Florida International University. Aaron's primary research interests are in behavioral ecology and predator-prey interactions.



Working Together Special Session Invited Speaker Biographies

Dr. Courtney Conway—Courtney is the Idaho Cooperative Fish & Wildlife Research Unit Leader in University of Idaho's Department of Ecology and Conservation Biology. He received a B.S. in Wildlife Biology from Colorado State University, an M.S. in Zoology from the University of Wyoming, and a Ph.D. in Organismal Biology and Ecology from the University of Montana. Dr. Conway works on applied questions to help wildlife managers make informed decisions. He also works on basic questions to better understand the ecological processes that affect behavior and demography of animal populations.

Barbara Garcia—Barbara is currently the Deputy Area Ranger on the Sawtooth National Recreation Area stationed in Stanley. Prior to her "adventure" as Ranger, she was a wildlife biologist for 12 years. During that time she worked on many wildlife species in forests of Idaho, Montana, Mississippi, Arizona, and New Mexico. Barbara has also been involved with the USFS International Forestry Program in Brazil. She earned her B.S. from the University of New Mexico in Biology and her M.S. from the University of Idaho in Wildlife Resources. Barbara has a passion for herpetofauna and bats and continues to serve in various capacities toward the conservation of these species. Barbara is married to Robert and has a Goldendoodle named Keegan and a lab/boxer named Iris.

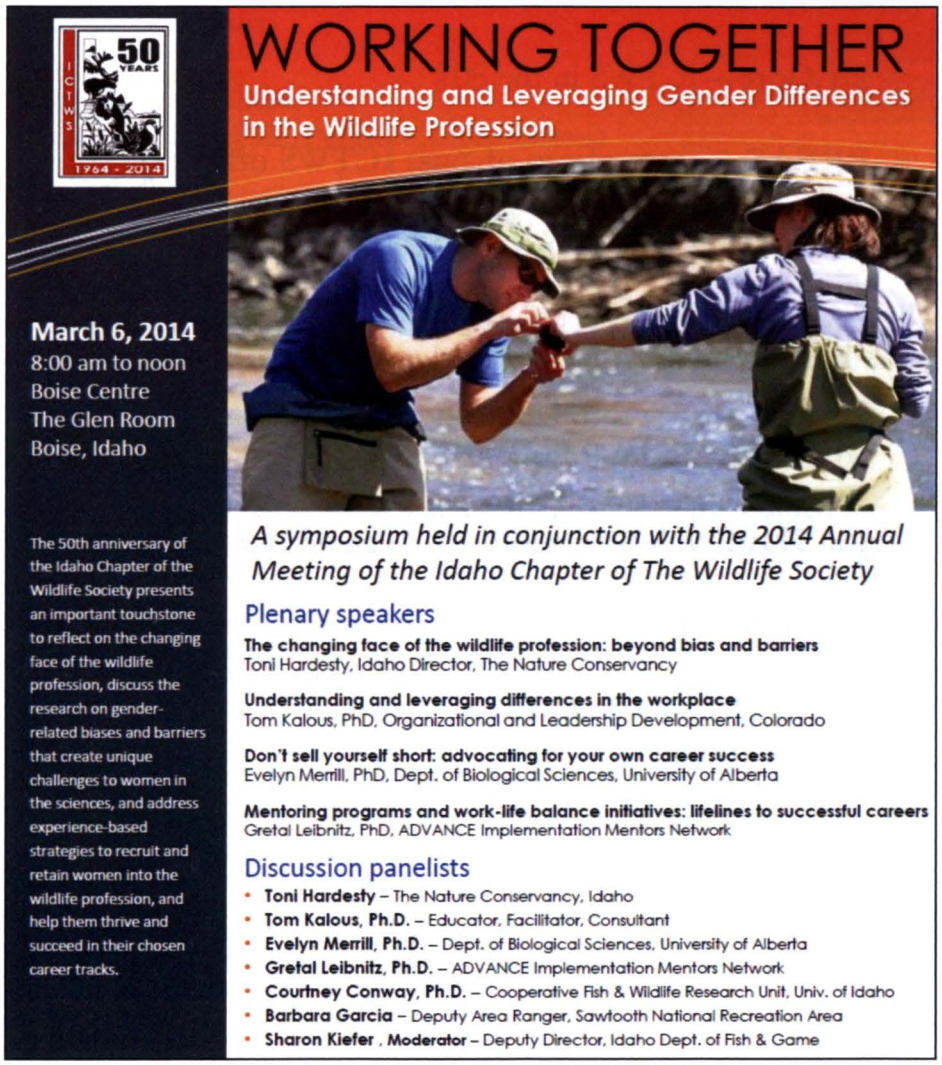
Toni Hardesty—Toni joined The Nature Conservancy in Idaho in February 2012. As state director, she oversees the Conservancy's work around Idaho, focusing on collaborative conservation projects that protect land and water for nature and people. Prior to assuming this post, Toni was appointed by Governor Dirk Kempthorne to serve as director of Idaho's Department of Environmental Quality in 2004, and subsequently reappointed by Governors James Risch and C.L. "Butch" Otter. In this role, she was responsible for leading efforts to preserve the quality of Idaho's air, land and water. Toni has also worked for the U.S. Environmental Protection Agency and in the private sector as an environmental consultant working. She has a bachelor's in Environmental Health from Boise State University. Toni, her husband Doug, and children are outdoor enthusiasts who enjoy backpacking, hiking, skiing and exploring the special places of Idaho.

Dr. Tom Kalous—Tom provides organizational consultation and corporate trainings that help participants understand the hard science that validates the importance of "soft skills". Dr. Tom is best known for his work on the role of emotional intelligence in the workplace and in leadership. His most recent interests involve applying the science of behavior change and social influence to the field of conservation and effective meeting facilitation during times conflict and change. For over 15 years, Dr. Tom gathered firsthand observations and case studies on human behavior and emotional intelligence while running a successful psychological counseling and consultation practice in the Denver area. In addition, he has been a successful entrepreneur, business leader, and product manager. His inviting and humorous teaching style and rich context of real-life examples add considerable dimension to his interesting instructional workshops.

Dr. Gretal Leibnitz—Gretal is an Experimental Psychologist and co-Principal Investigator (PI) on Washington State University's (WSU) National Science Foundation ADVANCE Institutional Transformation grant (2008). She currently serves as the ADVANCE at WSU's Assistant Director for the Excellence in Science and Engineering (EXCELinSE) Center. In her current role she is involved in a broad range of Center activities including program development and implementation, research and assessment, and coordination of Proactive Recruitment and Network Development (PRO-NET) activities. Dr. Leibnitz established and coordinates the national ADVANCE Implementation Mentors (AIM) Network for ADVANCE Program Coordinators/Directors and is co-PI on the AIM Network Women of Color Allies and Partners Project. Dr. Leibnitz has served as invited presenter, workshop facilitator and training coordinator on topics such as workforce inclusivity, barriers to gender equity, unconscious bias in decision making, and organizational best practices and policies.

Working Together Special Session Invited Speaker Biographies

Dr. Evelyn Merrill—is a professor at University of Alberta's Department of Biological Sciences. Her research focuses on large mammals with emphasis on foraging and nutritional ecology of ungulates, plant-herbivore interactions, and landscape modifications on wildlife populations. Dr. Merrill received a B.A. from St. Lawrence University, an M.S. from University of Idaho, and a Ph.D. from University of Washington. Her current interest lies in linking small-scale processes to large-scale patterns in animal distribution and population dynamics. Dr. Merrill has been actively involved in The Wildlife Society throughout her career and currently serves as Editor-in -Chief of the Journal of Wildlife Management.



Tuesday Morning—Summit Auditorium

Idaho Chapter of The Wildlife Society
Plenary Session (Chair: Jim Unsworth)

08:00-08:10 Welcome: Don Kemner, ICTWS President

Idaho Chapter of the Wildlife Society Turns 50

08:10-08:20 **Don Kemner**—ICTWS in the 60's

08:20-08:40 **Marty Morache**—ICTWS in the 70's

08:40-09:00 **Jay Gore**—ICTWS in the 80's

09:00-09:30 BREAK (group photo of past ICTWS officers)

09:30-09:50 **Paul Moroz**—ICTWS in the 90's

09:50-10:10 **Rita Dixon**—ICTWS in the 2000's

10:10-10:20 **Dave Musil**—From Hook and Bullet to Climate Change: Summarizing 50 Years of ICTWS Presentations

10:20-10:30 **Jon Haufler** (TWS President)—Perspectives from the Parent Society

10:30-11:20 **Panel Discussion**

11:20-13:10 Idaho Chapter Business Meeting and Luncheon (Waters Room), lunch provided

Tuesday Lunch Break—Waters Room

Idaho Chapter TWS 2014 Business Meeting Agenda
11:20-13:10, Tuesday March 4th, 2014
Lunch Provided
(Action Items in **bold**)

2013 Business Meeting Minutes - Don Kemner
- **Approve the minutes**

Treasurer's report – Laura Wolf
- Discuss free registration for student and retirees and the costs
- **Approve Treasurer's report**

2015 Annual Meeting – Don Kemner
- **Vote for location** (Idaho Falls, Pocatello, other choices)

2016 Annual Meeting – Don Kemner
- Washington Chapter has asked to have a joint meeting
- Skip Boise in 2016 and have joint meeting?
- **Vote on having a joint meeting**
- **If approve having a joint meeting, then vote for a northern Idaho location**

Scholarships – Don Kemner
- One scholarship awarded. Will announce the recipient at the banquet
- **Consider more scholarships or make each scholarship a higher dollar amount**

Grants – Don Kemner
- Three applications received. Winner will be announced at the banquet
- **Consider changing grant funding amount**

National Conference – Don Kemner
- Boise Convention and Tourism is interested in helping pursue a bid to host the TWS National Conference in Boise in 2020 or later
- **Consider exploring the possibility**

Membership survey – Don Kemner
- Membership will be surveyed shortly after the 2014 meeting

Committees – Don Kemner

Other subjects - All

Tuesday Afternoon—Summit Auditorium

*Names of presenters are capitalized; those presenters with an * are students*

Avian Ecology (Chair: Toni Holthuijzen)

13:10-13:30 **Eight waterfalls in 14 days—black swift surveys within and around the Idaho Panhandle National Forest, 2013.** ROBERT MILLER, K. E. deKramer, and J. D. Carlisle.

13:30-13:50 **Habitat selection of pinyon jays at the pinyon-juniper/sagebrush-steppe ecotone.** CHRIS WITT

13:50-14:10 **Effects of juniper encroachment on sage-grouse nest selection in southeastern Oregon.** JOHN SEVERSON*, K. P. Reese, and J. T. Forbes

14:10-14:30 **Newly discovered greater sage-grouse leks and an analysis of multiple lek-supporting landscape types.** SETH HARJU, C. V. Olson, M. R. Dzialak, and J. B. Winstead

14:30-14:50 **Why are most snags never used by woodpeckers for nesting? The role of wood mass density in woodpecker nest site selection**. TERESA LORENZ*, K. T. Vierling, P. C. Fischer, and T. R. Johnson

14:50-15:10 **Hummingbird migration and banding in Idaho.** JESSICA POLLOCK, J. Carlisle, H. Ware, and E. Urban

15:10-15:30 BREAK

To The Point (Chair: Jim Hayden)

15:30-15:40 **Artificially simulated wildlife and it's use in the apprehension of wildlife violators.** ERIC CRAWFORD

15:40-15:50 **Where's the grouse? Estimating observer error for ruffed grouse drumming surveys.** DAVID MUSIL

15:50-16:00 **Declines in counts of pileated woodpeckers on Craig Mountain WMA: declines in abundance or detection probability?** ZACH SWEARINGEN, C. Conway, F. Cassirer, and P. Zager

16:00-16:10 **Why here and not there? Factors that influence big game harvest in northern Idaho.** DAVID NEUMEYER and S. Hayes

16:10-16:20 **Restitution for illegally purchased Fish & Game licenses and tags.** BILL LONDON

16:20-16:30 **Conservation strategy for the North American wolverine in Idaho.** BETH WATERBURY

16:30-16:40 **Sage-grouse movements and survival near Wedge Butte, Idaho.** REGAN BERKLEY

16:40-16:50 **A model-based approach for estimating elk abundance from aerial survey data.** JON HORNE, J. Fieberg, S. Bergen, and P. Zager

16:50-17:00 **Evaluating habitat in a functional framework: what is productive mule deer fawning habitat in the Salmon Region and why is it important?** GREG PAINTER

17:00-17:10 **The Clearwater Basin Collaborative and elk monitoring in north-central Idaho.** PETE ZAGER, J. White, J. Cook, and R. Cook

17:30 **Fun Run** (visit registration desk for details)

18:00 **Social and Poster Session (Hawk Room)**, no host-bar/mixer & hors d'oeuvres

Tuesday Afternoon—Cottonwood/Firs

*Names of presenters are capitalized; those presenters with an * are students*

Mammalian Ecology (Chair: Jericho Whiting)

13:10-13:30 **Evaluating tradeoffs in risks by specialist and generalist herbivores.** MEGHAN CAMP*, M. M. Crowell, L. A. Shipley, J. S. Forbey, J. L. Rachlow, and T. R. Johnson

13:30-13:50 **Why are north Idaho ground squirrels so rare?** AMANDA GOLDBERG*, C. J. Conway, and D. Evans Mack

13:50-14:10 **North Idaho ground squirrel (*Urocitellus brunneus*) and cattle diets in Adams County, Idaho, 2010-11.** ERIC YENSEN, T. Tarifa, D. Evans Mack, B. Wagner, and B. M. Shock

14:10-14:30 **A predictive model of predator species at caribou calf kill sites in a multi-predator community.** MATTHEW MUMMA*, C. Soulliere, S. Mahoney, and L. Waits

14:30-14:50 **The roles and benefits of captive animal research for on-the-ground wildlife management.** AMY ULAPPA* and L.A. Shipley

14:50-15:10 **Important hibernacula and long-term trends of hibernating bats on the Snake River Plain, Idaho: implications for conservation and management.** JERICHO WHITING, B. Sewall, B. Doering, J. W. Lowe, G. J. Wright, S. Earl, A. Earl, D. K. Englestead, J. A. Frye, and T. Stefanic

15:10-15:30 BREAK

Habitat Management (Chair: Terry Thomas)

15:30-15:50 **The impacts of anthropogenic noise on northern saw-whet owl hunting ability.** TATE MASON* and J. Barber

15:50-16:10 **Bird community response to juniper removal.** STEVEN KNICK and S. E. Hanser

16:10-16:30 **Bird response to juniper removal II: winners and losers.** STEVEN HANSER and S. Knick

16:30-16:50 **Effects of ventenata (*Ventenata dubia*) infestation on nesting success of tree swallows (*Tachycineta bicolor*) within CRP fields of the Palouse.** ANDREW MACKEY*, T. Prather, J. Wallace, G. Shewmaker, and C. Conway

16:50-17:10 **Quantifying restoration effectiveness using multi-scale habitat models: implications for sage-grouse in the Great Basin.** ROBERT ARKLE, D. S. Pilliod, and S. E. Hanser

17:30 **Fun Run** (visit registration desk for details)

18:00 **Social and Poster Session (Hawk Room)**, no host-bar/mixer & hors d'oeuvres

Wednesday Morning—Summit Auditorium

Northwest Section of The Wildlife Society
Plenary Session

08:00-08:10 Welcome: Harriet Allen, NW Section Representative to TWS Council

The Rise of Technology in Wildlife Science: Transforming Wildlife Conservation in the 21st Century

08:10-08:30 **Janet Rachlow**, J. Forbey, L. Shipley, M. Burgess, P. Olstoy, J. Nobler, C. Wilson—Advancing Our Understanding of Wildlife Habitat: Using High-Resolution Imagery Obtained from an Unmanned Aircraft System to Quantify Habitat Characteristics in the Shrub-Steppe

08:30-08:50 **Scott Bergen**—NDVI: A Vegetation Index 3.5 Billion Years in the Making

08:50-09:10 **Joan Hagar**—Using LIDAR Data to Model Forest Structure for Canopy-Associated Wildlife Species

09:10-09:40 **David Pilliod**—Applications of Environmental DNA for Monitoring Aquatic Organisms

09:40-10:05 BREAK

10:05-10:25 **Michael Schwartz** and G. Luikart—Will Genomics Help Us Manage Wildlife Populations: Is More Always Better?

