



**1993
ANNUAL MEETING
OF THE
IDAHO CHAPTER OF
THE WILDLIFE SOCIETY**

**March 25-27, 1993
Boise, Idaho**

**IDAHO CHAPTER OF THE WILDLIFE SOCIETY
1993 ANNUAL MEETING - BOISE, IDAHO**

**PROGRAM COORDINATORS
ALAN SANDS - PROGRAM CHAIR**

Jack Connelly	Bill Mullins
Michael Gratson	Signe Sather-Blair
Tom Hemker	Jeri Williams
Sam Mattise	Helen Ulmschneider
Paul Moroz	

KEYNOTE SPEAKER

Tom Kovalicky

CHAPTER OFFICERS

Paul Moroz - President
Alan Sands - Vice-President
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Idaho Chapter of The Wildlife Society

1993 Annual Meeting (March 25 - 27)

Red Lion Inn, Downtowner
Boise, Idaho

'Adapting to Changing Environments'

Wednesday, March 24 (6:00 p.m. - 8:00 p.m.)

6:00 - 8:00 Registration - Main Lobby

Thursday, March 25 (7:00 a.m.- 7:00 p.m.)

7:00 - 8:00 Registration - Main Lobby

Annual Meeting - Selway/Teton Meeting Rooms

8:00 - 8:05 Welcome - Paul Moroz, President, Idaho Chapter

8:05 - 8:10 TWS Section News - Chuck Blair, President, NW Section

8:10 - 8:30 Keynote Address: *'Adapting to Changing Environments'*
Tom Kovalicky, USDA Forest Service, retired

8:30 - 10:00 *'Surviving the 90's'* - Coping with Conflicts and Change (Panel Discussion)
Tom Kovalicky, Chairman; Delmar Vail, Idaho State Director BLM; Jeff DeBonis,
AFSEE/PEER; Don Oman, District Ranger, Sawtooth National Forest.

10:00 - 10:30 Break

Session A - Management Programs

Chairperson - Hugh Harper, retired U.S. Bureau of Land Management

10:30 - 10:50 Peregrine Falcon Recovery in Idaho. Ed Levine and Wayne Melquist, Idaho
Department of Fish and Game.

10:50 - 11:10 Status of Wolf Reintroduction EIS. Jerome Hansen and Jon Rachael, Idaho Fish and
Game.

11:10 - 11:30 Pheasants Forever in the Role of Nongovernmental Entities in Wildlife Management.
David Lockwood, Pheasants Forever.

11:30 - 1:00 Lunch

Session B - Nongame Birds

Chairperson - Arch Mehrhoff, retired U.S. Fish & Wildlife Service

- 1:00 - 1:20 Breeding Bird Survey of Old-Growth/Seral, Prescribed Burn, and Clearcut Stands of Western Juniper. Matt McCoy and Colleen Sweeny, Golden Eagle Chapter, Audubon Society.
- 1:20 - 1:40 Bird Communities and Spatial Heterogeneity of Landscapes in Southwestern Idaho. Steven T. Knick, Bureau of Land Management and John T. Rotenberry, Univ. of Cal., Riverside.
- 1:40 - 2:00 Songs of Brewer's Sparrow: Microgeographic and Individual Variation. Terrell D. Rich, Bureau of Land Management.
- 2:00 - 2:20 Distribution of Bald Eagles Wintering in the Boise River Drainage. Gregory Kaltenecker and Marc J. Bechard, Boise State Univ., and Larry Donohoo, U.S. Forest Service.
- 2:20 - 2:40 Effect of Prey and Weather on Golden Eagle Reproductive Rates. Karen Steenhof and Michael Kochert, Bureau of Land Management.
- 2:40 - 3:05 Break
- 3:05 - 5:00 Riparian Habitat Workshop - Tracy Trent, Chairperson
- 5:00 - 7:00 Social - No Host Bar - Garden Area

Friday, March 26 (8:00 a.m. - midnight)

Selway/Teton Meeting Room

8:00 - 9:30 *'Innovative Approaches to Resource Management'* (Panel Discussion) Michael Gratson, IDFG; Pete Bradley, Nevada Dept of Wildlife; Greg Servheen, IDFG; Bill Wall, Potlatch Corp.; Neal Middlebrook, BLM.

