

Idaho Chapter of  
**The Wildlife Society**

2003 Annual Meeting  
March 5 - 7, 2003

**Program and Abstracts**



**West Coast Hotel (Downtown)  
1800 Fairview Ave.  
Boise, Idaho**

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## Program Development

Michelle Commons	Planning and Registration
Gregg Servheen	Planning and Facilities
Anna Owsiak	Ted Trueblood Communications Awards
Kerry Reese	Chapter Awards
Tom Hemker and Don Kemner	Fundraising/Auction
Sam Mattise	Auctioneer
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## Idaho Wildlife Society Chapter Officers

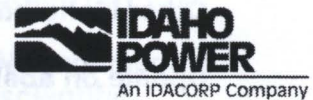
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# Program

Wednesday, March 5<sup>th</sup>

(Selway/Sawtooth Room)

7:00-8:00am

Registration (Lobby)

**IDAHO PARTNERS IN AMPHIBIAN AND REPTILE CONSERVATION** 8:30 a.m. – 12:00 noon

**IDAHO BAT WORKING GROUP** 1:00 p.m. – 5:00 p.m.

**Agenda:**

**2003 Western Bat Working Group Meeting, Durango, Colorado** – (6 people from Idaho attended)

Review of key papers

Status of the revised regional bat priority matrix – review changes

West-wide Townsend big-eared bat conservation actions

Bat survey protocols

Other items of interest from the meeting

**Idaho Panhandle Bat Surveys** – Jenny Taylor

**Other Idaho bat survey projects**

**Update on abandoned mine land surveys**

**Update on bat gating projects**

**Idaho Department of Fish and Game's Comprehensive Wildlife Plan/Strategy** – Chuck Harris

**State bat conservation plans** – Nevada, Arizona, Colorado

**Idaho bat conservation plan: how to get it done**

**Plans for 2003 field season**

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Thursday, March 6<sup>th</sup>

(Selway/Sawtooth Meeting Room)

7:00–8:00am

Registration (Lobby)

8:00–8:10am

Introductory Remarks, Kurt Becker  
President, Idaho Chapter of The Wildlife Society

**Symposium - Tribal Wildlife Management in Idaho: Programs and Perspectives**

8:10–8:20am

**Introduction.** Chair: Gregg Servheen, Wildlife Program Coordinator, Idaho Department of Fish and Game

8:20–8:40am

**Tribal Wildlife Management.** Steve Torbit, Defenders of Wildlife, Denver, CO

8:40–9:00am

**Coeur D'Alene Tribe Wildlife Projects and Program,** Anders Mikkelsen

9:00–9:20am

**Shoshone-Bannock Tribe Wildlife Projects and Program,** Mike Haddix

9:20–9:40am

**Nez Perce Tribe Wildlife Projects and Program,** Keith Lawrence

9:40–10:00am

**Kootenai Tribe Wildlife Projects and Program,** Scott Soult

10:10–10:20am

Break

10:20–10:40am

**Shoshone Paiute Tribe Wildlife Projects and Program,** Mattie Allen

10:40–11:00am

**Kalispell Tribe Wildlife Projects and Program,** Ray Entz

11:00–12:00am

**Panel and Discussion on Tribal Wildlife Management in Idaho: legal, management, cultural, and scientific perspectives.**

Speakers:

Aaron Miles: Nez Perce Tribe

Chad Coulter: Shoshone-Bannock Tribes

Scott Soult: Kootenai Tribe

Robert Matt: Coeur d'Alene Tribe

Guy Dodson: Shoshone Paiute Tribe

Ray Entz: Kalispell Tribe

Steve Torbit: Defenders of Wildlife

12:00–1:20pm

Lunch (on your own)

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- 1:20–2:40pm      **Session A:** Conservation Biology and Landscape Management  
Chair: To be announced
- 1:20–1:40pm      **Comprehensive Conservation Assessments: A Future for Idaho?** Leona Svencara and J. Michael Scott
- 1:40–2:00pm      **Genetics and Conservation of an Idaho Endemic, The Idaho Ground Squirrel.** Alisse Garner and Janet Rachlow
- 2:00–2:20pm      **Does 15 Meters Matter? A Comparison of LANDSAT and ASTER Classifications.** Gina M. Wilson, Leona K. Svencara, Karen S. Humes
- 2:20–2:40pm      **The Idaho Department of Fish and Game’s Comprehensive Wildlife Conservation Plan.** Chuck Harris
- 2:40–3:00pm      Break
- 3:00–5:00pm      **ICTWS BUSINESS MEETING**
- 6:30–11:00pm      **SOCIAL AND AUCTION (BALLROOM)**
- Awards—Kerry Reese
- Raffles and Auction—Tom Hemker and Don Kemner
- Auctioneer—Sam Mattise

