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Idaho Chapter of

# The Wildlife Society

## 2002 Annual Meeting

*Programs and Abstracts*



**West Coast Hotels**

**Idaho Falls, Idaho**

**March 14 - 15, 2002**

Idaho Chapter of  
*The Wildlife Society*

## Program Development

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Anna Owsiak  
Kerry Reese  
Don Kemner  
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Planning and Registration  
Planning and Facilities  
Program Assembly  
Ted Trueblood Communications Awards  
Chapter Awards  
Fundraising/Auction  
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# Program at a Glance

Thursday, March 14<sup>th</sup>

7:00–8:00am  
 8:00–8:15am  
 8:15–9:00am  
 8:00am–9:00pm  
 9:20am–3:10pm  
 3:30–5:30pm  
 6:30–11:00pm

**Registration**  
**Introductory Comments**  
**Plenary Address**  
**Posters**  
**General Paper Session**  
**ICTWS Business Meeting**  
**Social And Auction**



Friday, March 15<sup>th</sup>

7:15am–8:00am  
 8:00am–3:10pm  
 8:00am–3:10pm  
 3:10pm

**Registration**  
**General Paper Session**  
**Posters**  
**Adjourn**

# Program

Thursday, March 14<sup>th</sup>

(Targhee/Bonneville Room)

7:00–8:00am

Registration (Lobby)

8:00–8:10am

Introduction and Welcome—Chuck Harris,  
President, Idaho Chapter of The Wildlife Society

8:10–8:15am

Introduction of Plenary Speaker—Chuck Harris

8:15–9:00am

Plenary Speaker—Dr. Kent Marlor

9:00–9:20am

Break

9:20am–3:10pm

**General Paper Sessions (A–C)**

9:20–10:00am

**Session A: Amphibians and Reptiles**  
Chairperson: Brad Compton, Idaho Department of Fish  
and Game



9:20–9:40am

AMPHIBIANS OF THE FRANK CHURCH RIVER OF NO  
RETURN WILDERNESS AREA: Crystal Strobl

9:40–10:00

HABITAT SELECTION AND MOVEMENTS IN NORTHERN  
LEOPARD FROGS IN SOUTHEASTERN IDAHO: Jennifer C.  
Merriam and Charles R. Peterson

10:00–10:30am

Break

10:30–12:10pm

**Session B: Big Game**  
Chairperson: Leona Svancara, University of Idaho



10:30–10:50am

PREDICTING MULE DEER HARVEST AND POPULATION  
TREND: James Peek, Brian Dennis, and Frank Edelman

10:50–11:10am

ELK SUMMER RANGE CARRYING CAPACITY IN  
NORTHEASTERN NEVADA: Jeffrey L. Beck, and James M.  
Peek

11:10–11:30am

LAMB PRODUCTION AND SURVIVAL OF A BIGHORN SHEEP  
POPULATION IN CENTRAL IDAHO: Christopher S. McDaniel

11:30–11:50am

SPACE-USE AND MOVEMENTS OF MATERNAL FEMALE  
BIGHORN IN THE HELLS CANYON REGION: Leona K.  
Svancara, Janet L. Rachlow, and E. Frances Cassirer

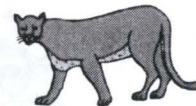
11:50–12:10am

DISTRIBUTION AND STATUS OF SAGE-GROUSE IN UTAH  
Jeffrey L. Beck, Dean L. Mitchell, and Brian D Maxfield

12:10–1:10pm

Lunch Break (**Lunch Provided Free of Charge**)

1:10–3:10pm **Session C: Conservation Biology and Habitat Management**  
Chairperson: Janet Loxterman, Idaho State University



1:10–1:30pm — CURRENT STATUS OF PYGMY RABBITS IN THE WESTERN UNITED STATES: Peggy Bartels

*(Borrowing  
our talk  
given  
instead)  
(see Friday)*

1:30–1:50pm CONSERVATION GENETICS OF PUMAS (*Puma concolor*) IN IDAHO: Janet L. Loxterman

1:50–2:10pm THE MISCONCEPTIONS OF CONSERVATION TERMINOLOGY:  
Leona K. Svancara, Gina M. Wilson, and R.G. Wright

2:10–2:30pm ASSESSMENT OF HIGH VALUE RESOURCE AREAS IN LATAH COUNTY, IDAHO: Gina Wilson, Leona Svancara, and R.G. Wright

2:30–2:50pm IDAHO DEPARTMENT OF FISH & GAME MITIGATION PROGRAM: Mary Terra-Berns

2:50–3:10pm HABITAT AND PREDATOR MANAGEMENT FOR WATERFOWL PRODUCTION AT THE STERLING WILDLIFE MANAGEMENT AREA, SOUTHEASTERN IDAHO: Dean Rose

3:10–3:30pm Break

3:30–5:30pm 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 Dave Musil*

Friday, March 15<sup>th</sup>

(Targhee/Bonneville Room)



7:15–8:00am

Registration (Lobby)

**8:00am–3:10pm General Paper Sessions (D–E)**

8:00–10:50am

**Session D: Nongame Wildlife**  
Chairperson: Brian Moser, Potlatch Corporation



8:00–8:20am

DISTRIBUTION AND HABITAT ASSOCIATIONS OF SELECTED RARE AND SPECIAL STATUS FUNGI, PLANT, AND WILDLIFE SPECIES NEAR DWORSHAK RESERVOIR, IDAHO. Dorothy Bowers *Cancelled*

8:20–8:40am

WESTERN BURROWING OWL ECOLOGY AND TREND IN THE COLUMBIA BASIN: Peggy Bartels

*(Pygmy Rabbit talk given Friday here?) (Given Thurs 1:10)*

8:40–9:00am

BREEDING BIRD USE OF SHORT-ROTATION HYBRID POPLAR STANDS: Patricia J. Heglund, Brian W. Moser, William A. Wall, and Halley Henderson

9:00–9:20am

BIRD USE OF BURNED AND UNBURNED HABITATS IN THE BOISE FOOTHILLS: Ann Rocklage and Gregory Kaltenecker

9:20–9:40am

CONSERVATION AND MANGAGEMENT EFFORTS OF TRUMPETER SWANS IN SOUTHEAST IDAHO DURING THE WINTER OF 2001-2002: Lauri Hanauska-Brown

9:40–10:00am

INFLUENCE OF BURN EDGES ON NESTING SUCCESS OF LEWIS'S WOODPECKER: Stephen C. Abele, Edward O. Garton, and Victoria A. Saab