9:30 - 10:00 Break

Session C - Habitat Management

Chairperson - Mart Morache, retired Idaho Department of Fish and Game.

- 10:00 - 10:30 Proposed Big Springs Training Range, Owyhee County. Herb Meyr, US Air Force, Retired.
- 10:30 - 10:50 Forest Health Strategy on the Boise National Forest. Truman Puchbauer, US Forest Service.
- 10:50 - 11:10 Advancements in the Rehabilitation of Burned Rangelands in Southern Idaho. Mike Pellant, Bureau of Land Management.

- 11:10 - 11:30 Habitat Delineation from Landsat Thematic Mapper Satellite Imagery in Southwestern Idaho. Steven T. Knick, Bureau of Land Management, John Rotenberry, Univ. Cal. Riverside, and Thomas Zarriello, Bureau of Land Management.
- 11:30 - 11:50 BLM's Western Fish and Wildlife Staff: It's Role and Implications for Idaho. William "Buz" Kennedy, Bureau of Land Management.
- 11:50 - 1:00 Lunch
- Session D - Reptiles and Amphibians**
Chairperson - Pete Carter, retired U.S. Fish and Wildlife Service
- 1:00 - 1:20 Amphibians and Reptiles of Yellowstone and Grand Teton National Parks. Edward D. Koch, U.S. Fish and Wildlife Service and Charles R. Peterson, Idaho State University.
- 1:20 - 1:40 The Distribution and Habitat Associations of Amphibians on the Targhee National Forest. R.J. Clark, Charles R. Peterson, and P.E. Bartelt, Idaho State University.
- 1:40 - 2:00 Monitoring Amphibian Populations in the Greater Yellowstone Ecosystem. C.R. Peterson, Edward D. Koch, and P.S. Korn, Idaho State University.
- 2:00 - 2:20 Amphibian and Reptile Survey on Tex Creek Wildlife Management Area: Species Composition, Optimal Sampling Times, and Evaluation of Survey Techniques. M.J. McDonald, Idaho Department of Fish and Game.
- 2:20 - 2:40 Factors Affecting Body Temperature Variation in Free-ranging Rubber boas. Michael E. Dorcas, Idaho State University.
- 2:40 - 3:00 The Thermal Ecology of Pregnancy in Great Basin Rattlesnakes. Vincent A. Cobb, Idaho State University.
- 3:00 - 3:20 Break
- 3:20 - 5:00 **Business Meeting**
- 6:00 - 12:00 **Social - Ballroom**
- 6:00 - 7:00 Browsing on Hors d'oeuvres (dinner), No Host Bar, and Silent Auction.
- 7:00 - 8:30 Auction - Sam Mattise, Auctioneer
- 8:30 - 12:00 Music/Dancing - 'Uncertain Texas' Dale Keys, Vicki Stagi-Dorflehner
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Saturday, March 27 (8:00 a.m. - noon)

Selway/Teton Meeting Rooms

Session E - Upland Game Birds

Chairperson - Joe Greenley, retired Nevada Department of Wildlife and Idaho Department of Fish and Game

- 8:30 - 8:50 Renesting by Sage Grouse in Southeastern Idaho. John W. Connelly, Richard A. Fisher and Kerry P. Reese, Univ. of Idaho; Anthony D. Apa and Wayne Wakkinen, Idaho Department of Fish and Game.
- 8:50 - 9:10 Winter Habitat Ecology of Columbian Sharp-tailed Grouse. Mark J. Ulliman and Kerry P. Reese, Univ. of Idaho; John W. Connelly, Idaho Department of Fish and Game; and James H. Klott, Bureau of Land Management.
- 9:10 - 9:30 Winter Feeding Ecology of Columbian Sharp-tailed Grouse. James W. Schneider and Kerry P. Reese, Univ. of Idaho; John W. Connelly, Idaho Department of Fish and Game; and James H. Klott, Bureau of Land Management.
- 9:30 - 9:50 Brood-Rearing Habitat of Merriam's Wild Turkeys in Southwestern Idaho. John O'Neill and Kerry P. Reese, Univ. of Idaho.
- 9:50 - 10:10 Survival and Reproduction of Introduced and Resident Merriam's Wild Turkeys in Western Idaho. Frank Edelmann, Kerry P. Reese, and John O'Neill, Univ of Idaho; Pete Zager, Idaho Department of Fish and Game.
- 10:10 - 10:30 Break