10:25-10:45 **Gordon Luikart** and M. K. Schwartz—RADs, Exon Capture, and Genome Sequencing: Examining Many Genes and Those That Matter

10:45-11:05 **Aaron Wirsing**—The Rise of Animal-Borne Video Systems as Tools for Wildlife Research

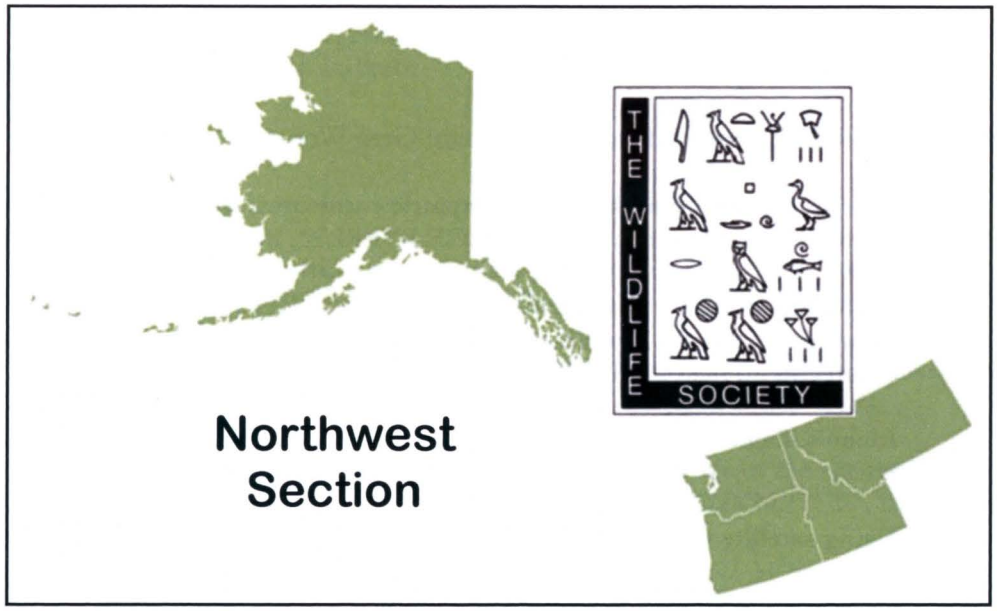
11:05-11:25 **Jennifer Forbey**—Solving Wildlife Issues with Emerging Technology

11:25-11:35 Questions/Discussion

11:40-13:15 NW Section Business Meeting and Luncheon (Merlins Room), lunch provided

Wednesday Lunch Break—Merlins Room

Northwest Section TWS 2014 Business Meeting
11:40-13:15, Wednesday March 5th, 2014
Lunch Provided



Wednesday Afternoon—Summit Auditorium

*Names of presenters are capitalized; those presenters with an * are students*

Wildlife Management (Chair: Rob Cavallaro)

13:15-13:35	**Temporal and spatial changes in golden eagle reproduction in relation to increased off highway vehicle activity.** KAREN STEENHOF, J. L. Brown, and M. N. Kochert
13:35-13:55	**The effects of off highway recreation on the breeding behavior of a shrub-steppe raptor.** ROBERT SPAUL* and J. A. Heath
13:55-14:15	**Development of a conservation management plan for the Idaho National Laboratory Site: using a new method to facilitate adaptive management.** QUINN SHURTLIFF
14:15-14:35	**Dynamics of Columbian sharp-tailed grouse in southeast Idaho.** GIFFORD GILLETTE*, K. P. Reese, J. W. Connelly, and J. M. Knetter
14:35-14:55	**Idaho Power's avian protection program.** NATALIE TURLEY
14:55-15:15	**Effects of fire and post-fire restoration on wildlife habitat and insect prey availability.** ASHLEY ROHDE*, D. S. Pilliod, and S. Novak
15:15-15:35	**BREAK**

Population Dynamics/Wildlife Law Enforcement (Chair: Greg Wooten)

15:35-15:55	**Resource partitioning between sympatric carnivores: a comparison of historic and contemporary dietary overlap.** PAIGE BYERLY*, R. Lonsinger, and L. P. Waits
15:55-16:15	**Enforcing wildlife management decision: Idaho Department of Fish and Game's effort to protect, preserve, perpetuate and manage Idaho's wildlife resources through law enforcement.** ERIC CRAWFORD
16:15-16:35	**Idaho's illegal big game harvest: have we given it all the attention it deserves?** MARK HILL
16:35-16:55	**Using satellite telemetry to study Idaho-breeding long-billed curlews.** JAY CARLISLE, J. Pollock, H. Ware, L. Urban, and F. Smith
16:55-17:15	**Assortative mating as a mechanism for advancing nesting phenology in American kestrels (*Falco sparverius*) of southwestern Idaho.** ALEXANDRA ANDERSON*, J. Heath, J. Smith, S. Novak, E. Stolen, and K. Steenhof
18:00	**Banquet (Falcon Room)** No host-bar/mixer & dinner Raffle, silent auction, awards & election results

Wednesday Afternoon—Cottonwood/Firs

*Names of presenters are capitalized; those presenters with an * are students*

Landscape Ecology/Development of Methodologies (Chair: Scott Bergen)

13:15-13:35 **Ecosystem engineers ina coniferous forest: using LIDAR to understand the role of vegetation structure and disturbance across spatial scales.** JOE HOLBROOK*, K. Vierling, L. Vierling, P. Adam, and A. Hudak

13:35-13:55 **Developing an integrated pest management strategy for controlling ventenata (*Ventenata dubia*) in Conservation Reserve Program lands in the Palouse.** ANDREW MACKEY*, T. Prather, J. Wallace, G. Shewmaker, and C. Conway

13:55-14:15 **Implementing habitat restoration projects to mitigate wildlife habitat losses due to the construction and operation of hydroelectric projects.** KATHERINE COUSINS

14:15-14:35 **Surrogate species: can the concept work in Idaho (or anywhere)?** TERRELL RICH

14:35-14:55 **Evaluating measurement error of flight height estimates for risk assessments.** SYLVIA COPELAND

14:55-15:15 **Does road noise degrade stopover habitat for migrating songbirds?** HEIDI WARE*, C. J. W. McClure, and J. R. Barber

15:15-15:35 BREAK

Genetics (Chair: Lisette Waits)

15:35-15:55 **Preliminary results of non-invasive genetic sampling for mark-recapture studies of endangered Sonoran pronghorn.** SUSANNAH WOODRUFF*, T. Johnson, and L. Waits

15:55-16:15 **Developing molecular methods for population genetic analysis of Andean fox in southern Ecuador.** DANIELA ARIAS*, R. Cisneros, and L. Waits

16:15-16:35 **Fecal DNA sampling and phylogeographic analysis of the spectral bat, *Vampyrum spectrum*, in southern Ecuador.** MICHAELA BRINKMEYER*, R. Cisneros, D. Roon, and L. Waits

16:35-16:55 **Agricultural intensification in a neotropical biological corridor: can functional connectivity for frugivorous bats be maintained?** KATE CLEARY*, L. Waits, and B. Finegan

16:55-17:15 **Population estimation and systematics of brown bears (*Ursus arctos*) in Mongolia.** OD-BAYAR TUMENDEMBEREL*, M. Proctor, H. Reynolds, T. Khorloojav, A. Luvsanjamba, T. Tserenbataa, N. Yanjin, U. Ramakrishnan, L. Waits

18:00 Banquet (Falcon Room)
No host-bar/mixer & dinner
Raffle, silent auction, awards & election results

Thursday Morning—Cottonwood/Fir/Pine

Special Session (Moderator: Sharon Kiefer)

Working Together: Understanding and Leveraging Gender Differences in the Wildlife Profession

08:00-08:10	Welcome: **Sharon Kiefer**, Moderator
08:10-08:35	**Toni Hardesty**—The Changing Face of the Wildlife Profession: Beyond Bias and Barriers
08:35-09:00	**Tom Kalous**—Understanding and Leveraging Differences in the Workplace
09:00-09:25	**Evelyn Merrill**—Don't Sell Yourself Short: Advocating for Your Own Career Success
09:25-09:50	**Gretal Leibnitz**—Mentoring Program and Work-Life Balance Initiatives: Lifelines to Successful Careers
09:50-10:05	**BREAK**
10:05-12:00	**Panel Discussion and Question Session**

Sharon Kiefer (moderator)—Deputy Director, Idaho Department of Fish and Game
Toni Hardesty—The Nature Conservancy
Tom Kalous—Educator, Facilitator, Consultant
Evelyn Merrill—Dept. of Biological Sciences, Univ. of Alberta
Gretal Leibnitz—ADVANCE Implementation Mentors Network
Courtney Conway—Cooperative Fish & Wildlife Research Unit, Univ. of Idaho
Barbara Garcia—Deputy Area Ranger, Sawtooth National Recreation Area

Thursday Afternoon—Willows

Idaho Bird Conservation Partnership (Chair: Jay Carlisle)

13:00 Welcome and Introductions – *Jay Carlisle*

13:10 Partners in Flight updates – *Terry Rich*
The future of the Partners In Flight National Coordinator position
2015 update to the PIF land bird plan (Continental Plan, 2004)
Status of USFWS Strategic Habitat Conservation plans for Idaho

13:30 Raptor-focused Partner updates:
Regional Distribution Shifts Help Explain Local Changes in Wintering Raptor Abundance: Implications for Interpreting Population Trends – *Neil Paprocki, Wild Lens Inc.*
Idaho Power Company Raptor Protection Program – *Natalie Turley, Idaho Power Company.*
Short-eared Owls: Status Review and a Survey Method – *Travis Booms, Alaska Department of Fish and Game, and Matt Larson, Owl Research Institute*

14:15 Working Group updates (3-10 min update per group) – *Working Group leaders*
Will include:
Brief updates from: '**Funding**', '**Information Management**', '**SWAP revision**', and '**Outreach, Education, and Citizen Science**'
Conservation Delivery: Bird workshops for NRCS field staff – *Don Kemner*
Pressing Issues: Action Plan Development – *Colleen Moulton*
Research and Monitoring: IBCP raptor action plan – *Rob Miller*

15:00 Coffee/snack break

15:15-17:00 Breakout discussions:
SWAP revision:
- data needed
- ranking/assessing species

Research and Monitoring
- Raptor Action Plan – moving from planning to implementation
- Other research and monitoring ideas

Pressing Issues
- Action Plan finalization and implementation; revisit ranking?

~18:00 Optional group dinner (location TBD)

Friday, March 7th (meeting continued)
Location: M.K. Nature Center, 600 S. Walnut, Boise, ID

8:45 Convene … coffee/tea

9:00 Brief updates from Thursday afternoon breakouts

9:15 Breakout sessions (*break ~1015 am*):
Research and Monitoring (*~915-1015; continued from Thursday*)
Conservation Delivery:
- Bird workshops for NRCS field staff
- Effectiveness monitoring

Outreach, Education, & Citizen Science:
- Photo contest, partner/project profiles, uncapped pipes action plan progress, etc.

11:30 Next steps: work plans & deliverables for the spring/summer

~12:00 Meeting adjourned (*continued lunch discussions for those interested*)

ANDERSON, ALEXANDRA*[1], J. Heath[1], J. Smith[1], S. Novak[1], E. Stolen[2], and K. Steenhof[3]. [1]Boise State University, Boise, Idaho 83725. [2]Ecological Programs, Kennedy Space Center, Florida 32899. [3]Owyhee Desert Studies, Murphy, Idaho 83650. ***ASSORTATIVE MATING AS A MECHANISM FOR ADVANCING NESTING PHENOLOGY IN AMERICAN KESTRELS (*FALCO SPARVERIUS*) OF SOUTH-WESTERN IDAHO.***

The ability of species to respond to climate change will depend on phenotypic plasticity, adaptation, or both. Bird populations have responded to warming temperatures by shifting their wintering and breeding distributions, adjusting the timing and length of their migration, and breeding earlier. American kestrels (*Falco sparverius*) in southwestern Idaho have advanced their nesting by over 20 days in the last 23 years, and this change has been correlated with warming winter temperatures and declining winter precipitation. The mechanisms allowing for this shift in nesting phenology, however, are not clearly understood. In this study, we investigated if the non-random mating of sympatric winter-resident kestrels and non-resident kestrels is contributing to the shift in nesting phenology. We addressed whether 1) winter resident kestrels mate with winter residents and non-residents mate with other non-residents, 2) winter resident kestrels mate earlier than non-residents, and 3) winter resident kestrels are genetically different from non-winter residents. Our results suggest that non-random mating does occur significantly more than expected by chance and that winter residents have significantly earlier nesting phenology compared to non-residents. However, there is no evidence that non-random mating has resulted in genetic differentiation. Lack of genetic differences between these groups may be the result of recent changes in nesting phenology or of mixing between residents and non-residents. Mixing could occur if birds switched wintering strategies or nesting phenologies between years or if birds re-nest with a mate of a different wintering strategy or nesting phenology. Our results imply that wintering strategy has carry-over effects on the breeding season but that these effects have not resulted in significant genotypic differences. This study provides insight on ways bird populations may respond to new environmental pressures.