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Friday, March 7<sup>th</sup> (Selway/Sawtooth Meeting Room)



7:30–8:00am

Registration (Lobby)

**General Paper Sessions**

8:00–8:20am

**Session A: Non-game Wildlife**

Chair: Chuck Harris, Idaho Department of Fish and Game

8:20–8:40am

**Goshawk Nesting Ecology on Industrial Forestlands in Northern Idaho.** Brian W. Moser and Rita Dixon

8:40–9:00am

**Change in the Sagebrush Steppe: A Look At Reptile Distributions.** Leona K. Svancara, Charles R. Peterson, and Christopher Jenkins

9:00–9:20am

**Potential Role of Prey Availability in the Association of Burrowing Owls with Agriculture.** Colleen E. Moulton, James R. Belthoff, and Ryan S. Brady

9:20–9:40am

**Life History Variation Among Western Rattlesnake (*Crotalus viridis*) Populations.** Christopher Jenkins and Charles Peterson

9:40–10:00am

**Northern Goshawk Home Ranges and Habitat in Southern Idaho: Successful vs Failed Nesting Males and an Urban Wintering Site.** Kristin W. Hasselblad and March J. Bechard

10:00–10:20am

Break

10:20–10:40am

**Emergence Surveys and Foraging Activity of Central Idaho Bats.** Katie E. Gillies

10:40–11:00am

**Regional Landscape Composition and The Nesting Success of Western Forest Birds.** Rex Sallabanks, Patricia Heglund, Jonathan Haufler, Brian Gilbert, and William Wall

11:00–11:20am

**Nutritional Analysis Of Snowshoe Hare Winter Browse.** Ethan Ellsworth

11:20–11:40am

**Prioritizing Pygmy Rabbit Habitat.** Leona Svancara, Greg Kaltenecker, and Marc Bechard

11:40–12:00noon

**Idaho Panhandle Bat Surveys 1997 – 2002.** Jenny Taylor

12:00am–1:20pm

Lunch

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	<b>Session A: Nongame Wildlife</b> (continued) Chair: Chuck Harris, Idaho Department of Fish and Game
1:20–2:40pm	<b>Restoration of a Spotted Frog Population by Reintroduction of Beaver.</b> Jim Munger, Tim Carrigan, Allen Tarter, and Hallie Lingo
1:20 –1:40pm	<b>Session C: Big Game Wildlife</b> Chair: Brad Compton, Idaho Department of Fish and Game
1:40–2:00pm	<b>Development of a Non-Invasive Method for Determining Sex Ratio and Pregnancy Rate in an Idaho Elk Herd.</b> Adair Muth, Pete Zager, Steve Monfort, Melanie Murphy, and Lisette Waits
2:00–2:20pm	<b>Reproductive and Habitat Ecology of California Bighorn Sheep in Owyhee County, Idaho.</b> Regan Berkley and Janet Rachlow
2:20–2:40pm	<b>Idaho Mule Deer Research Update.</b> Mark Hurley
2:40-3:00pm	<b>Status and Management of Moose in Idaho: a Revision.</b> Gary Vecellio and Dale Towell
3:00-3:20pm	<b>Update on Owyhee Bighorn Sheep Research Project.</b> Regan Berkley
3:20-5:00pm	Break
3:40-4:00pm	<b>Session D: Upland Game Wildlife</b> Chair: Jeff Gould, Idaho Department of Fish and Game
4:00–4:20pm	<b>Influences on Greater Sage-Grouse Nesting Habitat and Productivity: A Study In Progress.</b> David D. Musil
4:20–4:40pm	<b>Breeding Parameters of Greater Sage-Grouse In Southeast Idaho.</b> Nathan A. Burkepile, Kerry P. Reese, and J.W. Connelly
4:40–5:00pm	<b>Using Wing Plumage to Determine Age of Mountain Quail.</b> David Delehanty and Nichole Turek
5:00pm	<b>TED TRUEBLOOD COMMUNICATIONS AWARDS</b> (Professional and Student). Anna Owsiak
5:00pm	Meeting Adjourned

*Have a safe trip home  
and see you next year!*

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*General Paper Session  
and Poster Papers*