Session F - Potpourri

Chairperson - Dick Woodworth, retired U.S. Bureau of Reclamation

- 10:30 - 10:50 Movements of Black-tailed Jackrabbits at the Idaho National Engineering Laboratory. Adam T. Porth, Nancy Huntly, and Jay E. Anderson, Idaho State University.
- 10:50 - 11:10 Wintering and nesting site Fidelity of Long-eared Owls in the Snake River Birds of Prey Area. Helen Ulmschneider, US Fish and Wildlife Service.
- 11:10 - 11:30 Mutualism in the Hinterlands: Linking Watchable Wildlife and Rural Economic Opportunities Through Bed, Breakfast, and Binoculars. Mark Hilliard, BLM.
- 11:30 - 12:00 Awards, Closing Remarks
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Poster Session

8:00 a.m. Thursday through 10:00 a.m. Saturday

Albion Room

Cheatgrass Invasion of Shrubsteppe Vegetation: Effect on Breeding Birds in South-Central Idaho. Terrell D. Rich, Bureau of Land Management.

Status of Mountain Quail in the Intermountain West. Tom Hemker, Idaho Department of Fish and Game, Alan Sands, Bureau of Land Management, and Ed Robertson, The Chukar Foundation.

Current Research on Mountain Quail in Idaho. Patricia E. Heekin and Kerry P. Reese, University of Idaho and Pete Zager, Idaho Dept. of Fish and Game.

Neotropical Bird Management on BLM Land. Terrell D. Rich, Bureau of Land Management.

Harvesting Water for Wildlife Use From Aspen Stands. Bill Rice, Bureau of Land Management.

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A B S T R A C T S

Idaho Chapter

The Wildlife Society

1993 Annual Meeting

SESSION A - MANAGEMENT PROGRAMS

PEREGRINE FALCON (FALCO PEREGRINUS ANATUM) RECOVERY IN IDAHO, 1982-1992.

ED LEVINE, Idaho Dept. Fish and Game, Boise, ID 83707.

WAYNE MELQUIST, Idaho Dept. Fish and Game, Boise, ID 83707.

The Idaho population of peregrine falcons (Falco peregrinus anatum) was essentially extirpated by 1974 (Bechard et al. 1987). In 1982, work to restore this population was begun through the release of captive-produced young using a process referred to as "hacking" (Heinrich 1989). To date, a total of 244 young peregrines have been released at 16 sites within Idaho (Heinrich 1992, 1991, 1990, 1989, 1988). Also, as of 1992, 10 pairs of peregrine falcons occupied territories within the state. Eight were successful in producing 25 young for an average of 2.5 young produced per pair and 3.0 young produced per successful pair.

STATUS OF WOLF REINTRODUCTION EIS.

JEROME HANSEN, Idaho Dept. Fish and Game, Boise, ID 83707.

JON RACHAEL, Idaho Dept. Fish and Game, Boise, ID 83707.

On November 13, 1991, Congress directed the US Fish and Wildlife Service, in consultation with the National Park Service and Forest Service, to prepare a draft Environmental Impact Statement (EIS) on wolf reintroduction in Yellowstone National Park and central Idaho. During the 1992 Idaho legislative session, the Idaho Department of Fish and Game was authorized to participate in the EIS. After a lengthy public participation process, five alternatives for wolf reintroduction are being analyzed. The draft EIS is due out to the public in June 1993.

PHEASANTS FOREVER AND THE ROLE OF NON-GOVERNMENTAL ENTITIES IN WILDLIFE MANAGEMENT.

DAVID R. LOCKWOOD, Western Regional Representative, Pheasants Forever, Inc.

Historically, the role of wildlife conservation, management, and education have been reliant, almost exclusively, upon government agencies. More recently, there is increasing emphasis (nationally and locally) to field more responsibility in the private sector. Pheasants Forever is a non-profit organization designed to bridge the gap between the public and private sectors. Staffed by professional wildlife biologists, the organization's focus is habitat development, land ethics, and conservation. Contrary to the exclusivity implied by the name, Pheasants Forever does habitat restoration that benefits a wide variety of game and non-game species, alike. Pheasants Forever promotes legislation that is advantageous to wildlife, conservation, and serves as an interface between private individuals and government entities to develop habitat on similar types of land.

