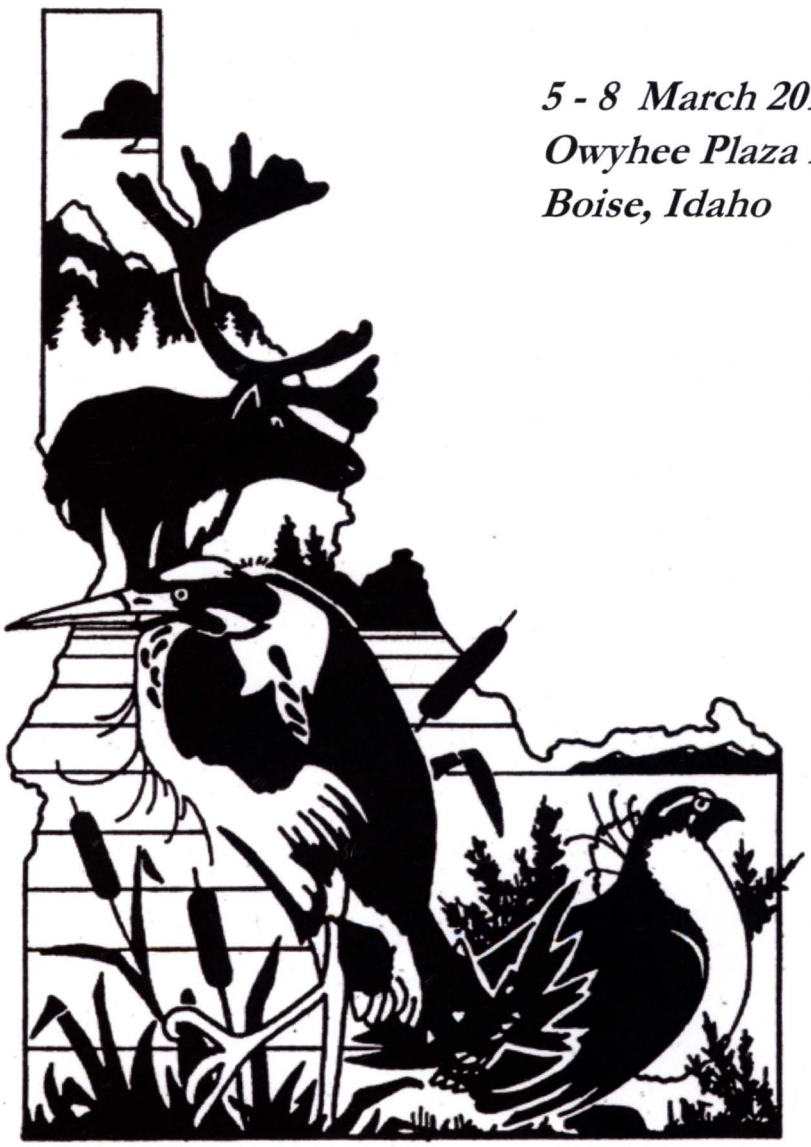
Hayden

42nd Annual Meeting of the

IDAHO CHAPTER OF THE WILDLIFE SOCIETY



5 - 8 March 2012
Owyhee Plaza Hotel
Boise, Idaho

CONCURRENT MEETINGS/WORKSHOPS

- Idaho Bat Working Group
- Idaho Bird Conservation Partnership.
- Idaho Partners in Amphibian and Reptile Conservation

PROGRAM AND ABSTRACTS

Table of Contents

Meeting Introduction and Host City

Meeting introduction

The annual meeting of the Idaho Chapter of The Wildlife Society, will take place 5-8 March 2012 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 a plenary session, symposium, contributed oral and poster presentations, social activities and the annual business meeting.

Host City — Boise, Idaho

Welcome to Boise!

The City of Boise is located at the western edge 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. Bald eagles winter along the Boise River and heron rookeries can also be spotted in the spring. Bring your binoculars!

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 Dr. · 334-2120
Morrison Knudsen Nature Center (IDFG) · 600 S. Walnut St. · 334-2225
Zoo Boise · 355 Julia Davis Dr. · 384-4260

Conference Venue

All conference activities and associated workshops will take place at the Owyhee Plaza Hotel, 1109 Main St. Boise, ID 83702. Phone: (208) 343-4611. *www.owyheeplaza.com*

Conference Contact

Jim Hayden - idahochaptertws@gmail.com; 208-651-6732 (cell)

Registration and Logistics

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

Registration Fees:

ICTWS	$110	full registration (includes social, banquet, and meeting gift)
	$ Free	retiree registration (includes social, banquet, and meeting gift)
	$ Free	student registration (includes social, banquet, and meeting gift)
	$ 30	extra banquet ticket
	$ 10	late registration fee – after February 15th

The registration desk will be open at the following times:

Monday	5 March	7:00 am – 12:30 pm
Tuesday	6 March	7:00 am – 1:30 pm
Wednesday	7 March	7:00 am – 1:30 pm

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

Parking
The Owyhee Plaza Hotel offers free parking directly behind the hotel entrance from either Main Street or Grove Street, as well as a lot kitty corner to the hotel on the south side of Grove Street between 12th and 13th Streets. Do not park in the Idaho Power parking lot.

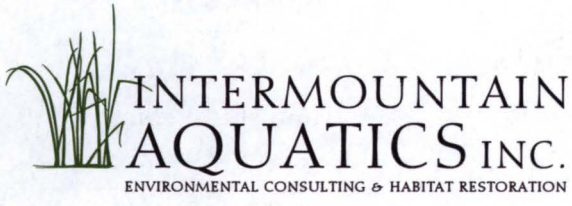
Lost And Found/Security
Please bring lost and found items to the Registration Desk.

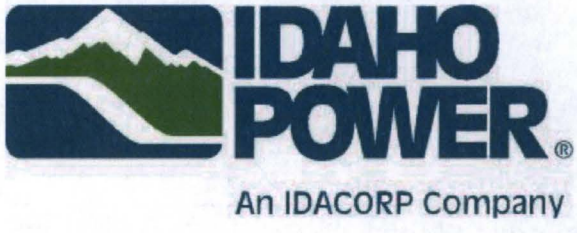
Organizing Committee

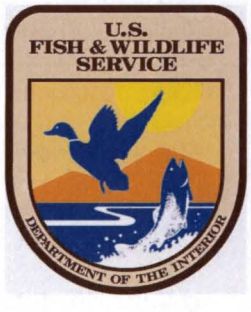
Jim Hayden	Idaho Department of Fish and Game
Dave Musil	Idaho Department of Fish and Game
Colleen Moulton	Idaho Department of Fish and Game
Jon Dudley	USFS Rocky Mountain Research Station

Sponsors and Contributors to the 2012 Annual Meeting

We wish to thank the Idaho State Offices of the Bureau of Land Management and U..S. Fish and Wildlife Service, the Morrison Knudsen Nature Center, Idaho Department of Fish and Game, Idaho Power, Power Engineers, North Fork Native Plants, and Intermountain Aquatics, Inc. for sponsoring the annual meeting of the Idaho Chapter of The Wildlife Society. We also wish to thank the individuals, businesses, and organizations who provided special contributions or donated items for our raffle and silent auction.







The Committee would like to thank the awards committee (Kerry Reese and Tom Hemker), Anna Owsiak and the paper awards committee, Bruce Ackerman (elections), MK Nature Center (labeling registrant gifts), and all of the students and volunteers that helped with AV and other logistics.

Program At a Glance

Monday 5 March

Time	**Regency & Rainier Rooms**
08:00-11:00	Idaho Bird Conservation Partnership
10:00-13:00	Idaho Partners in Amphibian and Reptile Conservation
13:00-17:00	Idaho Bat Working Group

Tuesday 6 March

Time	**Ballroom**	
08:00-08:10	Welcome - ICTWS President: Jim Hayden	
08:10-09:40	ICTWS Plenary Session Invited Speakers: Dan Dinning, Jim Stone, Tom Maloney	
10:10-11:00	Panel Discussion	
11:00-13:00	BUSINESS LUNCHEON & OFFICER ELECTIONS	
	Regency Room	**Rainier Room**
13:30-15:30	Landscape and Population Ecology	Avian Ecology
16:00-17:00	To The Point Session I	Mammalian Ecology
18:00-21:00	Poster Session and Social - in **Ballroom**	

Wednesday 7 March

Time	**Ballroom**	
08:00-11:00	Keynote: Stanley Temple and "Green Fire"	
	Regency Room	**Rainier Room**
11:00-12:00	Human Dimensions, Conservation Education	Climate Change
12:00-13:30	LUNCH - on your own	
13:30-17:20	Habitat: Restoration, Management, Change Shrub/Steppe Wildlife	Bird Conservation Symposium
18:00-21:00	Banquet, Election Results, Awards, Raffle, and Auction - in **Ballroom**	

Thursday 8 March

Time	**Ballroom**
08:00-10:00	To The Point Session II

Scientific Program

Locations
All symposia and general paper sessions will be held in two rooms in the Owyhee Plaza Hotel: the Rainier and Regency Rooms (rooms will be combined into the "Ballroom" for plenary and keynote sessions).

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, whereas **To The Point** session talks should be limited to 10 minutes (including discussion). 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., slide advance monitor, laser pointer) and how to use them. This is also the time to check and see if your PowerPoint presentation (ideally created and/or saved in Office 97-2003 PowerPoint Show 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 on Tuesday, March 6, in the Ballroom. Poster displays should be set up after the afternoon session of contributed papers. Putty 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 all attendees turn off all cellular phones while attending the symposia, meetings, or general sessions.

Plenary and Keynote Sessions

Keynote: Stanley Temple, Beers-Bascom Emeritus Professor in Conservation, Dept. of Forest and Wildlife Ecology, former Chairman of the Conservation Biology and Sustainable Development Program, Gaylord Nelson Institute for Environmental Studies, University of Wisconsin-Madison. A221 Russell Labs, 1630 Linden Drive, Madison, WI 53706

For 32 years, Dr. Stanley A. Temple held the academic position once occupied by Aldo Leopold. During that time, he won every teaching award for which he was eligible. He is currently a Senior Fellow with the Aldo Leopold Foundation. He has received major awards from The Society for Conservation Biology, The Wildlife Society and The Wisconsin Society for Ornithology, and he is a Fellow of The American Ornithologists' Union, The Explorer's Club, the Wildlife Conservation Society, and the American Association for the Advancement of Science. He has been President of the Society for Conservation Biology and Chairman of the Board of The Nature Conservancy in Wisconsin.

Invited: Dan Dinning, Boundary County Commissioner, Idaho
Dan is a longtime resident of Boundary County with a background in real estate and real estate development. He was elected County Commissioner in 2001, serving now for going on 12 years. Boundary County has a high proportion of public land, and is home to some prominent threatened and endangered species of wildlife including grizzlies, caribou, sturgeon, and burbot. Dan had been heavily involved in natural resource issues and has been a leader in the development of the Kootenai Valley Resource Initiative, a collaboration of private, city, county, state, federal and tribal entities.

Invited: Jim Stone, Chair, Board of Directors for the Blackfoot Challenge, Montana
Jim operates the Rolling Stone Ranch near Ovando, Montana, serving as chair of the Blackfoot Challenge. The Blackfoot Challenge grew out of the early cooperative efforts of landowners to work together to protect and share this valuable area and resource. These public and private partnerships were formalized in 1993. The mission then - as today - follows a consensus based approach to include all public and private stakeholders, and coordinating efforts that conserve and enhance the natural resources and rural way of life in the Blackfoot Watershed.

Invited: Tom Maloney, Executive Director, Tejon Ranch Conservancy, California
Tom became the Conservancy's first Executive Director in February 2009 with 15 years of experience as a conservationist, environmental advocate, natural resource planner and ecologist. Most recently Tom served as the North and Central Coast Ecoregional Director for The Nature Conservancy. Tom started his career on the Connecticut River as the first River Steward for the Connecticut River Watershed Council. The River Steward program provided leadership for river advocacy and restoration of New England's largest river. Tom left the Watershed Council to join The Nature Conservancy to establish the Plymouth Pinelands Program in Plymouth, MA where the focus was the conservation of globally rare pine barrens and coastal plain ponds. In 2005 Tom joined the California Program of The Nature Conservancy. The focus of that work was conservation planning for the Carrizo Plain National Monument and land conservation in Santa Barbara and San Luis Obispo Counties.

Tom holds a BA in Economics from Boston University and a MS in Resource Management from Antioch New England. Since 1997, Tom has also served as a natural history tour guide on three continents. As a dedicated birder and naturalist, Tom is thrilled to have the opportunity to discover the tremendous ecological resources of the Tejon Ranch.

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.

Scientific Program

MONDAY 5 MARCH

Idaho Bird Conservation Partnership
Chairs: Don Kemner and Jay Carlisle
Location: Regency Room

08:00-08:30	**Introduction** -What is IBCP? Progress over past year
08:30-08:45	**Brief Q & A**
08:45-10:00	**Working Group Break-outs/Discussions** Confirm/establish leadership for each group Specific project ideas Set goals for 2012, agree on assignments
10:00-10:15	**BREAK**
10:15-11:00	**Working Groups Reports**

Idaho Partners in Amphibian and Reptile Conservation
Chairs: Bill Bosworth and Chuck Peterson
Location: Rainer Room, 10:00-13:00

Idaho Bat Working Group
Chairs: Rita Dixon and Bill Doering
Location: Regency Room

13:00-13:15	**Introduction and Welcome:** Rita Dixon and Bill Doering
13:15-14:15	**White Nose Syndrome Response Planning and Surveillance** WNS Response Planning: Rita Dixon and Mark Drew WNS Submission Guidelines - Winter 2011/2012: Rita Dixon and Mark Drew WNS Decontamination: Rita Dixon and Mark Drew
14:15-14:45	**Bat priorities for Idaho's State Wildlife Action Plan Revision:** Rita Dixon
14:45-16:45	**Fellowship of the Wing (aka Eastern Idaho Bat Monitoring Collaborative)** Partners, Roles and Expectations: Bill Bosworth Update on Eastern Idaho Coordination and Collaboration: Bill Bosworth and Bill Doering Data Management: Bill Bosworth BLM update: Theresa Mathis INL Activities and Protocol Development: Jericho Whiting Acoustical Survey Issues (filters, call libraries etc.): Bill Doering Where are we going?: Bill Bosworth and Bill Doering
16:45-17:00	**Wrap-up**

TUESDAY 6 MARCH

Idaho Chapter of The Wildlife Society
PLENARY SESSION
Wildlife Conservation - Paths To Common Ground
Chair: Jim Hayden

08:00-08:10	Welcome: Jim Hayden, ICTWS President
08:10-08:40	**Invited Speaker:** Dan Dinning Let's Talk - How the Kootenai Valley Resource Initiative Has Brought the Community to Common Ground
08:40-09:10	**Invited Speaker:** Jim Stone The Blackfoot Challenge, Conserving and Enhancing Working Landscapes, Communities, and People
09:10-09:40	**Invited Speaker:** Tom Maloney Connectivity, Condors, and Collaboration: The Tejon Ranch Agreement
09:40-10:10	**BREAK**
10:10-11:00	**Panel Discussion**
11:00-13:00	**BUSINESS LUNCHEON & ELECTIONS** - sack lunch provided

Idaho Chapter of The Wildlife Society
CONTRIBUTED PAPERS SESSIONS (Concurrent Sessions)
Names of presenters are capitalized; those names with an * following their name are student presenters.