10:00–10:30am

Break

10:30–10:50am

NORTHERN GOSHAWK (*ACCIPITER GENTILIS*) HOME RANGES IN A NATURALLY-FRAGMENTED FOREST LANDSCAPE IN SOUTHERN IDAHO: Kristin W. Hasselblad and Marc J. Bechard

10:50–12:10am

**Session E: Upland Game Birds:** Chairperson—Nathan Burkepille University of Idaho

10:50–11:10am

BREEDING ECOLOGY AND SURVIVAL OF GREATER SAGEGROUSE IN NORTHWEST COLORADO: Doris Hausleitner and Kerry P. Reese



11:10–11:50am

NESTING AND BROOD-REARING ECOLOGY OF SAGE GROUSE IN SOUTHEASTERN IDAHO: Nathan A. Burkepille, Kerry P. Reese, John W. Connelly

11:50–12:10am	ANNUAL AND SEASONAL SURVIVAL RATES OF SAGE GROUSE IN SOUTHWEST IDAHO Paul A. Wik, John W. Connelly, and Kerry P. Reese
12:10–1:10pm	Lunch
1:10–3:10pm	<b>Session E:</b> Upland Game Birds (Continued): Chairperson—Nathan Burkepile, University of Idaho
1:10–1:30pm	SAGE GROUSE WINTER HABITAT – WHY WE NEED MULTIPLE YEARS OF DATA COLLECTION: Michelle Commons Kemner and Brad Lowe
1:30–1:50pm	EXPLOITATION OF SAGE-GROUSE: WHAT IS ENOUGH? Kerry P. Reese
1:50–2:10pm	ECOLOGY OF COLUMBIAN SHARP-TAILED GROUSE BREEDING IN COAL MINE RECLAMATION AND NATIVE UPLAND COVER TYPES IN NORTHWESTERN COLORADO. Cameron Collins and Kerry P. Reese
2:10–2:30pm	FACTORS AFFECTING HEN BLUE GROUSE REPOSSES TO HUMAN DISTURBANCE: Samantha J. Cooney
2:30–2:50pm	THE USE OF SENSORY PERCEPTION BY RING-NECKED PHEASANTS ( <i>PHASIANUS COLCHICUS</i> ) FOR THE DETECTION OF GERMINATING SEEDS, AND SEEDS COATED WITH 6-METHOXYBENZOXAZOLINONE: Barney Harper
2:50–3:10pm	SURVIVAL AND REPRODUCTION OF PEN-REARED AND WILD PHEASANTS TRANSLOCATED INTO SOUTHERN IDAHO: David D. Musil
8:00am–3:10pm	Posters (Lobby)
3:10pm	Meeting Ends

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

# Posters

(Lobby)

- I      **USE OF FORWARD LOOKING INFRARED ON A FIXED WING AIRCRAFT TO SURVEY SAGE GROUSE:** Susan Bernatas
- II     **EVALUATION OF HABITAT SELECTION BY A REINTRODUCED POPULATION OF CALIFORNIA BIGHORN SHEEP (*OVIS CANADENSIS CALIFORNIANA*) IN SOUTH-CENTRAL IDAHO:** Gretchen Fowles, John Laundré, and Tim Ferguson
- III    **GENDER IDENTIFICATION VIA MOLECULAR TECHNIQUES IN NORTHERN SAW-WHET OWLS & FLAMMULATED OWLS:** Lynda Leppert, Alfred M. Dufty, and Sarah Hamilton
- IV     **TERRITORIAL AGGRESSION AND PRODUCTIVITY OF BALD EAGLES (*HALIAEETUS LEUCOCEPHALUS*) AT LAKE CASCADE, IDAHO:** Scott A. Kimball and Marc J. Bechard

Arranged in Alphabetical Order  
by Senior Author



**A  
B  
S  
T  
R  
A  
C  
T  
S**

*General Paper Session  
and Poster Papers*



*Arranged in Alphabetical Order  
by Senior Author*

INFLUENCE OF BURN EDGES ON NESTING SUCCESS OF LEWIS'S WOODPECKER. Stephen C. Abele\*,

Edward O. Garton<sup>1)</sup>, and Victoria A. Saab<sup>2)</sup>,

<sup>1)</sup>University of Idaho, Moscow, Idaho 83844. <sup>2)</sup>USDA Forest Service, Rocky Mountain Research Station, 316 E. Myrtle Street, Boise, ID 83702.

Lewis's Woodpecker (*Melanerpes lewis*) has been characterized as a "burn specialist" because of their preference to nest in burned pine forests. This species is reported to have high nesting success in burned forests relative to unburned landscapes. We monitored 48 nests on 2 large stand-replacing wildfires east of Boise, Idaho U.S.A. during the breeding season of 2001. Nest predation was significantly higher on the more fragmented Star Gulch fire relative to the less fragmented Foothills fire. Nest predation appeared not to be significantly influenced by distance from unburned forest edge or nest height. No information is known about the influence of burn edges on predation rates or predator abundance and their effects on nesting success of Lewis's Woodpecker. Studies assessing the importance of burn patch size and distance to unburned forest in relation to predation rates and nesting success are critical to the long-term persistence and management of this species.

CURRENT STATUS OF PYGMY RABBITS IN THE WESTERN UNITED STATES. Peggy Bartels, Bureau of Land Management, Burley District, 15 East 200 South, Burley, ID 83318.

A compilation of recent survey efforts and results from Montana, Idaho, Washington, Wyoming, Oregon, and Nevada will be presented. Within each state, intensive survey efforts have been required to find a few sites inhabited by this species. Genetic markers have been identified and evaluated in Montana, Washington, Idaho, and Oregon. Oregon subpopulations appear diverse, while Washington subpopulations appear less diverse. Historical and recent habitat impacts from wildfires, agricultural development, and habitat fragmentation that caused population isolation have impacted the abundance and distribution of this species.

WESTERN BURROWING OWL ECOLOGY AND TREND IN THE COLUMBIA BASIN. Peggy Bartels, Bureau of Land Management, Burley District, 15 East 200 South, Burley, ID 83318.

Surveys for Western Burrowing Owls (*Athene cunicularia*) were conducted in 1991 and again in 1997, 1999, and 2000 using similar methodology within the same study area. The survey effort required to locate the same number of individuals and pairs increased by more than 1000%. Productivity declined by 50%; abundance remained approximately equal; and density within colonies declined by approximately 35%, but remained approximately equal by county. Diet items selected by owls were significantly different. Selection of nesting burrow locations and surrounding habitat attributes remained similar. Early burrow abandonment was high for males at their historic nesting locations. Two year nesting sites were 23% more likely to be abandoned than one-year nesting sites.