*Arranged in Alphabetical Order  
by Senior Author*



<p><b>A NON-INVASIVE TECHNIQUE TO ESTIMATE BODY CONDITION IN THE SOUTHERN IDAHO GROUND SQUIRREL.</b> Justin Barrett, Department of Biology, Boise State University, Boise, ID 83725.</p> <p>Recent concern has arisen in regards to the population status of the southern Idaho ground squirrel. In conjunction with monitoring demographic parameters through mark-recapture techniques on several sub-populations, this study also will monitor the percentage of body fat on individual ground squirrels as an index of body condition. Body condition is a measure of an organism's ability to balance energetic costs with available resources. Reproductive success, most active-season behaviors, and the chance of surviving the winter are all affected by energy availability and may vary among age classes and genders. Ground squirrels are herbivores/granivores and depend upon both the quality and the quantity of the surrounding vegetation to acquire this energetic allowance. Through a non-invasive measure of the electrical conductivity of an animal's body, an estimate of percent body fat can be derived. By estimating the amount of body fat on individual ground squirrels from varying habitats we will better understand how body condition in this species limits its demographic potential.</p>	<p><b>REPRODUCTIVE AND HABITAT ECOLOGY OF CALIFORNIA BIGHORN SHEEP IN OWYHEE COUNTY, IDAHO.</b> Regan Berkley and Janet Rachlow, Department of Fish and Wildlife Resources, University of Idaho, Moscow, ID 83844.</p> <p>California bighorn sheep (<i>Ovis canadensis californiana</i>) were once widespread throughout Owyhee County, Idaho, but were extirpated following the human westward expansion of the late 19<sup>th</sup> century. Following reintroductions in the 1960's, the California bighorn sheep population in Owyhee County steadily increased until the early 1990's. Because helicopter surveys have indicated a declining population since 1993, the Idaho Department of Fish and Game initiated a study to evaluate productivity, survival, and causes of mortality. In order to address these goals, we will examine ewe pregnancy rates, associations between habitat use and survival and productivity, and changes in survivorship and behavior that may have occurred concurrently with the population's decline. This study will help evaluate factors contributing to the current decline of California bighorn sheep in Owyhee County.</p>
<p><b>BREEDING PARAMETERS OF GREATER SAGE-GROUSE IN SOUTHEAST IDAHO.</b> Nathan A. Burkepile<sup>a</sup>, Kerry P. Reese<sup>a</sup>, and J. W. Connelly<sup>b</sup>, <sup>a</sup>Department of Fish and Wildlife, University of Idaho, Moscow, ID 83844; <sup>b</sup>Idaho Fish and Game, Pocatello, ID 83209.</p> <p>Greater sage-grouse populations have been declining throughout Idaho. Recent research indicates that reduced productivity may be causing this decline. We monitored greater sage-grouse productivity during the 1999 – 2002 breeding seasons to determine what breeding parameters may be influencing this decline. Nest success ranged between 40 – 51% and did not differ (<math>P &lt; 0.05</math>) between years. Clutch size averaged 8 eggs per clutch. Chick survival did not differ (<math>P &gt; 0.05</math>) between the 1999 – 2001 breeding seasons and ranged between 20 – 25%. Chick survival was higher (45%, <math>P &lt; 0.05</math>) in 2002 than 1999 – 2000. In all years, chick survival was lower (<math>P &lt; 0.05</math>) during the first 3 weeks post hatch. Our results indicate that clutch size and nest success are not limiting greater sage-grouse populations.</p>	<p>(continued)</p> <p>However, low chick survival may be limiting greater sage-grouse populations. Management objectives should focus on increasing chick survival during the first 3 weeks post-hatch.</p>

**USING WING PLUMAGE TO DETERMINE AGE OF MOUNTAIN QUAIL.** David Delehanty and Nichole Turek, Idaho State University, Pocatello, ID 83209.

We analyzed the occurrence of mottled versus solid-colored upper wing greater primary coverts (carpal coverts) on the wings of juvenile (1-10 months age), yearling (11-14 months), and adult ( $\geq 15$  months) Mountain Quail (*Oreortyx pictus*) in order to clarify the use of wing plumage as an indicator of Mountain Quail age. A pseudo molt limit occurs within the 9-feather covert tract in young Mountain Quail. Juvenal coverts #1-7 are mottled while coverts #8 (usually) and #9 are solid-colored like the coverts of adults. However, Mountain Quail retain mottled juvenal coverts into their first breeding season forming a reliable molt limit for aging individuals. Solid-colored coverts #8 and #9 are not informative for aging quail, but quail with 1 or more mottled coverts are  $<$  approximately 15 months old while quail with only solid-colored coverts are  $\geq$  approximately 15 months old.