Landscape and Population Ecology
Chair: Julie Heath
Location: Regency Room

13:00-1320	**Latitudinal patterns in demographic traits of burrowing owls in North America.** COURTNEY CONWAY
1320-1340	**The demography of sources and sinks in an amphibian metapopulation.** DAVID PILLIOD and R. Scherer
1340-1400	**Anthropogenic noise exposure: estimating the scale of ecological consequences.** JESSE BARBER

1400-1420 **Landscape level habitat selection of fishers (*Martes pennant*) in north-central Idaho.** JOEL SAUDER

1420-1440 **Seasonal migration movements of caribou on the North Slope of Alaska.** KERRY NICHOLSON, J. Horne, S. Aurther, and O. Garton

1440-1500 **Wintering raptor population trends in Idaho and the Morley Nelson Snake River Birds of Prey National Conservation Area**. NEIL PAPROCKI* and J. Heath

Avian Ecology
Chair: Carrie Hugo
Location: Rainier Room

13:00-1320 **Urbanization and avian species richness and abundance along the Boise River corridor.** ALLISON KORTE* and A. Dufty

1320-1340 **Prevalence of haemosporidian parasites in migrating Idaho raptors.** MICHELLE LASKOWSKI*, R. Ricklefs, and A. Dufty

1340-1400 **Northern goshawk (*Accipiter gentilis*) breeding and productivity relative to prey abundance within the Sawtooth National Forest.** ROBERT MILLER*, L. Lapinel, J. Carlisle, and M. Bechard

1400-1420 **Impacts of wind turbines on *Buteo* hawk fledgling mortality in the Columbia Plateau Ecoregion.** PATRICK KOLAR* and M. Bechard

1420-1440 **Flammulated owl (*Otus flammeolus*) distribution and abundance across southern Idaho.** JAY CARLISLE

1440-1500 **Modeling brown creeper occupancy using LiDAR derived forest canopy metrics.** CHARLES SWIFT*, A. Hudak, K. Vierling, L. Vierling, and J. Vogeler

15:00-15:30 **BREAK**

To The Point Session I
Chair: Jim Hayden
Location: Regency Room

15:30-15:40 **Wildlife management issues in Tasmania, Australia.** NATASHA WIGGINS

15:40-15:50 **Learning from Wikis, Pirates & LOLCats: harnessing the power of mass collaboration for wildlife.** BRENT THOMAS

15:50-16:00 **SWIMing in the wilderness: integrating wildlife surveys into wilderness management.** ROBIN GARWOOD

16:00-16:10 **The poaching double down: deer and elk poaching rates.** MARK CARSON

16:10-16:20 **Operation Or/Ida.** ROBERT HOWE

16:20-16:30 **eBird in Idaho: summary of its growth in Idaho and potential uses by professionals.** CHARLES SWIFT

16:30-16:50 **Capt'n, there be eagle watchers!** SCOTT ROBINSON

Mammalian Ecology
Chair: Greg Painter
Location: Rainier Room

15:30-15:50 **With over a century's worth of study and monitoring, are we getting pronghorn antelope population structure right?** SCOTT BERGEN, R. Seidler, and J. Beckmann

15:50-16:10 **Interstate movements of elk in the Centennial/Henry's Lake Mountains of eastern Idaho.** SHANE ROBERTS, H. Miyasaki, and D. Meints

16:10-16:30 **Timing and synchrony of births in bighorn sheep: implications for reintroduction and conservation.** JERICHO WHITING, D. Olson, J. Shannon, T. Bowyer, R. Klaver, and J. Flinders

16:30-16:50 **Winter habitat use by mule deer in Idaho and Montana.** SONJA SMITH, P. Krausman, and G. Painter

Social/Poster Session

18:00-21:00 Social and Poster Session in Ballroom
No host-bar/mixer & hors d'oeuvres

WEDNESDAY 7 MARCH
Idaho Chapter of The Wildlife Society
KEYNOTE SESSION
Chair: Jim Hayden

08:00-09:00	Stanley Temple: Aldo Leopold and the History of Wildlife Management
09:00-09:10	BREAK
09:10-10:40	Showing of 'Green Fire'
10:40-11:00	BREAK

Idaho Chapter of The Wildlife Society
CONTRIBUTED PAPERS SESSIONS (Concurrent Sessions)
Names of presenters are capitalized; those names with an * following their name are student presenters.

Human Dimensions and Conservation Education
Chair: Deniz Aygen
Location: Regency Room

11:00-11:20	**The WaterLife Discovery Center: getting huntin' boots and Birkenstocks talking.** MARK TAYLOR
11:20-11:40	**The St. Joe Bugle.** JERRY HUGO
11:40-12:00	**K-9 Unit IDFG.** JIM STIRLING

Climate Change
Chair: Toni Holthuijzen
Location: Rainier Room

11:00-11:20	**Using species vulnerability assessment to reduce uncertainty in setting bird conservation priorities in North America.** TERRELL RICH
11:20-11:40	**Assessing the vulnerability of species and ecosystems to climate change: an update for Idaho.** LEONA SVANCARA
11:40-12:00	**Linking climatic variability to behavior and fitness in herbivores: a bioenergetics approach.** RYAN LONG*, T. Bowyer, J. Kie, and W. Porter
12:00-13:30	**LUNCH -** on your own

Habitat Restoration, Management, and Change
Chair: Janet Rachlow
Location: Regency Room

13:30-13:50 **Bio-engineered streambank restoration on the lower Henrys Fork Snake River.** JEFFREY KLAUSMANN, K. Salsbury, and E. August

13:50-14:10 **Northern Idaho ground squirrel habitat restoration: insights into treatment effects.** ELISE SURONEN* and B. Newingham

14:10-14:30 **What are the effects of prescribed burning and conifer encroachment on pygmy rabbit habitat?** BONNIE WOODS*, M. Camp, and J. Rachlow

14:30-14:50 **When to run and when to hide: the influence of vegetation structure and distance to refuge on the predation risk of pygmy rabbits.** MEGHAN CAMP*, B. Woods, J. Rachlow, T. Johnson, and L. Shipley

14:50-15:10 **Long-term reproduction of golden eagles in relation to habitat alteration in southwestern Idaho.** MICHAEL KOCHERT and K. Steenhof

Bird Conservation Symposium
Chair: Terry Rich
Location: Rainier Room

13:30-13:50 **The North American context for setting landbird conservation priorities in Idaho.** TERRELL RICH

13:50-14:10 **Landscape prioritization for bird conservation by the Intermountain West Joint Venture.** DANIEL CASEY and J. Vest

14:10-14:30 **The BLM National Greater Sage-grouse Planning Strategy: implications for shrubsteppe habitat prioritization in Idaho.** TOM RINKES, P. Makela, and B. Ralston

14:30-14:50 **Integrating climate resilience into regional conservation planning: revising TNC's Columbia Plateau Ecoregional Assessment.** ROBERT UNNASCH and S. Buttrick

14:50-15:10 **Landscape Conservation Cooperatives: enacting broad-scale conservation from planning to action in Idaho and beyond.** SEAN FINN, R. Sojda, Y. Converse, and T. Olliff

15:10-15:40 BREAK

Shrub/Steppe Wildlife
Chair: Jennifer Forbey
Location: Regency Room

15:40-16:00 **Understanding the trade-off between safety and food quality in pygmy rabbits.** JAMIE UTZ*, J. Forbey, J. Rachlow, and L. Shipley

16:00-16:20 **Influence of sagebrush chemical composition on diet selection and habitat use by greater sage-grouse.** GRAHAM FRYE*, J. Forbey, and J. Connelly

16:20-16:40 **Greater sage-grouse nest site selection in the Virginia Mountains of northwestern Nevada: are female choices influencing survival abilities?** ZACH LOCKYER*, P. Coates, D. Delehanty, and M. Casazza

16:40-17:00 **If we know everything we need to know about conserving sage-grouse, why aren't we doing it?** STEVEN KNICK and J. Freemuth

Bird Conservation Symposium
Chair: Terry Rich
Location: Rainier Room

15:40-16:00 **GAP data, tools, and analysis for bird conservation.** JOCELYN AYCRIGG, J. Lonneker, A. Davidson, M. Croft, and M. Scott

16:00-16:20 **Idaho State Wildlife Action Plan revision: collective priorities for bird conservation .** RITA DIXON

16:20-16:40 **The Idaho Bird Conservation Partnership: a coordination point for bird conservation in Idaho.** JAY CARLISLE and D. Kemner

16:40-17:00 **DISCUSSION**

Special Topic - Regency Room

17:00-17:20 **A common sense approach to the process of finding and getting a job in wildlife.** TOBY BOUDREAU

Banquet

18:00-21:00 BANQUET in Ballroom
Awards Ceremony, Raffle, Silent Auction and Election Results

THURSDAY 8 MARCH

To The Point Session II
Chair: Dave Musil
Location: Ballroom

08:00-08:10	**Intraspecific competition on emergency winter feedgrounds in SE Idaho.** JASON BECK
08:10-08:20	**Juniper mastication to restore sage-grouse brood rearing habitat.** ARTHUR TALSMA
08:20-08:30	**Raptor migration utilizing satellite transmitters.** JILL HOLDERMAN
08:30-08:40	**Satellite transmitters on golden eagles within the Morley Nelson Birds of Prey NCA.** JILL HOLDERMAN
08:40-08:50	**True BROME-ance: a love affair with killing exotic grasses.** JOSH RYDALCH and D. Cureton
08:50-09:00	**Hungry herbivores in a changing climate.** JENNIFER FORBEY
09:00-09:10	**The effects of succession and disturbance on coleopteran abundance and diversity in Aeolian sand habitats.** ROSS WINTON
09:10-09:20	**Stomach contents of American white pelicans collected from the Blackfoot Reservoir.** EMILY RENNER
09:20-09:30	**Idaho's State Wildlife Action Plan revision.** RITA DIXON
09:30-09:40	**Comparing the use of DNA hair snares, live capture, and trail cameras for obtaining population density estimates in southwestern Idaho.** KATIE OELRICH, S. Nadeau, and J. Struthers
09:40-09:50	**Idaho National Laboratory (INL) bat monitoring update.** BILL DOERING, J. Whiting, B. Bosworth, and R. Cavallaro
09:50-10:00	**The recent history of vegetation growth in Idaho: a database plan looking for comments.** SCOTT BERGEN

Abstracts of Contributed Papers

Presented at the 2012 Annual Meeting of Idaho Chapter of The Wildlife Society. Presenter names are capitalized; those with an * following their name are students.

AYCRIGG, JOCELYN[1], J. Lonneker[1], A. Davidson[1], M. Croft[1], and J. Michael Scott[2]. [1]National Gap Analysis Program, University of Idaho, Moscow, Idaho 83843; [2]University of Idaho, Moscow, Idaho 83844. **GAP DATA, TOOLS, AND ANALYSIS FOR BIRD CONSERVATION.**

Gap analysis is the scientific approach of determining how well we are conserving biological diversity, including bird diversity. Our goal at the Gap Analysis Program (GAP) is to develop the data, tools, and analysis to scientifically support conservation. Data developed by GAP include land cover, species ranges and predicted distribution models, and protected areas. All these data are currently available at the national, Landscape Conservation Cooperative, and state scales. GAP tools include online viewers (gapanalysis.usgs.gov), which can be used to view, query, and download data. GAP analysis can improve management of conservation lands as well as assess vulnerability of birds and their habitats to proactively manage and maintain them. A gap analysis of ecological systems (i.e., bird habitats) across the US found the protection of some ecological systems lacking, but with a change in management the level of protection could be increased. Idaho birds could benefit from increased levels of protection of ecological systems. The analysis for the State of the Birds 2011 report used GAP data and found >300 bird species have >50% of their distribution on public lands and waters in the US. Furthermore, we analyzed the seasonal use of public lands by bird species to identify conservation partnerships between agencies, such as USDA Forest Service and Bureau of Land Management. Lastly, the gap analysis for the Northwest indicates there are species that need additional protection within their predicted distributions. Within Idaho, there is potential to increase the conservation of birds in lower elevation habitats, such as aridlands, by building public and private conservation partnerships. Across the US and within Idaho, GAP data, tools, and analysis can provide the best data and science available to the conservation of birds and their habitats.

BARBER, JESSE R. Boise State University, Department of Biological Sciences, Boise, Idaho 83725-1515. **ANTHROPOGENIC NOISE EXPOSURE: ESTIMATING THE SCALE OF ECOLOGICAL CONSEQUENCES.**

The extensive literature documenting the ecological effects of roads has repeatedly implicated noise as one of the causal factors. Recent studies of wildlife responses to noise have decisively identified changes in animal behaviors and spatial distributions that are caused by noise. Collectively, this research suggests that spatial extent and intensity of potential noise impacts to wildlife can be studied by mapping noise sources and modeling the propagation of noise across landscapes. Here we present models of energy extraction, aircraft overflight and roadway noise as examples of spatially extensive sources and to present tools available for landscape scale investigations. We focus these efforts in US National Parks (Mesa Verde, Grand Teton and Glacier) to highlight that ecological noise pollution is not a threat restricted to developed areas and that many protected natural areas experience significant noise loads. As a heuristic tool for understanding past and future noise pollution we forecast community noise utilizing a spatially-explicit land-use change model that depicts the intensity of human development at sub-county resolution. Biologists have long understood the hierarchical nature of most ecological relationships and the value of linking mechanistic studies conducted at finer scales with contextual studies conducted at broader scales. The study of anthropogenic noise must embrace this approach.

BERGEN, SCOTT[1], R. Seidler[2] and J. Beckmann[2]. [1]IDFG, Pocatello, Idaho 83204; [2]Wildlife Conservation Society, Bozeman, MT 59715. **WITH OVER A CENTURY'S WORTH OF STUDY AND MONITORING, ARE WE GETTING PRONGHORN ANTELOPE POPULATION STRUCTURE RIGHT?**

Pronghorn antelope (*Antilocapra americana*) have been monitored and counted, and their habitat and be-

havior documented by State, Federal, and private conservation groups since 1902 in the Upper Snake River Plain (ID). In the past four years, Idaho Dept. of Fish and Game, The Wildlife Conservation Society, Lava Lake Institute for Science and Conservation, and other institutions partnered in a scientific study that used GPS location technologies that have resulted in advances in the understanding of pronghorn antelope spatial life history in this region. In 2008, pronghorn antelope were captured-collared in the Little Wood River Basin and their 80 mile migration was discovered and described scientifically (to the Upper Snake River Plain). In 2009, the continued capture-collar experiment confirmed that there is extreme spatial fidelity to the discovered migration route (nearly 100%). In the winter of 2011, with funding from the BLM (Idaho Falls, ID), a capture-collar experiment was initiated with captures conducted on the winter range of these pronghorn antelope. Collared pronghorn migrated to the north and south of their winter range with some moving beyond the Continental Divide into Montana. These migrations are presented and statistically described using Brownian bridge movement algorithms 'fitted' to the characteristics of pronghorn antelope, the most mobile ungulate occurring in Idaho. Impassible barriers to pronghorn antelope are identified. The life history characteristics of this winter herd will be examined to possibly define a more biologically relevant understanding of their population structure within this region.