ELK SUMMER RANGE CARRYING CAPACITY IN NORTHEASTERN NEVADA. Jeffrey L. Beck, and James M. Peek, Department of Fish and Wildlife Resources, University of Idaho, Moscow, ID 83844-1136.

In the 1990s, elk (*Cervus canadensis*) were reintroduced into historical range in Elko County, Nevada's Jarbidge Mountains. In order to provide managers with estimates of elk summer range carrying capacity, we conducted a field study in the Jarbidge Mountains from 1998–2000. Our primary assumption was that elk would ultimately be limited by availability of key forage species in foraging areas used by sympatric ungulates (e.g., mule deer and livestock). Our model for estimating carrying capacity incorporates estimates of energy in key forages in key foraging areas. Estimates are established based on lactating cow elk energy requirements. Forage demands by other ungulates for key forage species are integrated through animal unit equivalents calculated with diet overlap. Aspen, a key community, comprised about 16% of the summer range, while elk use in aspen was  $\geq 70\%$ . Forbs composed  $\geq 59\%$  of summer diets for cow elk groups. In addition, forbs provided elk with more adequate energy and crude protein than graminoids or woody plants.

DISTRIBUTION AND STATUS OF SAGE-GROUSE IN UTAH. Jeffrey L. Beck<sup>1</sup>, Dean L. Mitchell<sup>2</sup>, and Brian D Maxfield<sup>2</sup>.

<sup>1</sup>Department of Fish and Wildlife Resources, University of Idaho, Moscow, ID 83844-1136 USA; <sup>2</sup>Utah Division of Wildlife Resources, 1594 West North Temple, Suite 2110, Box 146301, Salt Lake City, UT 84114-6301.

We reviewed literature, analyzed population data (1959–2000), and evaluated geographic information to examine the historical and current distribution and status of sage-grouse (*Centrocercus* spp.) in Utah. Sage-Grouse were abundant in all of Utah's 29 counties at the time of European settlement wherever sagebrush (*Artemisia* spp.) occurred. Greater Sage-Grouse (*C. urophasianus*) inhabited areas north and west of the Colorado River, and Gunnison Sage-Grouse (*C. minimus*) occupied suitable habitat south and east of the Colorado River. We stratified estimated spring breeding populations (1971–2000) for Greater Sage-Grouse into those counties with >500 adults (GT500) and those with <500 adults (LT500) from 1996–2000. Males observed per lek from 1971–2000 were greater in GT500 than in LT500 populations ( $P < 0.0001$ ). Sage-Grouse are extinct in 3 counties and leks in 4 other counties have become inactive since 1978. Overall, we detected >50% decline in available habitat, and subsequent sage-grouse distribution from pre-settlement levels.

USE OF FORWARD LOOKING INFRARED ON A FIXED WING AIRCRAFT TO SURVEY SAGE GROUSE. (POSTER)

Susan Bernatas, Vision Air Research, Inc., 904 East Washington St., Boise, ID 83712.

Airborne infrared was examined as a tool for sage grouse lek surveys. A forward-looking infrared sensor with natural color camera was attached to a fixed-wing airplane to determine if sage grouse could be detected and verified. The surveys were flown near the East Fork of the Owyhee River located in Southwestern Idaho in March 1999. Surveys were flown between 1,500 to 2,000 ft above ground level. The survey was conducted within two hours after sunrise. A known sage grouse lek was selected for this test. Transects were flown with the sensor positioned at 30 degrees to allow an oblique view. The sensor operator knew that sage grouse would be located along the transect however was not informed of at what point along the transect. The sage grouse were initially detected with a 30-degree look angle at 2,000 ft above ground level. Orbits were flown around the lek to evaluate the flight altitude, which influence sensor footprint. Sage grouse were detected and verified on the first pass. Birds were distinguished from the background because of the behavior or booming of the male grouse. This method was evaluated against line transect methods using human observers.

DISTRIBUTION AND HABITAT ASSOCIATIONS OF SELECTED RARE AND SPECIAL STATUS FUNGI, PLANT, AND WILDLIFE SPECIES NEAR DWORSHAK RESERVOIR, IDAHO. Dorothy Bowers, IDFG, Coeur d'Alene, Idaho and Steve Nadeau, IDFG, Lewiston, ID.

In cooperation with the U.S. Army Corps of Engineers, a 2-year research effort to survey for and inventory fungi, plants, and wildlife along Dworshak Reservoir in north-central Idaho was recently completed. Fourteen previously undescribed and/or USFS Survey and Manage fungi species, 31 rare plant taxa, and 16 Idaho and/or Federal special status wildlife species were detected in the Dworshak Study Area. Distributions and habitat associations of selected species and management challenges are discussed.

NESTING AND BROOD-REARING ECOLOGY OF SAGE GROUSE IN SOUTHEASTERN IDAHO. Nathan A. Burkepile<sup>1</sup>, Kerry P. Reese<sup>1</sup>, John W. Connelly<sup>2</sup>, <sup>1</sup>Department of Fish and Wildlife Resources, University of Idaho, Moscow, ID 83844-1136, <sup>2</sup>Idaho Department of Fish and Game, Pocatello, ID 83204.

Greater sage-grouse (*Centrocercus urophasianus*) populations are declining throughout their range, and our understanding of the factors contributing to this decline is limited. Grouse population dynamics are influenced by annual production indicating that reduced reproduction may be leading to population declines. During 1999 - 2001, we studied sage grouse nesting and brood-rearing ecology in southeast Idaho. We monitored 96 radio-marked hens on nests, nest success ranged from 41 - 54%, and the major cause of nest failure was predation. We radio-marked 123 chicks from 44 broods and monitored their survival for 10 weeks. Survival estimates of chicks ranged from 15 - 24%. The average age of death ranged from 8.9 - 10.7 days. In all years > 85% of the mortalities occurred within the first 2 weeks indicating that this period is critical to sage grouse chick survival. Predators were responsible for > 90% of mortalities. Other causes of death include exposure to weather and malnutrition. Relatively high nest success and low chick survival may be contributing to declining populations of sage grouse. Conservation to increase sage grouse populations should include efforts to increase survival of chicks during the first 2 weeks after hatching.

ECOLOGY OF COLUMBIAN SHARP-TAILED GROUSE BREEDING IN COAL MINE RECLAMATION AND NATIVE UPLAND COVER TYPES IN NORTHWESTERN COLORADO. Cameron Collins and Kerry P. Reese, Fish and Wildlife Resources, University of Idaho, Moscow, ID 83844.