**NUTRITIONAL ANALYSES OF SNOWSHOE HARE WINTER BROWSE.** Ethan Ellsworth, Fish and Wildlife Resources, University of Idaho, Moscow, ID 83844.

During two winters (2001 and 2002) I conducted a series of single-species food trials in order to examine the digestibility of winter browse of snowshoe hare (*Lepus americanus*) near Priest Lake, Idaho. My goal was to assess the relative nutritional importance of each browse species to hares. In northern Idaho, conifers are the primary component of hare winter diet, so I tested 10 common conifer species including lodgepole pine (*Pinus contorta*), ponderosa pine (*P. ponderosa*), white pine (*P. monticola*), Englemann spruce (*Picea engelmannii*), hemlock (*Tsuga heterophylla*), Douglas' fir (*Pseudotsuga menziesii*), subalpine fir (*Abies lasiocarpa*), grand fir (*A. grandis*), red cedar (*Thuja plicata*), and larch (*Larix occidentalis*). For periods of 6-10 days, I provided captive hares ( $n=16$ ) with 62-100% of a single browse species and measured weight change, food consumption and excretion daily. I assayed browse and feces for protein, fiber, and energy, and calculated assimilation efficiencies by subtracting the nutrients contained in feces from that contained in the browse. Although assays of digestibilities are incomplete at the time of this writing, there are differences in the nutritional composition of browse species, consumption rate, and hare weight change by diet. For example, the percent of protein ranged from 7.0% (lodgepole pine) to 4.4% (hemlock) and gross energy ranged from 5410.5 cal/g (subalpine fir) to 5110 cal/g (grand fir). Hares did not consume sufficient amounts of some browse species and lost weight while on diets of subalpine fir, hemlock, grand fir, cedar, and larch. These species also were largely avoided by free-ranging hares. On the other hand, hares maintained weight while eating all pine species, spruce, and Douglas' fir, each of which was consumed at a high rate by wild hares.

GENETICS AND CONSERVATION OF AN IDAHO ENDEMIC, THE IDAHO GROUND SQUIRREL. Alisse Garner and Janet L. Rachlow, Department of Fish and Wildlife Resources, University of Idaho, Moscow, ID 83844-1136.

The Idaho ground squirrel (*Spermophilus brunneus*), which consists of a northern and a southern subspecies, is the most geographically restricted of North American ground squirrels. The northern Idaho ground squirrel (NIDGS) was listed as threatened under the Endangered Species Act in April, 2000, and the southern Idaho ground squirrel (SIGS) has candidate status. Habitat alteration and fragmentation have eliminated or reduced dispersal corridors, leaving populations of Idaho ground squirrels small and isolated. Habitat fragmentation and subsequent isolation can cause loss of genetic variability in small populations and reduce their probability of long-term persistence. Microsatellites are highly variable genetic markers useful for assessing genetic diversity in populations. We are analyzing microsatellite diversity within and divergence among Idaho ground squirrel populations of both subspecies. In Spring, 2001, plucked hair samples were collected from seven NIDGS and eight SIGS populations, in conjunction with Idaho Fish and Game and Boise State University research efforts. DNA has been successfully extracted and amplified from those samples. Some polymorphic microsatellite loci from a related species have proven useful for genetic analyses of Idaho ground squirrels, and additional loci are being developed. Genetic information provided by this research will be helpful in conservation planning for Idaho ground squirrels and will develop genetic tools for use in evaluation of future conservation efforts, such as habitat restoration, translocation, and captive breeding.

EMERGENCE SURVEYS AND FORAGING ACTIVITY OF CENTRAL IDAHO BATS. Katie E. Gillies, Taylor Ranch Wilderness Field Station, University of Idaho, Moscow, ID 83843.

In 2002, I conducted the first surveys for bat populations in the Frank Church River of No Return Wilderness in central Idaho. I conducted emergence surveys at nine abandoned mines and caves and sampled during 25 nights from 2 June to 15 August. The ANABAT II echolocation device recorded vocalizations which I analyzed to determine species composition. I identified seven species of bats, four Idaho Species of Special Concern. I calculated the proportion of bat calls made per species and to determine the proportion of occupied to unoccupied caves and mines in the study area. There was no statistical difference among bat foraging activity in burned and unburned locations two years after a wildfire. Knowledge of the distribution and roosting locations of Idaho bat species is essential for conservation purposes.