SESSION B - NON-GAME BIRDS

BREEDING BIRD SURVEY OF OLD-GROWTH/SERAL, PRESCRIBED BURN, AND CLEARCUT STANDS OF WESTERN JUNIPER.

MATTHEW McCOY, Golden Eagle Audubon Society, Boise, ID 83707.

COLLEEN SWEENEY, Golden Eagle Audubon Society, Boise, ID 83707.

A survey of avian use of juniper stands subjected to three management strategies was conducted during May and June 1992 in Owyhee County, Idaho through a cooperative Challenge Cost-Share project between the Bureau of Land Management and Golden Eagle Audubon Society. Two-hundred and three 8-minute samples were conducted at 70 points. Fifty-four species and 1601 birds were observed. Old-growth/seral plots averaged 3.6 species and 5.2 birds per plot, prescribed burn plots averaged 2.2 species and 3.4 birds per plot, and clearcut plots averaged 1.2 species and 1.8 birds per plot. Gray flycatcher, American robin, mountain chickadee, and chipping sparrow were most abundant in old-growth/seral stands. Northern flicker, mountain bluebird, vesper sparrow, and Brewer's sparrow were most abundant in prescribed burn stands. House wrens were most abundant in clearcut areas.

BIRD COMMUNITIES AND SPATIAL HETEROGENEITY OF LANDSCAPES IN SOUTHWESTERN IDAHO.

STEVEN T. KNICK, RRTAC, Bureau of Land Management, Boise, ID 83705.

JOHN T. ROTENBERRY, Dept. of Biology, Univ. Cal., Riverside, CA 92521.

Spatial heterogeneity of landscapes may influence distribution and abundance of passerine birds breeding in the Snake River Birds of Prey Area, southwestern Idaho. To test this hypothesis, we developed resource selection models for sage (*Amphispiza belli*) and Brewer's sparrows (*Spizella breweri*), horned larks (*Eremophila alpestris*), and western meadowlarks (*Sturnella neglecta*). Vegetation characteristics, from field surveys were combined with a geostatistical analysis of each survey site using satellite imagery to determine factors predicting habitat occupancy.

SONGS OF BREWER'S SPARROW: MICROGEOGRAPHIC AND INDIVIDUAL VARIATION.

TERRELL D. RICH, Bureau of Land Management, Boise, ID 83706.

Territorial songs of 284 Brewer's Sparrows (*Spizella breweri*) were recorded in 18 populations in southern Idaho. Most males sang two-trill song types with fewer singing three- or one-trill types. Most males also had only one song type. Time and frequency variables measured from trill types were distinctive for trills in different song positions. Sharing of trill types, pairs of trill types, and time and frequency features of trill types between populations was only weakly related to geographical distance. Some pairs of neighboring populations were dissimilar while other pairs separated by relatively great geographic distance were most similar. Populations sampled in the same location in successive years were not especially similar to each other. Neighboring territorial males shared no more trill types or pairs of trill types than did randomly selected pairs of males. Small territory size, annual dispersal, population turnover, and continuous habitat may confound local song uniformity in the populations studied. Song features identifying species appear to predominate over features identifying individuals.

DISTRIBUTION OF BALD EAGLES WINTERING IN THE BOISE RIVER DRAINAGE.

GREGORY S. KALTENECKER, Boise State University, Boise, ID 83725.

MARC J. BECHARD, Boise State University, Boise, ID 83725.

LARRY DONOHOO, U.S. Forest Service, Boise, ID 83712.

Aerial surveys of wintering bald eagles (*Haliaeetus leucocephalus*) were conducted bi-monthly on the Middle and South Forks of the Boise River during the winters of 1990-1991 and 1991-1992. Eagle numbers peaked in mid-January during the first winter of the study, while the highest concentration of eagles was recorded in early November during the winter of 1991-1992. The heaviest eagle use areas included Anderson Ranch Reservoir and the South Fork of the Boise River between Anderson Ranch Dam and Arrowrock Reservoir. Eagles used Lucky Peak and Arrowrock Reservoirs intermittently depending on amount of ice and prey availability. Prey used by eagles consisted mainly of fish and winter-killed big game animals. Several communal night roosts were identified on the South Fork of the Boise River.