The Columbian sharp-tailed grouse has been reduced to a remnant distribution throughout much of its former range. The population in northwestern Colorado is stable or increasing, due possibly to recent increases in reclaimed surface coal mine lands. We are midway in a study to estimate survival, nest success, productivity, and brood home range size of hens breeding in reclamation and native upland cover types in Moffat County. Preliminary data analysis indicates that in 2001 hens breeding in mine reclamation had greater productivity and brood success while hens breeding in sage-steppe cover types suffered lower mortality throughout the breeding, nesting, and brood rearing seasons. Brood hens using mine reclamation had smaller home range sizes than brood hens in shrub-steppe. Nest and hen success did not differ between cover types. Greater grass cover in mine reclamation during the brood-rearing period may have contributed to the greater observed productivity and brood success.

SAGE GROUSE WINTER HABITAT – WHY WE NEED MULTIPLE YEARS OF DATA COLLECTION. Michelle Commons Kemner and Brad Lowe, Idaho Department of Fish and Game, 1515 Lincoln Ave, Idaho Falls, ID 83401.

Sage grouse (*Centrocercus* spp.) rely almost exclusively on sagebrush (*Artemisia* spp.) for food and cover during winter. During periods of deep snow, sage grouse use wind swept ridges or lowland areas with exposed sagebrush. During relatively mild winter weather, the distribution of sage grouse is more widespread because of extensive areas of exposed sagebrush. In the Upper Snake Region of Idaho, radio-marked sage grouse were followed during winters for up to 4 consecutive years from 1997-2001. Twenty-two sage grouse (18 females and 4 males) were followed for at least 2 winters. Seven (32%) sage grouse wintered within 5 km of previous years' locations during all winters followed. Seven (32%) other sage grouse wintered between 6 and 10 km from their previous years' locations. Three (14%) sage grouse wintered 11-20 km from previous years' locations, and 5 (23%) sage grouse wintered > 20 km from previous years' locations. Two of the sage grouse that wintered > 20 km from previous years' locations flew approximately 32.5 km from December 1999 to January 2000. Although none of the winters appeared severe enough to limit sage grouse to specific areas, there were sites where sage grouse could be found every winter. When attempting to identify key sage grouse winter habitats, agencies should use multiple years of data encompassing many different winter conditions. One year of rigorous sage grouse winter surveys is not an adequate method to determine important sage grouse wintering areas.

**FACTORS AFFECTING HEN BLUE GROUSE REPOSSES TO HUMAN DISTURBANCE.** Samantha J. Cooney, Department of Fish and Wildlife Resources, University of Idaho, Moscow, ID 83844.

The affect habituation to humans has on the behavior of blue grouse (*Dendragapus obscurus*) is unknown. During the summer of 2001, 18 hens were captured and marked at Taylor Ranch in the Frank Church-River of No Return Wilderness, Idaho. Banded and unbanded birds at Taylor Ranch and control birds encountered away from the ranch were compared. An observer walked directly at each bird and dropped a marker when the bird displayed certain behaviors. Three behaviors were examined: distance at which the bird assumed an alert posture, total distance moved, and occurrence of flushing. Type of bird (banded, unbanded, or control) had a p value < 0.10 for all behaviors. Management implications of habituation (e.g. affects on flushing counts) will be discussed.

**EVALUATION OF HABITAT SELECTION BY A RE-INTRODUCED POPULATION OF CALIFORNIA BIGHORN SHEEP (*OVIS CANADENSIS CALIFORNIANA*) IN SOUTH-CENTRAL IDAHO (POSTER)** Gretchen Fowles, John Laundré, and Tim Ferguson, Department of Biology, Idaho State University, Pocatello, ID 83209.

Translocations have proven to be a successful conservation tool for reestablishing populations of threatened and endangered species in areas where they have been extirpated. It has been estimated that the range of bighorn sheep in the western United States was reduced by as much as 98% by the early 1960s compared to pre-settlement numbers. The success rate of bighorn sheep translocations has been variable, with lack of habitat being a common source of failure. Given that translocation efforts are extremely expensive and time consuming, it is vital that we maximize their success rate by gaining a better understanding of what habitat is suitable for bighorns, and also rigorously assess proposed reintroduction areas to assure that enough usable habitat is available. In February of 2000 and 2001, 45 California bighorn sheep (*Ovis canadensis californiana*) were translocated from Oregon to the Jim Sage Range in Idaho in an effort to restore them to their historic habitat. Over an 18-month period after the first release, we used radio telemetry to estimate the habitat use of the sheep population. We then used GIS and the logistic regression modeling technique to compare the habitat characteristics of used sheep group locations versus the characteristics of randomly selected locations. The characteristics include vegetative composition, terrain ruggedness, distance to water sources, distance to steep slopes, slope, aspect, and elevation. I am developing three seasonal predictive habitat selection models based on winter (n = 55), lambing (n = 130), and summer (n = 211) habitat use. Preliminary results indicate that distance to steep slopes, areas composed of grass with 0-5% tree cover, elevation, flat slopes and steep slopes significantly relate to the presence of sheep year-round. Furthermore, during the summer, distance to perennial water sources and areas with southern exposure significantly contribute to the presence of sheep. The models can be applied to manage sheep where they currently exist, and also evaluate future reintroduction sites.

THE USE OF SENSORY PERCEPTION BY RING-NECKED PHEASANTS (*PHASIANUS COLCHICUS*) FOR THE DETECTION OF GERMINATING SEEDS, AND SEEDS COATED WITH 6-METHOXYBENZOXAZOLINONE. Barney Harper, Department of Biological Sciences, Idaho State University, Pocatello, ID 83209.

Ring-necked pheasants (*Phasianus colchicus*) can detect buried germinating corn seeds. I hypothesized that pheasants use their sense of smell to detect seeds. I planted non-viable corn seeds coated with the plant volatile 6-Methoxybenzoxazolinone (6-MBOA) and uncoated control seeds in a pre-irrigated test plot. A template was used to plant each seed and was used to locate uneaten seeds. I planted coated and non-coated seeds randomly. Three pheasants were allowed to forage in the plot for 10 days. Pheasants located more seeds coated with 6-MBOA than control seeds (Trial 1,  $\chi^2 = 21.42$ ,  $df=1$ ,  $P<0.01$ ; Trial 2,  $\chi^2 = 63.34$ ,  $df=1$ ,  $P<0.01$ ). I conducted 2 additional trials using the methods outlined above to test if birds that experimentally lost their sense of smell (thus, rendered anosmic) could locate buried seeds. Birds were rendered anosmic by irrigating the nostrils/olfactory tissue with 0.5ml of zinc sulfate ( $ZnSO_4$ ) 24 hours prior to the beginning of a trial. Anosmic pheasants locate seeds coated with 6-MBOA at the same rate as uncoated seeds (Trial 3,  $\chi^2 = 0.14$ ,  $df=1$ ,  $P<0.01$ ; Trial 4,  $\chi^2 = 0.11$ ,  $df=1$ ,  $P<0.01$ ). This supports the hypothesis that pheasants use their sense of smell to locate buried seeds. A histological evaluation confirmed that the control birds had normal olfactory epithelium, while the olfactory epithelium, and its cilia with the odorant receptors, was disrupted in the treated birds.