THE IDAHO DEPARTMENT OF FISH AND GAME'S COMPREHENSIVE WILDLIFE CONSERVATION PLAN. Charles E. Harris, Idaho Department of Fish and Game, Boise, ID 83707.

The Idaho Department of Fish and Game is required to prepare a Comprehensive Wildlife Conservation Plan (Comp Plan) by October 2005 as part of accepting congressional funds under the Wildlife Conservation and Restoration Program (WCRP) and State Wildlife Grants (SWG). These are annual appropriations the Department has received in lieu of long-term funding from the Conservation and Reinvestment Act (CARA). The Comp Plan must identify and be focused on the "species in greatest need of conservation," yet address the "full array of wildlife" and wildlife-related issues. Congress identified the required elements of the Comp Plan in the WCRP legislation. These required elements have been further refined into 7 guiding principles by a committee of the International Association of Fish and Wildlife Agencies. All state Comp Plans must adequately address these 7 principles to be approved by the Federal Aid Division of the Fish and Wildlife Service. Broad public participation is also an essential element of developing and implementing the Comp Plan.

NORTHERN GOSHAWK HOME RANGES AND HABITAT IN SOUTHERN IDAHO: SUCCESSFUL VS. FAILED NESTING MALES AND AN URBAN WINTERING SITE  
Kristin W. Hasselblad and Marc J. Bechard, Raptor Research Center, Department of Biology, Boise State University, Boise, ID 83725.

We collected home range data for 8 male northern goshawks (5 successfully nesting and 3 failed nesters) radiotracked in the South Hills of Idaho's Sawtooth National Forest. All birds were followed throughout the nesting season (early June to mid-August) during 2001 and 2002. Successfully nesting male home ranges averaged 811 ha (100% minimum convex polygon; MCP), and failed nesting male home ranges averaged 756 ha (100% MCP). Core areas (85% cluster analysis polygons) averaged 199 ha and 97 ha for successful and failed males, respectively. These are the smallest goshawk home range sizes reported for North America. Both successful and failed male home ranges and core areas contained approximately 50% forested and 50% shrub-steppe habitat. It is possible the proportions and juxtapositions of forest and open habitat found in this naturally-fragmented woodland system, paired with a ground squirrel prey base, constitute ideal foraging conditions for North American goshawks. We also report information on one study male found wintering in an urban setting, the first such finding for the continent.

**LIFE HISTORY VARIATION AMONG WESTERN RATTLESNAKE (*Crotalus viridis*) POPULATIONS.** Christopher L. Jenkins and Charles R. Peterson, Herpetology Laboratory, Idaho State University, Pocatello, ID 83209.

A combination of livestock grazing and invasive species has altered the historic fire regimes of sagebrush steppe ecosystems. Changes in fire regimes are altering the landscape and having negative indirect effects on wildlife. However, few studies have looked at the effects on reptiles. To determine if rattlesnake populations are experiencing negative impacts from landscape changes, I examined life history variation among snakes at three den complexes. Life history characteristics including size at birth, growth rate, and fecundity were significantly different among den complexes. In particular snake populations at one den complex have life history characteristics that could make them more susceptible to disturbance. In addition, this den complex experiences the highest level of livestock grazing and extensive burning of surrounding uplands relative to the other den sites. Reptiles are an important component of biodiversity in sagebrush steppe ecosystems and future management should consider the effects landscape change is having on this group of wildlife.

**GOSHAWK NESTING ECOLOGY ON INDUSTRIAL FORESTLANDS IN NORTHERN IDAHO.** Brian W. Moser, Potlatch Corporation, Lewiston, ID 83501; Rita D. Dixon, IDFG, Lewiston, ID 83501.

The role of industrial forestlands in providing nesting habitat for the northern goshawk is not well understood. We studied 9 nesting goshawk pairs in northern Idaho during 2002, and compared habitat components at multiple scales around nest trees to 7 random locations on the landscape. Nesting success was 100%, with a mean of 2.11 fledglings per nesting attempt. Goshawks selected for larger diameter nest trees, and most commonly nested in Douglas-fir. Goshawks selected nest stands with a greater mean dbh, basal area, canopy cover, and herbaceous understory cover compared to random stands. Mean trees per acre was greater in random stands. Most fragmentation metrics were similar among nest stands and random stands at the 170 ha post-fledgling scale, with the exception of mean patch size of mature forest, which was greater in goshawk nest territories. These preliminary data suggest that industrial forestlands can be productive for northern goshawks. Forest managers should try to manage for larger patches of mature timber across the landscape in order to provide suitable nesting habitat for northern goshawks.