BOUDREAU, TOBY. Idaho Dept. of Fish and Game, 1345 Barton Road Pocatello, Idaho 83204. **A COMMON SENSE APPROACH TO THE PROCESS OF FINDING AND GETTING A JOB IN WILDLIFE.**

Getting a fulltime job is the culminating goal after many years of academic training, field work, seasonal positions and possibly volunteering. This presentation is designed for anyone looking for their first job or even a new job- beginning with the basics of what types of job interest you and where you might find vacancies to the application process, pre-interviewing and help hints for interviewing. There is no magic bullet to getting a job in the natural resources field. However, there are some helpful hints that can put an applicant far ahead of their competitors by just following a few simple steps.

CAMP, MEGHAN J.*, B.A. Woods, J. L. Rachlow, T.R. Johnson, and L.A. Shipley. University of Idaho, Moscow, ID 83843. **WHEN TO RUN AND WHEN TO HIDE: THE INFLUENCE OF VEGETATION STRUCTURE AND DISTANCE TO A REFUGE ON THE PREDATION RISK OF PYGMY RABBITS.**

Predation is one of the leading sources of mortality for pygmy rabbits (*Brachylagus idahoensis*) and antipredator tactics likely influence their habitat use. Sagebrush and other shrub vegetation are the main structural components of pygmy rabbit habitat that provide cover from terrestrial and avian predators. In addition to vegetation structure, pygmy rabbits also rely on burrow systems for protection from predators. We studied the effects of vegetation structure (both concealment and visibility) and distance to a refuge on the distance at which rabbits flee from an approaching threat (flight initiation distance; FID). We tested the hypotheses that 1) FID would increase with decreasing concealment; and 2) FID would increase with distance from burrow entrances. We tested these hypotheses by conducting FID trials on populations of pygmy rabbits in southwestern Montana and east-central Idaho from May to August 2010. We measured concealment at the locations selected by pygmy rabbits using a 15x15-cm profile board, and we measured visibility as the percent of a 1x1-m board that was visible from the point-of-view of a rabbit. Concealment by vegetation decreased perceptions of risk by pygmy rabbits. Our measure of risk, FID, decreased significantly with increasing values of concealment. However, as visibility increased, the relationship between FID and concealment became less pronounced, indicating that pygmy rabbits had an elevated perception of risk at high levels of visibility, regardless of the amount of concealment. Proximity to burrow entrances also influenced perceptions of risk by pygmy rabbits, such that perceived risk was lower when rabbits were on the burrow system than when they were off a burrow system. A more comprehensive understanding of the factors that influence wariness in pygmy rab-

bits will provide insight into how habitat structure mechanistically relates to predation risk and can help to guide habitat restoration and management strategies for sagebrush steppe.

CARLISLE, JAY. Idaho Bird Observatory, Boise State University, Boise, ID 83725. **FLAMMULATED OWL (*OTUS FLAMMEOLUS*) DISTRIBUTION AND ABUNDANCE ACROSS SOUTHERN IDAHO, 2009-11.**

The Flammulated Owl (*Otus flammeolus*) is a 'species of greatest conservation need' (Idaho Department of Fish and Game), is listed as sensitive by the U.S. Forest Service, and as a 'regional/state imperiled' (Type 3) species by the BLM. To improve our current understanding of the distribution and abundance of Flammulated Owls in Idaho, Idaho Bird Observatory conducted standardized nocturnal surveys during the 2009-11 breeding seasons across southern Idaho. Specifically, we conducted surveys in the Owyhee Mountains in southwestern Idaho, the Sawtooth National Forest (NF) and nearby BLM land in south-central Idaho, and the Caribou-Targhee NF in eastern Idaho. We used two approaches for surveys, including (1) randomly-selected, spatially-balanced grids and (2) road-based survey routes. At each survey point, we used a 10-min survey protocol that consisted of alternating silent listening and playback time periods. I examined patterns of detections based on study area and habitat type. Flammulated Owls were found in higher abundance in the Minidoka Ranger District of the Sawtooth NF and low to moderate abundance in the northern portion of the Sawtooth NF, the Owyhee Mountains, and on the Caribou-Targhee NF. We detected owls at points with mature Douglas fir, aspen, ponderosa pine, lodgepole pine, and subalpine fir and also had a few detections in juniper-dominated habitat in the Owyhees. In particular, mature aspen may be an important factor affecting Flammulated Owl presence. These data add important information to our state-level and regional understanding of this enigmatic species.

CARLISLE, JAY[1] and D. Kemner[2]. [1]Idaho Bird Observatory, Boise State University, Boise, Idaho, 83725; [2]Idaho Department of Fish and Game, Boise, Idaho 83707. **THE IDAHO BIRD CONSERVATION PARTNERSHIP: A COORDINATION POINT FOR BIRD CONSERVATION IN IDAHO**.

Many bird species and their habitats in Idaho have experienced long-term downward trends in both abundance and distribution. There also is a lack of knowledge about many bird species and their habitats in Idaho. Successful long-term conservation, recovery, and restoration of birds and their habitats will require a sustained and well-coordinated effort. The Idaho Bird Conservation Partnership (IBCP) can coordinate cooperation among state and federal agencies, non-governmental organizations, private industry, and interested citizens for the management, science delivery, outreach, and conservation of birds and their habitats in Idaho. The IBCP will also strive to implement strategic management and conservation efforts that contribute to the achievement of high priority regional and continental bird objectives aligned with national and state bird conservation initiatives and Idaho's State Wildlife Action Plan.

CASEY, DANIEL[1] and J. Vest[2]. [1]American Bird Conservancy, Kalispell, MT 59901; [2]Intermountain West Joint Venture, Missoula, MT 59807. **LANDSCAPE PRIORITIZATION FOR BIRD CONSERVATION BY THE INTERMOUNTAIN WEST JOINT VENTURE.**

The mission of the Intermountain West Joint Venture (IWJV) is to conserve priority bird habitats through partnership-driven, science-based projects and programs across 495 million ac in the western U.S. We help deliver strategic habitat conservation that meets the objectives of the North American Waterfowl Plan, the U.S. Shorebird Conservation Plan, the Intermountain West Waterbird Conservation Plan, and the Partners in Flight Landbird Conservation Plan. Our 2005 Implementation Plan did this in part by identifying 382 "Bird Habitat Conservation Areas" that covered the 28% of the IWJV land base where priority species, priority habitats and opportunities came together. The diverse partners of the IWJV Idaho State Steering Committee identified 23 such areas in the state. For our 2012 revised Implementation Plan, four science teams worked to convert continental population objectives from the four bird initiative plans to ecoregional scales using population-habitat models to establish quantifiable habitat objectives and identify priority areas for conservation. They include energetic-based models for wa-

terfowl and shorebirds, the identification of key sites for waterbirds, and habitat and density-based models of sagebrush and grassland-dependent landbirds. These models also are permitting the development of spatially-explicit decision-support tools that inform conservation delivery.

CONWAY, COURTNEY. USGS Idaho Cooperative Fish and Wildlife Research Unit, University of Idaho, Moscow, Idaho 83844. **LATITUDINAL PATTERNS IN DEMOGRAPHIC TRAITS OF BURROWING OWLS IN NORTH AMERICA.**

Burrowing Owls (*Athene cunicularia*) have declined in the northern half of their breeding range in North America, and are listed as federally endangered in Canada and a Species of Conservation Concern at both regional and national levels in the United States. I examined how occupancy, population trend, fecundity, and dispersal of Burrowing Owls vary among different vegetative communities, different land uses, and across latitudes throughout their breeding range in North America. I used GIS data layers to quantify land use surrounding 1500 North American Breeding Bird Survey (BBS) routes and a comparative analysis based on estimates of demographic traits from past studies. I used stable isotopes to quantify the proportion of breeders that were recruited from the local population to examine how recruitment varies with latitude. Fecundity (offspring fledged per successful nest) was lower in urban and agricultural study sites compared to those in rural and undeveloped sites. Abundance of Burrowing Owls was positively correlated with agriculture, but population trends were negatively correlated with amount of agriculture within 400m of BBS survey routes. However, Burrowing Owls have increased dramatically in several agricultural areas in the southern portion of their breeding range. Variation in demographic performance of Burrowing Owls among different agricultural landscapes in North America appears to be related to the type of agriculture and the prevailing agricultural practices. Migratory populations at the northern extent of the species' range lay larger clutches but have lower local recruitment and lower annual return rates of breeders. These results have implications for persistence of Burrowing Owls at northern latitudes and in agricultural landscapes.

DIXON, RITA D. Idaho Department of Fish and Game, Boise, ID 83707. **IDAHO STATE WILDLIFE ACTION PLAN REVISION: COLLECTIVE PRIORITIES FOR BIRD CONSERVATION**.

In September 2005, Idaho completed its first Comprehensive Wildlife Conservation Strategy, a congressionally mandated effort by each US state and territory to qualify for continued funding under the State Wildlife Grants Program. The US Fish and Wildlife Service subsequently reviewed and approved the Strategy. Since then, conservation partners throughout the state have implemented the Strategy by effecting conservation actions for many Species of Greatest Conservation Need, and the lands and habitats they depend on. To ensure the relevance and efficacy of these strategies (collectively known as state wildlife action plans [SWAPs]), Congress also affirmed that each state/territory review and revise its respective plan at least every 10 years. As such, the Idaho Department of Fish and Game (IDFG) (as the state agency vested with the formal authority for ongoing development and implementation of the Plan), has begun the review and revision process, which necessarily includes an assessment of priorities in the state, and an update to the Species of Greatest Conservation Need list. The revised plan will also address emerging threats, such as wind energy and climate change. Although responsibility for the Plan rests with IDFG, Congress explicitly stated that the states must coordinate with conservation partners and the public to ensure that the resultant plan addresses the state's collective needs and priorities. Moreover, implementation of the plan requires a coordinated and strategic effort among partners. Consequently, IDFG intends to work closely with the nascent Idaho Bird Conservation Partnership and others to collectively establish bird conservation priorities in the state, and to seek ways to implement appropriate conservation actions.

FINN, SEAN P.[1], R. Sojda[2], Y. Converse[2], and T. Olliff[2]. [1]Great Northern Landscape Conservation Cooperative, Boise ID; [2]Great Northern Landscape Conservation Cooperative, Bozeman, MT. **LANDSCAPE CONSERVATION COOPERATIVES: ENACTING BROAD-SCALE CONSERVATION FROM PLANNING TO ACTION IN IDAHO AND BEYOND.**

Landscape Conservation Cooperatives (LCCs) are public-private partnerships that focus on natural resource challenges which transcend political and jurisdictional boundaries and require a more holistic, collaborative, and adaptive approach to conservation that is firmly grounded in science and strives to ensure the sustainability of America's land, water, wildlife and cultural resources. As a collaborative, LCCs seek to identify best practices, connect efforts, identify gaps, and avoid duplication through improved conservation planning and design. Partner agencies and organizations coordinate with each other while working within their existing authorities and jurisdictions. Each LCC is guided by a Steering Committee made up of key conservation agencies and organizations in the region and all guidance on conservation prioritization, funding, and action are determined by the coordinated action of the Committee; therefore decisions on these conservation elements are attained by 'local' coordination rather than top-down designation.

The Great Northern LCC, which intersects northern and eastern Idaho including the Idaho Batholith, is near completion of a 2-yr process that synthesizes conservation priorities among the 25 organizations represented on the Steering Committee and their partners. This Strategic Conservation Framework identifies priority species, ecosystems, and ecosystem processes across the Northern Rockies and Columbia Plateau based on synthetic summarizations of five state-based Wildlife Action Plans, 40 other regional conservation planning documents, and focused interviews with key personnel across the region. The next steps include refining these priorities to focal ecoregions, coordinating resource-based Partner Forums that tier regional priorities down to system-specific objectives, and initiating collaborative conservation actions, with appropriate monitoring and evaluation, to drive the adaptive management process. This presentation will describe the process used to build shared priorities; the hurdles and roadblocks encountered on the way to large landscape conservation prioritization; and the species, systems, and processes the GNLCC partnership will focus on over the next 5 years.

FRYE, GRAHAM G. *[1], J. S. Forbey[1], and J. W. Connelly[2]. [1]Department of Biological Sciences, Boise State University, Boise, ID 83725; [2]Idaho Department of Fish and Game, Blackfoot, ID 83221. **INFLUENCE OF SAGEBRUSH CHEMICAL COMPOSITION ON DIET SELECTION AND HABITAT USE BY GREATER SAGE-GROUSE.**

The defensive and nutritional chemistry of plants constrains the diet and habitat use of herbivores. The greater sage-grouse (*Centrocercus urophasianus*) is an avian herbivore with a specialized diet of sagebrush (*Artemisia* spp.). Sagebrush contains abundant defensive compounds that exert deleterious effects on vertebrates. We hypothesized that sage-grouse employ a selective foraging strategy to maximize the intake of nutrients and minimize the intake of toxic defensive compounds. We also hypothesized that a selective foraging strategy would influence habitat use on multiple spatial scales. We located foraging sites of radio-marked sage-grouse and collected browsed and unbrowsed plants. We also collected sagebrush at randomized locations throughout the study area. We quantified concentrations of defensive compounds (monoterpenes) and nutrients (calcium, phosphorus, crude protein), and modeled the logit probability of patch-use and plant-use as a function of sagebrush chemical composition. Sage-grouse used dwarf sagebrush (*A. arbuscula* and *A. nova*) habitat more than expected on the basis of availability (Fisher's exact test, $P < 0.0001$, odds ratio = 27.8). Dwarf sagebrush had lower total monoterpene concentrations (x = 626.71 AUC/mg ± 20.6 SE) than Wyoming sagebrush (*A. tridentata wyomingensis*; x = 827.52 AUC/mg ± 35.05 SE), which was used less than expected on the basis of availability. Within dwarf sagebrush habitat, the probability of patch-use increased with crude protein concentration (odds ratio = 1.65, 95% CI = 1.15-2.49). Within foraging patches, the probability of plant-use increased with crude protein concentration (odds ratio = 2.14, 95% CI = 1.02-4.50) and decreased with concentrations

of two monoterpenes: alpha-pinene (odds ratio = 0.76, 95% CI = 0.54-1.07) and 1,8-cineole (odds ratio = 0.79, 95% CI = 0.64-0.96). Our results highlight the importance of sagebrush chemistry in sage-grouse diet and habitat use decisions on multiple spatial scales, and suggest that sagebrush chemistry should be considered in conservation and management efforts.

HUGO, JERRY. Idaho Fish and Game, Coeur d' Alene, Idaho 83815. **THE ST. JOE BUGLE.**

This presentation is meant to show how **ANY** local wildlife professional can share current wildlife management information over email with a diverse slice of society and other agency professionals - that are simply craving truthful information about wildlife in Idaho. This two way avenue of communication joins the public and other agencies with our mission and has benefited wildlife and Idaho Fish and Game in **many** ways. Come and hear how.