CONSERVATION AND MANGAGEMENT EFFORTS OF TRUMPETER SWANS IN SOUTHEAST IDAHO DURING THE WINTER OF 2001-2002. Lauri Hanauska-Brown, Idaho Department of Fish and Game, 1515 Lincoln Road, Idaho Falls, ID 83401.

Trumpeter swans were once abundant and widespread throughout North America. By the early 1900's however, the population was nearly extinct with only small flocks remaining in Alaska and remote areas of the Rocky Mountains. Past conservation efforts, including artificial feeding and habitat improvement, have brought the population back to over 3,000 birds. However, continued habitat loss, low productivity, and overcrowding on wintering grounds in southeast Idaho still threaten the overall health of the Rocky Mountain swan population and the stability of the local population. The USFWS Pacific Flyway Management plan recommends limiting the number of wintering swans in tri-state area (i.e., southeast Idaho, southern Montana, and northwest Wyoming) to less than 1,500 birds. The carrying capacity of Harriman State Park alone is estimated at 300 birds. During the winter of 2001-2002, a multi agency effort captured and marked 95 cygnet swans at Harriman State Park, releasing 48 on site and moving 47 to the Bear River area in southern Idaho. The objectives of this effort were to: 1) Reduce the number of swans wintering at Harriman State Park, and 2) Establish new migratory patterns and wintering sites for trumpeter swans. Trapping and hazing, along with low water levels and early freezing, prevented numbers from building to unacceptable levels at Harriman State Park this year. Preliminary results show the majority of birds that were moved south remained in the area or moved further south. Preliminary results also show 'grafting' of cygnets to adults may keep the young birds in the translocation area and may facilitate the establishment of new winter migration patterns.



NORTHERN GOSHAWK (*ACCIPITER GENTILIS*) HOME RANGES IN A NATURALLY-FRAGMENTED FOREST LANDSCAPE IN SOUTHERN IDAHO. Kristin W. Hasselblad and Marc J. Bechard, Raptor Research Center, Department of Biology, Boise State University, 1910 University Drive, Boise, ID 83725.

The South Hills of Idaho's Sawtooth National Forest supports a dense population of breeding Goshawks. The habitat consists of naturally-fragmented lodgepole pine (*Pinus contorta*) and aspen (*Populus tremuloides*) stands, interspersed with shrub-steppe communities dominated by sage brush (*Artemisia tridentata*). Three breeding male goshawks were trapped and radio-tagged in 2001. They were followed throughout the nesting season (from the time young were approximately 10 d old to 22 d after fledging (9 June to 14 August). A total of 185 points, collected at least one hour apart, were used in this analysis. 175 locations were obtained through triangulation, while 10 were visual observations. Mean number of points used for each home range analysis was 62 (range = 58-66). Home range (100% MCP) sizes for the three males were 390 ha, 588 ha, and 2068 (mean = 1015 ha). Although this data is preliminary, it suggests that breeding male goshawk home ranges in the South Hills may be much smaller than those typically reported (i.e., 2,400 ha).

BREEDING ECOLOGY AND SURVIVAL OF GREATER SAGE-GROUSE IN NORTHWEST COLORADO. Doris Hausleitner and Kerry P. Reese, Fish and Wildlife Resources, University of Idaho, Moscow, ID 83844.

In Moffat County, Colorado the number of male greater sage-grouse on breeding grounds has declined by 82% between 1978-1998. In response to this decline, intensive radio-telemetry studies started in March 2001 to investigate productivity and survival of the grouse throughout their annual cycle. Mean clutch size for adult hens was (7.4,  $n=17$ ) greater than that of yearling hens (5.8,  $n=9$ ). Overall nest success (>1 egg hatched) was 65% ( $n = 43$ ). Hen success was 67% ( $n = 42$ ). Chick survival from hatch to 6 weeks was 49.1% ( $n=171$ ) and did not differ between yearling and adult hens. We estimated apparent monthly and seasonal survival rates of radio-collared hens from 1 April - 31 December 2001 using program MARK. The 9-month survival was 68% for adult hens ( $n= 34$ ) and 78% for yearling hens ( $n= 27$ ). Apparent monthly survival was lowest for both ages in July, during the late brood-rearing period. Preliminary results indicate that neither productivity nor adult hen survival rates are limiting this population.

**TERRITORIAL AGGRESSION AND PRODUCTIVITY OF BALD EAGLES (*Haliaeetus leucocephalus*) AT LAKE CASCADE, IDAHO. (POSTER) Scott A. Kimball and Marc J. Bechard, Raptor Research Center, Department of Biology, Boise State University, 1910 University Drive, Boise, ID 83725.**

We conducted a study in 2000 and 2001 to determine the relationship between Bald Eagle productivity (number of nestlings fledged) and inter- and intraspecific aggressive interactions during all stages of the breeding season at Lake Cascade, ID. We observed behaviors at eight nest sites in both 2000 and 2001 to quantify the level of territorial aggression exhibited by nesting pairs of eagles. Interactions were classified according to the level of aggression exhibited: vocalizing, chasing, stooping, or kleptoparasitizing. We recorded a total of 119 interactions, of which 53 were instigated by nesting eagles. Of these 53, nesting Bald Eagles showed aggression toward a variety of different avian species. Most commonly involved were Ospreys (*Pandion haliaetus*), immature Bald Eagles, Common Ravens (*Corvus corax*), and American Crows (*Corvus brachyrhynchos*). Results of this study suggest that productivity is not related to the level of aggression exhibited by nesting Bald Eagles at Lake Cascade.

**GENDER IDENTIFICATION VIA MOLECULAR TECHNIQUES IN NORTHERN SAW-WHET OWLS & FLAMMULATED OWLS. (POSTER) Lynda Leppert, Alfred M. Duffy, and Sarah Hamilton. Boise State University, Raptor Biology Dept., Boise, ID 83709.**

Genetic techniques have become an important tool in conservation biology. Accurate gender identification is critical in studies of brood sex ratios, sex differences in migratory activity, and where sex differences in physiology or behavior are important. Often avian biologists are unable to determine gender based on plumage or morphological characteristics. DNA, extracted from blood, has been shown to be effective and reliable for sexing birds. We sexed 211 Northern Saw-whet Owls (*Aegolius acadicus*) and 62 Flammulated Owls (*Otus flammeolus*) using three different molecular methods. All methods gave consistent results with known-sex samples, although some differences in results occurred among the methods. For example, Method 2, using primers P2 and P8 with an acrylamide gel, showed a polymorphism in the male gene (CHD-Z). Method 3, using primers P2550 and P2718, was the least expensive and time-consuming. We recommend DNA sexing of any birds of unknown gender.