POTENTIAL ROLE OF PREY AVAILABILITY IN THE ASSOCIATION OF BURROWING OWLS WITH AGRICULTURE. Colleen E. Moulton, James R. Belthoff, and Ryan S. Brady, Department of Biology and Raptor Research Center, Boise State University, Boise, ID 83725.

Burrowing owls are the only species of raptor that show an affinity for agricultural areas in southwestern Idaho. To investigate the role of prey availability in the association of burrowing owls (*Athene cunicularia*) with agriculture, we conducted rodent and invertebrate surveys, documented cached prey remains, and analyzed pellets of nesting owls during the 2001/2002 breeding seasons in southwestern Idaho. We live-trapped six rodent species (*Dipodomys ordii*, *Mus musculus*, *Perognathus parvus*, *Peromyscus maniculatus*, *Reithrodontomys megalotis*, and *Spermophilus mollis*) during the nestling period. *M. musculus* and *R. megalotis* were only found in agricultural habitat, whereas *S. mollis* was found in greater abundance in non-agricultural habitats. *P. maniculatus* and *P. parvus* were found in similar abundance in both habitats. Overall, we did not detect a difference in relative abundance of rodents between habitat types. In contrast, pellets of owls nesting in agricultural habitats contained significantly greater numbers and biomass of prey items than those in non-agricultural habitats. This difference was predominately driven by greater invertebrate prey in pellets in agricultural habitat. This indicates the potentially overlooked importance of invertebrate prey to breeding burrowing owls. These findings suggest that prey availability may play an important role in the association of burrowing owls with irrigated agriculture in southwestern Idaho.

RESTORATION OF A SPOTTED FROG POPULATION BY REINTRODUCTION OF BEAVER. Jim Munger, Tim Carrigan, Allan Tarter, and Hallie Lingo, Department of Biology, Boise State University, Boise, ID 83725; and Bureau of Land Management, Lower Snake River District, Boise, ID 83706.

A closely monitored population of Columbia spotted frogs (*Rana luteiventis*) in the Owyhee Mountains declined from an estimated 165 adults in 1995 to one adult in 2000. We hypothesized that erosion of an old beaver (*Castor canadensis*) dam caused loss of habitat needed for in breeding, foraging, and hibernation, resulting in the decline in frog numbers. To test our hypothesis, we reintroduced five beaver during the summer of 2001. Prior to reintroduction, the existing dam was artificially repaired to create habitat more attractive to beaver. By September 2002, the beaver had reinforced our repairs to the original dam and constructed an additional four dams. The resulting standing water and wetlands with interconnecting channels provided habitat meeting all spotted frog life history requirements. Frog numbers increased to eight adults in 2002. Recruitment of metamorphs increased from zero in 2000 to 184 in 2002. Reintroduction of beaver is a highly effective means of restoring frog habitat and enhancing frog populations. Successful beaver reintroduction is contingent on management practices that promote suitable beaver habitat. Foraging conditions consisting of healthy willow stands and sufficient growth of non-woody vegetation need to be present for beaver reintroduction to be effective at enhancing frog populations.

**INFLUENCES ON GREATER SAGE-GROUSE NESTING HABITAT AND PRODUCTIVITY: A STUDY IN PROGRESS.** David D. Musil, Idaho Department Fish & Game, 868 East Main Street, Jerome, ID 83338.

We are investigating parameters influencing greater sage-grouse nest success and habitat selection. Past research has focused on shrub structure and generalized understory cover, overlooking the possible importance of species diversity and variance of plant structure. Past studies have also focused on single study sites dominated by 1 or 2 habitat types. Our study is being conducted on 11 study areas throughout southern Idaho with at least 12 habitat types available. We are also including range utilization, grazing systems, and other land management practices as variables. We are proposing to model grass growth from measurements taken upon hatch to predict grass conditions at nest initiation. Horizontal cover, measured with a modified Robel pole and observed from the view of the hen on the nest, was tested in 2002. Other preliminary results will be presented from 56 nests measured in 2002. We are questioning whether actual or potential habitat should be used to classify habitat types at nests.

**DEVELOPMENT OF A NON INVASIVE METHOD FOR DETERMINING SEX RATIO AND PREGNANCY RATE IN AN IDAHO ELK HERD.** Adair Muth, Pete Zager, Steve Monfort, Melanie Murphy and Lisette Waits. Department of Fish and Wildlife, College of Natural Resources, University of Idaho, Moscow, ID 83844-1136.