THE EFFECT OF PREY AND WEATHER ON GOLDEN EAGLE REPRODUCTIVE RATES.

KAREN STEENHOF, RRTAC, Bureau of Land Management, Boise, ID 83705.

MICHAEL N. KOCHERT, RRTAC, Bureau of Land Management, Boise, ID 83705.

We studied golden eagle (*Aquila chrysaetos*) populations nesting in the Snake River Canyon from 1971 through 1991, and analyzed eagle reproduction in relation to black-tailed jackrabbit (*Lepus californicus*) populations and several weather variables. The best predictor of eagle productivity was jackrabbit abundance prior to the breeding season. Winter weather (as expressed by heating degree days during December and January) was associated with eagle productivity primarily when jackrabbit populations were low; cold winter temperatures were associated with reduced numbers of eagle pairs that laid eggs. Extreme heat during brood-rearing was associated negatively with eagle nesting success in years with low jackrabbit populations.

SESSION C - HABITAT MANAGEMENT

ADVANCEMENTS IN THE REHABILITATION OF BURNED RANGELANDS IN SOUTHERN IDAHO.

MIKE PELLANT, Bureau of Land Management, Boise, ID 83706.

Wildfires continue to adversely affect many resource values on public lands in Idaho. Idaho BLM is attacking the wildfire problem and associated loss of wildlife habitat on three fronts. Fire rehabilitation procedures have changed from planting single grass seedings to the use of multi-species seed mixtures of grass, forbs and shrubs with an emphasis on native shrubs. The Intermountain Greenstripping and Rehabilitation Research Project was initiated in 1987 to develop new plant materials and seeding equipment to restore perennial vegetation in cheatgrass environments prone to wildfires. The greenstripping program was also initiated in 1987 to reduce wildfire spread into native shrublands by the strategic planting of strips of fire resistant vegetation.

HABITAT DELINEATION FROM LANDSAT THEMATIC MAPPER SATELLITE IMAGERY IN SOUTHWESTERN IDAHO.

STEVEN KNICK, Bureau of Land Management, Boise, ID 83705.
JOHN ROTENBERRY, Dept. of Biology, Univ. of Cal., Riverside, CA 92521.
THOMAS ZARRIELLO, Bureau of Land Management, Boise, ID 83705.

We mapped habitats in the Snake River Birds of Prey Area, southwestern Idaho, from LandSat Thematic mapper satellite images taken on 3 September 1990 and 30 March 1991. We used a supervised method with a hierarchical approach to translate spectral characteristics in the satellite images into vegetation types. After identifying water and agriculture pixels, we used a series of discriminant function analyses to classify remaining pixels using special characteristics in the images as predictor variables. Accuracy of the map was estimated at approximately 80% from a test sample of 709 sites.

SESSION D - REPTILES AND AMPHIBIANS

AMPHIBIANS AND REPTILES OF YELLOWSTONE AND GRAND TETON NATIONAL PARKS.

EDWARD D. KOCK, U.S. Fish Wildl. Ser., Boise, ID 83705.
CHARLES R. PETERSON, Dept. Biol. Sciences, Idaho State University, Pocatello, ID 83209.

To determine occurrence and distribution of amphibians and reptiles in Yellowstone and Grand Teton National Parks, we compiled approximately 1,030 occurrence records from over 100 museum collections and from observations. We determined that 12 species of amphibians and reptiles occur here: 1 salamander, 5 anuran, 1 lizard, and 5 snake species. Questionable records exist for 4 other species.

Four of the amphibian species are widespread throughout both parks, and the remaining two are confined to only one or two sites in the Tetons. Two snake species are confined to the lowest elevations of Yellowstone, two are widespread throughout both parks, and one is found only in the Tetons and in part of Yellowstone. The sagebrush lizard is found in the lowest elevations in Yellowstone, and otherwise appears isolated at higher elevations in areas with significant solar thermal resources available.