CONSERVATION GENETICS OF PUMAS (*Puma concolor*) IN IDAHO. Janet L. Loxterman, Department of Biological Sciences, Box 8007, Idaho State University, Pocatello, ID 83209.

An important goal of conservation biology is to characterize the genetic diversity of species. However, genetic data alone rarely provide sufficient information for conservation and management. Coupling genetic data with ecological data can provide a more comprehensive view of the geographic population structure of a species, which can then be used in designing management plans. Subpopulations of pumas in Idaho provide the opportunity to apply such a combined approach to characterizing population genetic structure. The geographic distribution of the puma has been drastically reduced and in Idaho, suitable puma habitat in the southern portion of the state has become fragmented, with subpopulations restricted to small, isolated mountain ranges. Currently, little is known about the effects of habitat fragmentation on the population genetic structure of pumas, with the exception of the Florida panther, whose habitat has become critically reduced in size. This research was designed to investigate the population genetic structure of pumas in Idaho at various spatial scales. At a regional scale, measures of genetic diversity at microsatellite loci indicate that fragmentation is having subtle effects on the levels of genetic variation and the distribution of this variation within and between subpopulations. At a smaller scale, fragmented subpopulations of pumas are exhibiting reduced within-population diversity and increased inbreeding, along with increased genetic differentiation and reduced gene flow relative to more continuously distributed subpopulations from northern Idaho. Results of my research will provide information important in ensuring population persistence of pumas in Idaho.

LAMB PRODUCTION AND SURVIVAL OF A BIGHORN SHEEP POPULATION IN CENTRAL IDAHO. Christopher S. McDaniel, University of Idaho, Moscow, ID 83843.

Long-term monitoring allows for the accumulation of baseline data over extended time periods and gives biologists the opportunity to develop predictive management strategies. The Rocky Mountain bighorn sheep (*Ovis canadensis*) population in the Big Creek drainage of the Frank Church-River of No Return Wilderness in Central Idaho experienced a sudden population decline from 1988 to 1990 as the result of a *Pasteurella* related die-off. Extensive monitoring of the population during that period provided information on lamb production and survival during the die-off phase. A replicate survey of lamb production and survival was conducted during the summer of 2001 to assess the recovery stage of the die-off. The average number of lambs:100 ewes was established for three different lambing areas and across three different time periods associated physiologically with lamb development. These were compared to similar data collected during the summers of 1989 and 1990. Chi-square analysis showed significant differences between lamb:ewe ratios collected in 1989-1990 and ratios collected in 2001. Lamb:ewe ratios did not differ significantly between lambing areas in each of the die-off and 2001 periods ( $p \geq 1$ ,  $p \geq 1$ , respectively). Results show an average 86:100 lamb:ewe ratio through the beginning of August 2001 compared with a significantly lower ratio of 19:100 in August 1989, and 12:100 in August, 1990.

HABITAT SELECTION AND MOVEMENTS IN NORTHERN LEOPARD FROGS IN SOUTHEASTERN IDAHO. Jennifer C. Merriam and Charles R. Peterson, Idaho State University, Pocatello, ID 83209.

Northern leopard frog (*Rana pipiens*) populations have declined in many parts of their range and particularly in the western United States. In Idaho this once common species is now designated a Species of Special Concern. Causes for these declines are not well understood. While loss of habitat is one potential cause in southeastern Idaho, the habitat relationships of the northern leopard frog are relatively unstudied in the western United States. This study reports on habitat selection and movements of a population of northern leopard frogs near the Portneuf River south of Pocatello, Idaho from May-November 2001. We compared used and available habitat at three spatial scales, and recorded individual and population level movements of frogs using visual encounter surveys, traps, and radio-telemetry. Use of habitat was non-random and differed between summer and fall. Movement from breeding ponds to the river occurred for both adults and juveniles and there was limited dispersal once in the river. Most observed frogs overwinter in the river. These results indicate the importance of considering non-breeding habitat in the management of this species.

BREEDING BIRD USE OF SHORT-ROTATION HYBRID POPLAR STANDS. Patricia J. Heglund, U.S. Fish and Wildlife Service, Anchorage, AK 99517; Brian W. Moser, Potlatch Corporation, Lewiston, ID 97818; William A. Wall, Safari Club International, Herndon, VA 20170; Halley Henderson, Turnstone Ecological Research Associates, Ltd, Moscow, ID 83843

We studied bird use of hybrid poplar plantations in comparison to surrounding cover types such as agriculture and shrub-steppe in the Columbia River Basin of northeastern Oregon. A total of 50 bird species was recorded from point counts and another 78 species from incidental observations during the 4-yr period. Bird species richness was greatest along plantation edges and roads adjacent to plantations, followed by shrub-steppe, agriculture, and the interiors of plantations. Overall bird densities did not differ among cover types or among plantation age classes. Young plantations contained birds associated with shrub-steppe landscapes, whereas older plantations contained birds associated with forested landscapes. The establishment of large hybrid poplar plantations in this region has resulted in an increase in bird species richness and a change in bird species composition. However, it appears that overall bird densities supported by this landscape have not changed.

EFFECTS OF PREDATOR CONTROL ON TRANSLOCATED WILD AND PEN-REARED HEN PHEASANTS IN SOUTHERN IDAHO. David D. Musil, Idaho Dept. Fish & Game, 868 East Main Street, Jerome, ID 83338.

We captured 112 wild hen pheasants (Oregon, California), purchased 1,059 pen-reared hen pheasants, and released them during the spring of 2000 and 2001, into 2 counties in southern Idaho (Jefferson, Minidoka). Predators were removed (327 in Minidoka County, 297 in Jefferson County) in 2001 (March – July) to increase hen survival and production. We radio-marked 63, 40 wild hens and 49, 40 pen-reared hens and monitored survival during March-September 2000 and 2001, respectively. The survivorship function (survival distribution curve) was not different between years for wild hens ( $P = 0.5213$ ) but was greater for pen-reared hens ( $P = 0.0018$ ) during the predator control year. Predator removal slowed the mortality rate during the first 80 days post-release for pen-reared birds but did not increase their overall survival estimate ( $0.05 \pm 0.08$  in 2000,  $0.08 \pm 0.09$  in 2001 [% survival  $\pm$  95% C.I.]). Overall survival for wild hens was also not different between years ( $0.39 \pm 0.13$  in 2000,  $0.43 \pm 0.16$  in 2001). Nesting rate (% radio-marked birds nesting) was 11% ( $n=63$ ), 30% ( $n=40$ ) for wild and 2% ( $n=49$ ), 15% ( $n=40$ ) for pen-reared hens in 2000 and 2001, respectively. Nest success was 57% ( $n=7$ ), 50% ( $n=12$ ) for wild and 0% ( $n=1$ ), 33% ( $n=6$ ) for pen-reared hens in 2000 and 2001, respectively.