KLAUSMANN, JEFFREY, K. Salsbury and E. August. Intermountain Aquatics, Driggs, Idaho 83422. **BIO-ENGINEERED STREAMBANK RESTORATION ON THE LOWER HENRYS FORK SNAKE RIVER.**

The 226-acre Northfork Property lies along the Henry's Fork River west of Rexburg, Idaho, and is part of ≈1,600 acres surrounding the Cartier Slough Wildlife Management Area (WMA) that are protected by conservation easements. Accelerated streambank erosion threatens highly functional natural and restored habitats including 2,710 ft on the Northfork Property. Current bank stabilization techniques rely heavily on rock rip-rap that impedes ecological functions. Despite extensive bank erosion, there are many functional reference reaches where bank stability is maintained by a robust riparian plant community dominated by coyote willow (*Salix exigua).* Working with a diverse public/private partnership and funding from Idaho Fish and Game and the Natural Resources Conservation Service we tested bio-engineered stream restoration techniques on 1,100 linear feet of streambank using a combination of bank re-sloping and heavy planting of actively growing (not dormant) plant materials. Restored species composition and bank morphology were based on stable reference reaches and HEC-RAS hydraulic modeling. Plant materials consisted of two rows of prevegetated coir blankets (aka Wetland Sod), a row of 15" deep-rooted willows between the two wetland sod rows, a row of 30" deep-rooted willows upslope of the second row of sod and two rows of 5 gallon container willows at the top of slope. Snow fencing was temporarily installed in front of the first row of sod to dissipate wave energy during the first growing season. Treatments were established in mid-July 2010 at the anticipated summer base flow levels and irrigated through September to ensure plant establishment. Base flow levels during the summer of 2010 were unusually low and water levels did not reach above the first row of wetland sod. Despite a record flow event in 2011 that resulted in up to 12 weeks of continual inundation for some plant materials, the treatments held with little bank damage.

KNICK, STEVEN T.[1] and J.C. Freemuth[2]. [1]US Geological Survey, Boise, ID 83706; [2]Boise State University, Boise, ID 83725. **IF WE KNOW EVERYTHING THAT WE NEED TO KNOW TO CONSERVE SAGE-GROUSE, WHY AREN'T WE DOING IT?**

Greater sage-grouse (*Centrocercus urophasianus*) currently are a candidate species for protection under the Endangered Species Act. The biological foundation for developing sage-grouse conservation actions is clear. Sage-grouse depend on sagebrush (*Artemisia* spp.) and are most likely to persist when >60% of the surrounding landscape is dominated by sagebrush; viable populations do not occur in landscapes with <25% sagebrush. Sage-grouse also are highly sensitive to many sources of disturbance, including fire and human activities. Although threats to sage-grouse populations may be clear, their solution is a complicated tangle of ecosystem dynamics superimposed on a mosaic of public/private ownerships and multiple management objectives. Conservation measures developed in one region may not be effective elsewhere because of the diversity of environments across the 11 states and 2 provinces in the sage-grouse range. Sage-grouse conservation also is just one of many competing purposes for which public

and private lands are used. Consequently, other uses and perspectives are necessarily part of land use decisions. Thus, key components to successful conservation include not only knowing how to conserve sage-grouse but also an ability to present the relevant science in multiple forums, and to effectively negotiate in the arena in which resource decisions are made. Many of our current ecological, social, and institutional challenges were established over a century ago during the disposition and settlement of the western United States. Given this trajectory and inertia, it is unrealistic to expect immediate results measured in numbers of sage-grouse. Therefore, long-term goals are important and will require a realistic vision that can be achieved by focusing what we know about sage-grouse conservation in those areas having the greatest potential benefit.

KOCHERT, MICHAEL N.[1] and K. Steenhof[2]. [1]USGS, Forest and Rangeland Ecosystem Science Center, Snake River Field Station, 970 Lusk Street, Boise Idaho 83706; [2]Owyhee Desert Studies, 18109 Briar Creek Road, Murphy, Idaho 83650. **LONG-TERM REPRODUCTION OF GOLDEN EAGLES IN RELATION TO HABITAT ALTERATION IN SOUTHWESTERN IDAHO.**

We assessed occupancy and productivity at Golden Eagle nesting territories in the Morley Nelson Snake River Birds of Prey National Conservation Area (NCA) from 1971 to 2011. Preliminary results show that the number of occupied territories declined significantly decreasing from 35 territories in the early 1970s to 25 in 2011. Pairs occupying territories reproduced above the long-term mean in 2011, producing 28 young and 1.1 young per territory. We observed no trend in total number young or young per territory between 1971 and 2011. The lack of a trend in productivity in spite of a declining trend in number of pairs suggests that less productive territories in the NCA have become vacant and a core of productive pairs may be producing most of the young. We recorded four incidences where pairs subsumed a neighboring vacant territory, and in three cases productivity increased in these territories. Preliminary results suggest that only 14 (35%) of the 40 historical territories produced 60% of the total number of young, with the four most productive territories producing 20% of the young. Highly productive territories did not appear to be clustered in any part of the NCA, and 57% of the productive territories occur in extensively burned areas. Continued high production in some territories in extensively burned areas suggests an adaptation by eagles to altered habitats in heavily burned areas.

KOLAR, PATRICK S.* and M. Bechard. Raptor Research Center, Department of Biological Sciences, Boise State University, Boise, ID USA. **IMPACTS OF WIND TURBINES ON *BUTEO* HAWK FLEDGLING MORTALITY IN THE COLUMBIA PLATEAU ECOREGION.**

Production of energy from wind power has expanded throughout the Columbia Plateau Ecoregion (CPE) in recent years. Despite this rapid development, little data has been published that pertains to the response of breeding raptors or their young to wind turbines. Previous studies have provided some evidence that the risk of mortality due to collisions with wind turbines may depend upon age or breeding status, indicating that some life history stages may be impacted differently. Collision mortality for fledglings associated with nests near wind turbines may be of particular concern because juveniles at this stage could lack the necessary flight skills to avoid spinning turbine blades. To determine the impact of wind turbines on juvenile *Buteo* hawk mortality during the post-fledging period, we first located occupied nests for three sympatric species [Ferruginous Hawks (*Buteo regalis*), Red-tailed Hawks (*Buteo jamaicensis*), and Swainson's Hawks (*Buteo swainsoni*)] within 5 km of the nearest wind turbines during the 2010 and 2011 breeding seasons. Next, we selected nests using a gradient-response design and radio-marked 60 nestlings to record location information and determine sources of mortality. In total, the mortality rate was 30% for Ferruginous Hawks (3/10), 20% for Red-tailed Hawks (5/25, excluding two juveniles with failed transmitters), and 22% for Swainson's Hawks (5/23). However, none of these deaths resulted from collisions with wind turbines. A prospective proportional power analysis determined that the sample size should have been sufficient detect a medium or large effect size on juvenile mortality during the post-fledging period. This may indicate that juveniles are less vulnerable to collisions during the relatively short period prior to initiation of natal dispersal compared to other age classes; this could be pri-

marily due to low activity, limited natal range, and the relatively short duration of exposure to wind turbines.

KORTE, ALLISON*, and A. Dufty. Department of Biological Sciences, Boise State University, Boise, Idaho 83709. **URBANIZATION AND AVIAN SPECIES RICHNESS AND ABUNDANCE ALONG THE BOISE RIVER CORRIDOR.**

Riparian corridors provide valuable habitat for breeding, migration, and dispersal activities of birds. However, these ecosystems are popular targets for urban development as they bring wildlife closer to city-dwellers. Boise has mandated a 70-ft buffer between all buildings and the river's edge. This law was implemented to maintain the riparian corridor along the river. However, with increasing population there is added anthropogenic pressure along the river's edge. We examined whether urbanization is associated with decreased avian richness and abundance along the Boise River. We conducted three, 10-min. point-count surveys at 50 sites during the breeding season (May–June), noting the number and species of birds. We used GIS to survey twelve vegetation and four habitat variables to determine percent coverage of riparian area, urban structures, grasses, and shrubs. We then determined the level of tolerance to anthropogenic habitat disturbance of the avian species living in the riparian corridor. Over 80 species were identified during the surveys. They were separated into nesting and foraging guilds to show effects of human disturbances on species composition. We analyzed the data using Akaike Information Criterion Corrected modeling. For example, the presence of birds in the cavity-nesting guild was best described by the presence of live grass, suggesting a need to preserve open habitat. We also analyzed several individual species. For instance, the top model for the Yellow Warbler was characterized by the presence of riparian habitat and the presence of people, suggesting that this species is tolerant of people, as long as riparian habitat is maintained. This study improves our basic understanding of the effects of urban development on avian species along riparian corridors. Additionally, it will help in developing local conservation plans to aide in preserving the attractiveness of riparian areas along the Boise River while minimizing the impacts on the avian community.

LASKOWSKI , MICHELLE*[1], R. Ricklefs[2], and A. Dufty[1]. [1]Boise State University, Department of Biological Sciences, 1910 University Drive, Boise, ID 83725; [2]University of Missouri, Department of Biology, One University Boulevard, St. Louis, MO 63121. **PREVALENCE OF HAEMOSPORIDIAN PARASITES IN MIGRATING IDAHO RAPTORS.**

Many studies have examined blood parasites in raptors during the breeding season but few have examined raptor blood parasites during migration. Migration is energetically demanding, even in healthy birds, and parasitic infections can be a serious threat, especially to young, inexperienced birds. We tested four species of diurnal raptors during their fall migration from 2010 - 2011 for haemosporidian blood parasites *(Plasmodium, Haemoproteus,* and *Leucocytozoon* spp.) using microscopy and polymerase chain reaction: Red-tailed Hawks (*Buteo jamaicensis*), Cooper's Hawks (*Accipiter cooperii*), American kestrels (*Falco sparverius*), Northern goshawks (*Accipter gentilis*), and sharp-shinned hawks (*Accipter striatus*). We compared prevalence and intensity of blood parasites to identify infection patterns between years, sex, and age classes, and as related to the timing of migration. Raptors were more likely to test positive for blood parasites if sampled late in their migration season. We also observed variation of patterns between years, sex, and age classes. In addition, we evaluated the energetic condition and immune system of the bird at the time of capture. We used a simple measure of body condition, absolute and differential leukocyte counts, and heterophil/lymphocyte ratio with regard to the effects of parasite infection. Lymphocytes were the most abundant white blood cell type, with higher numbers in infected than in non-infected individuals, with variations in individuals with multiple infections. These results link pressures of migration with blood parasite prevalence, intensities and the immune cost associated with multiple infections. Host-parasite interactions reflect the overall fitness and help us to understand the physiological and immunological constraints imposed on the host, as well as the ecological factors, such as distribution and

abundance of hosts, parasites and vectors. With the data provided by this study, future, more in-depth research can help us to better understand the physiological cost of parasitic infections in migrating raptors.

LOCKYER, ZACH*[1], P. Coates[2], D. Delehanty[1], and M. Casazza[2]. [1]Idaho State University, Pocatello, ID, 83201; [2]United States Geological Survey (USGS), Dixon, CA, 95620.**GREATER SAGE-GROUSE NEST SITE SELECTION IN THE VIRGINIA MOUNTAINS OF NORTHWESTERN NEVADA: ARE FEMALE CHOICES INFLUENCING SURVIVAL PROBABILITIES?**

Population vital rates of greater sage-grouse (*Centrocercus urophasianus*), currently designated as a candidate species under the Endangered Species Act, within the Great Basin are not well-understood. Nest survival for female sage-grouse may be influenced by habitat-based nest site selection decisions prior to nest initiation. Linking female nest site selection (defined as use disproportionate to availability) to nest survival at multiple spatial scales may provide greater insight to inform conservation and management efforts aimed at improving fitness. In Nevada, we monitored sage-grouse nest survival relative to multi-scale habitat features from 2009 – 2011. At used and random locations we measured microhabitat features in the field (scale, 3.1 ha), and GIS habitat features (scales, 39.2 ha, 147.8 ha, 617.5 ha, and 2470.0 ha) based on seasonal movements of females within our study area. Using maximum likelihood procedures we estimated nest survival at 22.4% (CI, 13.0 – 33.4%), which is substantially lower than other derived likelihood values across sage-grouse range. Female sage-grouse selected nest sites with greater shrub and perennial grass cover at the nest bowl, and selected greater total sagebrush cover at the GIS spatial scales compared to random locations. Nest survival models revealed increased survival with increased horizontal cover and shrub cover at the nest bowl as well as increased survival for females who initiated nests later in the nesting season, perhaps due to increased vegetative cover later. These results suggest that female sage-grouse are making nest site decisions, first, based on larger habitat features such as large expanses of sagebrush. Within these larger spatial scales females are choosing sites at smaller spatial scales with greater perennial grass and shrub cover which also were shown to increase nest survival probabilities. We suggest that management be aimed to maintain or create contiguous tracts of sagebrush while additionally promoting perennial grass and shrub cover on a local scale, specifically during nesting periods, could yield increased fitness.

LONG, RYAN A.*[1], R.T. Bowyer[1], J.G. Kie[1], and W.P. Porter[2]. [1]Department of Biological Sciences, Idaho State University, Pocatello, ID 83209; [2]Department of Zoology, University of Wisconsin Madison, Madison, WI 53706. **LINKING CLIMATIC VARIABILITY TO BEHAVIOR AND FITNESS IN HERBIVORES: A BIOENERGETIC APPROACH**.

Large herbivores often act as keystone species, and consequently are likely to play an important role in responses of ecosystems to climate change. Nevertheless, little is known about how large herbivores respond behaviorally to spatiotemporal variability in the thermal environment. We evaluated direct and indirect influences of the thermal environment on behavior of North American elk occupying a montane forest versus an arid sagebrush-steppe ecosystem. We used a mechanistic biophysical model that combined detailed data on microclimate, topography, habitat, physiology, and morphology to produce estimates of metabolic expenditures by individual elk. Costs of locomotion were also estimated, and predicted levels of energy expenditure were combined with high-frequency location data from GPS collars and data on important fitness correlates such as birth mass of young and body condition of adult females to evaluate relationships among the thermal environment, behavior, energy balance, and fitness of elk. Preliminary results indicate that elk occupying arid sagebrush-steppe habitat face substantially greater demands for energy and water than those occupying forested habitat, particularly during the summer months. During summer, colder operative temperatures at night resulted in metabolic costs that were 5-10% higher for elk in the desert than for those in the montane forest. In contrast, hotter operative temperatures during the day often forced a complete cessation of daytime activity among elk in the desert, and increased evaporative water loss by 75-100% over that experienced by elk in the mon-

tane forest. As a result of these increased costs, the thermal environment played a much more important role in structuring daily and seasonal patterns of behavior among elk in the desert than in the forest. Our results provide important clues about how behaviorally-mediated effects of large herbivores on ecosystem structure and function may be altered as global temperatures continue to rise.