ARIAS, DANIELA*, R. Cisneros, and L. Waits, University of Idaho, Moscow, ID 83844-1136. ***DEVELOPING MOLECULAR METHODS FOR POPULATION GENETIC ANALYSIS OF ANDEAN FOX IN SOUTHERN ECUADOR.***

Ecuador is a biodiversity rich country that contains 401 or 8% of the world's mammal species. However, Ecuador ranks first in South America and second in the world in the number of threatened and vulnerable species (104). This number is also expected to increase given the current rate of recourses exploitation, habitat loss and fragmentation. *Lycalopex culpaeus*, also known as the culpeo, Andean Wolf or Andean Fox, is an endemic canid of South America and the largest of its genus. The species utilizes a wide variety of habitat types from 0-4500 m and is distributed along the Andes mountain chain from Ecuador to Chile. Little is known about the ecology and behavior of the species, and there are no published studies of genetic diversity and structure. Thus, there is a great need to develop sampling approaches to study the ecology and genetics of Andean Fox. No researchers are currently trapping and collaring Andean Fox in Ecuador so this study was designed to gather information about the species using noninvasive genetic sampling (NGS) of fecal material. Specifically, we want to evaluate success rates for obtaining mitochondrial DNA and nuclear DNA from fox fecal samples to determine the feasibility of using NGS to collect information on species distribution, demographics, genetic diversity, genetic structure and evolutionary relationships across the range. From 2009-2014, we collected 200 fecal samples in the Podocarpus National Park of southern Ecuador. DNA was extracted from all fecal samples using the Qiagen Stool Mini Kit. We are currently testing over 20 nuclear DNA microsatellite loci developed for dogs and North American canids to identify loci that can be used to collect data for individual identification, genetic diversity and population structure of this species. This information will be used to help develop long-term research and conservation plans for this species.

ARKLE, ROBERT S., D.S. Pilliod, and S.E. Hanser. U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Boise, Idaho 83706. ***QUANTIFYING RESTORATION EFFECTIVENESS USING MULTI-SCALE HABITAT MODELS: IMPLICATIONS FOR SAGE-GROUSE IN THE GREAT BASIN.***

We developed multi-scale empirical models of Greater Sage-Grouse occupancy in 211 randomly located plots within the Great Basin. We then used these models to predict sage-grouse habitat quality at 826 plots associated with 101 landscape-scale, post-wildfire seeding projects implemented from 1990-2003 in the region. We also compared conditions at restoration sites to published habitat guidelines. Sage-grouse occupancy was positively related to plot- and landscape-level dwarf sagebrush (*Artemisia arbuscula, A. nova, A. tripartita*) and big sagebrush steppe prevalence, and negatively associated with non-native plants and human development. The predicted probability of sage-grouse occupancy at treated plots was low on average (0.09) and was not significantly different from burned areas that had not been treated. Restoration was most often effective at higher elevation locations with low annual temperatures, high spring precipitation, and high plant diversity. Of 313 plots seeded after fire, none met all sagebrush guidelines for breeding habitats, but approximately 50% met understory guidelines, particularly for perennial grasses. This trend was similar for summer habitat. Ninety-eight percent of treated plots did not meet winter habitat guidelines. Restoration actions did not increase the probability of burned areas meeting most guideline criteria. The probability of meeting guidelines was influenced by a latitudinal gradient, climate, and topography. Sage-grouse are not likely to use many burned areas of the Great Basin within 20 years of fire, regardless of treatment. Understory conditions are more likely to be adequate than overstory conditions, but in most climates, establishing forbs and reducing cheatgrass dominance is unlikely. Reestablishing sagebrush cover will require more than 20 years using past restoration methods. Given current fire frequencies and restoration capabilities, protection of landscapes containing a mix of dwarf sagebrush and big sagebrush steppe, minimal human development, and low non-native plant cover may provide the best opportunity for conservation of sage-grouse habitats.

BERGEN, SCOTT. Idaho Dept. of Fish and Game, Pocatello, ID 83204. ***NDVI - A VEGETATION INDEX WITH 3.5 BILLION YEARS IN THE MAKING.***

Recent ungulate studies have recognized the Normalized Difference of Vegetation Index (NDVI) as a possible determinant of migratory spatial behaviors and population level changes occurring in northern Rocky Mountain systems. NDVI and is not a new technology but one that has developed with the origin and emergence of space-based earth observation systems. In this inquiry and development, NDVI has been used to quantify gas exchanges between the atmosphere and biosphere, estimate global CO_2 emissions, identify and characterize fire events and their subsequent recovery, identifying areas infested with cheat grass, identify good range for domestic cattle and sheep, as well as identify areas that have potential for diseases such as malaria and West Nile virus. Despite this forty years of research and inquiry, wildlife biologist are still asking the questions-- "What is NDVI ?" and "how can this statistic be used for wildlife management and research?" This presentation aims to explain the optical nature of NDVI, how NDVI is derived, and what information can be garnered from this metric for the purposes of wildlife management, as well as provide information for when its use is inappropriate. Specific examples from current and past research in Idaho will be provided as examples of NDVI's use for wildlife and resource management purposes.

BRINKMEYER, MICHAELA*, R. Cisneros, D. Roon, and L. Waits. University of Idaho, Moscow, ID, 83844-1136. ***FECAL DNA SAMPLING AND PHYLOGEOGRAPHIC ANALYSIS OF THE SPECTRAL BAT, VAMPYRUM SPECTRUM, IN SOUTHERN ECUADOR.***

Traditional techniques for sampling bat populations (i.e. mist netting and tissue biopsies) are invasive and require the capture of many individuals to accurately assess population dynamics. Noninvasive genetic sampling (NGS) of fecal material could be a useful alternative method. However, very few genetic studies of bats have employed NGS techniques, and no NGS studies have been conducted on tropical bat species. Our research project had three main goals: 1) evaluate success rates for obtaining mitochondrial DNA (mtDNA) and nuclear DNA (nDNA) from a colony of spectral bats, *Vampyrum spectrum*, in the Ecuadorian dry forest, 2) estimate genetic

diversity and relatedness of bats in this colony, and 3) determine the genetic relationships of bats in this colony to bat samples collected at multiple locations across the current range. We obtained tissue samples of nine *V. spectrum* specimens from four countries from the Museum at Texas Tech University. On the Arenillas Ecological Reserve in southeastern Ecuador we located single colony of *V. spectrum*, and collected fecal pellets from the bottom of the roost every 12 hours over a two day period. We extracted DNA from 45 fecal pellets with the Qiagen DNA Stool Kit. To find suitable nDNA microsatellite loci, we tested 19 loci developed for other bat species using DNA extracted from the nine museum specimens. Fourteen loci produced scorable PCR products and two loci were highly variable. Analyses of the remaining samples, genetic diversity and genetic relationships of bats across the range are ongoing. Current results suggest that NGS of fecal pellet DNA is a promising approach for obtaining genetic samples from *V. spectrum* to address a wide range of research questions the ecology, behavior, demography, and genetic structure of this species.

BYERLY, PAIGE A.*, R. Lonsinger and L.P. Waits. University of Idaho, Moscow, Idaho 83843.
RESOURCE PARTITIONING BETWEEN SYMPATRIC CARNIVORES: A COMPARISON OF HISTORIC AND CONTEMPORARY DIETARY OVERLAP.
Changes in resource partitioning between sympatric species can give important insights into the likelihood of persistence of subordinate species. The occurrence of resource partitioning is difficult to prove empirically; the most effective way to study the process may be through two species with previously limited contact brought into recent sympatry. In the Great Basin Desert of Utah, kit foxes (*Vulpes macrotis*) and coyotes (*Canis latrans*) have experienced increased distribution overlaps over the past 50 years. These canids have a high level of dietary similarity and there is a negative correlation between kit fox survivorship and coyote presence in the area, indicating competition for resources. Historically, leporids were the primary prey for kit fox, and decreased access to this group could have important implications for kit fox persistence. We analyzed coyote (n = 776) and kit fox (n = 266) scats obtained in western Utah over two seasons in 2013 to evaluate competition for dietary resources. We then compared our results to those from a previous study conducted in the same region to determine if and how the dietary overlap has changed. Our results indicate that leporids had a percent occurrence of 5.8% in kit fox diets, and 19.9% in coyote diets, as compared to an occurrence of 10.8% in kit fox diets and 30.1% in coyote diets during the historical study. Dietary overlap between species was high (Horn's index = 0.9057), but significant differences in Shannon-Wiener's diversity indices ($t = 3.77$, $df = 492$, p-value <0.001) suggest that the utilization of dietary items varied. In particular, leporids, kangaroo rats, rodents, and insects composed >75% of the coyote diets, while kit fox used considerably less leporids, obtaining >75% of their diet from the latter three groups. Altered dietary proportions of kit foxes may be resulting from competition with coyotes.

CAMP, MEGHAN J.*[1], M. M. Crowell[1], L. A. Shipley[1], J. S. Forbey[2], J. L. Rachlow[3], and T. R. Johnson[3]. [1]Washington State University, Pullman, WA 99163; [2]Boise State University, Boise, ID 83725; [3]University of Idaho, Moscow, ID 83844. ***EVALUATING TRADEOFFS IN RISKS BY SPECIALIST AND GENERALIST HERBIVORES.***
When acquiring food, herbivores must cope with the risks imposed by the intrinsic properties of plants such as the fiber present in the cell walls and plant secondary compound concentrations. Both of these factors affect how herbivores use food patches. When choosing what eat, they often face trade-offs between the nutritional benefits of the food and the physiological costs incurred in dealing with the anti-herbivory defenses of the food item. Our aim was to examine the tradeoffs that dietary specialist and generalist lagomorphs make between the risk of starvation and the risk of toxicity. We conducted a series of feeding trials to determine how individuals perceive the fiber levels in food relative to the toxicity level of the food using intake as the common currency. We determined the equivalence points (i.e., the levels of each toxin and fiber that result in equal intake between feeding patches) for multiple combinations of fiber levels and toxicity levels. Then we used the series of equivalence points to construct tradeoff curves for the two risks for mountain cottontails and pygmy rabbits.

The equivalence points occurred at higher toxicity and lower fiber levels for the specialist pygmy rabbits than cottontails. Furthermore, the slope of the tradeoff curve was steeper for pygmy rabbits than for cottontails indicating that the marginal rate of substitution between toxicity and digestibility was higher for pygmy rabbits than for cottontails. Pygmy rabbits are willing to consume higher levels of toxicity to obtain lower fiber values than cottontails. Our results show that variation in toxin concentration and the nutritional quality of plants can influence the risks associated with foraging. We demonstrate that herbivores quantify and balance these two risks by altering their foraging behavior and that there are differences in how a specialist and generalist herbivore balance these risks.

CARLISLE, JAY[1], J. Pollock[1], H. Ware, L. Urban, and F. Smith[2]. [1]Idaho Bird Observatory, Boise State University, Boise, Idaho 83725; [2]Center for Conservation Biology, College of William & Mary *and* Virginia Commonwealth University, Williamsburg, VA 23188. ***USING SATELLITE TELEMETRY TO STUDY IDAHO-BREEDING LONG-BILLED CURLEWS.***
Long-billed Curlew populations have declined in portions of their breeding range, including in some historical strongholds in Idaho. Though we can identify many breeding season threats that may be occurring in Idaho, it's also critical to know where curlews spend the rest of their annual cycle and learn about potential threats outside of Idaho. In the spring of 2013, we deployed four satellite transmitters (Microwave Telemetry 9.5g solar PTTs) on breeding adult curlews from two populations: the Long-billed Curlew Habitat Area of Critical Environmental Concern (ACEC) in southwestern Idaho and the Big Creek Ranch in the Pahsimeroi Valley. The four birds traveled through Nevada and Utah during migration, and have spent time wintering in areas of Mexico and California. We will present movement details, compare results with other western states, consider threats to curlew populations, and discuss future objectives.

CLEARY, KATE*[1], Waits, L[1], and Finegan, B[2]. [1] Department of Fish and Wildlife Sciences, Moscow Idaho, 83843; [2] Tropical Agricultural Research and Higher Education Center, Turrialba, Costa Rica.
AGRICULTURAL INTENSIFICATION IN A NEOTROPICAL BIOLOGICAL CORRIDOR: CAN FUNCTIONAL CONNECTIVITY FOR FRUGIVOROUS BATS BE MAINTAINED?
As global human populations increase, the current trend of agricultural intensification in both temperate and tropical landscapes is projected to continue. We use genetic approaches to investigate the impacts of agricultural intensification, specifically the recent expansion of pineapple plantations, on functional connectivity for frugivorous bat populations in the San Juan-La Selva (SJLS) biological corridor in Costa Rica. We focus on two bats of differential size and mobility that are key seed dispersers for hundreds of Neotropical plants: *Artibeus jamaicensis* and *Carollia castanea.* We hypothesize that populations of the larger, more mobile *A. jamaicensis* will retain higher functional connectivity in landscapes dominated by pineapple than populations of the smaller, more sedentary *C. castanea.* In 2012 and 2013, we collected genetic samples from 445 *A. jamaicensis* and 440 *C. castanea* in 30 remnant primary forest patches in a matrix of pasture, annual crops, and pineapple in the SJLS. Using 10 microsatellite loci for *A. jamaicensis* and 6 microsatellite loci for *C. castanea*, we estimated genetic diversity within patches and gene flow between patches as functions of 1) patch size and isolation and 2) agriculture type in the matrix. Preliminary results indicate that *A. jamaicensis* retains higher functional connectivity through pineapple than *C. castanea.* Our research advances current understanding of the impacts of habitat fragmentation on bat populations and the plant species which depend on them for dispersal, and contributes to bat conservation in the SJLS and in other landscapes undergoing agricultural intensification.

COPELAND, SYLVIA. Nampa, Idaho 83686. ***EVALUATING MEASUREMENT ERROR OF FLIGHT HEIGHT ESTIMATES FOR RISK ASSESSMENTS.***
Collision risk models are used to predict avian fatalities and develop mitigation for wind energy facilities, particularly for eagles. Relative risk is determined in part by the probability of a bird colliding with a turbine, based on pre-construction studies. Flight heights are estimated visually, often with no man-made objects in the landscape for height comparison. In order to evaluate the accuracy of flight height estimates, I flew kites at known altitudes in 2013 while four observers estimated 80 heights of three bird-like kites. Kites were flown at

different distances from observers (range: 26-753 m) and on average 67.2 m (SE=4.5; range: 7.6-148.6 m) above the ground. Observers underestimated more than overestimated heights (mean: 47.4 m; SE=2.7; range: 12-100 m), particularly when kites were > 75 m above the ground. The mean measurement error, i.e. difference between visual estimate and kite height, was -19.8 m (SE=4.5; range: -109.8, +68.2 m). ANCOVA models indicated that object height, observer distance, and observer affected measurement error. Levels of precision and bias of height estimates differed significantly among observers. I recommend evaluating measurement error of height estimates, possibly with kites, in order to improve fatality estimates produced by collision risk models.