THE DISTRIBUTION AND HABITAT ASSOCIATIONS OF AMPHIBIANS ON THE TARGHEE NATIONAL FOREST.

R.J. CLARK, Dept. Biol. Sciences, Idaho State University, Pocatello ID 83209.
C.R. PETERSON, Dept. Biol. Sciences, Idaho State University, Pocatello ID 83209.
P.E. BARTELT, Dept. Biol. Sciences, Idaho State University, Pocatello ID 83209.

To determine the distribution, relative abundance, and habitat associations of amphibians on the Targhee National Forest (TNF), we surveyed 98 sites throughout the forest during the spring and summer of 1992. We conducted timed searches for amphibians and measured a variety of habitat variables (water temperature, wetlands type, etc.) at each site. We found tiger salamanders (*Ambystoma tigrinum*), western toads (*Bufo boreas*), western chorus frogs (*Pseudacris triseriata*), and spotted frogs (*Rana pretiosa*), which were the most widespread and abundant species. We did not encounter any northern leopard frogs (*Rana pipiens*), even though historical records exist for the TNF. Amphibians were unevenly distributed in the forest, being most abundant in the northeast and least abundant in the southeast. They were found in all wetland habitat systems (palustrine, lacustrine, and riverine). A key habitat characteristic was the presence of potential breeding sites (i.e., standing water).

MONITORING AMPHIBIAN POPULATIONS IN THE GREATER YELLOWSTONE ECOSYSTEM.

C.R. PETERSON, Dept. Biol. Sciences, Idaho State University, Pocatello, ID 83209.

E.D. KOCH, U.S. Fish Wildl. Ser., Boise, ID 83705.

P.S. CORN, U.S. Fish Wildl. Ser., Fort Collins, CO 80525.

Because of growing concerns over downward population trends of amphibians, we initiated an amphibian monitoring program in the Greater Yellowstone Ecosystem in 1991. We monitored eight sites from May through August. We gathered information on environmental conditions at each site which we counted or estimated the number of egg masses, larvae, juveniles, and adults seen or heard. We found tiger salamanders (*Ambystoma tigrinum*), western chorus frogs (*Pseudacris triseriata*), and spotted frogs (*Rana pretiosa*) to be widespread and common or abundant. Comparisons of our data with historical records indicate that western toads (*Bufo boreas*) have suffered considerable declines in distribution and abundance during the past forty years. Our data do not suggest habitat destruction or acidification as the primary causes of these apparent declines.

AMPHIBIAN AND REPTILE SURVEY ON TEX CREEK WILDLIFE MANAGEMENT AREA: SPECIES COMPOSITION, OPTIMAL SAMPLING TIMES, AND AN EVALUATION OF SURVEY TECHNIQUES.

M.J. MCDONALD, Idaho Dept. Fish and Game, Jerome, ID 83338.

Amphibians and reptiles were surveyed on Tex Creek Wildlife Management Area (Bonneville County, Idaho) from 17 May to 29 August 1991 to: (1) determine species composition, (2) determine optimal sampling times, and (3) evaluate the effectiveness of 5 sampling techniques. Two species of amphibians and 7 species of reptiles, 4 of which were new county records, were observed. The best months to sample were July and August for amphibians and June and July for reptiles. Time-constrained searches were the most effective techniques, yielding 7 of 9 species; road driving and aquatic funnel trapping each added another species. Pit-fall trapping and funnel trapping were least effective and yielded few additional data. This type of data provides an important source of information on a rarely studied group of wildlife and has the potential to aide wildlife and land management professionals in making better informed land-use decisions.

FACTORS AFFECTING BODY TEMPERATURE VARIATION IN FREE-RANGING RUBBER BOAS (*CHARINA BOTTAE*).

MICHAEL E. DORCAS, Dept. Biol. Sciences, Idaho State University, Pocatello, ID 83209.