MILLER, ROBERT A.*[1], L.L. Lapinel[1], J. D. Carlisle[1], M. J. Bechard[1], and D. Santini[2]. [1]Idaho Bird Observatory and Raptor Research Center, Department of Biological Sciences, Boise State University, Boise, ID 83725 USA; [2]Minidoka Ranger District, Sawtooth National Forest, Burley, ID 83318 USA.**NORTHERN GOSHAWK (*ACCIPITER GENTILIS*) BREEDING AND PRODUCTIVITY RELATIVE TO PREY ABUNDANCE WITHIN THE SAWTOOTH NATIONAL FOREST.**

The health of an ecosystem is dependent upon the interactions within and among species. Predator-prey interactions often have a disproportionately larger influence on ecosystem health and ecosystem functions than other interactions. It follows that predator-prey interactions must be understood and evaluated as part of any ecosystem health monitoring program. As a top predator within the South Hills of Sawtooth National Forest, the Northern Goshawk provides an ideal model for studying predator-prey interactions in a unique setting. The isolated nature of the mountain range and naturally fragmented forest structure, exhibit the constraints of island biogeography as the top identified food source of Northern Goshawks worldwide, tree squirrels of genera *Sciurus* and *Tamiasciurus*, are naturally absent. To better understand the current status and role of the goshawk in this unique ecosystem, we first measured goshawk occupancy and productivity for comparison with historical measurements. In 2011, we located ten occupied nests located within 24 historical territories, for an occupancy rate of 42%, comparable to the 40% occupancy rate measured during a ten year study between 1994 and 2003. Productivity was also similar with a fledging average of two offspring per successful nest. We then related goshawk productivity and nest success to prey abundance, forest structure, and forest health, to identify the top ecosystem influences affecting goshawk success. We found that avian prey abundance, but not mammalian prey abundance, was a significant predictor of goshawk breeding status even though their breeding season diet was dominated by mammals. This study provides novel data on Northern Goshawk prey consumption and the relationship of consumption to prey abundance, forest structure and forest health, factors important to our understanding of goshawks and their role in the ecosystem. This study provides data important to future management actions within the Sawtooth National Forest.

NICHOLSON, KERRY L., J. Horne, S. Aurther and E.O. Garton. University of Idaho, Moscow, Idaho 83843. **SEASONAL MIGRATION MOVEMENTS OF CARIBOU ON THE NORTH SLOPE OF ALASKA.**

Migration is an important ecological phenomenon that is a critical component to the life history of many plant and animal species. Persistence of large terrestrial migrations are being challenged by over-exploitation, climate change, and anthropogenic forces. These challenges result in habitat destruction and habitat fragmentation by the creation of obstacles and barriers. In Alaska, one of the 4 barren ground caribou (*Rangefer tarandus*) sub-populations, the Central Arctic Herd (CAH), makes large seasonal migrations. However, very little is known about the specifics of their seasonal and migration behavior. Between 2003 and 2007, we collared and monitored 54 female caribou on the North Slope of Alaska. We collected >126,000 locations and calculated individual seasonal ranges for each year (2003-2004 n = 49, 2004-2005 n = 48, 2005-2006 n = 35, 2006-2007 n = 28). The proportion of seasonal range overlap varied at a 90% utilization distribution (UD) between summer and winter (VI = 5-21%) and was virtually nonexistent at a 60% UD (VI = 0-3%). Fidelity of caribou to yearly summer ranges was high, as expected, but the location of their wintering ranges varied. We calculated Brownian bridges for the populations fall and spring migration yearly and then created an averaged route for all 4 years to identify what parts of the landscape were repeatedly used. Retroactive preservation is a challenge for protecting

large expanses of landscape; however, with the appropriate prior knowledge regarding movements, threats, and meta-population structure, protection is often possible by local decision makers.

PAPROCKI, NEIL A.* and J.A. Heath. Boise State University, Boise, Idaho 83725. **WINTERING RAPTOR POPULATION TRENDS IN IDAHO AND THE MORLEY NELSON SNAKE RIVER BIRDS OF PREY NATIONAL CONSERVATION AREA.**

A majority of raptor studies focus on surveys during the breeding and fall migration seasons. However, breeding populations of birds may be partly limited to winter mortality and habitat conditions, which are poorly represented in the scientific literature. The goal of this research was to monitor how wintering raptor populations in Idaho and the Morley Nelson Snake River Birds of Prey National Conservation Area (NCA) have changed over the last 20 years. Variable-radius point counts were conducted at 190 sites in the NCA during the 2010 and 2011 winters following protocols used to monitor these same point count sites from 1991-1994. We then compared raptor population numbers to the historical records from 1991-1994. These species population changes were then compared to Christmas Bird Count (CBC) trends across the entire state of Idaho. The most numerous raptor species' observed in the NCA during the 2010 and 2011 winters were similar to the historical record. However, some species have shown changes in abundance: American Kestrels (*Falco sparvarius*), Northern Harriers (*Circus cyaneus*), Prairie Falcons (*Falco mexicanus*), and Rough-Legged Hawks (*Buteo lagopus*) have all increased in abundance, while Golden Eagles (*Aquila chrysaetos*) and Red-Tailed Hawks (*Buteo jamaicensis*) have stayed similar to the historical record. Some of these trends are consistent with CBC data for the state of Idaho as American Kestrels ($F_{1,49}=12.49$, $P<0.001$) and Rough-Legged Hawks ($F_{1,38}=8.972$, $P=0.005$) have shown significant increases. However, other species' show inconsistent trends with CBC data and the possible causes for this vary between species. The main factor driving increased abundance for many species appears to be climate change as winters in the NCA are becoming significantly warmer, less severe ($F_{1,27}=11.75$, $P=0.002$), with less snow cover ($F_{1,27}=8.45$, $P=0.007$). Climate change may ultimately be shifting the winter range of several key North American raptor species, greatly influencing their conservation planning.

PILLIOD, DAVID S.[1] and R.D. Scherer[2]. [1]U.S. Geological Survey, Snake River Field Station, 970 Lusk St., Boise, Idaho 83706; [2]Colorado State University, Department of Fish, Wildlife and Conservation Biology, Fort Collins, Colorado 80523. **THE DEMOGRAPHY OF SOURCES AND SINKS IN AN AMPHIBIAN METAPOPULATION**.

The discrete habitats occupied by subpopulations of a metapopulation often vary in character such that survival and production vary through time. We examined this hypothesis by analyzing the demographics of 12 subpopulations within a metapopulation of Columbia spotted frogs (*Rana luteiventris*) in central Idaho. Preliminary results suggest that adult survival was high (82-83%) and did not vary among subpopulations. Our results also suggest that reproduction was high, with successful breeding occurring about 75% of the time over the last 16 years in all but three subpopulations. Despite fairly stable reproduction, recruitment of juveniles and recruitment of adults varied widely among subpopulations and among years, suggesting that factors influencing metapopulation dynamics vary spatially and temporally. Preliminary analyses indicate that only three subpopulations functioned consistently as sources (lambda > 1), whereas the others either functioned as sinks (lambda < 1) or fluctuated between source and sink. Understanding the demography of subpopulations can help explain the persistence of species in heterogeneous landscapes and aid conservation and management decisions regarding habitat protection.

RICH, TERRELL D. U.S. Fish and Wildlife Service, 1387 S. Vinnell Way, Boise, ID 83709. **USING SPECIES VULNERABILITY ASSESSMENT TO REDUCE UNCERTAINTY IN SETTING BIRD CONSERVATION PRIORITIES IN NORTH AMERICA.**

There are a variety of ways to predict the effects of climate change on species, habitats and ecosystems. The objective of species vulnerability assessment (SVA) is to determine if there are species or species

groups that are more vulnerable than we might otherwise have thought. The strength of SVA is that it seeks to evaluate the capacity of species to adapt to any major stressor, whether climate change or something else. SVA also separates the uncertainty about a species' capacity from the uncertainty in climate-habitat predictive models. This should help sharpen our modeling and conservation focus. I examined 10 species traits, e.g., mean clutch size and migration distance. Each of these traits can be scored and total scores then used to array species or groups of species along a vulnerability axis. There are complete data for 668 North American bird species. Principle components analysis shows that the 10 species traits are largely independent. Vulnerability scores are consistent with those from the 2010 State of the Birds Climate Change analysis, but not highly correlated (r^2=0.30). Vulnerability scores are also consistent with Partners in Flight species assessment scores (r^2=0.55) and with IUCN risk categories. Among major bird groups, waterbirds and shorebirds are the most vulnerable, followed by landbirds and waterfowl. Among families with more than 8 species, the Alcidae are most vulnerable. However, the Trochilidae are second, scoring as more vulnerable than shorebirds and other waterbirds. The latter is the sort of unexpected result we need to examine more carefully.

RICH, TERRELL D. U.S. Fish and Wildlife Service, 1387 S. Vinnell Way, Boise, ID 83709. **THE NORTH AMERICAN CONTEXT FOR SETTING LANDBIRD CONSERVATION PRIORITIES IN IDAHO.**

The Partners in Flight (PIF) North American Landbird Conservation Plan (2004) established conservation priorities for the 448 species of landbirds that regularly breed in the US and Canada. Species were evaluated on 6 metrics of future vulnerability – 4 based on data and 2 based on expert opinion. This PIF Species Assessment Process allows species to be arrayed from least vulnerable to most vulnerable along a continuous scale. The results have been widely used as the foundation for bird conversation priority setting, such as the U.S. Fish and Wildlife's Birds of Conservation Concern, state Wildlife Action Plans, Joint Venture Implementation Plans and many more. PIF also estimated the global population sizes of all 448 species and set population objectives. Population size and objective for each species was then stepped down to 3 finer scales – Bird Conservation Region (BCR), state, and BCR x state polygon. This provides specific, measurable numbers for use in conservation design and for setting project-level objectives. In 2010, PIF released Saving Our Shared Birds: The Partners in Flight Tri-National Vision. Preparation for this assessment of all 882 species of landbirds that regularly breed in the US, Canada, and Mexico let to a reevaluation of those species among the original 448 that breed in the US and Mexico. I will discuss how this assessment will affect current priorities in North America. Finally, in 2005 PIF released a Monitoring Needs Assessment which identified those species for which current monitoring of long-term population trend is not sufficient. The Monitoring Needs Assessment should be updated, taking advantage of data gathered since 2005. This is also fundamentally important information for bird conservation partnerships to use when setting priorities.

RINKES, TOM, P. Makela, and B. Ralston. Bureau of Land Management, Boise Idaho 83709. **THE BLM NATIONAL GREATER SAGE-GROUSE PLANNING STRATEGY: IMPLICATIONS FOR SHRUBSTEPPE HABITAT PRIORITIZATION IN IDAHO.**

Recent decisions by the U.S. Fish and Wildlife Service (FWS) in March 2010 to list the Greater Sage-grouse *(Centrocercus urophasianus)* as "warranted but precluded" and subsequent litigation between FWS and various groups have resulted in accelerated timelines to address final listing determinations for the species. As the largest single land manager of Greater Sage-grouse habitats the Bureau of Land Management has begun a west wide planning effort to revise 68 resource management plans involving more than 57 million acres of public lands across the range of the Greater Sage-grouse. In Idaho and southwestern Montana, this planning effort will involve revision of 23 resource management plans and address needed greater sage-grouse conservation measures in those plans involving 12.7 million acres of public lands. In addition, the U.S. Forest Service National Forests that support important sage-grouse

habitats will have cooperating agency status and will revise forest plans as part of this effort. The inclusion of science based conservation measures in those land use plans and forest plans are needed to provide the FWS the knowledge that adequate regulatory mechanisms are in place for managing the species over much of the their range. The conservation measures and the large landscapes that are required by greater sage-grouse will likely benefit many sagebrush dependent species and other species found in the sagebrush matrix.

ROBERTS, SHANE, H. Miyasaki, and D. Meints. Idaho Department of Fish and Game, Idaho Falls, Idaho 83401. **INTERSTATE MOVEMENTS OF ELK IN THE CENTENNIAL/HENRY'S LAKE MOUNTAINS OF EASTERN IDAHO**.

Elk management objectives, and associated harvest strategies, in the Centennial (CM) and Henry's Lake Mountains (HLM) have differed between Idaho and Montana during the 21st century. Idaho significantly reduced harvest in response to declining Island Park elk population estimates while Montana liberalized harvest in response to increasing agricultural depredations. Although elk in this area have effectively been managed as independent populations by each state, data from a Montana research project suggested a large amount of seasonal interchange across the Idaho-Montana border. We studied the fall movements and winter migration of elk calves born on the Idaho side of the CM/HLM to further investigate this interchange and its potential impact on harvest and population estimation,. During the springs of 2009 and 2010, we captured 80 (2009 HLM = 38, 2010 CM = 42) neonatal elk calves and fitted them with expandable VHF radio-collars. We monitored calf survival daily for 13 weeks post-capture and overall survival during this time period was 83% (95% CI = 75% - 92%). We used fixed-wing telemetry flights at the beginning of each major Idaho elk hunting season (i.e., A-tag archery, controlled antlered, A-tag spike only, controlled antlerless or either sex), and during winter, to determine harvest availability and winter destination of collared elk. In both years combined, 77% - 88% of calves (n = 45 - 56) were in Idaho at the start of each of Idaho's elk hunting seasons. However, ≥80% of calves available during Idaho's hunting seasons migrated to winter ranges in Montana. Of the 37 calves that were monitored throughout the winter migration, 5 (14%) wintered within the area typically surveyed to estimate Idaho's Island Park elk population. The results of this study highlight the need for effective interstate cooperation in managing this elk population.

ROBINSON, SCOTT. Bureau of Land Management, Coeur d'Alene, Idaho 83815. **CAPT'N, THERE BE EAGLE WATCHERS!**

The arrival of bald eagles (*Haliaeetus leucocephalus*) at Lake Coeur d'Alene in northern Idaho is an anticipated event for many people. The Bureau of Land Management (BLM) has hosted the annual *Coeur d'Alene Eagle Watch Week* from 1991 to the present time, with the exceptions of 1995 and 2008. Since 1994, eagle watchers have recorded their mailing zip code, number of people in their group, hours of their stay, and comments. More than 53,600 eagle watchers came to Lake Coeur d'Alene during 105 days of advertised viewing during the 15 years of this study. Although the total eagle watchers for any year varied, an average of 3,576 people came each year or 511 per day. Sixty-eight percent of eagle watchers came from local Kootenai County, Idaho and neighboring Spokane County, Washington. The remaining 32% came from everywhere else including all 50 American states and 37 different foreign countries. After Washington and Idaho, California provided the third greatest number of all eagle watchers. California also provided the greatest number of individual zip codes from all states. These numbers reflect the migration of people from California to Idaho and Washington during these 15 years. The distance population of eagle watchers increased as the local population of eagle watchers from Kootenai and Spokane counties decreased during these 15 years. Thirty percent of eagle watchers expressed the exaltation, exhilaration, and excitement of seeing bald eagles. Another 14% were well pleased and impressed by our education display, courteous staff, and viewing telescopes. An additional 13% offered a hardy "Thank You" to the agency and volunteer staff. This information may help recreation specialists and wildlife biologists to better understand and serve their public.

SAUDER, JOEL D.[1] and J. Rachlow[2]. [1]Idaho Department of Fish and Game, 3316 16th Street, Lewiston, ID 83501; [2]Department of Fish and Wildlife, University of Idaho, Moscow, ID 83844-1136. **LANDSCAPE LEVEL HABITAT SELECTION OF FISHERS (MARTES PENNANTI) IN NORTH-CENTRAL IDAHO.**

The fisher (*Martes pennanti*) is a rare forest carnivore that is generally associated with mesic, closed canopy, mature forests across its distribution. However, habitat use and selection by fishers in the Northern Rockies are poorly studied, and a better understanding of their habitat needs would contribute to development of conservation plans in multi-use forest landscapes. Between 2007 and 2010, we deployed Argos satellite telemetry collars on 26 fishers in north-central Idaho. To evaluate habitat selection at the landscape scale, we employed a conditional logistic regression approach contrasting known occupied home ranges with pseudo home ranges of equal size and shape located at random within our study area. We developed a suite of *a priori* models of habitat selection based on current knowledge of the habitat requirements of fishers and landscape ecology principles. We analyzed LANDFIRE GIS habitat layers using Program FRAGSTATS to calculate landscape habitat composition and configuration metrics and evaluated support for our competing models in an information theoretic framework. Fishers did not locate their home ranges at random on the landscape, but instead selected areas with increased abundance of mature forest. In general, habitat configuration did not contribute substantially to explaining habitat selection beyond metrics of habitat composition. Overall, selection for mature forest habitat was better supported than selection for high canopy cover or selection against low canopy cover.