COUSINS, KATHERINE, Idaho Department of Fish and Game, Panhandle Office, Coeur d'Alene, Idaho 83814. ***IMPLEMENTING HABITAT RESTORATION PROJECTS TO MITIGATE WILDLIFE HABITAT LOSSES DUE TO THE CONSTRUCTION AND OPERATION OF HYDROELECTRIC PROJECTS.***

The majority of wildlife habitat loss along low-lying marsh lands, deltas and shorelines of Lake Pend Oreille occurred with construction and operation of the Albeni Falls dam. This dam, which uses a portion of the Pend Oreille River and the top 11 feet of Lake Pend Oreille as its reservoir, holds the lake level artificially high at an elevation of 2,062.5 feet between June and September, and then lowers the lake level to either 2,051 feet or to 2,055 feet in elevation during the winter months. At elevated summer lake levels, wind-generated waves erode shoreline soils over a much longer period than would have occurred naturally. Shoreline sloughing also occurs when saturated soils on steep shorelines are left unsupported following lake-elevation drawdown in September. Also, two dams located on the Clark Fork River remove sediments from the water and cause daily fluctuations of the river through the Clark Fork River delta until it enters Lake Pend Oreille. The purpose of the restoration projects are to protect what wildlife habitat remains and to create herbaceous, scrub-shrub and forested wetlands in an areas where these wildlife habitats once existed and are now gone. Restoration projects, one completed in the Pack River delta in 2009, and a second larger project being proposed for the Clark Fork River delta in 2014, involve installing shoreline erosion control measures and structures to redirect local water flow, raising islands, deepening channels, establishing vegetation and controlling weeds. The Pack River delta project demonstrated that it is possible to reclaim wetland habitats impacted by altered hydrologic regimes and to improve wildlife habitat quality. This project also provided valuable lessons learned and information on what to expect during the implementation of the larger Clark Fork River delta restoration project scheduled to start in June 2014.

CRAWFORD, ERIC. Idaho Department of Fish and Game, Lewiston, Idaho 83501. ***ENFORCING WILDLIFE MANAGEMENT DECISIONS; IDAHO DEPARTMENT OF FISH AND GAME'S EFFORT TO PROTECT, PRESERVE, PERPETUATE AND MANAGE IDAHO'S WILDLIFE RESOURCES THROUGH LAW ENFORCEMENT.***

The Idaho Dept. of Fish and Game's Enforcement Bureau plays a critical role in the management of people as they recreate in outdoor activities associated with Idaho's fish and wildlife resources. This presentation is an overview of the activities by Conservation Officers of the Idaho Dept. of Fish and Game that relate to management and protection of Idaho's wildlife resources. The 107 conservation officers are perhaps the most visible component of the Idaho Dept. of Fish and Game to the recreating public. Conservation Officers are charged with the enforcement of Idaho Code Title 36, which deals with laws associated with the taking of fish and wildlife. In addition to their enforcement role, Conservation Officers conduct a great deal of public outreach and education. This extensive interaction with the public provides a unique opportunity for wildlife professionals by potentially bolstering support for management decisions. During 2010, 2011 and 2012 conservation officers contacted approximately 83,549 hunters and made an additional 87,321 non-enforcement contacts. In addition to law enforcement duties, officers assisted wildlife biologists and managers with depredation calls totaling 2586 and nuisance wildlife calls totaling 8686. Wildlife professionals can benefit from an understanding of the role Conservations Officers play and a recognition of the opportunity that role presents in communicating with the public. The hope is that this presentation furthers that understanding and stimulates communication between wildlife and enforcement staff in the development of Wildlife Enforcement Action Plans and setting shared goals in the ongoing protection of Idaho's rich Wildlife resources.

FORBEY, JENNIFER. Department of Biological Sciences, Boise State University, Boise, ID. ***SOLVING FUTURE WILDLIFE ISSUES WITH EMERGING TECHNOLOGY.***

A number of recent technological developments have emerged to help researchers evaluate and solve the multitude of challenges facing wildlife. These technological advances provide more extensive information about habitat quality and use of changing habitats by wildlife. I will review how researchers can take advantage of advances in molecular, biochemical, robotic and remote sensing equipment to better manage the interactions between wildlife and a changing environment.

GILLETTE, GIFFORD L.*[1], K. P. Reese[1], J. W. Connelly[2], J. M. Knetter[3]. [1]University of Idaho, Department of Fish and Wildlife Sciences, Moscow, 83844; [2]Idaho Department of Fish and Game, Pocatello, Idaho 83201; [3]Idaho Department of Fish and Game, Boise, Idaho 83712. ***EFFECTS OF LANDSCAPE CHARACTERISTICS ON POPULATION DYNAMICS OF COLUMBIAN SHARP-TAILED GROUSE IN SOUTHEAST IDAHO.***

Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*; hereafter CSTG) were once considered the most abundant, well-known gallinaceous bird of the Intermountain West. Beginning in the early 1900's CSTG severely declined in distribution and abundance. By 1980 CSTG existed as isolated populations inhabiting 10–30% of historic range and were extirpated from Oregon, California, and Nevada. In the last 25 years, CSTG have reoccupied portions of their range and populations have increased in Idaho, Utah, British Columbia, Nevada, and Oregon. Recovery of CSTG populations has been attributed to the Conservation Reserve Program (CRP) in the United States. The 2008 Farm Bill reduced CRP allowances in Idaho. Furthermore, Idaho is at risk of losing additional CRP lands to expanding crop production. Because of the lack of empirical data, quality of private lands enrolled in CRP can only be described as positively correlated with CSTG populations in Idaho. Our objective was to quantify the quality of CRP by measuring the demographic rates of CSTG utilizing CRP versus those utilizing native shrub-steppe rangelands. We monitored 135 female CSTG during the 2011-2013 breeding seasons in the Rockland and Curlew valleys of Idaho. CSTG occupying CRP lands successfully hatched young and reared broods in fields dominated by a nonnative Eurasian grass. CSTG in CRP experienced lower survival (68%, n=80), nest success (28%; n=72), and brood success (38%, n=24) compared with CSTG occupying shrub-steppe rangelands (80% survival, n=60; 37% nest success, n=63; 55% brood success, n=22). Nevertheless, CRP lands provide additional perennial vegetation for CSTG allowing the species to occur over broader landscapes. Moreover, opportunities may exist to increase productivity of CSTG occupying CRP lands under the guidelines of the State Acres for Wildlife Enhancement (SAFE) subprogram of CRP. Although CRP provides useful habitat for CSTG, maintaining native shrub-steppe habitats is also clearly important for CSTG conservation.

GOLDBERG, AMANDA R.*[1], C.J. Conway[1,2], D. Evans Mack[3]. [1]University of Idaho, Moscow, Idaho 83844; [2]United States Geological Survey, Idaho Cooperative Fish and Wildlife Research Unit, Moscow, Idaho, 83844, [3]Idaho Department of Fish and Game, McCall, Idaho, 83638. ***WHY ARE NORTHERN IDAHO GROUND SQUIRRELS SO RARE?***

Northern Idaho ground squirrels (*Urocitellus brunneus brunneus*; NIDGS) are listed as federally threatened by the U.S. Fish & Wildlife Service. Habitat degradation is thought to be the main cause of the species' decline. We used abundance estimates (provided by Idaho Department of Fish and Game) from all known NIDGS colonies, collected 2003-2010, to examine the relationship between population trends and habitat characteristics. We classified each colony as either: 1) stable/increasing, or 2) extinct/decreasing. We used binary logistic regression and AIC_c to select the most parsimonious model. Models that included colony area, elevation, % canopy cover, and distance to nearest colony were included in several of the best-supported models designed to explain changes in abundance of NIDGS colonies. Plague (*Yersinia pestis*) may be another cause of decline in NIDGS abundance, but no study has examined the role of plague in this system. We collected fleas (which transfer plague to mammals) from 3 species on active NIDGS colonies in 2013: NIDGS, Columbian ground squirrels (*Urocitellus columbianus*), and yellow-pine chipmunks (*Tamias amoenus*). Flea loads were high and variation among the 3 species reflected differences in body mass: NIDGS averaged 4.3 fleas, Columbian ground squirrels

averaged 12.1 fleas, and yellow-pine chipmunks averaged 3.0 fleas per individual animal.

HAGAR, JOAN C. U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Corvallis, OR 97331. ***USING LIDAR DATA TO MODEL FOREST STRUCTURE FOR CANOPY-ASSOCIATED WILDLIFE SPECIES.***

Recovery plans for threatened species associated with old-growth forest identify the need for refined measures of habitat structure, to more accurately estimate the availability of suitable habitat. Yet accurately modeling habitat for these species can be challenging because of the difficulties of discerning and measuring the relevant features at an appropriate spatial scale in complexly structured, 3-dimensional space. LiDAR (Light Detection And Ranging) is an emerging remote-sensing tool that can provide fine-scale data describing vertical complexity of vegetation, offering a promising application for improving characterization of habitat for species that are responsive to forest structure. We used LiDAR data to address needs identified in recovery plans for more accurate estimation of the availability of nesting habitat for the federally threatened marbled murrelet and northern spotted owl in the Oregon Coast Range. We used murrelet and owl occupancy data collected by the Bureau of Land Management Coos Bay District, and canopy metrics calculated from discrete return airborne LiDAR data, to model probabilities of occupancy. LiDAR provided a means of quantifying 3-dimensional canopy structure with variables that are ecologically relevant to canopy-associated species, but have not been as accurately quantified by other mensuration methods. By providing new ways to quantify forest structure, LiDAR expands the lexicon that can be used to describe and understand the physical features that influence habitat selection and use, thereby increasing our capacity to understand habitat relationships.

HANSER, STEVEN E. and S. T. Knick. U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Boise, ID 83706. ***BIRD COMMUNITY RESPONSE TO JUNIPER REMOVAL. II. WINNERS AND LOSERS.***

Removal of conifers using fire and mechanical methods is commonly used to restore areas undergoing woodland encroachment to sagebrush (*Artemisia* spp.) vegetation and with the goal to reestablish sagebrush-dependent wildlife. We surveyed breeding birds at 14 study sites in Utah, Nevada, Oregon, Idaho, and California from 2006-2012 to assess species-specific responses to conifer removal relative to the bird community composition prior to treatment. We first used a cluster analysis of our 388 surveyed point transects to identify groups with similar bird communities prior to treatment. We then analyzed changes in bird abundance within each cluster to: (1) determine if species responded to treatment, (2) assess differences in response according to pre-treatment bird community, and (3) evaluate the influence of vegetation composition and structure on species responses to treatment. Our preliminary results indicate that treatments influenced the community as a whole and also individual species. However, species responses differed between pre-treatment communities and vegetation influenced or mediated the strength of the response. There were both winners and losers following treatments and species-specific characteristics and habitat associations influenced the strength and direction of the response to conifer removal. Our preliminary results highlight the importance of including species-specific objectives to understand how habitat treatments structure bird communities.

HARJU, SETH[1,2], C.V. Olson[1], M.R. Dzialak[1], J.B. Winstead[1]. [1]Hayden-Wing Associates, LLC, Laramie, Wyoming, 82070; [2]Heron Ecological, LLC, Kingston, Idaho, 83839. ***NEWLY DISCOVERED GREATER SAGE-GROUSE LEKS AND AN ANALYSIS OF MULTIPLE LEK-SUPPORTING LANDSCAPE TYPES.***

In the process of monitoring a study population of greater sage-grouse (*Centrocercus urophasianus*) using GPS-backpack units in central Wyoming, USA, we discovered six breeding leks that were previously unknown. It has been asked whether these leks were also recently established or have gone previously undiscovered. We used k-means cluster analysis of nine spatially-explicit landscape variables to compare the landscape composition of the newly discovered leks (n=6) with nearby known leks (n=32). Unexpectedly, we found there were three distinct landscape types that supported active sage-grouse leks. The first cluster (i.e., landscape type), with 22 of the 38

leks, fit our classic understanding of sage-grouse lekking landscapes, characterized by a flat site in level terrain and surrounded by high amounts of big sagebrush (*Artemisia tridentata*) and high-quality nesting, brood-rearing, connectivity, and winter habitat. The leks in the second and third cluster were characterized by either a poor site or were not surrounded by critical habitat. Known active leks were distributed across all three clusters and cluster validation performed well. Average peak male sage-grouse attendance from 2000-2013 was twice as high at leks in cluster 1 compared to clusters 2 and 3. At least one lek in each cluster has been known and active for >30 years. These results provide an interesting description of potentially distinct landscape types surrounding active sage-grouse leks, with implications for our understanding of sage-grouse ecology and land management.

HILL, MARK. Idaho Department of Fish and Game, Lewiston, Idaho 83501. ***IDAHO'S ILLEGAL BIG GAME HARVEST: HAVE WE GIVEN IT THE ATTENTION IT DESERVES?***
There have been very few attempts to measure Idaho's illegal big game harvest. Despite the lack of research specific to the illegal harvest of big game in Idaho, enough evidence exists that the issue needs to be addressed more thoroughly. A graduate student at the University of Idaho in the late 60s measured the detection rate of closed season deer violations at less than 2%. A recent mule deer population study in Oregon found that more deer were unlawfully killed (24) (19 does and 5 bucks 13% of the mortality) than were harvested by hunters (20 or 11%) (586 total collars 91 bucks 495 females). A randomized response survey of over 2,500 Washington hunters had 7% respond that they had transferred or used a tag of another person in the last five years. The unlawful take of 38 elk were investigated last year in the Clearwater Region. The violations were documented with a warning (8), incident (21) or citation (9). The bigger story is that the 38 elk we investigated represent only a fraction of the total elk that were unlawfully killed in the region last year. Using a 5% violation detection rate, we potentially had 760 elk unlawfully taken in the region. Even if it is a 10% detection rate, it suggests that 380 elk were taken unlawfully. Despite the heightened focus on other mortality factors affecting big game populations there has been little to no attention directed towards the impacts associated with the illegal harvest component. This information is important to making informed decisions and providing a more accurate assessment of all the factors that affect our big game populations and the lawful hunter harvest opportunity.

HOLBROOK, JOSEPH,* K. Vierling, L. Vierling, P. Adam, and A. Hudak. University of Idaho, Moscow, Idaho 83844. ***ECOSYSTEM ENGINEERS IN A CONIFEROUS FOREST: USING LIDAR TO UNDERSTAND THE ROLE OF VEGETATION STRUCTURE AND DISTURBANCE ACROSS SPATIAL SCALES.***
Ecosystem engineers influence the availability of resources for other species, and thus it is important to understand what factors determine their abundance and distribution. Red-naped Sapsuckers are ecosystem engineers because they create sapwells and cavities that many other species use for food and nesting. Red-naped Sapsucker occurrence within aspen (*Populus tremuloides*) has been relatively well-studied, but less is known about Red-naped Sapsucker occurrence in conifer forests that lack a deciduous tree component. We implemented a multi-scale approach (i.e., 2, 4, and 10 ha buffers around survey locations) using LiDAR data to examine Red-naped Sapsucker occurrence in a conifer-dominated system. We surveyed for sapsuckers using callbacks at 162 sites in northern Idaho during 2009 and 2010. We used an information-theoretic approach to model sapsucker occurrence as a function of four LiDAR-based metrics, and one non-LiDAR metric (distance to roads). Top model weight was highest at the 4 ha scale, which suggested that 4 ha was the most relevant scale describing sapsucker occurrence. Sapsuckers were positively associated with variation of canopy height and area harvested, and negatively associated with shrub and large tree density. These results suggest that harvest regimes and structural diversity of vegetation at moderate scales (e.g., 4 ha) influence occurrence of Red-naped Sapsuckers in conifer forests. We suggest that future studies of this ecosystem engineer include occurrence and demographic data to better understand the relative importance of habitat characteristics on vital rates of this species.