Throughout North-central Idaho elk recruitment is low or has declined. This decline may be associated with low pregnancy rates, low birth rates, poor calf survival, or other factors. As part of an elk recruitment investigation, we are developing a non-invasive approach to evaluate pregnancy rates for free-ranging elk populations. Elk fecal pellets of known sex and pregnancy status were collected during January through March, as well as pellets of free-ranging animals of unknown sex and status. The samples were placed in plastic bags and frozen. For all samples, fecal steroid metabolite levels were determined and steroid levels  $> 1.4$  micrograms/gram indicated pregnancy. Samples with low metabolite levels were from females that were not pregnant or males. To determine the sex for those samples, we used PCR amplification of a section of X and Y- chromosomes in duplicate. The samples identified as females were tested an additional six times to evaluate test accuracy. PCR amplification success was 60% (18/30) for known samples and 79% (142/180) for field samples. No sex identification errors were observed (160/160). This study demonstrates the value of combining non-invasive genetic sampling with hormone analyses for population monitoring.

<p><b>LIFE HISTORY VARIATION AMONG WESTERN RATTLESNAKE (<i>Crotalus viridis</i>) POPULATIONS.</b> Christopher L. Jenkins and Charles R. Peterson, Herpetology Laboratory, Idaho State University, Pocatello, ID 83209.</p> <p>As part of a study to determine the effects of landscape change on snake populations, we examined life history variation among Western Rattlesnakes at three den complexes on the Idaho National Engineering and Environmental Laboratory in southeastern Idaho. Life history characteristics including size at birth, growth rate, and fecundity were significantly different among the three den complexes. In particular the snake population at one den complex, Crater Butte, has lower fecundity, smaller size, slower growth, and later age at maturity. Two potential causes of these life history characteristics are livestock grazing and extensive burns around Crater Butte. Reptiles are an important component of biodiversity in sagebrush steppe ecosystems and future management should consider the effects landscape change is having on this group of wildlife.</p>	<p><b>REGIONAL LANDSCAPE COMPOSITION AND THE NESTING SUCCESS OF WESTERN FOREST BIRDS.</b> Rex Sallabanks<sup>1</sup>, Patricia Heglund<sup>2</sup>, Jonathan Haufler<sup>3</sup>, Brian Gilbert<sup>4</sup>, and William Wall<sup>5</sup>, <sup>1</sup>Idaho Department of Fish and Game, Boise, ID 83707; <sup>2</sup>U.S. Geological Survey, Onalaska, WI 54650; <sup>3</sup>Ecosystem Management Research Institute, Seeley Lake, MT 59868; <sup>4</sup>Gilbert Environmental, Veradale, WA 99037; <sup>5</sup>Safari Club International, Washington, D.C. 20002.</p> <p>To examine the influence of landscape composition on nesting success and productivity of western forest birds, we monitored 2,847 nests in Idaho and Montana during 1997–1999. The landscapes that we sampled represented a gradient from heavily fragmented landscapes containing agriculture and silviculture, through moderately fragmented landscapes containing only silviculture, to relatively unfragmented landscapes containing neither agriculture nor silviculture. Despite this gradient, neither nesting success nor nesting productivity varied with landscape composition for any species examined or all species combined. Our findings suggest that birds adapted to historically fragmented landscapes may exhibit reduced sensitivity to landscape heterogeneity and habitat discontinuity.</p>
<p><b>IDENTIFYING AND PRIORITIZING IDAHO'S PYGMY RABBIT HABITAT.</b> Leona K. Svancara<sup>1</sup> and Janet L. Rachlow<sup>2</sup>, <sup>1</sup>Landscape Dynamics Lab, University of Idaho, Moscow, ID 83844; <sup>2</sup>Department of Fish and Wildlife, University of Idaho, Moscow, ID 83844.</p> <p>Pygmy rabbits (<i>Brachylagus idahoensis</i>) are considered a species of concern by many agencies in Idaho. Although information is available about localized populations, data on distribution, numbers, and status on a statewide scale are lacking. Our goals were to 1) gather existing information on pygmy rabbit distributions and habitat associations, 2) use these data to model potential habitat, and 3) prioritize habitat for future surveys. Based on 358 known locations, we defined pygmy rabbit habitat as all sagebrush types on deep (&gt;60cm) soils. Areas of predicted habitat were then prioritized based on type of sage, percentage of clay soils, degree of slope, elevation and fire history. Our work will help define a sampling frame for surveys in 2003 and serves as an example application for using models in the pursuit of virtually unknown species.</p>	<p><b>COMPREHENSIVE CONSERVATION ASSESSMENTS: A FUTURE FOR IDAHO?</b> Leona K. Svancara<sup>1</sup> and J. Michael Scott<sup>2</sup>, <sup>1</sup>Landscape Dynamics Lab, University of Idaho, Moscow, ID 83844; <sup>2</sup>IDCFWRU, University of Idaho, Moscow, ID 83844.</p> <p>In the face of increasing human populations, and with a national policy of sustainable growth that is dependent on increased rates of consumption of natural resources, all species not adapted to anthropogenic environments are at risk of extinction. While the Gap Analysis Program has been a leader in identifying unprotected species and ecosystems, the creation of new reserves often operates without a comprehensive plan in mind. This ad hoc approach often leads to opportunistic, uncoordinated, and inefficient attempts at protection. To help guide future conservation efforts in Idaho, we are developing a complimentary network of conservation opportunity areas using biotic and abiotic factors. In addition, we document the capabilities and limitations of GAP data sets in the identification, selection, and design of reserves.</p>