SMITH, SONJA M. [1], P.R. Krausman[2], and G. Painter[3].Wildlife Biology Program, University of Montana, Missoula, MT 59812, USA; [2]Boone and Crockett Program in Wildlife Conservation, College of Forestry and Conservation, University of Montana, Missoula, MT 59812, USA; Idaho Department of Fish and Game, Salmon, ID 83467, USA. **WINTER HABITAT USE BY MULE DEER IN IDAHO AND MONTANA.**

Winter survival for species such as Rocky Mountain mule deer (*Odocoileus hemionus hemionus*) depends on an energy conservation strategy where they use habitats at lower elevations and on south facing slopes with adequate thermal or canopy cover. However, not all mule deer habitats are equivalent in components or weather conditions, which contribute to differences in habitat use patterns and behavior among wintering populations. We examined winter habitat use by mule deer on the East Front of the Rocky Mountains, Montana, and Warm Springs and Sink Creek, east-central Idaho to determine how weather and vegetation affect habitat use in different winter ranges. We used radiotelemetry to locate adult female mule deer and estimated microsite habitat conditions including wind speed, snow depth, percent cover of individual plant species, hiding cover, and canopy cover during winter 2010—2011. We compared data at deer locations to random locations across each study area using logistic regression, developing models based on pooled data for each study area, times of snow accumulation, and times of high wind speeds (for the East Front). We evaluated model fit using a Receiver Operating Characteristic (ROC). Our final models indicated that deer use different habitat components on different winter ranges. On the East Front, a combination of landscape and weather variables predicted probability of deer use of areas. These included percent cover of trees, creeping juniper (*Juniperus horizontalis*), buffaloberry (*Shepherdia canadensis*), curly sedge (*Carex rupestris*), prairie sagewort (*Artemisia frigida*), whitemargin phlox (*Phlox albomarginata*), percent slope, snow depth, wind speed, and exposure to wind. These and additional covariates changed in magnitude depending upon weather conditions. Model covariates also changed depending on deer behavior. In Idaho, tall threetip sagebrush (*A. tripartita tripartita*) and phlox (*Phlox* spp.) were important predictors of mule deer habitat use, while tall threetip sagebrush and cumulative forbs predicted use of areas under snow conditions. Mule deer habitat use differed between Idaho study areas. In the Warm Springs study area, covariates related to foraging predicted habitat use whereas in Sink Creek, covariates related to thermal or hiding cover predicted habitat use. Differences

among all 3 study areas indicate that deer use different habitat components under different winter conditions. Discrepancies among winter ranges are important considerations for habitat requirements of mule deer.

STIRLING, JIM. Idaho Department of Fish and Game, Jerome, ID. **K-9 UNIT IDFG.**

In 2011, Idaho Department of Fish and Game commenced a new pilot program utilizing dogs to assist conservation officers in detecting and apprehending wildlife violators. K9 "Pepper" has amazing abilities and has already proved useful to officers in the Twin Falls area. This session will cover how IDFG built the program, the K9's unique skill set, and how officers are using this new tool to enforce game laws.

SURONEN, ELISE F.* and B.A. Newingham. University of Idaho, Moscow, Idaho 83844-1133. **NORTHERN IDAHO GROUND SQUIRREL HABITAT RESTORATION: INSIGHTS INTO TREATMENT EFFECTS.**

The northern Idaho ground squirrel (NIDGS, *Urocitellus brunneus brunneus)* is endemic to the West Zone of the Payette National Forest. In 2000, the NIDGS was listed as threatened primarily due to habitat loss. Fire suppression has altered the open habitat of the NIDGS due to increases in ponderosa pine forest density and extent; therefore, recovery plans encourage the use of thinning and burning to open up encroached habitat. We collected data on habitat attributes altered by thinning and burning at three sites selected for NIDGS habitat restoration. Sites included an occupied unit and a thinned and burned unoccupied unit. We sought to assess whether treatments generate habitat features commonly associated with NIDGS. Unoccupied sites had higher densities of ponderosa pine and higher levels of regeneration across trees size classes compared to areas occupied by NIDGS. NIDGS habitat canopy cover was less than 25%, while unoccupied sites before and after treatment had an average canopy cover greater than 25%. Understory vegetation structure was reduced at the unoccupied sites after treatment making those sites structurally more similar to squirrel habitat. Litter layer was thicker before treatment, but after thinning and burning the litter layer depth was similar to occupied sites. Soil acidity decreased slightly after the treatment toward levels analogous to areas with squirrels. Understory characteristics were altered to resemble currently occupied NIDGS habitat one-year after thinning and burning; however, overstory attributes did not change one-year post-treatment. Our study captures the initial effects of thinning and burning treatments. By quantifying NIDGS habitat and measuring treatment effects, our results will better inform managers about their restoration practices to attain recovery goals.

SVANCARA, LEONA K. Idaho Dept of Fish and Game, Moscow, Idaho 83843. **ASSESSING THE VULNERABILITY OF SPECIES AND ECOSYSTEMS TO CLIMATE CHANGE: AN UPDATE FOR IDAHO.**

Future climate changes projected for the Pacific Northwest will affect the region's species and ecosystems in a multitude of ways, presenting challenges for conservation and natural resource managers. IDFG is a partner in a large, collaborative research project designed to assess the vulnerability of species and ecosystems to potential future climate changes in the Pacific Northwest. The study uses downscaled future climate projections and models to simulate vegetation and species responses to future climate changes. An overview of the entire research project will be provided and results from the first phases of the study will be presented including examples of the downscaled future climate change projections, vegetation simulations, relative species sensitivities and species distribution models. The implications of these projected future climate changes for conservation and natural resource planning will be discussed, with a particular focus on the Idaho State Wildlife Action Plan.

SWIFT, CHARLES*, A. Hudak, K. Vierling, L. Vierling, and J. Vogeler. University of Idaho, Moscow, ID, 83844. **MODELING BROWN CREEPER OCCUPANCY USING LIDAR DERIVED FOREST CANOPY METRICS**.

In western coniferous forests where the abundance of old growth stands are decreasing, species such as the Brown Creeper (*Certhia americana*) may be useful as indicator species for monitoring the health of old growth systems because they (1) exhibit strong associations with habitat characteristics associated with old growth and (2) are especially sensitive to forest management. Light Detection and Ranging (LiDAR) is a remote sensing technology useful for acquiring fine-resolution, three-dimensional vegetation structure data across broad spatial extents. LiDAR derived canopy metrics were used to model Brown Creeper occupancy of forested landscapes in 2 north-central Idaho coniferous forests. Upper canopy (20 – 30 meter) density was the most important structure variable for predicting Brown Creeper occupancy in our study sites, although mean height and height variability were also included in the top models following AIC model selection. The upper canopy was twice as dense in occupied sites as compared to unoccupied sites, and mean height (m) was almost 50% higher in occupied sites than unoccupied sites. Performance of the LiDAR derived model was strong and we were able to map occupancy probabilities of Brown Creepers in ~ 60,000ha of forest. In addition, we evaluated the model in mapping occupancy probabilities using LiDAR data acquired 6 years earlier to determine the usability of older LiDAR data and the potential for quantifying species specific habitat change where multiyear LiDAR datasets are available. Maps of occupancy probability can be used at the local, forest stand, and landscape scale, and illustrate the potential utility of LiDAR-derived data for studies of avian distribution and management in forested landscapes.

TAYLOR, MARK S. Idaho Department of Fish and Game, Coeur d'Alene, ID 83815.
THE WATERLIFE DISCOVERY CENTER: GETTING HUNTIN' BOOTS AND BIRKENSTOCKS TALKING.

In 2001, the Panhandle region of IDFG embarked on a journey of transforming part of the Sandpoint Hatchery grounds into a nature center. While the Department owned the 10 acres, it had little to no money to put toward this project. The challenge posed was to build it with volunteers, contributions, and grants. Ten years later, with the assistance and support of the Kootenai and Bonner County communities, we have a fully functioning and robust "WaterLife Discovery Center." It provides an opportunity for people of all ages to enjoy and learn about nature and to understand the role water plays in our environment. The Learning Building may be reserved for meetings or classrooms, or the general public may take a self guided tour of the grounds. The Center itself provides people from all walks of life to gather around a common interest: learning about our natural world. However, just as important was the building process It was a truly a community effort that engaged diverse groups of people with all sorts of political philosophies. People wearing Hunting boots and people wearing Birkenstocks set aside their differences to labor side by side on a project that promoted Conservation…as well as the community in general.

UNNASCH, ROBERT[1] and S. Buttrick[2]. [1]The Nature Conservancy, Boise, Idaho 73702; [2]The Nature Conservancy, Portland, Oregon 97214. **INTEGRATING CLIMATE RESILIENCE INTO REGIONAL CONSERVATION PLANNING; REVISING TNC'S COLUMBIA PLATEAU ECOREGIONAL ASSESSMENT.**

Ecoregional Assessments are a widely accepted process for identifying areas of critical conservation importance and designing portfolios of conservation areas that, in total, should protect all native biodiversity within a region. Over the past decade The Nature Conservancy and its partners have completed Ecoregional Assessments for all 63 ecoregions in North America. As our understanding of the consequences of climate change has improved, it is now clear that traditional ecoregional assessment methods -- based entirely on the distribution of biotic conservation targets -- are insufficient. The nature Conservancy is developing a toolset that allows conservation planners to measure both geophysical diversity and conductivity and multiple spatial scales. We are currently implementing this toolset across several northwestern ecoregions, including the Columbia Plateau. Through this process we will identify areas

that are most likely to be resilient to impacts of climate change. We will be integrating this resilience information with a conservation portfolio based upon Land Facets and a portfolio based upon current biodiversity in the Columbia Plateau. The resulting combined conservation portfolio should include conservation areas that have high internal resilience to climate change, are highly interconnected providing high regional resilience, and capture the full suite of both biotic and geo-physical diversity. In short, we hope this new portfolio captures both the geophysical stage and all biological actors in this ecoregional play.

UTZ, JAMIE*[1], J. Forbey[1], J. Rachlow[2], and L. Shipley[3]. [1]Boise State University, Boise ID 83725; [2]University of Idaho, Moscow ID 83844; [3]Washington State University, Pullman, WA 99163. **UNDERSTANDING THE TRADE-OFF BETWEEN SAFETY AND FOOD QUALITY IN PYGMY RABBITS.**

Conserving a sensitive animal species requires understanding the simultaneous tradeoffs between food and shelter within a landscape. Most management approaches only consider singular factors like percent cover at landscape spatial scales. Quantifying the synergy between food and cover quality at a scale relevant to a foraging animal could better reveal the forces that shape habitat use. To better understand habitat use components, we investigated tradeoffs between predation risk and diet quality in a sagebrush endemic, the pygmy rabbit (*Brachylagus idahoensis*). This species is a rare example of a specialist herbivore that relies almost entirely on sagebrush for cover and 50-99% of its diet. We hypothesized that pygmy rabbits would forage in areas with low predation risk and high quality food, but would trade off lower predation risk for higher quality food. We compared food intake of pygmy rabbits during three double-choice trials designed to elicit tradeoffs by varying the levels of predation risk (cover) and food quality (toxicity). Rabbits ate under dark cover and preferred non-toxic food. However, interaction results suggested that the value of cover can decrease if food quality is low and that the value of quality food can be reduced if cover is not optimal. Furthermore, foraging decisions by individual rabbits suggested strong variation in tolerance of toxins or predation risk. Preliminary field studies also show that heterogeneity of diet and cover quality in the sagebrush landscape could influence habitat use by pygmy rabbits, creating the potential for tradeoffs between food quality and cover. Interactions between diet quality and cover can influence foraging behavior and shape patterns of habitat use, and understanding these effects can contribute to habitat management for pygmy rabbits and other mammalian herbivore specialists.

WHITING, JERICHO C. [1], Daniel D. Olson[2], Justin M. Shannon[3], R. Terry Bowyer[4], Robert W. Klaver[5], and Jerran T. Flinders[6]. [1]Gonzales-Stoller Surveillance, 120 Technology Drive, Idaho Falls, Idaho 83401; [2]Department of Wildland Resources, Utah State University, 375 BNR, 5230 Old Main Hill, Logan Utah 84322; [3]Utah Division of Wildlife Resources, 319 N Carbonville Road, Price, Utah 84501; [4]Department of Biological Sciences, Idaho State University, Pocatello, Idaho 83209-8007; [5]U.S. Geological Survey, Earth Resources Observation and Science Center, Sioux Falls, South Dakota 57198; [6]Department of Plant and Wildlife Sciences, Brigham Young University, Provo, Utah 84602. **TIMING AND SYNCHRONY OF BIRTHS IN BIGHORN SHEEP: IMPLICATIONS FOR REINTRODUCTION AND CONSERVATION.**

Timing (mean birthdate) and synchrony (variance around that date) of births can influence survival of young and growth in ungulate populations. Some restored populations of ungulates may not adjust these life-history characteristics to environments of release sites until several years after release, which may influence success of reintroductions. We quantified timing and synchrony of births from 2005 to 2007 in 4 populations of reintroduced bighorn sheep occupying 2 ecoregions (Central Basin and Range and Wasatch and Uinta Mountains) in Utah, USA, to investigate if bighorns would adjust these life-history characteristics to environmental conditions of the 2 ecoregions. We also compared timing and synchrony of births for bighorns in their source herd (Antelope Island) with bighorns in an ecologically similar release site (Stansbury Mountains) during 2006 and 2007. Although only separated by 57 km, bighorn populations occupying the Central Basin and Range Mountains gave birth an average of 29 days earlier than those on the Wasatch and Uinta Mountains, which corresponded with the initiation of vege-

tation green-up. Additionally, bighorn sheep on the Stansbury Mountains (ecologically similar release site) gave birth at similar times as bighorns on Antelope Island (source area). Our results indicate that consideration should be given to the adjustment of timing and synchrony of births when reintroducing bighorns, especially when animals are released into different ecoregions. Also, biologists should select release sites that are ecologically similar to sources areas, thereby reducing potential negative effects of animals adjusting timing and synchrony of births to environmental conditions of restoration areas.