KNICK, STEVEN T. and S. E. Hanser. U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Boise, ID 83706. ***BIRD COMMUNITY RESPONSE TO JUNIPER REMOVAL. I. STABILITY, SHOCK, AND REALITY***

We explored the concept that prescribed fire can return regions currently undergoing pinyon (*Pinus* spp.) - juniper (*Juniperus* spp.) expansion to a functioning sagebrush (*Artemisia* spp.) vegetation and obligate bird system. Our preliminary results were based on a statistical ordination of pre- and post-disturbance surveys of bird communities at 14 locations in sagebrush-woodland ecotones across Utah, Nevada, Idaho, and Oregon. We attempted to pair large (> 400 ha) control and treatment plots at four locations. However, bird communities differed between paired landscapes, thus confounding direct comparison of yearly community structure to identify disturbance effects. Yearly trajectories of bird communities were erratic over 5 years of post-disturbance surveys but generally shifted slightly towards the ordination space defined by the sagebrush bird community. Nonetheless, prescribed fire as applied in our study locations was insufficient to force the community across the ecological scale separating woodland and sagebrush systems. Initial results also indicated that regional dynamics contribute to local bird community structure. We estimated regional patterns of stability in bird communities using counts from Breeding Bird Surveys (BBS) located within 125 km of our study locations. When BBS results across the four states were standardized to remove elevation and geographic trends, broad-scale patterns of bird communities were relatively stable. Areas experiencing changes in bird community structure were inconsistent both regionally and in direction of change. Similarly, we observed an inconsistent relationship of dynamics derived from BBS to our woodland study sites. We are finding that defining stability, resistance, and resilience to system shock within the reality of ecological scale is necessary if we are to identify global patterns from broadly-distributed sites.

LORENZ, TERESA J.*[1], K. T. Vierling[1], P. C. Fischer[2], T. R. Johnson[3]. [1]Department of Fish and Wildlife, University of Idaho, Moscow, ID 83844; [2]Retired Civil Engineer, 1405 Jesica Drive, Selah, WA 98942; [3]Department of Statistics, University of Idaho, Moscow, ID 83844. ***WHY ARE MOST SNAGS NEVER USED BY WOODPECKERS FOR NESTING? THE ROLE OF WOOD DENSITY IN WOODPECKER NEST SITE SELECTION.***

Nest excavation by woodpeckers is a keystone ecological process and factors that influence woodpecker nest site selection are important for managing forested ecosystems. Despite the large number of studies on woodpecker nesting ecology, the role of wood mass density, or hardness, in nest site selection has largely been ignored. Most studies assume that wood hardness is not influential, or is accurately represented by snag decay classes. We tested these assumptions with six species of woodpecker, including two Idaho Species of Greatest Conservation Need, American Three-toed Woodpecker (*Picoides dorsalis*) and White-headed Woodpecker (*P. albolarvatus*). Using 518 snags in the eastern Cascades, we used an information theoretic approach to examine selection and found wood hardness was an important factor affecting nest site selection by all species. All species selected snags with interior wood that was softer than wood at random sites ($F_{(12/517)} = 113.27$, $P<0.0001$). We also found wood hardness did not always change predictably with decay class and offer several explanations for this. Lastly, on average we found that 88% of wood sampled from snags was unsuitably hard for nesting, and so-called 'strong' excavators like Black-backed Woodpecker (*P. arcticus*) appeared just as limited as 'weak' excavators like White-headed Woodpecker. These findings support recent research in Eurasia that wood density is one of the most important factors affecting woodpecker nesting, and that incorporation of such data into management plans for cavity nesting species of concern is important.

LUIKART, GORDON and M. K. Schwartz, Flathead Lake Biological Station, University of Montana, Division of Biological Science, Missoula, MT (GL) , U.S. Forest Service, Rocky Mountain Research Station, Wildlife Genetics Laboratory, Missoula, MT (MKS). ***RADs, EXON CAPTURE, AND GENOME SEQUENCING—EXAMINING MANY GENES AND THOSE THAT MATTER.***

Two of the most important new genomic techniques are RAD sequencing and Exon Capture. The former approach is a way to find thousands of genetic markers spread throughout the entire genome. A major

advantage of this approach is the ability to find these markers relatively quickly, and in non-model systems. This is important as the entire genome sequence is not available for many of the most imperiled species for which this information may be used. Another novel approach is exon capture, where genes identified as functional in other related genomes can be surveyed in wildlife species. This approach allows us to look at genes under selection and begin to understand how these genes are important for adaptation to different environments. Finally, whole genome sequencing (WGS) provides complete genome information. WGS might detect adaptive genetic variation that RADs and exon capture do not. A WGS can also greatly facilitate RAD approaches and exon capture. We compare advantages, disadvantages, and synergy among the three approaches. This talk provides examples from both our labs and collaborators to show how these approaches can improve conservation and management.

MACKEY, ANDREW*[1], T. Prather[1], C. Conway[1,2], J. Wallace[1], G. Shewmaker[1] and J. Johnson[1]. [1]University of Idaho, Moscow, Idaho 83844; [2]U.S. Geological Survey, Idaho Cooperative Fish and Wildlife Research Unit, Moscow, Idaho 83844. ***EFFECTS OF VENTENATA (VENTENATA DUBIA) INFESTATION ON NESTING SUCCESS OF TREE SWALLOWS (TACHYCINETA BICOLOR) WITHIN CRP FIELDS OF THE PALOUSE***

Ventenata (*Ventenata dubia*) is a non-native winter annual grass that has invaded agricultural and rangeland systems throughout the Pacific Northwest. Ventenata invasion causes reductions in plant species diversity, but little is known about the effects of this invasive grass on wildlife and insect assemblages. Changes in plant community structure in Conservation Reserve Program (CRP) lands on the Palouse due to ventenata invasion led us to examine the effects of ventenata on survival, reproductive success and nestling growth rates of tree swallows (*Tachycinata bicolor*) over two years. We compared CRP fields with little ventenata (<10% foliar cover) to CRP fields with high ventenata (>50% foliar cover). We measured survival, reproductive success, and nestling growth rates for tree swallows nesting in artificial nest boxes at six study sites (three sites with high ventenata cover and three sites with low ventenata cover). Nest boxes were monitored every other day and nestlings were weighed at 4, 6, 10 and 12 days old. We used four 50 m permanent transects to calculate foliar cover and species diversity using the line-point intercept method for each nest box. Principle component analysis (PCA) and *t*-tests were used to analyze data and our results indicate a ventenata density effect on tree swallow fledgling number (P=0.002), brood size (P=<0.0001), and clutch size (P=0.0007). However, we found that nestling growth rates did not differ between infestation levels. Lack of differences in nestling growth rates could reflect lower sibling competition for food resulting from the smaller broods in high infestations. Our results suggest that ventenata invasion is negatively impacting tree swallow reproductive output; further research is needed to identify the mechanisms by which ventenata invasion negatively affects tree swallow fecundity.

MACKEY, ANDREW*[1], T. Prather[1], J. Wallace[1], G. Shewmaker[1], and C. Conway[1,2]. [1]University of Idaho, Moscow, Idaho 83844; [2]U.S. Geological Survey, Idaho Cooperative Fish and Wildlife Research Unit, Moscow, Idaho 83844. ***DEVELOPING AN INTEGRATED PEST MANAGEMENT STRATEGY FOR CONTROLLING VENTENATA (VENTENATA DUBIA) IN CONSERVATION RESERVE PROGRAM LANDS IN THE PALOUSE.***

Ventenata (*Ventenata dubia*) is a non-native winter annual grass that has invaded perennial grass-dominated agricultural systems throughout the Pacific Northwest. The objective of this study was to use an integrated pest management (IPM) framework to evaluate techniques to control ventenata across two infestation levels (>50% foliar cover and <25% foliar cover) within land enrolled in the Conservation Reserve Program (CRP). We measured percent foliar cover and biomass of ventenata and desirable perennial vegetation along permanent transects, using the line-point intercept method and 25 cm by 50 cm sampling frames. Common CRP mid-management techniques were selected and evaluated for their effectiveness in controlling ventenata. The following six treatments were applied alone and paired with a fall herbicide (sulfosulfuron, at a rate of 54.8 ml active ingredient per ha): fall prescribed burn, spring prescribed burn, sickle mow and remove, rotary mow, fertilize, and a control. Treatments responded differently in ventenata control at the two infestation levels however, fall prescribed burn plus herbicide performed the best at both infestation levels. Herbicide application

significantly decreased percent cover and biomass of ventenata but control was highest with integrated treatments. Alternatively, we found that sickle mow and remove and the rotary mow treatments increased ventenata biomass when applied without an herbicide. Results from our experiments will be used to create a decision support tool that utilizes annual grass cover and type of perennial grass system to assist land managers in making decisions within an integrated pest management framework.

MASON, TATE* and J. Barber. Department of Biological Sciences, Boise State University 1910 University Dr. Boise, ID 83725-1515. ***THE IMPACT OF NATURAL GAS COMPRESSOR STATION NOISE ONNORTHERN SAW-WHET OWL HUNTING ABILITY.***

Anthropogenic noise has risen dramatically worldwide yet the impacts on acoustically-oriented predators have received scarce attention. Here we present evidence that natural gas compressor station noise degrades the ability of the Northern Saw-whet Owl (*Aegolius acadius*) to capture prey in the absence of light. We used a subset of migratory owls captured during Idaho Bird Observatory's long term owl monitoring project on Lucky Peak, which is located near Boise, ID. Trials were conducted during 2012 and 2013, and took place inside a large flight tent where sound and light levels were controlled. Utilizing a repeated measures design, the owls were permitted to hunt mice under experimental background sound levels which varied from 46 - 73 dB(A). These intensities correspond with distances of 50 - 800m from a compressor station. During control trials no noise was played. All interactions were recorded using HD cameras and the owl behavior was quantified from each trial. Our preliminary findings indicate that unmitigated natural gas compressor station noise has the potential to drastically decrease habitat suitability for acoustically-oriented owls.

MILLER, ROBERT A., K. E. deKramer, and J. D. Carlisle. Idaho Bird Observatory, Boise State University, Boise, Idaho 83725. ***EIGHT WATERFALLS IN 14 DAYS - BLACK SWIFT SURVEYS WITHIN AND AROUND THE IDAHO PANHANDLE NATIONAL FOREST 2013.***

The Black Swift (*Cypseloides niger*) is a sensitive species that is not adequately sampled using generalized bird survey techniques. Prior to 2013, four Black Swift breeding sites were known in Idaho (Shadow Falls, Fern Falls, Char Falls, and Wellington Falls). We surveyed 14 waterfalls in 12 areas in north Idaho for Black Swift breeding activity. We assessed habitat suitability and performed nest searches at each site. We conducted evening roosting surveys at select sites. We confirmed two additional sites as breeding areas (Johnson Falls and Copper Falls) and confirmed habitat use at two other sites (Myrtle Falls and Granite Falls [WA]). We conclude that the Black Swift population in Idaho is larger and nest diversity is greater than previously expected.

MUMMA, MATTHEW*[1], C. Soulliere[2], S. Mahoney[2], and L. Waits[1]. [1]Department of Fish and Wildlife Sciences, College of Natural Resources, University of Idaho, Moscow, ID 83843, [2]Sustainable Development and Strategic Science, Department of Environment and Conservation, Government of Newfoundland and Labrador, St John's, Newfoundland. ***A PREDICTIVE MODEL OF PREDATOR SPECIES AT CARIBOU CALF KILL SITES IN A MULTI-PREDATOR COMMUNITY.***

The Newfoundland woodland caribou (*Rangifer tarandus*) population has decreased greater than 66% since 1996. High calf predation by native black bears (*Ursus americanus*) and invasive coyotes (*Canis latrans*) is a limiting factor to herd recovery. In 2010, 2011, and 2012, radio-telemetry collars were placed on approximately 300 neonate caribou calves (1 to 3 days-old). Calves were monitored throughout June and July. When a mortality signal was detected, the collar location was investigated to determine if predation had occurred. Carcass and site characteristics were recorded at each kill site and calf carcasses were inspected for killing bite wounds as evidenced by hemorrhaging. Killing bite wounds and other non-killing bite wounds were sampled for predator saliva cells with an ethanol-soaked cotton swab. When the carcass was absent, bones, hide, and/or the collar were swabbed. Swab samples were analyzed using several DNA species identification tests to distinguish among black bears, coyotes, Canada lynx (*Lynx canadensis*) and red foxes (*Vulpes vulpes*). Molecular techniques identified a predator species at 75% of 134 kill sites. We are using a random forest framework with the molecular predator species identification as the response variable to predict the predator species at kill sites where a molecular

identification is unavailable. Predictor variables include: proportion consumed, tissues consumed, carcass treatment (buried-decapitated, buried-halved, unburied-halved, unburied-dismembered, unburied-scattered, or unburied-intact), mastication of unconsumed tissues, throat trauma, presence of predator sign, slope, topography, and distance to nearest tree. Accurate determination of the predator species at caribou calf kill sites and the proportion of predation attributed to each predator species will allow managers to make informed caribou management decisions.

PILLIOD, DAVID S. U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Boise, Idaho 83706. ***APPLICATIONS OF ENVIRONMENTAL DNA FOR MONITORING AQUATIC ORGANISMS.***
Environmental DNA (eDNA) methods have been used successfully to detect native and non-native aquatic species in a variety of habitats, but several challenges remain for integrating these approaches into monitoring programs. Factors such as inference, detection limits, and cost are important considerations when combining eDNA methods with existing or traditional field methods. This presentation provides an overview of eDNA method development and describes current applications for monitoring aquatic organisms as well as what new developments are forthcoming. I provide examples from my research on Idaho Giant Salamanders and Rocky Mountain Tailed Frogs.