PREDICTING MULE DEER HARVEST AND POPULATION TREND. James Peek, Brian Dennis and Frank Edelmann. Department of Fish & Wildlife Resources, University of Idaho (JP and BD), Idaho Power Company, Boise (FE).

Predictions of deer harvest in Idaho unit 22 and deer population trend in the Lookout Mountain, Oregon, unit, using precipitation records are presented. A time series model of density dependent population growth that used precipitation as covariates was the basis for developing the predictions. Correlations between the log of the rate of change in the estimate from one year to the next were predicted using a Z score of monthly precipitation as an initial step. Akaike information criterion and Schwartz information criterion were used to identify the best predictors. The results show that standard monitoring of harvest and populations as typically conducted by management agencies, and readily available weather records, can be used to develop first-order predictive models that can be useful in developing an adaptive approach to management. The information is correlative in nature and must have a biological cause-effect basis to be justifiable. Prolonged drought, conditions during the hunting season, and late winter precipitation were major influences on population and harvest trend, and have biological justification. The nature of the predictions is expected to vary between areas. They are best used to focus attention on limiting factors that influence population change and will always be subject to refinement and coordination with field information.

EXPLOITATION OF SAGE-GROUSE: WHAT IS ENOUGH? Kerry P. Reese, Fish and Wildlife Resources, University of Idaho, Moscow, ID 83844.

Sage grouse populations have declined an average of 33% during the past 30 years. Extirpated in British Columbia and 5 states, the species is extant in 11 states and 2 provinces. Petitions have been filed to list populations of the species as endangered, yet 10 states continue to permit harvest of sage grouse. Are current levels of exploitation of sage grouse concordant with management goals for the species? Is legal harvesting a factor contributing to population decline or slowing population increase? Should harvesting be reduced or prohibited until populations increase? I will review and synthesize existing literature on the impacts of harvest on populations of sage grouse, relate exploitation parameters to population ecology of the species, and suggest answers to the above questions regarding exploitation.

BIRD USE OF BURNED AND UNBURNED HABITATS IN THE BOISE FOOTHILLS. Ann Rocklage and Gregory Kaltenecker, Idaho Bird Observatory, Dept. of Biology, Boise State University, Boise, ID 83725.

From 1999-2001, we compared breeding and fall bird populations in unburned shrubsteppe, riparian, and mountain shrub habitats to those that burned in 1995 and 1996 in the Boise Foothills. In both seasons, overall bird density and species richness were consistently higher at unburned sites in all habitats. Mountain shrub areas had the highest bird densities, followed by riparian and shrubsteppe. However, we recorded more species in riparian areas. Compared to burn sites, breeding bird density was 111% higher in unburned shrubsteppe, 64% higher in unburned riparian, and 35% higher in unburned mountain shrub. In the fall, densities were 50% higher in unburned shrubsteppe, 76% higher in unburned riparian, and 47% higher in unburned mountain shrub. In both seasons, we detected, on average, 1-6 more species at unburned sites. Differences in bird use of burned and unburned habitats can largely be explained by the cover and height of shrubs. Burned shrubsteppe had an average shrub cover of 4.29%, while unburned sites had 36.21% shrubs. Shrubs in unburned shrubsteppe were 0.28 m taller. Unburned riparian sites were, on average, 2.51 m taller, 5.19 m wider, had 23% more shrubs, and 2.37 fewer breaks in vegetative cover. Unburned mountain shrub sites had 20% more cover, but shrub heights were comparable. American robin, Brewer's sparrow, chipping sparrow, Gambel's white-crowned sparrow, lazuli bunting, and spotted towhee all had higher densities in areas with taller shrubs and/or greater shrub cover. Density differences were especially dramatic for birds breeding in shrubsteppe; we recorded 8 times more lazuli buntings, 12 times more Brewer's sparrows, and 20 times more spotted towhees in unburned shrubsteppe. These results emphasize the negative effects of wildfires in arid areas of the Intermountain West on both breeding and migratory songbirds.

HABITAT AND PREDATOR MANAGEMENT FOR WATERFOWL PRODUCTION AT THE STERLING WILDLIFE MANAGEMENT AREA, SOUTHEASTERN IDAHO. Dean Rose, Idaho Department of Fish and Game, 1345 Barton Rd. Pocatello, ID 83204.

Sterling Wildlife Management Area (SWMA) near Aberdeen, Idaho is approximately 1,335 hectares of upland and wetland habitats that are managed primarily for waterfowl production. The statewide goal for waterfowl producing WMA's is 30%. Graduate research revealed that waterfowl nest success on SWMA was 7.4% in 1992 and dropped to 2.7% in 1993. Data from the studies indicated that magpie (*Pica pica*) predation was the primary cause of waterfowl nest failure. Furthermore, the studies linked magpie densities with Russian olive tree (*Elaeagnus angustifolia*) presence. Russian olives were removed during the spring of 1994 and the winters of 1994-95, 1998-99 and 2000-01. In addition, mammalian predator removal, mammalian predator habitat management and aversive conditioning of magpies were also conducted during this time. The 2001 nest search results showed a Mayfield success rate of 37%.

AMPHIBIANS OF THE FRANK CHURCH RIVER OF NO RETURN WILDERNESS AREA. Crystal Strobl, University of Idaho, Moscow, ID 83844.