WOODS, BONNIE A. *, M.J. Camp, and J.L. Rachlow. Department of Fish and Wildlife Resources, Department of University of Idaho, Moscow ID 83843-1136. **WHAT ARE THE EFFECTS OF PRESCRIBED BURNING AND CONIFER ENCROACHMENT ON PYGMY RABBIT HABITAT?**

As a sagebrush specialist, the pygmy rabbit (*Brachylagus idahoensis*) relies on big sagebrush *(Artemesia tridentata spp.)* for both forage and protection from predators. Fire and conifer encroachment can markedly alter sagebrush habitats and might change both quality and quantity of habitat for this sensitive species. We investigated how spring prescribed burns, designed to reduce densities of conifer species at the conifer-sagebrush ecotone, affect potential forage and cover resources for rabbits. During June-August 2011, we studied burns that occurred from 5 to 32 years ago, as well as areas of conifer encroachment, ranging from low to high density, in Idaho and Montana. We compared habitat characteristics in both encroached and burned areas to those in adjacent, undisturbed sagebrush sites. We predicted significant changes in sagebrush and conifer densities, and alterations in understory plant composition and biomass. Preliminary results indicate that slight and mid levels of encroachment are similar to undisturbed sites, but both burned areas and heavy levels of conifer encroachment diverge from undisturbed areas in terms of concealment and visibility (properties which impact pygmy rabbit predation risk), and quantity and diversity of potential forage plants. Fire and heavy conifer encroachment appear to decrease concealment and increase visibility. Forage forbs and grasses increase in burned areas, while sagebrush cover decreases, until approximately 22 years after the burn. All forage resources decrease with heavy conifer encroachment. We are analyzing data from both types of habitat change to characterize the magnitude and temporal patterns of each on cover and forage for pygmy rabbits. This information can contribute to habitat management plans for high-elevation sagebrush sites where conifer encroachment is of concern to land managers.

Abstracts of To The Point Papers

Presented at the 2012 Annual Meeting of Idaho Chapter of The Wildlife Society. Presenter names are capitalized.

BECK, JASON. Idaho Department of Fish and Game. **INTRASPECIFIC COMPETITION ON EMERGENCY WINTER FEEDGROUNDS IN SE IDAHO.**

Attempts to decrease winter mule deer mortality with artificial feeding generally fall short of public expectations, yet elk are regularly fed to prevent starvation and increase production. I placed motion activated cameras on feedgrounds in Idaho to determine whether intraspecific competitive behaviors influence this difference in success. Elk (N=10, x=183s) spent 60% more time at a feed pile than mule deer (N=17, x=115s). I observed that deer (N=96) were 14.1 times more likely to become engaged in direct intraspecific competition than elk (N=413). This study indicates that competitive behavior is contributing to the failure of deer feeding.

BERGEN, SCOTT. Idaho Department of Fish and Game. **THE RECENT HISTORY OF VEGETATION GROWTH IN IDAHO, A DATABASE PLAN LOOKING FOR COMMENTS.**

Vegetation productivity has been monitored using remotely sensed satellite data for over thirty years using indices such as the Normalized Difference Vegetation Index (NDVI). NDVI records the amount of chlorophyll within a study area and has been recorded from satellites daily since the late 1970's. In this talk we present a prospectus for collecting this satellite data, processing it into 'user friendly' formats for the purposes of providing data on vegetative growth patterns across Idaho for wildlife and habitat analysis purposes.

CARSON, MARK. Idaho Department of Fish and Game. **THE POACHING DOUBLE DOWN: DEER AND ELK POACHING RATES.**

A snapshot of Unit 69, glancing into illegal harvest; detection rate multiplying effects, and how it compares to the "legal harvest" of Big Game Unit 69.

DIXON, RITA. Idaho Department of Fish and Game. **IDAHO'S STATE WILDLIFE ACTION PLAN REVISION.**

In fall 2005, Idaho completed its first State Wildlife Action Plan (formerly known as Comprehensive Wildlife Conservation Strategy). Congress requires that each US state and territory review and revise its respective plan at least every 10 years. Over the next three years, the Idaho Department of Fish and Game will be coordinating with conservation partners statewide to revise the existing Plan.

DOERING, BILL[1], J.Whiting[2], B. Bosworth[3], and R. Cavallaro[3]. [1]Power Engineers; [2]Gonzales-Stoller Surveillance; [3]Idaho Department of Fish and Game. **IDAHO NATIONAL LABORATORY (INL) BAT MONITORING UPDATE.**

Addressing region-wide concerns about bats facing emerging threats (e.g. wind energy development, white-nose syndrome, and habitat degradation) requires good information on species distribution, status, important habitats, movement corridors, and seasonal occurrence patterns. For Idaho bats, however, data are sorely lacking and no framework exists to coordinate efforts, share limited resources, standardize methods, and archive compiled regional data. In September of 2011, the Eastern Idaho Bat Monitoring collaborative (a.k.a. "The Fellowship of the Wing") was formed to begin tacking these issues. Collaborative partners include IDFG, BLM, Forest Service, US Fish and Wildlife Service and INL. To support shared goals and address site-specific bat conservation planning, a substantial bat research program at the INL has been initiated. To begin data collection, twenty-three AnaBat SD2 units and supporting equipment were obtained, In November 2011, we established permanent bat acoustical monitoring stations at the 8 INL facilities and at the 3 largest known bat hibernacula (Middle Butte,

Aviator, and Rattlesnake Caves). An update will be provided and future research plans will be briefly presented.

FORBEY, JENNIFER. Boise State University. **HUNGRY HERBIVORES IN A CHANGING CLIMATE.**

Brief presentation description (2-3 sentences): Fire, drought, and rises in CO2 will increase the chemical defenses in plants and these chemicals are likely to become more toxic to herbivores with increasing temperatures.in current conservation strategies.

GARWOOD, ROBIN. Sawtooth National Recreational Area. **SWIMing IN THE WILDERNESS: INTEGRATING WILDLIFE SURVEYS INTO WILDERNESS MANAGEMENT.**

The Sawtooth Wilderness Inventory and Monitoring (SWIM) Project was developed in order to determine baseline conditions within the Sawtooth Wilderness and determine change over time. The need for the project came about after the Sawtooth Wilderness Management Plan revision was completed in 1997 in which standards and indicators of desired conditions were developed from natural resources specialists and the public. The project began in 2000 and has been implemented every year since then. I'll discuss how wildlife and wildlife habitat condition are part of this inventory and monitoring effort.

HOLDERMAN, JILL. Bureau of Land Management. **RAPTOR MIGRATION UTILIZING SATELLITE TRANSMITTERS.**

The idea is to look for pinch points for migration routes. Are their specific routes to consider limiting structures (powerlines or wind farms), are the routes the same going north to south as they are south to north? Is migration time similar between cooperhawks and red-tailed hawks, or is one species time to migrate a lot longer leaving them more susceptible to manmade obstacles in the migration path. Currently focusing more on units with GPS attached to attempt to retrieve elevational data that would be useful for the Airforce Base.

HOLDERMAN, JILL. Bureau of Land Management. **SATELLITE TRANSMITTERS ON GOLDEN EAGLES WITHIN THE MORLEY NELSON BIRDS OF PREY NCA.**

The NCA has experienced numerous habitat altering fires since previous work was conducted on golden eagle home ranges, and diets (mid 1990's). This focus will be to compare some of data of recently tagged birds with info from the 1990's to determine if there is a change in territory , and seasonal foraging areas. There is the intent to follow-up with some diet work to compare to the earlier data as a fair amount of habitat supporting jack rabbits has been lost to wildfire. Hopefully this information will aide in focusing restoration efforts within the NCA.

HOWE, ROBERT. Idaho Department of Fish and Game. **OPERATION OR/IDA.**

This is a presentation of poachers from Idaho and Oregon working together to try and cheat the system and harvest trophy species. Based on a search warrant conducted by the Oregon State Police, IDFG received hours of video tape documenting poaching activities and mentality. The presentation will feature the "low"-lights of that video.

OELRICH, KATIE, S. Nadeau, and J. Struthers. Idaho Department of Fish and Game, 3101 S. Powerline Rd., Nampa, Idaho. **COMPARING THE USE OF DNA HAIR SNARES, LIVE CAPTURE, AND TRAIL CAMERAS FOR OBTAINING POPULATION DENSITY ESTIMATES IN SOUTHWESTERN IDAHO.**

DNA was collected from 4 different populations of bears from 2007 through 2011 including the Middle and North Forks of the Boise River (Unit 39), Little Weiser River and Middle Fork Weiser River (Unit 32A), Middle Fork of Payette River (Unit 33), and the Deadwood River drainage (Unit 34). Through

2011, 422 individual black bears were identified. Preliminary modeling generated black bear density estimates of approximately 0.75 bears/sq. mile in the Unit 39 study area (heavily hunted) and 1 bear/sq. mile in Unit 32A (lightly hunted). Mark/recapture data were analyzed for the Unit 39 live capture effort where we marked 39 bears over 2 years, and produced a population estimate of approximately XX bears/sq. mile. Trail cams will be set during the summer 2012 to develop a population estimate using the mark-resight technique. The three population estimates will be compared, and the techniques will be analyzed for cost, ease of use, and reliability of results.

RYDALCH, JOSH and D. Cureton. Sand Creek WMA, Idaho Department of Fish and Game. **TRUE BROME-ANCE: A LOVE AFFAIR WITH KILLING EXOTIC GRASSES.**

Can smooth brome and other permanent grass stands be beat? Fields of permanent grass have had a reduction in wildlife use and we are trying to get this real estate back into production for wildlife. A report on what is being done at Sand Creek Wildlife Management Area, Region 6.

SWIFT, CHARLES. Moscow, Idaho. **EBIRD IN IDAHO - SUMMARY OF ITS GROWTH IN IDAHO AND POTENTIAL USES BY PROFESSIONALS.**

eBird is a web-based tool for collecting geo-referenced bird distribution data. eBird submissions now top several million per month world-wide and participation rates among birders continue to grow including in Idaho. eBird has enormous potential to provide important data for use by wildlife professionals in bird conservation and management.

TALSMA, ARTHUR R. The Nature Conservancy. **JUNIPER MASTICATION TO RESTORE SAGE-GROUSE BROOD REARING HABITAT.**

Throughout southern Idaho, encroachment of western juniper into sage-steppe habitat is recognized as a significant threat to sage-grouse populations. In 2009, The Nature Conservancy partnered with the Owyhee Local Working Group, Idaho Department of Fish and Game, and ranchers to complete juniper mastication projects on two significant sites These projects resulted in the restoration of approximately 526 acres of sage-grouse brood rearing habitat adjacent to wet meadows. Depending on the technique used, it cost $82 - $245/acre for the treatments.

THOMAS, BRENT. Idaho Fish & Game, Boise, Idaho 83716. **LEARNING FROM WIKIS, PIRATES & LOLCATS - HARNESSING THE POWER OF MASS COLLABORATION FOR WILDLIFE.**

Wikipedia, an online encyclopedia curated by strangers working for free, functions seemingly in conflict with our most basic instincts about human nature, yet has proven to be as accurate as its nearest commercial counterpart with 50 times the content. The success of Wikipedia and other social platforms is built on a relatively new, large-scale collaborative structure which is more organic than hierarchical. Just as individual cells exhibit new functions when working together in a complex organism, we are witnessing powerful new behaviors in humans working collectively online. Idaho Fish and Game is piloting applications which harness our collective passion for wildlife and expose powerful new ways to aggregate, connect, analyze and share biological data.

WIGGINS, NATASHA. University of Tasmania and Boise State University. **WILDLIFE MANAGEMENT ISSUES IN TASMANIA, AUSTRALIA.**

Throughout Australia, there are many instances where localised populations of iconic mammalian herbivores become overabundant in numbers and reach pest status. Competition for resources between land managers and native herbivore populations present serious challenges for wildlife managers. I will present a range of strategies that have been employed in attempts to manage native herbivore pest populations, and the socio-political concerns that have helped shape wildlife management strategies in Tasmania, Australia.

WINTON, ROSS C. Idaho Department of Fish and Game. **THE EFFECTS OF SUCCESSION AND DISTURBANCE ON COLEOPTERAN ABUNDANCE AND DIVERSITY IN AEOLIAN SAND HABITATS.**

Sandhill habitats, and management strategies aimed at maintaining these habitats, were studied for beetles inhabiting the different successional stages in the Centennial Sandhills of southwestern Montana. Sampling occurred in plots representing three successional stages found in the sandhills, as well as in the unique microhabitat features commonly associated with sandhills and dunes. The distributions and habitat associations of seven tiger beetle species were examined to determine if there were any potential treatment effects and recommendations are made for increasing the habitat of each species in the Centennial Sandhills.

DIXON, RITA D. and M. Drew. Idaho Department of Fish and Game, Boise, ID 83707. **WHITE-NOSE SYNDROME IN BATS: WHO YOU GONNA CALL?**

Since first documented in New York in 2006, white-nose syndrome (WNS) has spread to 16 US states and four Canadian provinces, leaving a death toll estimated at 5.7 to 6.7 million bats. The presumptive causative agent, a cold-loving fungus named *Geomyces destructans* (Gd), has been detected in three more states: Delaware, Missouri, and Oklahoma. As of February 2012, WNS has been confirmed positive (i.e., histopathologic criteria for the disease fulfilled) in six bat species, two of which occur in Idaho: little brown myotis (*Myotis lucifugus*) and big brown bat (*Eptesicus fuscus*). Three more species are considered suspect for the disease. Several hypotheses exist to explain why WNS causes mortality in bats. One possibility is that fungal infection alters bat behavior by causing more frequent or longer arousals from torpor, and thus depletes fat reserves; or that infected bats may shift from thermally stable roost sites to sites with more extreme and variable temperatures near entrances. Recent evidence suggests that the fungus disrupts the water balance in bats because it actually invades the tissues and disrupts the bat's wing–dependent physiological functions. Because the first clinical signs of WNS were observed at Howes Cave, a hibernaculum connected to a popular show cave with high human traffic, scientists believe that a European visitor might have inadvertently introduced Gd to this American site. To date, WNS has not been detected in Idaho. The purpose of this presentation is to raise awareness about WNS, to describe methods that reduce the risk of human-mediated transmission, and to outline efforts underway to address this emerging threat. I will also discuss winter field signs associated with WNS in bats, provide information on decontamination protocols, and outline a mechanism for reporting unusual bat behavior or mortality in Idaho.

FRYE, GRAHAM G.*[1], J.S. Forbey[1], X. Pu[1], and J.W. Connelly[2]. [1]Department of Biological Sciences, Boise State University, Boise, ID 83725; [2]Idaho Department of Fish and Game, Blackfoot, ID 83221. **REGULATED ABSORPTION: A STRATEGY TO PREVENT OVERDOSING ON PLANT TOXINS BY SAGE-GROUSE?**

Co-evolutionary processes in plant-herbivore systems have resulted in a diversity of plant defenses and herbivore counter-defenses. Production of toxic chemical compounds is a common plant defense strategy, and one that is employed by sagebrush (*Artemisia* spp.). Sagebrush contains defensive compounds, including monoterpenes, sesquiterpene lactones, and phenolics, which can exert deleterious effects on vertebrate herbivores. The greater sage-grouse (*Centrocercus urophasianus*), an avian herbivore, has a diet composed almost exclusively of sagebrush throughout much of the year. The counter-defenses that enable sage-grouse to tolerate sagebrush toxins are unknown, and may have a direct bearing on the conservation and management of this species. We hypothesized that sage-grouse regulate the absorption of these chemicals, thereby minimizing toxic effects and reliance on energetically expensive detoxification processes. We predicted that such a strategy would yield fecal droppings with detectable quantities of unmetabolized defensive compounds that were identical to those in browsed sagebrush. We located foraging sites of radio-marked sage-grouse, and collected samples of freshly browsed plants and fresh fecal droppings. We quantified the concentrations of monoterpenes in samples using headspace gas chromatography. Droppings contained all monoterpenes detected in browsed plants, except for the two most volatile compounds. These results indicate that sage-grouse may employ a physiological strategy to limit systemic exposure to defensive compounds. This is the first study to provide evidence for regulated absorption as a physiological counter-defense to plant defensive chemicals in an avian herbivore. Identifying mechanisms of toxin tolerance will enhance our understanding of differential sage-

for regulated absorption as a physiological counter-defense to plant defensive chemicals in an avian herbivore. Identifying mechanisms of toxin tolerance will enhance our understanding of differential sagebrush use by sage-grouse, and improve our ability to assess impacts of changing landscapes and climate on sage-grouse conservation.