POLLOCK, JESSICA[1], J . Carlisle[1], H. Ware[1], E. Urban[1]. [1]Idaho Bird Observatory, Boise State University, Boise, Idaho, 83725. ***HUMMINGBIRD MIGRATION AND BANDING IN IDAHO.***
Hummingbirds are extremely popular with the public, yet compared to other avian families we know relatively little about their life history since they are difficult to survey for. Standardized banding efforts can provide demographic information including annual indices of adult population size and post-fledging productivity, estimates of adult survivorship, and recruitment into the adult population. As part of a larger international effort led by the Western Hummingbird Partnership and the Hummingbird Monitoring Network (HMN), we established a study in Idaho City, Idaho with complementary objectives of public outreach and standardized population monitoring of hummingbirds on and near the Boise National Forest. In 2012 and 2013, we used standardized banding and feeder counts in Idaho City and have banded 635 hummingbirds of five species to date for this project. This is the first HMN site in Idaho and the first HMN site in the nation within the breeding range of the Calliope Hummingbird. We hope to continue annual monitoring that generates information about relative abundance, productivity, population trends, migration timing, migratory routes, and survivorship. Through our collaboration with the U.S. Forest Service International Programs, we aim to provide data that are useful to inform land managers so key habitats can be managed in ways that support hummingbird populations and also help agencies meet their management objectives.

RACHLOW, JANET, J. Forbey, L. Shipley, M. Burgess, P. Olsoy, J. Nobler, C. Wilson. Department of Fish and Wildlife Sciences, University of Idaho, Moscow, ID 83844-1136 (*JLR, CW*), Department of Biology, Boise State University, Boise, ID 83725 (*JF, JN, PO*), Department of Wildlife Ecology and Conservation, University of Florida, Gainesville, FL 32611 (*MB*). ***ADVANCING OUR UNDERSTANDING OF WILDLIFE HABITAT: USING HIGH-RESOLUTION IMAGERY OBTAINED FROM AN UNMANNED AIRCRAFT SYSTEM TO QUANTIFY HABITAT CHARACTERISTICS IN THE SHRUB-STEPPE.***
Use of unmanned aircraft systems (UAS) for applications in wildlife research and management has increased rapidly over the past decade. In addition to counting and mapping distributions of animals or wildlife structures (e.g., salmon redds), UAS technology is well suited for quantifying characteristics of wildlife habitat. Our interest in UAS technology is to assess and map habitat for a study of tradeoffs among competing habitat needs by pygmy rabbits (*Brachylagus idahoensis*). To evaluate these habitat relationships in ways that are relevant to land and wildlife managers, we are interested in scaling up from individual animals and shrubs to populations and landscapes. We are exploring use of high-resolution imagery obtained via UAS across broad study areas to characterize shrub-steppe vegetation for this purpose. Our applications include: 1) use of color imagery to quantify aerial concealment from predators to assess predation risk; 2) color infrared imagery to map distribution

and abundance of potential forage plants; and 3) 3-dimensional surfaces of shrub heights estimated from color imagery for modeling wind speed at the ground surface to estimate the thermal environment experienced by rabbits.

RICH, TERRELL D. U.S. Fish and Wildlife Service, Boise, Idaho, 83709. ***SURROGATE SPECIES: CAN THE CONCEPT WORK IN IDAHO (OR ANYWHERE)?***

The surrogate species concept has been around for decades. The basic idea is that we identify one species – the indicator – to serve as a surrogate for several other species. The reasoning is that a properly selected indicator will be easier and cheaper to monitor and manage, and will thus result in more efficient use of limited resources while leading to desirable outcomes for the indicated. This fundamental idea quickly becomes complicated as we move to, for example, selecting several species to indicate the level of functioning of an ecosystem. Additional issues arise as we attempt to identify exactly what we want to indicate and metrics for those. The surrogate species concept lived somewhat harmlessly in the literature until the Director of the U.S. Fish and Wildlife Service decided to implement the concept in the real world in July 2012. I argue that the surrogate species concept will not, and cannot, work in Idaho, and probably cannot work in most wildlife conservation settings. There are three fatal flaws: 1) We do not understand the relationships between most species and most other species well enough to identify indicators, and the research necessary to improve our understanding is not accounted for; 2) We do not currently have the resources to monitor even our priority species adequately. Implementing the surrogate species concept would require an increase in monitoring because we would need to track both the indicator and the indicated; and 3) Work for many species that agencies are required by law to manage, e.g., endangered species, cannot yet be transferred to indicators because we don't know if the idea will work. All three require significant increases in funding, personnel, and other resources, increases which are completely unrealistic in the foreseeable future.

ROHDE, ASHLEY*[1,2], D. S. Pilliod[1] and S. Novak[2]. [1]U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, 970 Lusk St., Boise, ID 83706; [2]Department of Biological Sciences, Boise State University, Boise, ID 83725. ***EFFECTS OF FIRE AND POST-FIRE RESTIORATION ON WLIDLIFE HABITAT AND INSECT PREY AVAILABILITY***

Sagebrush-steppe ecosystems comprise approximately 43 million ha of the Intermountain West in the United States, and these habitats are home to several sagebrush obligate species including sage thrashers, sage sparrows, Brewer's sparrows and sage grouse, among others. Wildfire is pervasive in sagebrush-steppe ecosystems resulting landscape-level changes in wildlife habitats that often take decades to recover after burning. After fire, the loss of vegetation cover and changes in food resources, including insect prey, have strong influences on many wildlife species. Many sagebrush-obligate species use insects as a food source during May and June, when provisioning their young. To assess the effects of fire and reseeding on vegetation and the diversity and abundance of insects, we established three treatments: unburned, burned and seeded, and burned and unseeded. Treatments were located in southwestern Idaho and sampling took place in 2010 and 2011. Percent vegetation cover was determined and >22,000 insects were captured and identified to family. Preliminary results indicate that the vegetation within the three treatments was significantly different due to disparities in percent cover of sagebrush, litter, biological crust and moss, and native forbs. Measures of Simpson's diversity (D') and heterogeneity (B_D) indicated little difference among treatments. However, insect assemblages varied among treatments suggesting that different insect families are associated with different treatments. In some cases, we found insect families' abundance to be correlated with certain vegetation characteristics that may be associated with treatments. Our preliminary results suggest that these seeding treatments did not restore sagebrush-steppe habitats to their pre-fire state. Relationships between insect families and vegetation cover provide information that could be used to improve habitat conditions for certain insects groups, such as members of the orders Hymenoptera, Coleoptera, Orthoptera and Lepidoptera, which have been shown to be especially important prey for sagebrush obligate species.

SCHWARTZ, MICHAEL K. and G. Luikart, U.S. Forest Service, Rocky Mountain Research Station, Wildlife Genetics Laboratory, Missoula, MT (MKS), Flathead Lake Biological Station, University of Montana, Division of Biological Science, Missoula, MT (GL) . ***WILL GENOMICS HELP US MANAGE WILDLIFE POPULATIONS—IS MORE ALWAYS BETTER?***

Much has been made about the advances in genomics and how it will improve our ability to manage and understand wild populations. In this talk we investigate situations in which genomic information has been brought to bear on wildlife management. Using examples from both our genomics laboratories and laboratories around the world, we ask if this information has improved the ability to manage wild populations. We also, describe some of the basics of genomics and newest approaches in genomic research as it is being applied to wildlife.

SEVERSON, JOHN P.*[1], K. P. Reese[1], and J. T. Forbes[2]. [1]University of Idaho, Moscow, Idaho 83844; [2]Bureau of Land Management, Lakeview, Oregon 97630. ***EFFECTS OF JUNIPER ENCROACHMENT ON SAGE-GROUSE NEST SELECTION IN SOUTHEASTERN OREGON.***

Greater sage-grouse (*Centrocercus urophasianus*) have experienced range-wide declines due to numerous factors, causing the Fish and Wildlife Service to consider them as a candidate species for listing under the US Endangered Species Act (ESA). One of the main factors is thought to be habitat alteration and fragmentation caused by conifer encroachment throughout much of their range, but little research has been done specifically to evaluate the effect. For example, western juniper (*Juniperus occidentalis*) distribution in the Great Basin has increased ~10-fold since pre-European settlement, with much of the expansion into the sagebrush steppe, but, although juniper management is becoming more widespread, little is known about how juniper encroachment and management may actually affect sage-grouse. Our goal was to assess specific effects of juniper encroachment on nest-site selection at multiple spatial scales. We analyzed high resolution spatial data of individual juniper trees in proximity to 85 nests located from 2010-2011 in southern Oregon using non-parametric multivariate classification techniques to determine the most important spatial scales of juniper characteristics from 0.2 ha to 400 ha and how those characteristics affect nest-site selection at those scales. Our results indicate that various scales of juniper characteristics are important to sage-grouse nesting habitat. This information will be vital to determining how conifer encroachment effects sage-grouse populations as well as informing management decisions. Studies evaluating the effects of conifer encroachment, such as this, will be integral to the Fish and Wildlife Service ESA listing decision in 2015.

SHURTLIFF, QUINN R. Gonzales-Stoller Surveillance, 120 Technology Dr., Idaho Falls, ID 83402. ***DEVELOPMENT OF A CONSERVATION MANAGEMENT PLAN FOR THE IDAHO NATIONAL LABORATORY SITE: USING A NEW METHOD TO FACILITATE ADAPTIVE MANAGEMENT.***

Conservation planning is most likely to have a positive impact on natural resources when the product helps managers take action to ameliorate the root causes of threats and to monitor appropriate indicators that will inform adaptive management. Multiple stakeholders are often involved in plan development, and it can be difficult to achieve consensus in identifying the greatest threats to conservation targets, the drivers of those threats, and the best strategies for ameliorating such. The Wildlife Conservation Society collaborated with the U.S. Department of Energy, Idaho Operations Office (DOE) and its Environmental Surveillance, Education, and Research Program, to lead a multi-stakeholder team in applying a relatively new, yet widely accepted method know as *Open Standards for Conservation* (OS) to develop a conservation management plan for the Idaho National Laboratory (INL) Site. The planning team identified nine conservation targets and 10 threats that directly impact those targets. Resource experts helped develop conceptual models that explicitly outline drivers of threats (i.e. contributing factors) on the INL Site. Strategies were then developed that would address contributing factors, and an explicit theory of change (i.e. results chain) was created to show managers the team's hypothesis about how strategy implementation would produce measurable results. The conceptual model and results chain also provided a framework for developing a plan to monitor (1) strategy implementation, (2) threats, and (3) status of conservation targets. I show how this method forms the basis for improved decision

making, and share lessons learned while trying to balance DOE mission needs with biodiversity conservation.

SPAUL, ROBERT*[1], and J. A. Heath[1]. [1]Boise State University, Department of Biological Sciences, 1910 University Drive, Boise, Idaho, 83725. ***THE EFFECTS OF OFF HIGHWAY RECREATION ON THE BREEDING BEHAVIOR OF A SHRUB-STEPPE RAPTOR.***

With the rapid increase in Off Highway Vehicle use and backcountry recreation, wildlife and recreation managers need better information on the impacts of this recreation on breeding raptors and their habitat. Current management efforts are based upon limited information, but the Bureau of Land Management's Owyhee Field Office has implemented an adaptive management plan for historical Golden Eagle (*Aquila chrysaetos*) territories, in an effort to stem apparent territory abandonment and nesting failures. We monitored eagle behavior and territory occupancy, and studied recreation traffic at 23 historical Golden Eagle territories within the Owyhee Front of southwest Idaho, from January 15th to July 6th of 2013. During 4-hour behavioral and reproductive surveys we documented predefined behavior types, all vehicular and non-vehicular traffic within 1km of each territory's focal nest, and flushing distance of any nesting or perched Golden Eagles. In addition, trail camera surveys were conducted at each territory recording all road vehicle, all-terrain vehicle, dirt bike, rock crawler, equestrian, mountain bike and pedestrian trail use over an 8-10 day period, once every 5 weeks. Recreation traffic was greater on weekends and increased throughout the early portion of the Golden Eagle breeding season. In some instances, eagles flushed in response to human activity at a mean distance of 301m (± 206m, n=16). Most recreationists and vehicles passed with no discernible response by Golden Eagles, unless they lingered near the bird or nest. A second season of field work is in progress for 2014, and data will contribute to testing 4 hypothesis categories of trail density, recreation disturbance, vegetative habitat associations, and eagle breeding biology, using Nest Survival Models.

STEENHOF, KAREN[1], J. L. Brown[2], and M. N. Kochert[3]. ***TEMPORAL AND SPATIAL CHANGES IN GOLDEN EAGLE REPRODUCTION IN RELATION TO INCREASED OFF HIGHWAY VEHICLE ACTIVITY.***

We used more than 40 years of data on golden eagles (*Aquila chrysaetos*) nesting in southwestern Idaho to assess whether the proportion of territories producing young has changed over time, and whether territories in areas where Off Highway Vehicle (OHV) use has increased were less likely to be productive than those in areas that continued to have little or no motorized recreation. The proportion of territories that produced young was similar across southwestern Idaho from the late 1960s to 1999. After a dramatic increase in OHV use from 1999-2009, occupancy and success of territories in close proximity to recreational trails and parking areas declined, and the proportion of these territories producing young differed significantly from territories not impacted by OHVs. We could not pinpoint which types of motorized activity are most disturbing, nor could we identify disturbance thresholds at which eagles abandon their eggs, their young and finally their territory. Timing, proximity, duration, and frequency of disturbance could all play a role.

TUMENDEMBEREL, ODBAYAR*[1,4], M. Proctor[2], H. Reynolds[3], T. Khorloojav[4], A. Luvsanjamba[4], T. Tserenbataa[5], N. Yanjin[6], U. Ramakrishnan[7], L. Waits[1]. [1] Fish and Wildlife Sciences, University of Idaho 875 Perimeter Drive MS 1136 Moscow ID 83844; [2] Birchdale Ecological, PO Box 606, Kaslo, BC. Canada; [3] Gobi Bear Project, Gobi Bear Fund, Inc. PO Box 80843, Fairbanks, AK 99708; [4]Institute of Biology, Mongolian Academy of Sciences, Ulaanbaatar-210351 Mongolia; [5]United Nations Development Project in Mongolia; [6]Great Gobi Strictly Protected Area, Govi-Altai province, Mongolia; [7]National Centre for Biological Sciences, Bangalore, India. ***POPULATION ESTIMATION AND SYSTEMATICS OF BROWN BEARS (*URSUS ARCTOS*) IN MONGOLIA.***

A relict population of unique desert dwelling brown bears (*Ursus arctos*) inhabits remote oases in the Great Gobi Strictly Protected Area in southern Mongolia. Due to the remoteness of the region, relatively little is known about this highly endangered population of less than 35 bears. This population is isolated from other *Ursus arctos* populations by ~1200 km, and the evolutionary and systematic relationships with other brown bear subspecies

are unclear. Previous genetic work on the species suggests that the population has very low levels of genetic diversity and may be more closely related to Himalayan brown bears in Pakistan and India (*Ursus arctos isabellinus)* than brown bears in Mongolia. Our project is part of a larger effort to expand the knowledge of Gobi bear ecology and genetics to improve conservation and management efforts for this species. We have three main goals: 1) estimate population size and determine sex ratios, 2) evaluate connectivity of subgroups in the Mongolian desert and assess inter-oases movements, 3) evaluate levels of genetic variation and 4) examine evolutionary and systematic relationships of Gobi bears to other brown bear populations in Mongolia and neighboring regions. We have collected 82 tissue samples from brown bear populations in three regions of Mongolia. We conducted baited-barbed wire hair trapping to collect 690 hair samples from the Gobi desert. DNA was extracted using a Qiagen blood and tissue kit. Individual identification analyses are underway using a sex identification locus and 12 nuclear DNA microsatellite loci that were shown to be polymorphic in previous studies of this species. These data will be used to evaluate population size, sex ratio, individual movement, genetic diversity, and gene flow. Also, we are collecting mitochondrial DNA sequence data from the control region and cytochrome oxidase 2 to evaluate the systematic relationships of Mongolian brown bears.