I conducted amphibian occurrence, distribution, relative abundance, and habitat relationship research at the Taylor Ranch Biological Field Station, located in central Idaho. Four amphibian species were detected in the early 1990s (Duncan and Karl unpublished data): Columbia spotted frogs (*Rana luteiventris*), long-toed salamanders (*Ambystoma macrodactylum*), western toads (*Bufo boreas*), and tailed frogs (*Ascaphus truei*). There were 42 sites sampled in 1994 and 52 sites sampled in 1995. I repeated earlier studies and expanded the number of sites sampled to 90 in 2001. Columbia spotted frogs were evenly distributed throughout the study area and occurred at 43% of the sites, while long-toed salamanders occurred at only 21% of the sites. Western toad and tailed frog distribution and abundance could have been limited due to small sample sizes. I used S-Plus 2000 statistics package that showed a significant difference between Columbia spotted frog breeding sites ( $P = 0.0194$ ) and the presence of fire disturbance. The frogs only occurred at five sites (3%) that had fire disturbance. Long-toed salamander breeding sites were located at 11 fire-disturbed sites (6%). There is only one known breeding site for the western toad in the entire study area. Tailed frog breeding sites occurred more often in areas without fire disturbance (65%) than in areas with fire disturbance (35%). The field season of 2001 showed a wider distribution and abundance of amphibians compared to previous years. Future management of these populations should include long-term monitoring within the Big Creek drainage and its surrounding tributaries to evaluate changes, trends, and effects of fire disturbance.

ASSESSMENT OF HIGH VALUE RESOURCE AREAS IN LATAH COUNTY, IDAHO. Gina Wilson<sup>1</sup>, Leona Svancara<sup>1</sup>, and R.G. Wright<sup>2</sup>,

<sup>1</sup>Landscape Dynamics Lab, Univ. of Idaho, University of Idaho, Moscow, <sup>2</sup>Idaho. Dept. of Fish and Wildlife, Univ. of Idaho, Moscow, ID 83844.

Idaho is one of five western states to stand out in recent years as having twice the growth rate as the national average. This is also reflective on county level population growth patterns. With the population increase and the steady increase of development, the use of resources and the loss of wildland and wetland areas are major concerns. There is a growing need to conserve the habitat, resources, scenery and scientific values of Latah County, Idaho. Before conservation can begin, we first need to identify high resource value areas and describe the biological and environmental resources they contain. Using GIS we identified these areas of high resource value in Latah County based upon information such as species richness, vegetation, the National Wetlands Inventory, and cultural information. Final areas targeted for future conservation efforts were selected after incorporating ideas from various land management agencies, environmental organizations and local citizens gathered at workshops.

THE MISCONCEPTIONS OF CONSERVATION TERMINOLOGY. Leona K. Svancara<sup>1</sup>, Gina M. Wilson<sup>1</sup>, and R.G. Wright<sup>2</sup>,

<sup>1</sup>Landscape Dynamics Lab, Univ of Idaho, Moscow, ID. <sup>2</sup>Dept of Fish and Wildlife, Univ of Idaho, Moscow, ID 83844.

Conservation, preservation, protection. What do our audiences hear? Is it what we really intend? Most biologists would agree that the definition of "conservation" can take many forms but, in general, implies something about the planned management and preservation of a natural resource. In reality, the term has developed as many different meanings as there are groups who are concerned about the land and land practices. Ranging from "the preservation and protection of land" to "the wise-use of land and its resources", these definitions create confusion that can hamper efforts to maintain biodiversity if not addressed. At a recent workshop, federal and state agencies, private industry, environmental groups, and local citizens came together to discuss "conservation" in Latah County. Workshop participants quickly learned of the need to clearly define many terms that are common knowledge within their own disciplines.



SPACE-USE AND MOVEMENTS OF MATERNAL FEMALE BIGHORN IN THE HELLS CANYON REGION. Leona K. Svancara<sup>1</sup>, Janet L. Rachlow<sup>2</sup>, and E. Frances Cassirer<sup>3</sup>, <sup>1</sup>Landscape Dynamics Lab, Univ. of Idaho, Moscow, ID. <sup>2</sup>Dept of Fish and Wildlife, Univ. of Idaho, Moscow, ID. <sup>3</sup>Idaho Dept of Fish and Game, Lewiston, ID.

Lamb recruitment is a critical and often highly variable component of mountain sheep population dynamics. Understanding space-use, philopatry, and movements of maternal female bighorns during lambing and lamb-rearing can provide useful insights for population management. Between 1997 and 2001 we monitored movements and productivity of approximately 70 radio-collared bighorn ewes in 6 herds within the Hells Canyon region of Idaho and Oregon. We conducted spider distance analyses within a GIS to develop spatial-temporal representations of ewe movements between March and October of each year. Due to dietary and predator-avoidance requirements associated with parturition and lamb-rearing, we hypothesized that space use and movements by ewes would vary between the pre-lambing, lambing, and post-lambing time periods. Implications of movement patterns will be discussed.

IDAHO DEPARTMENT OF FISH & GAME MITIGATION PROGRAM. Mary Terra-Berns, Idaho Department of Fish & Game, Coeur d'Alene, ID 83815.

Dams built to generate power, control flooding and provide navigation, irrigation, and recreation have altered streams draining the Columbia River Basin. Twenty-nine Federal hydroelectric dams and numerous other dams now regulate the flow of many of these streams. Several of these dams and resulting reservoirs have inundated floodplains and riparian habitats important to many wildlife species in Idaho. The Pacific Northwest Power Act directs Bonneville Power Administration to provide funding to mitigate for the loss of wildlife habitat caused by the development of the Federal Columbia River Power System. The Northwest Power Act also directs the Northwest Power Planning Council to develop a program to protect, mitigate and enhance fish and wildlife of the Columbia River Basin that have been impacted by hydropower dams, and make annual funding recommendations to the Bonneville Power Administration for projects to implement the program. The Idaho Wildlife Mitigation Program maintains ongoing projects that focus on protecting and enhancing wildlife habitat throughout the State to mitigate for habitat lost due to development and operation of hydropower projects.

ANNUAL AND SEASONAL SURVIVAL RATES OF SAGE GROUSE IN SOUTHWEST IDAHO Paul A. Wik, Fish and Wildlife Resources, University of Idaho, Moscow, ID 83844, John W. Connelly, Idaho Department of Fish and Game, 1345 Barton Road, Pocatello, ID 83204, and Kerry P. Reese, Fish and Wildlife Resources, University of Idaho, Moscow, ID 83844.

We used necklace-style radio transmitters and the Kaplan-Meier staggered entry method to determine annual and seasonal survival rates of sage grouse by sex and age in southwest Idaho. Fieldwork was conducted from March 1999 until October 2001. Males were not separated into age categories due to small sample size. Males exhibited annual survival rates of 51% (1999), 61% (2000) and 74% (March through October 2001). Adult survival for females was 60% (1999), 61% (2000) and 46% (March through October 2001), while juvenile survival was 18% (1999), 63% (2000) and 50% (March through October 2001). Male survival was higher and female survival lower than previously published for sage grouse in Idaho (Connelly et al. 1994). Overall, 7.3% of radio-marked birds were harvested, and males experienced 5.3% harvest, adult females 6.9% and juvenile females 15.4%.