GEHLKEN, KRISTINA*, BRECKEN ROBB*, SVETLANA AGAFONOV*, and J. Forbey. Boise State University, Boise ID 83725. **SEE NO, SMELL NO, TASTE NO EVIL – HOW SAGE-GROUSE DETECT TOXIC SAGEBRUSH.**

There is increasing evidence that sage-grouse selectively consume individual and species of sagebrush that have the lowest concentrations of chemical defenses, or toxins. We propose that this selection requires the ability to see, smell or taste specific chemicals or groups of chemicals that vary quantitatively and qualitatively in sagebrush available throughout the winter range of sage-grouse. We are developing methods to determine if and how selected and avoided sagebrush may differ in color, smell and taste. We used ultraviolet and near infrared detectors to determine the variation in the "color" of phenolics in sagebrush. We used gas chromatography to determine the variation in the "smell" of monoterpenes in sagebrush. We are developing microscopy techniques to determine if sage-grouse possess receptors in the beak and tongue that could taste chemicals in sagebrush. Our goal is to develop detectors that can act as sage-grouse eyes, nose and mouth and allow managers to identify and conserve the least toxic sagebrush for foraging sage-grouse.

LANKFORD, AMBER*. University of Idaho, Moscow, Idaho 83843. **ASSESSING THE VULNERABILITY OF WILDLIFE SPECIES TO CLIMATE CHANGE.**

Climate change poses an increasing threat to wildlife species around the world. Improving the understanding of climate impacts on species and their environment, as well as identifying those species most vulnerable to changes in climate, can assist in the development of adaptive management strategies. I used the vulnerability cube approach refined by Lin and Morefield (2011) to create a visual representation of the vulnerability of wildlife species in Idaho. This approach uses habitat availability, Nature Serve State Rankings, and scores from the Climate Change Sensitivity Database to rank species vulnerability. I will use this assessment to evaluate the vulnerability of various clades and functional groups to better inform adaptive management development at the state level.

LIMBERGER, A. J. *, C. Sullivan, E. Suronen, andB. Newingham. University of Idaho, Moscow, Idaho 83844. **SMALL-SCALE HABITAT USE BY THE NORTH IDAHO GROUND SQUIRREL, UROCITELLUS BRUNNEUS BRUNNEUS.**

Many wildlife species are threatened presumably due to habitat loss. The northern Idaho ground squirrel, *Urocitellus brunneus brunneus,* is endemic to west-central Idaho and fire suppression is attributed to causing habitat loss. However, little quantitative data exists on describing its habitat. We measured small-scale habitat characteristics of *U. b. brunneus* near Bear, Idaho. We then observed *U. b. brunneus* in 20 plots measuring 20 m^2 on two sites. All plots were measured for cover height, number and size of rocks, length of logs, and stump height. Shrubs and trees in each plot were noted by species, height and diameter. We attempted to further define the known habitat requirements of *U. b. brunneus* by comparing their relative presence in each plot to its components of shrubs, rocks, logs and stumps.

SHERBURNE, JESSICA J. * and A.M. Dufty, Jr. Department of Biological Sciences, Boise State University, Boise, ID, 83725. **FOOD CHAIN DIFFERENCES IN POLYBROMINATED DIPHENYL ETHER (PBDE) LEVELS IN BOISE, IDAHO.**

A major goal in toxicology is determining the effects of potentially harmful and persistent environmental pollutants, such as polybrominated diphenyl ethers (PBDEs), on biota and the environment. PBDEs are flame retardants found in many consumer products. However, because PBDEs are not

fixed in their polymer product, they can spread into the environment. One potential mechanism for introduction of PBDEs in the environment is the disposal of sewage sludge or biosolids through land application. To assess contaminant levels, we studied American kestrel (*Falco sparverius*) and European starling (*Sturnus vulgaris*) eggs. All clutches were laid in artificial nest boxes placed on telephone poles near Boise, ID. The experimental eggs were from nest boxes adjacent to land where biosolids have been applied as fertilizer for five years. Control eggs were collected from similar boxes located at least 5 km from the experimental site, in areas where biosolids were not applied. We examined differences in egg size and eggshell thickness between species and sites. If PBDE accumulation affects egg size or eggshell thickness, we expect the effect to be more evident in kestrel eggs than in starling eggs. In the future, spatial and interspecific differences in PBDE levels will be determined in egg yolk from both species. We hypothesize that PBDE levels will be highest in the kestrel and starling eggs collected where biosolids were applied. Additionally, we expect higher PBDE levels in the kestrel (secondary consumers) than in the starling (primary consumers) eggs because of bioaccumulation of pollutants at higher trophic levels. Through this research we hope to better understand how exposure to PBDEs through land-applied biosolids affects the eggs of birds at different trophic levels.

SULLIVAN, CHRISTINA*, E.F. Suronen, and B.A. Newingham. University of Idaho, Moscow, ID, 83844-1133. **NORTHERN IDAHO GROUND SQUIRREL MICROHABITAT PREFERENCE IN RESPONSE TO PRESCRIBED BURNS.**

The northern Idaho ground squirrel *(Urocitellus brunneus brunneus)* is a threatened species that prefers open meadow habitats in ponderosa pine forests. Prescribed fire is used in habitat restoration; however, little is known about the squirrel's response following prescribed burns. We investigated microhabitat use one year post-fire at two sites: Cap Gun and Summit Gulch in Adams County, Idaho. Squirrel colonies reside in Cap Gun and Summit Gulch. An area adjacent to the occupied territory was treated with fire in fall 2010. We monitored squirrel microhabitat use in unburned/occupied and burned/unoccupied plots. Each plot was visually observed for 1.5 hours in the morning, afternoon, and evening in June, July, and August. Squirrel microhabitat use was recorded and measured. Due to our limited ability to trace squirrel movement, we limited 'use' to the following types of behavior: food acquisition, food consumption, and lookout spots for individual squirrels. Once the observation period was over, over/understory canopy cover and vegetation height was recorded where the squirrel was standing. At Cap Gun and Summit Gulch, percent canopy cover was greater in burned plots while vegetative visual obstruction was less in burned plots. Within unburned plots, squirrels were observed 20% more at Summit Gulch and 16% more at the Cap Gun ttthan in burned plots. Squirrel use was lower in the burned area one-year post-fire, suggesting habitat characteristics may not yet be ideal in burned areas or some squirrels have yet to detect the recent burn. Monitoring in subsequent years is suggested to determine whether responses to prescribed burning treatments are forthcoming.

THIEL, JESSIE*[1], M. Hurley[2], C. Hendricks[2], R.A. Long[1], and R.T. Bowyer[1]. [1]Department of Biological Sciences, Idaho State University, Pocatello Idaho 83209; Idaho Department of Fish and Game, Idaho Falls and Salmon, Idaho. **COMPARISON OF SUMMER FORAGE SELECTION BY MULE DEER DURING PEAK LACTATION.**

Foraging by female mule deer (*Odocoileus heminous*) is critical for meeting the costs of lactation. The comparison of forage selection at a time of high-nutritional demand should determine patterns of selection that are associated with enhanced nutritional acquisition. We investigated diet selection by mule deer from a high-quality habitat in southeastern Idaho and compared this with diets of mule deer from a low-quality habitat in central Idaho (n = 40). In 2010, we radio-collared 44 neonates in southeast Idaho between 1 June and 17 June. In 2011, we radio-collared 52 neonates in central Idaho between 1 June and 16 June. We gathered fecal samples from the mothers of the radio-collared neonates, which were analyzed for plant genera. Plant species available to the maternal deer were determined by grid classification at each maternal site, which was compared with diet analysis to generate selection or avoidance of

summer forage. In total, 60,000 individual points were classified to provide availability of forage. Comparing use with availability at a high-quality site (aspen dominated landscape of southeast Idaho) with that of a low-quality area (conifer grasslands of central Idaho) will determine how forage selection by maternal mule deer differs by habitats of varying quality. Those forages that are selected in both areas are likely supporting the elevated nutritional demands of maternal deer in many parts of Idaho.

WINTON, ROSS C. and A. Ogden. Idaho Department of Fish and Game, Southwest Region, Nampa, ID 83686. **PHEASANT CHICK INSECT FOOD SOURCES IN SOUTHWEST IDAHO AND THEIR PLANT ASSOCIATIONS, WITH HABITAT MANAGEMENT SUGGESTIONS TO MAXIMIZE INSECT PRODUCTION.**

This study was conducted to help Idaho wildlife and habitat managers better understand some of the dietary factors limiting the survival of newly hatched pheasant chicks. The goal was to identify the insect species targeted by pheasant chicks for food during the six weeks following their hatch and the plant species those insects are associated with. Field work was conducted at three sites in southwest Idaho where pheasants are known to occur and have been historically seen in high numbers. Insects were sampled utilizing sweep nets and pitfall traps to ensure that insects inhabiting all levels of the canopy and understory were sampled equally. Collected specimens were identified to morpho-species and literature sources and field notes were consulted to determine known host plants or associated plant species. Results from this study will better enable habitat managers to specifically encourage forage vegetation that increases the abundance of potential food sources for foraging pheasant chicks.

WONDER, ERIN * and A. Dufty. Jr. Boise State University, Boise, ID 83702. **THE EFFECTS OF INVESTIGATOR HANDLING ON THE STRESS RESPONSE IN AMERICAN KESTREL NESTLINGS.**

Wildlife biologists routinely handle nestling birds to band them, take morphological measurements, etc. This frequently is done to monitor nestling development, with the general assumption is that the investigators' activities themselves are benign. However, this assumption has rarely been tested. We studied the effects of investigator handling on the development of stress responsiveness because the ability to mount appropriate physiological responses to stressors can affect survival and reproductive success. Several studies have shown that exposing birds to stressors during the nestling stage can alter their stress responsiveness later in life. This may be due to stress-induced changes in the development of the hypothalamic-pituitary-adrenal (HPA) axis, which controls the stress response. To ascertain whether or not investigator handling during the nestling stage can alter the development of the HPA axis, American kestrel (*Falco sparverius*) nestlings were subjected to three different handling protocols. An "early-handled" group was gently held for 15 minutes daily from day 0 (day of hatching) through day 7, a "late-handled" group was handled from day 18 through day 24, and a control group was not handled. On days 25 and 26, just prior to fledging, all birds were exposed to a novel noise stressor in the form of 10 minutes of continuous white noise played at 100 decibals. At the end of the 10 minute period, ~75 microliters of blood was obtained from the brachial artery of each bird and levels of the stress hormone corticosterone (CORT) were analyzed via EIA. There was no significant difference between noise stress-induced CORT levels in the control and late-handled birds, while the early-handled birds displayed significantly lower CORT levels. This suggests that investigator handling during the early nestling period can induce changes in HPA function and stress responsiveness that last at least throughout the end of the nestling period.

Call for Contributed Papers and Posters

The Wildlife Society 19th Annual Conference

Portland, Oregon
October 13-18, 2012
Deadline: April 13, 2012

The Wildlife Society will hold its 19th Annual Conference in Portland, Oregon from October 13-18, 2012. The meeting will include workshops, symposia, panel discussions, breakfast roundtables, special poster sessions, contributed papers (oral presentations), and contributed posters. We invite submission of contributed papers and posters on topics of wildlife ecology, management, conservation, education, or policy. Presentations will not be published, so we encourage reports from the author's most recent scientific investigations and management experiences. Presentations will be audio recorded and made available to conference attendee at the conclusion of the conference.

All contributed papers (oral presentations) will be scheduled for 20 minutes, which includes 15 minutes for the presentation and 5 minutes for questions.

We urge participants to consider presentation of their work as posters, as posters provide an opportunity for authors to participate in more detailed communication with attendees. Posters are displayed for a half day and authors are requested to attend their posters during scheduled breaks.

Instructions for Submitting Abstracts

TWS is working with Coe Truman Technologies - OASIS for abstract submission and conference program planning. The submission site will be open by February 15, 2012. The site is accessed via a link from www.wildlife.org. The OASIS site will lead you through the submission steps; guidelines for submissions are summarized below. You may initiate a submission, leave it, and return to complete or revise your submission as often as you like until the submission deadline. The submission deadline is April 13, 2012 at midnight CST. Abstracts that miss this deadline will not be considered. **Only one contributed paper or poster maybe submitted per primary author.**

Complete submission details can be found on the OASIS site, Highlights are listed here to aid in preparing your abstract. Abstracts must be under 300 words, and should include a statement of objectives, brief description of methods, principal results, and conclusions. Include scientific names in the abstract but not in the paper/poster title. Do not abbreviate place names (e.g. state or country) in the paper/poster title. Do not include paper/poster title or author information in the abstract. This information must be entered in the spaces provided on the site. You will be asked to choose one of the following subject categories for your paper/poster.

- Conservation and Management of Birds
- Ecology and Habitat Relationships of Birds
- Population Dynamics of Birds
- Conservation and Management of Mammals
- Ecology and Habitat Relationships of Mammals
- Population Dynamics of Mammals
- Reptiles and Amphibians
- Biometrics
- Conservation of Communities, Ecosystems, and Landscapes

- Human Dimensions, Conservation Education, and Conservation Policy
- Wildlife Damage Management
- Wildlife Diseases and Toxicology
- New Technology and Applications
- Biology, management, and conservation of pikas and other montane animals

Abstract Evaluation

Papers and posters will be accepted based on their technical merit and contribution to our knowledge of species, populations, communities, ecological processes, management practices, conservation initiatives, education models, or policy issues. Papers and posters should present results from **completed studies** or completed phases of long-term projects. Work in progress is more appropriate for presentation at local or regional meetings and will not be accepted. Students can submit research-in-progress abstracts as part of a separate poster session. Information and a separate call for abstracts for the Student Research in Progress Poster Session can be found on the conference website under 'Students'. Do not submit abstracts for Student Research in Progress poster session at this time.

All abstracts will be **blindly** reviewed by 2-3 reviewers. Please note that presentations from students are welcome but are not given preferential treatment. We have found that students do as well as or better than professionals under our blind review process. However, time/space is a limiting factor and we will not be able to accept all papers/posters submitted (whether from students or professionals).

Notice of Decision

Notice of acceptance will be made by Early June 2012 .

Registration

All presenters MUST register and pay the appropriate conference registration fee. Advance registration is strongly recommended. Registration information will be posted on TWS' website, www.wildlife.org, in July.

Questions?

Questions about the conference program may be directed to Program Committee Coordinator, Tricia Fry at tricia@wildlife.org. For all other conference questions, please call (301) 897-9770 or membership@wildlife.org.

Thank you's – Dave Musil
Colleen Moulton
Jon Dudley
Jessica Pollack
Anna Odosiak

Mark Taylor
Ticket-sellers Kristie Mullan
Sandy [redacted] Amdor
Lana Wolf

Ross Winton
Committee Volunteers

Awards – Kerry Reese

Election Results –

Raffle

Silent Auction

Next Years Meeting