TURLEY, NATALIE. Idaho Power Company, Boise, Idaho 83707. ***IDAHO POWER'S AVIAN PROTECTION PROGRAM.***

Idaho Power Company (IPC) has a long history of working to protect birds of prey. Birds of prey are attracted to power poles for perching and nesting. Unfortunately, birds landing on these structures may be electrocuted if their wings touch two electrical wires. To protect raptors from electrocution, Idaho Power has developed an Avian Protection Program requiring all new or rebuilt lines be built to raptor-safe standards and modification of poles where an incident has occurred. In addition, we are identifying high-priority areas to target remedial actions. Hundreds of thousands of power poles exist within IPC's service territory, many of which are within suitable habitat for raptors. However, not every power pole carries the same risk of electrocution. We developed a spatial model to identify high priority areas for surveys. Model components included a habitat layer, historic mortality locations, known nesting eagle locations, and power line configuration. Risk assessment surveys in these high priority areas are conducted to identify high risk poles based on evidence of bird use and pole configuration. Using a risk assessment to prioritize poles posing the highest electrocution risk ensures that money spent modifying poles results in the greatest benefit to birds of prey and system reliability.

ULAPPA, AMY* and L.A. Shipley. Washington State University, 115 Johnson Hall, Pullman WA 99164. ***THE ROLES AND BENEFITS OF CAPTIVE ANIMAL RESEARCH FOR ON-THE GROUND WILDLIFE MANAGEMENT.***

Understanding how wildlife use habitat is often a central focus in wildlife research. For wild herbivores, plant quality and availability often plays a critical role in habitat selection. Assessing the diets of herbivores in the wild is a difficult yet important component to understand how available forage affects habitat selection. Ideally, biologists need to know the forages consumed and the nutritional content of the animals' diets. However, this type of data is difficult to accurately collect from wild populations. Using tractable animals both in the field and in captive settings provides a valuable tool for collecting data on habitat quality that is not otherwise available from observing wild animals. In the field, observing the foods consumed by tractable animals can be used to measure the quality of habitat they experience in units directly related to their fitness at scales relevant to many habitat treatments. In captive settings, researchers can isolate attributes of food (e.g., digestible energy and protein, plant secondary metabolites) to better understand choices made by animals and the fitness value of these choices. We demonstrate several examples of the use of tractable mule deer (*Odocoileus hemionus*) to compare landscape management techniques in eastern and western Washington. Additionally, captive mule deer and captive pygmy rabbits (*Brachylagus idahoensis*) have been used to show the effects of plant secondary metabolites on intake. These data are valuable to determine the effect of landscape management techniques on herbivores and provides insight to wildlife managers about how animals make foraging decisions in the wild.

WARE, HEIDI*, C.J.W. McClure, and J.R. Barber. Boise State University, Boise, Idaho 83725. ***DOES ROAD NOISE AFFECT STOPOVER OF MIGRATING SONGBIRDS?***

Over the last 40 years, anthropogenic noise has expanded across the landscape dramatically, and road noise in particular continues to increase in both urban and natural areas. Since the 1970's, vehicle traffic has tripled in the US and more than 83% of land in the United States is now within ~1km of a road. Previous studies indicate that traffic noise may be the cause of observed declines in animal populations near roads; however the mechanism of these road impacts has not been tested experimentally. By adding road noise to the landscape using an array of speakers, we were able to experimentally test the effects of noise alone on more than 20 species of songbirds. We will present data from our "Phantom Road" experiment on the body condition of migrating songbirds exposed to traffic noise. Since increased sound levels are known to reduce a bird's ability to forage, we predicted that birds exposed to traffic noise would have lower body condition. We conducted additional experiments in the lab to examine this hypothesis by exposing one of our study species, white-crowned sparrows (*Zonotrichia leucophrys)*, to noise while foraging. Our findings have broad application to management concerns since mitigation of noise could potentially prevent habitat degradation for a variety of species.

WIRSING, AARON J. School of Environmental and Forest Sciences, Box 352100, University of Washington, Seattle, WA 98195. ***THE RISE OF ANIMAL-BORNE VIDEO SYSTEMS AS TOOLS FOR WILDLIFE RESEARCH.***

Until recently on the methodological fringe, animal-borne video systems are now being used increasingly by wildlife scientists as a research tool. I will provide an overview of the applications of animal-borne video in wildlife research, with special reference to its capacity to yield novel insights about behavior and improve telemetry studies. I will conclude by discussing how I am integrating animal-borne video into my exploration of the ecological impacts of gray wolf recolonization in Washington.

WHITING, JERICHO[1], B. Sewall[2], B. Doering[3], J. W. Lowe[4], G. J. Wright, S. Earl[4], A. Earl[4], D. K. Englestead[4], J. A. Frye[4], and T. Stefanic[5]. [1]Gonzales-Stoller Surveillance, Idaho Falls, ID 83401; [2]Temple University, Philadelphia, PA 19122; [3]Power Engineers, Meridian, ID 83642; [4]U.S. Bureau of Land Management, Idaho Falls, ID 83401 and Shoshone, ID 83352; [5]Craters of the Moon National Monument and Preserve, Arco, ID 83213. ***IMPORTANT HIBERNACULA AND LONG-TERM TRENDS OF HIBERNATING BATS ON THE SNAKE RIVER PLAIN, IDAHO: IMPLICATIONS FOR CONSERVATION AND MANAGEMENT.***

Bat populations are being impacted by many threats, including human disturbance and modification of hibernacula. Identifying hibernacula and then estimating population trajectories of bats at these locations are important conservation measures for these mammals. We identified important hibernacula from 253 surveys during winter (November 1 to March 31) in 53 caves from 1984 to 2014 in south-central and southeastern Idaho, USA. We used a generalized additive mixed model to investigate long-term population trajectories of Townsend's big-eared bats (*Corynorhinus townsendii townsendii*) using 234 surveys in 41 of those caves. Across all surveys, researchers counted 34,082 bats representing 6 species. Townsend's big-eared bats comprised 96.6% (32,934 individuals) of those bats and used 51 caves, and western small-footed myotis (*Myotis ciliolabrum* ssp.) comprised 3.3% (1,117) of those bats and used 30 caves. Twenty-nine of the 53 caves were substantial hibernacula (maximum count ≥ 20 individuals) for Townsend's big-eared bats, and the largest hibernating colony of this species occupied Kid's Cave ($\bar{x}$ = 1,446 individuals, *SD* = 516.3, range = 619 to 1,994 individuals). Twelve caves were substantial hibernacula (maximum count ≥ 5 individuals) for western small-footed myotis, and the largest hibernating colony of this species occupied Fool's Wading Pool Cave ($\bar{x}$ = 87 individuals, *SD* = 51.4, range = 32 to 146 individuals). The relative abundance of Townsend's big-eared bats has remained stable in this area since 1984. Caves on the Snake River Plain are crucial for hibernating Townsend's big-eared bats and western small-footed myotis in the western USA. Our data provide essential long-term population trajectories of Townsend's big-eared bats prior to these mammals contacting lethal pathogens or the arrival of major threats to the Snake River Plain.

WITT, CHRIS. U.S. Forest Service, Rocky Mountain Research Station, Forest Inventory and Analysis, Boise, Idaho 83702. ***HABITAT SELECTION OF PINYON JAYS AT THE PINYON-JUNIPER / SAGEBRUSH-STEPPE ECOTONE.***

In order to better understand how pinyon jays influence in-fill and expansion in pinyon-juniper woodland communities, we measured forest and understory structure at sites used by pinyon jays in southern Idaho and east-central Nevada. In 2010-2012, birds from in Idaho and Nevada were captured, measured and banded, while eight individuals from three separate flocks were affixed with radio transmitters in order to locate and observe various behaviors. In 2013, USFS Forest Inventory crews visited activity sites and collected tree and understory data. We then compared mean tree canopy cover, shrub cover, grass cover, live basal area, and basal area of dead trees between sites used for nesting/roosting, foraging and seed caching activities. Mean canopy cover, shrub cover and live basal area were lower at seed caching sites while basal area of standing dead trees and mean grass cover were higher at these locations than at other activity sites. No differences were found in mean grass cover or live basal area between foraging and nesting/roosting sites, while mean shrub cover was greater and basal area of dead trees was less at foraging sites than at nesting/roosting locations. Our preliminary results suggest that pinyon jays prefer open, sparsely-stocked or disturbed areas for seed caching, stands of moderately-stocked seed producing trees for foraging, and mature, densely-stocked stands for nesting and roosting activities.

WOODRUFF, SUSANNAH *, T. Johnson, and L. Waits. University of Idaho, Moscow, ID 83843. ***PRELIMINARY RESULTS OF NON-INVASIVE GENETIC SAMPLING FOR MARK-RECAPTURE STUDIES OF ENDANGERED SONORAN PRONGHORN.***

Knowledge of population demographics is important for species' management but can be challenging in low density, wide-ranging species. The endangered Sonoran pronghorn (*Antilocapra americana sonoriensis*), found exclusively in the Sonoran Desert of Arizona and Mexico, declined to <50 animals in 2003, growing to 159 individuals by 2012 in the US portion of its range. At present, abundance estimates are based on biennial aerial counts which are costly and do not provide information on survival, sex ratio, or genetic diversity. Noninvasive genetic sampling (NGS) of fecal pellets could provide a more cost-effective and less intrusive method of monitoring. This study assesses the effectiveness of NGS methods for evaluating occupancy and population demographics of Sonoran pronghorn throughout their geographic range. Here we present 1) results from a pellet deposition and DNA degradation pilot study designed to determine an optimal temporal interval for mark-recapture sampling, and 2) preliminary estimates of population size from one season of sampling. In May and June 2013, we searched for fecal pellets at 15 pronghorn drinkers (artificial watering holes) with a sampling interval of approximately 7 days. Three sites were sampled four times, three sites were sampled three times, and nine remote sites were sampled one time. We obtained 730 pellet piles from twelve drinkers, while three drinkers had no evidence of recent pronghorn use. We analyzed 500 pronghorn samples and identified 95 individuals including 73 adults and 22 fawns. Overall PCR success rates were 74.5% varying from 60%-84% per locus, and individual ID success rates were 84%. Population estimates were 111 (CI: 95-120) using a single-session estimation model in CAPWIRE and 108 (CI: 89-178) using a multisession model in MARK. Results indicate use of fecal pellets is a feasible method for population estimation, demographic monitoring, and occupancy surveys of Sonoran pronghorn.

YENSEN, ERIC[1], T. Tarifa[2], D. Evans Mack[3], B. Wagner[3], and B. M. Shock[4]. [1]Department of Biology, The College of Idaho, 2112 Cleveland Blvd., Caldwell, Idaho 83605; [2]Research Associate, Museum of Natural History, The College of Idaho, Caldwell, Idaho 83605; [3]Idaho Department of Fish and Game, McCall, Idaho 83638; [4]Scientific Ecological Services, Inc., 1059 SW 2nd Ave., Ontario, Oregon 97914-2120. ***NORTHERN IDAHO GROUND SQUIRREL (*UROCITELLUS BRUNNEUS*) AND CATTLE DIETS IN ADAMS COUNTY, IDAHO, 2010-11.***

There is little information on the diet of the federally Threatened northern Idaho ground squirrel (*Urocitellus brunneus*), yet there are important questions regarding potential competition from domestic cattle and the appropriate plant species needed for habitat restoration projects that affect ground squirrel recovery. We analyzed

116 northern Idaho ground squirrel fecal pellet samples collected at five study sites in Adams County, Idaho in 2010 and 2011. We also collected 20 cattle fecal samples at two study sites in July 2010. Diet composition was determined at the Wildlife Habitat and Nutrition Laboratory at Washington State University using a microhistological technique. Diet overlap between ground squirrels and cattle was only 15%. The two species were completely separated in a principal components (PCA) scatterplot, suggesting minimal dietary overlap between them, at least at two of our sites in July. Ground squirrel diets were dominated by large quantities of forbs (44-83%), followed by roots, bulbs, and rhizomes (7-37%), but few grasses or sedges (5-14%). Yarrow (*Achillea millifolium*), lupines (*Lupinus* spp.), buckwheat (*Eriogonum*) flowers, and spring beauty (*Claytonia*) corms were especially important to ground squirrels. Surprisingly, seeds were a minor component (0-6%) of ground squirrel diets in this study. In contrast, cattle ate mostly grasses and sedges (85-89% of diet), but few forbs (9-12%). We found no significant differences in diets of male and female ground squirrels. There were differences among age classes (adults, yearlings, and juveniles), but these appear to result from younger squirrels being active later in the season. Our results suggest sampling throughout the active season is more important than age or sex of individuals sampled. For restoration projects, seed mixes with a diversity of forbs, especially *Achillea*, *Lupinus*, *Eriogonum*, and species with bulbs and rhizomes appear to be important.

Abstracts of To The Point Papers

Presenter names are capitalized; those presenters with an * are students

BERKLEY, REGAN. Idaho Department of Fish and Game, McCall Idaho 83638. ***SAGE-GROUSE MOVEMENTS AND SURVIVAL NEAR WEDGE BUTTE, IDAHO.***
During 2010-2011, Blaine County identified several potential sites for relocation of the Friedman Memorial Airport. One of the preferred sites, just south of Wedge Butte, was known to be an area used year-round by greater sage-grouse. From 2012-2013, IDFG staff captured and then monitored survival and movements over 40 radio-collared sage-grouse near the Wedge Butte site. Resulting data helped clarify how proposed local land uses may affect sage-grouse at a landscape scale.

CRAWFORD, ERIC. Idaho Department of Fish and Game, Lewiston, Idaho 83501. ***ARTIFICIALLY SIMULATED WILDLIFE AND ITS USE IN THE APPREHENSION OF WILDLIFE VIOLATORS.***
One of the most effective tools a Conservation Officer has in combating wildlife violators is the Artificially Simulated Animal, ASA. The ASA is overly productive in addressing chronic road hunting and trespass issues across the state. This presentation will provide insight into the ASA's use and its effectiveness in addressing the unethical pursuit of Idaho's big game animals.

HORNE, JON[1], J. Fieberg[2], S. Bergen[1], and P. Zager[1]. [1]Idaho Department of Fish and Game, Boise, Idaho 83712; [2]University of Minnesota, St. Paul, Minnesota, 55108. ***A MODEL-BASED APPROACH FOR ESTIMATING ELK ABUNDANCE FROM AERIAL SURVEY DATA.***
Estimates of ungulate abundance are traditionally obtained from visibility-bias corrected aerial surveys via design-based inference. We describe an alternative model-based approach that may provide additional flexibility to managers for implementation while improving the efficiency of the estimators.