CHANGE IN THE SAGEBRUSH STEPPE: A LOOK AT REPTILE DISTRIBUTIONS. Leona K. Svancara<sup>1</sup>, Charles R. Peterson<sup>2</sup>, and Christopher Jenkins<sup>2</sup>, <sup>1</sup>Landscape Dynamics Lab, University of Idaho, Moscow, ID 83844; <sup>2</sup>Herpetology Lab, Idaho State University, Pocatello, ID 83209.

An objective of the Interior Columbia Basin Ecosystem Management Project (ICBEMP) is to provide public land managers with scientific information to make reasoned decisions about broad-scale issues. Because of the large number of species in the basin, ICBEMP analyzed only 4 reptile species in Idaho. We analyzed 13 additional species that occur in Idaho's sagebrush-steppe. Our objective was to combine ICBEMP spatial data with current knowledge of reptile habitat associations to model and quantify changes in reptile habitat over the last 100 years. In most cases, fragmentation of reptile habitat exhibited a spatial pattern and resulted in fewer, smaller patches. However, these results were species specific. The outcome of this work will help prioritize reptile conservation issues on the Snake River plain and identify future concerns.

IDAHO PANHANDLE BAT SURVEYS. Jenny C. Taylor, Idaho Panhandle National Forests, Coeur d'Alene, ID 83865.

Between 1997 and 2002, bat surveys were conducted at 96 abandoned mines in the Idaho Panhandle. Prior to 1997, Townsend's big-eared bat (*Corynorhinus townsendii*) was known from only five sites in north Idaho. Recent surveys have located 4 hibernacula, a maternity roost and 10 additional mines used by this sensitive species. Five other bat species have also been mistnetted at North Idaho mines: California bat (*Myotis californicus*), western small-footed bat (*Myotis ciliolabrum*), western long-eared bat (*Myotis evotis*), long-legged bat (*Myotis volans*) and fringed bat (*Myotis thysandodes*). Fifty mines have been closed in the Idaho Panhandle with bat gates. Bats used 13 of 18 mines that were monitored after gate installation. Twenty-three mines have been closed with a gate inside a culvert. Bats used 6 of 19 mines that were monitored after culvert installation. In 2003, surveys will focus on monitoring known Townsend's big-eared bat sites and mines that have not had a bat survey after closure with a bat gate and/or culvert.

**DOES 15 METERS MATTER? A COMPARISON OF LANDSAT AND ASTER CLASSIFICATIONS.**  
Gina M. Wilson<sup>1</sup>, Leona K. Svancara<sup>1</sup>, and Karen S. Humes<sup>2</sup>, <sup>1</sup>Landscape Dynamics Lab, University of Idaho, Moscow, ID 83844; <sup>2</sup>Geography Department, University of Idaho, Moscow, ID 83844.

Accurate and up-to-date information about the earth's surface drives the development of sound policies regarding the use and management of public lands. In the past two decades Landsat satellites have provided multispectral data for most landcover mapping. Recently new sensors have been launched that provide better spatial resolution than Landsat's 30 meters. One such sensor is the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER). ASTER obtains high-resolution (15 to 90 square meters per pixel) images of the Earth in 14 different wavelengths of the electromagnetic spectrum, ranging from visible (15m) to thermal infrared light (90m). Our objective was to compare landcover classifications derived from the two sensors over a portion of Northern Idaho to determine if a smaller spatial resolution will improve the accuracy of the classification. Availability, cost, and future applications of ASTER will be addressed.

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