LONDON, BILL. Idaho Department of Fish & Game, Nampa, Idaho 83686. ***RESTITUTION FOR ILLEGALLY PURCHASED FISH & GAME LICENSES AND TAGS.***
Poachers defraud the Idaho Fish & Game (IDFG) of license and tag fees, thus reducing the agency funding and effectiveness. The IDFG was able to streamline and increase the revenue flow from court ordered restitutions for illegally purchased licenses and tags. This was a collaborative effort involving the IDFG Conservation Officers, The Idaho Prosecuting Attorneys Association, Idaho's 44 County Prosecutors and Magistrate courts, and the Idaho Supreme Court.

MUSIL, DAVID D. Senior Wildlife Research Biologist, Idaho Department of Fish & Game. ***WHERE'S THE GROUSE? ESTIMATING OBSERVER ERROR FOR RUFFED GROUSE DRUMMING SURVEYS.***
The purpose of this field exercise was to determine the error rate for biologists locating simulated drumming ruffed grouse (*Bonasa umbellus*) along a point intersect transect (PIT). Error rates were determined for 15 observers detecting play-back recordings of ruffed grouse at 3 distances. Observers estimated drummer locations by triangulating directions of drumming cues from 2 observation points spaced 100 m apart. Predicted location errors averaged 68 $\pm$ 20 m (mean $\pm$ 95% CI, n=38) overall and were lowest (16 $\pm$ 4 m, n=15) for the closest drummer (100 m distant), larger (79 $\pm$ 25 m, n= 15) for the 200 m distance, and largest (142 $\pm$ 46 m, n=8) for the furthest distance (300 m to either observation post). Distance from estimated locations to the transect showed similar patterns of increasing error for more distant drummers. Distance errors averaged 83 $\pm$ 7 m (82 m actual distance to transect), 188 $\pm$ 45 m (181 m), and 165 $\pm$ 55 m (283 m) for the 100, 200, and 300 m drummer locations, respectively. Locations and distances to transect were accurate (precise and unbiased) at 100 m, imprecise but unbiased at 200 m, and inaccurate (imprecise and biased) at 300 m. All of the estimates for the closest drumming cue were within 35 m of the actual location, but only 17% of the locations for the 2 distant drumming cues were this accurate. Accuracy varied regardless of observer's belief in their own, hearing abilities. If PIT is to be used

to estimate density of ruffed grouse, error rates need to be determined to screen each potential observer. Current roadside surveys could be modified to include 2 PIT observation posts per listening station to estimate density, rather than only occupancy. This method could also be used for observer practice prior to conducting surveys.

NEUMEYER, DAVID and S. Hayes. Gonzaga University, Spokane WA, 99202; Idaho Fish and Game, Coeur d' Alene, Idaho 83815. **WHY HERE AND NOT THERE? FACTORS THAT INFLUENCE BIG GAME HARVEST IN NORTHERN IDAHO.**
By using GIS software I have been researching and analyzing some of the factors that influence big game harvest in northern Idaho. I have looked at factors including elevation, slope, vegetation, accessibility, and many more, along with harvest data to find any correlations.

PAINTER, GREG. Idaho Department of Fish and Game, Salmon, Idaho 83467. ***EVALUATING HABITAT IN A FUNCTIONAL FRAMEWORK: WHAT IS PRODUCTIVE MULE DEER FAWNING HABITAT IN THE SALMON REGION AND WHY IS IT IMPORTANT?***
Mule deer seasonal ranges in the Upper Salmon River watershed have been mapped over the last 15 years, with the exception of fawning areas. Recent research has shown fawning habitats in the watershed drive mule deer production and deserve special attention when developing habitat manipulations and assessing land use development impacts for mule deer. Since 2008, 180 mule deer does have been collared and tracked throughout the year in the watershed to assess survival and habitat use. Doe/fawn locations throughout the critical fawn rearing period (late-May thru mid-July) were recorded spatially using ArcGis. Plant communities (based on a locally modified ReGap plant community base layer) selected by does were then identified using R program habitat selection statistics and modeled across the entire watershed. Important plant communities selected by does were Aspen Woodland, Riparian, Mesic Sagebrush, and Agriculture. All Agriculture and Aspen Woodland, Riparian, and Mesic Sagebrush plant communities located above 9000 feet elevation were eliminated from the analysis. The plant communities identified were selected at one, three and five acre minimum patch sizes and buffered by 100 meters using ArcGis functions. The final maps depict critical mule deer fawning habitat in the watershed at three scales. Additional data needs to improve the model are discussed.

SWEARINGEN, ZACH[1,3], C.J. Conway [1,2], F. Cassirer[3], and P. Zager[3]. [1]University of Idaho, Moscow, Idaho, 83884. [2]United States Geological Survey, Idaho Cooperative Fish and Wildlife Research Unit, Moscow, Idaho, 83844, [3]Idaho Department of Fish and Game, Lewiston, Idaho, 83501. ***DECLINES IN COUNTS OF PILEATED WOODPECKERS ON CRAIG MOUNTAIN WMA: DECLIES IN ABUNDANCE OR DETECTION PROBABILITY?***
Bird surveys have been conducted on the Craig Mountain Wildlife Management Area (CMWMA) at four intervals over the past 20 years (1993/94, 1997, 2002, 2013). Counts of pileated woodpeckers (one of three target bird species on CMWMA) have declined between the 1993/94 and 2002 surveys, but the timing of these surveys was not consistent across years. This presentation will examine whether the decline in numbers of pileated woodpeckers counted reflects a decline in abundance or merely an effect of survey date on detection probability.

WATERBURY, BETH. Idaho Department of Fish & Game, Nampa, Idaho 83686. ***CONSERVATION STRATEGY FOR THE NORTH AMERICAN WOLVERINE IN IDAHO.***
The North American wolverine (*Gulo gulo luscus*) is a species of heightened conservation concern in the contiguous United States, where it is proposed for listing as threatened under the Endangered Species Act due to the primary threat of climate change-induced habitat and range loss. The states of Idaho, Montana, Wyoming, and Washington currently harbor wolverines, which exist as a small metapopulation dependent on successful dispersal over a vast geographic region. Biologists from Idaho Department of Fish and Game have recognized the need to integrate wolverine metapopulation priorities into a "stepped-down" conservation strategy scaled to the State of Idaho. Intended as a resource for agency, tribal, municipal, NGO, and public

sectors to guide wolverine conservation and management in Idaho for the next 5 years, the strategy addresses the distribution and status of wolverines in Idaho; describes factors affecting the population and its habitat; identifies focal areas for conservation; and prescribes conservation actions for achieving long-term viability of wolverines at state and metapopulation levels.

ZAGER, PETE[1], J. White[1], J. Cook[2], and R. Cook[2]. [1]Idaho Department of Fish and Game, Lewiston ID 83501; [2]National Council for Air and Stream Improvement, Inc., La Grande, OR 97850. ***THE CLEARWATER BASIN COLLABORATIVE AND ELK MONITORING IN NORTH-CENTRAL IDAHO.***

The Clearwater Basin Collaborative (CBC) is a consortium of state and federal agencies, business and industry, NGOs, and the private sector that was formed in 2008 to address natural resource issues in the Clearwater Basin. The CBC's vision is to "... *enhance and protect the ecological and economic health of our forests, rivers and communities within the Clearwater Basin by working collaboratively across a diversity of interests*". Restoration and management of elk populations and habitats are a primary focus of CBC. Hence, CBC endorses and supports efforts to better understand elk population dynamics and the mechanisms that link populations to their habitats. We launched a CBC-supported pilot project in 2013 to assess the status of Clearwater Basin elk herds. During Dec 2013 and Jan 2014, we captured, evaluated, and radio-collared 54 adult female elk distributed across 3 contrasting study areas in the Clearwater Basin. We documented relatively low body fat and pregnancy rates, supporting the hypothesis that Clearwater Basin summer habitats are nutritionally deficient. We will present results from this pilot project and discuss "what's next".

Abstracts of Contributed Posters

Presenter names are capitalized; those presenters with an * are students

BARNES, JARED L.*, J. Maxwell, R. Meyers, K. Downard, M. E. Ludlow, J. C. Pettit, B. Jones, T. W. Pettit. Brigham Young University. Rexburg, Idaho 83440. ***RELATIVE INSECT ABUNDANCE AND BAT ACTIVITY OF HEBER VALLEY CAMP.***

Bush, D. A.[1], J. Shive[2], and **CHUCK PETERSON**[1]. [1]Department of Biological Sciences, Idaho State University, Pocatello, Idaho 83209-8007; [2]Gonzales Stoller Surveillance, Idaho Falls, Idaho 83401. ***MONITORING RATTLESNAKE DEN USAGE WITH TIME-INTERVAL PHOTOGRAPHY.***

CARLISLE, JAY. Idaho Bird Observatory, Boise State University, Boise, Idaho 83725. ***THE IDAHO BIRD CONSERVATION PARTNERSHIP: A COORDINATION POINT FOR BIRD CONSERVATION IN IDAHO.***

DOWNARD, KRISTINE*, J. I. Barnes, J. C. Pettit, J. Maxwell, R. Meyers, B. Jones, M. E Ludlow, T. W. Pettit. Brigham Young University-Idaho, Rexburg, ID 83440. ***INFLUENCE OF REPRODUCTION ON BAT ACTIVITY IN HEBER VALLEY, UT.***

FREMGEN, MARCELLA*, J. Forbey and J. Connelly. Boise State University, Boise, Idaho 83725. ***DOES PLANT SIZE, SPECIES, AND DIVERSITY MATTER TO FORAGING SAGE GROUSE?***

HILL, MARK. Idaho Department of Fish and Game, Lewiston, ID. ***AN ASSESSMENT OF THE PUBLICS ATTITUDE OF WILDLIFE VIOLATIONS AND NON- COMPLIANCE IN IDAHO.***

HOLDERMAN, JILL[1], K. Warner[2], M. Fuller[3], and J. Wood[4]. [1]Bureau of Land Management; [2]Idaho National Guard; [3]U.S. Geological Survey; [4]U.S. Fish and Wildlife Service. ***WINTERING GOLDEN EAGLE MIGRATION ROUTES AND HABITAT USE IN THE NCA.***

LANKFORD, AMBER[1,2], L.K. Svancara[1], J.J. Lawler[3], and K. Vierling[2]. [1]Idaho Department of Fish and Game, Moscow, Idaho 83843; [2]University of Idaho, Moscow, Idaho 83843; [3]School of Environmental and Forest Sciences, University of Washington, Seattle, Washington 98195. ***SPATIAL CLIMATE CHANGE VULNERABILITY ASSESSMENT FOR TERRESTRIAL WILDLIFE: AN IDAHO CASE STUDY.***

LUDLOW, MELISSA E.*, J. Maxwell, J. C. Pettit, J. L. Barnes, B. Jones, Kristine Downard, Rachel Meyers, and Thomas W. Pettit; Brigham Young University, Rexburg, Idaho 83440. ***EXAMINING THE REOCCURRING AUGUST SPIKE IN BAT ECHOLOCATION ACTIVITY IN HEBER VALLEY CAMP, UTAH.***

MAXWELL, JORDAN*, J. Barnes, C. Downard, R. Meyers, B. Jones, J. Pettit, M. Ludlow, T. W. Pettit. Brigham Young University-Idaho, Rexburg, Idaho 83440. ***EVIDENCE OF SUMMER BAT MIGRATION IN THE HEBER VALLEY, UTAH.***

MILLER, ROBERT A., J. D. Carlisle, N. Paprocki, G. S. Kaltenecker, and J. A. Heath. Idaho Bird Observatory, Boise State University, Boise, Idaho 83725. ***ANNUAL VARIATION IN AUTUMN MIGRATION PHENOLOGY AND ENERGETIC CONDITION AT A STOPOVER SITE IN THE WESTERN U.S.***

NOBLER, JORDAN[*1], Olsoy, P.J.[1], Shipley, L.A.[2], Rachlow, J.L.[3], Forbey, J.S.[1]. [1]Boise State University, Boise, Idaho 83725. [2]Washington State University, Pullman, WA 99164. [3]University of Idaho, Moscow, Idaho 83844. ***ASSESSING HABITAT HETEROGENEITY FOR A SPECIALIST MAMMALIAN HERBIVORE.***

OLSOY, PETER[1], J. Nobler[1], J. Forbey[1], J. Rachlow[2], M. Burgess[3], J. Mitchell[4], N. Glenn[1], and L. Shipley[5]. [1]Boise State University, Boise, Idaho 83725, [2]University of Idaho, Moscow, Idaho 83844, [3]University of Florida, Gainesville, Florida 32611, [4]University of Delaware, Newark, Delaware 19716, [5]Washington State University, Pullman, Washington 99164. ***MAPPING HERBIVORE FEARSCAPES AND FOODSCAPES: HIGH-RESOLUTION HABITAT ASSESSMENT USING REMOTE SENSING***

PUGESEK, GENEVIEVE[*1], M. Mumma[1], S. Gullage[2], S. Mahoney[2], and L. Waits[1]. [1]Department of Fish and Wildlife Sciences, College of Natural Resources, University of Idaho, Moscow, ID, 83843, [2]Sustainable Development and Strategic Science, Department of Environment and Conservation, Government of Newfoundland and Labrador, St. John's, Newfoundland. ***A GENETIC EVALUATION OF THE EFFECTS OF SUPPLEMENTARY FEEDING ON BLACK BEAR PREDATION OF CARIBOU IN NEWFOUNDLAND.***

ROBB, BRECKEN*[1], G. Frye[2], M. Fremgen[1], J. Connelly[3], and J. Forbey[1]. [1]Boise State University, Boise, Idaho 83725; [2]University of Alaska--Fairbanks, Fairbanks, Alaska 99775; [3]Idaho Department of Fish and Game, Blackfoot, Idaho 83221. ***CAN FLUORESCING COMPOUNDS IN SAGEBRUSH EXPLAIN DIET SELECTION FOR WILDLIFE?***

SMITH, SHAWN H.* and J. A. Heath. Boise State University, Boise, Idaho 83725. ***THE EFFECT OF CLIMATE CHANGE ON AVAILABLE RESOURCES FOR AMERICAN KESTRELS (*FALCO SPARVERIUS*) IN SOUTHWESTERN IDAHO: IS A PREDATOR DRIVEN MISMATCH OCCURRING OR WILL THERE BE ONE IN THE FUTURE?***

WARNER, KEVIN[1], B. Doering[2], and C. Baun[1]. [1]Idaho Army National Guard, Boise, Idaho 83705; [2]Power Engineers, Meridian, Idaho 83642. ***BAT MONITORING AND MANAGEMENT, ORCHARD COMBAT TRAINING CENTER.***