To examine the influence of activity and daily variation in the thermal environment on body temperature variation in free-ranging rubber boas, I surgically implanted temperature sensitive radiotransmitters in 8 snakes from a small canyon in southeast Idaho. The body temperatures of telemetered rubber boas were continuously monitored using an automated telemetry system. The thermal preference of rubber boas was determined in a laboratory thermal gradient. As previously reported, rubber boas are often active at night and exhibit low body temperatures. Body temperatures of active snakes were variable and ranged from 6.5 to 32°C. However, rubber boas spent most of the time in underground retreats at relatively constant body temperatures often near their thermal preference of 27°C (e.g., $\bar{x}=24.8^{\circ}\text{C}$, $\pm 2.6^{\circ}\text{C}$, for 24 hours, 10 July 1991). These continuous body temperature data sets reveal a picture of rubber boa body temperature variation different from that based on opportunistic spot measurements. Although rubber boas tolerate a wide range of body temperatures while active, inactive rubber boas often maintain relatively constant body temperatures similar to diurnal snakes.

THE THERMAL ECOLOGY OF PREGNANCY IN GREAT BASIN RATTLESNAKES (CROTALUS VIRIDIS LUTOSUS).

VINCENT A. COBB, Dept. of Biol. Sciences, Idaho State University, Pocatello, ID 83209.

This study describes how pregnancy influences body temperature (T_b) patterns of individual, free-ranging rattlesnakes. I surgically implanted radiotransmitters, containing both temperature and motion sensors, into female Great Basin rattlesnakes and then released the snakes at their denning area on the Idaho National Engineering Laboratory. I used portable, recording telemetry systems to sample snake T_b every five minutes. During the active season, nonpregnant female snakes made lengthy migrations of 3-7 km from the winter den, whereas pregnant snakes did not disperse over 3 km. Pregnant snakes selected and remained at rocky basalt outcrops throughout the active season until they give birth in August. By measuring operative environmental temperatures using painted, copper snake models, thermocouples, and a datalogger, I have shown that the rocky outcrops allow pregnant snakes to maintain a high, steady T_b . In fact, at night, T_b of nonpregnant snakes remained several degrees cooler. After the pregnant snakes give birth, their T_b patterns changed to resemble the T_b patterns of nonpregnant snakes.

SESSION E - UPLAND GAME BIRDS

RENESTING BY SAGE GROUSE IN SOUTHEASTERN IDAHO.

JOHN W. CONNELLY, Idaho Dept. Fish and Game, Pocatello, ID 83221.

RICHARD A. FISCHER, Dept. Fish Wildl. Res., Univ. of Idaho, Moscow, ID 83843.

KERRY P. REESE, Dept. Fish Wildl. Res., Univ. of Idaho, Moscow ID 83843.

ANTHONY D. APA, Idaho Dept. Fish and Game, Jerome ID 83338.

WAYNE WAKKINEN, Idaho Dept. Fish and Game, Bonners Ferry, ID 83805.

We documented reneesting rates of sage grouse (Centrocercus urophasianus) in southeastern Idaho and also compared nesting and reneesting rates between yearling and adult age classes. Overall, 69% of the hens ($n = 242$) initiated nests. Nesting effort by adults was greater than that of yearlings ($P = 0.001$). Nest success between age classes was similar ($P = 0.95$) and we could not detect a difference in reneesting rates between age classes ($P = 0.65$). Our findings suggest that a relatively large number of female sage grouse either fail to nest or terminate their nesting effort very early in the nesting period. Contrary to some previous work, we also documented a very low reneesting rates may be a function of this species' relatively xeric environment and the relatively limited time in which suitable food is available for broods.

WINTER HABITAT ECOLOGY OF COLUMBIAN SHARP-TAILED GROUSE.

MARK J. ULLIMAN, Dept. Fish Wildl. Res., Univ. of Idaho, Moscow, ID 83843.

KERRY P. REESE, Dept. Fish Wildl. Res., Univ. of Idaho, Moscow, ID 83843.

JOHN W. CONNELLY, Idaho Dept. Fish and Game, Pocatello, ID 83204.

JAMES H. KLOTT, Bureau of Land Management, Twin Falls, ID 83301.

Our study seeks to quantify characteristics of Columbian sharp-tailed grouse winter habitat and to document their movement patterns, home range size, and habitat selection. Preliminary results from the 1991-92 winter revealed that 12 radio-marked birds were located predominantly in CRP (67.6% of locations), followed by sagebrush (15.2%), intermediate (CRP/sagebrush, 11.9%), mountain shrub (3.8%), and agriculture (1.4%). Mean farthest distance moved from lek of capture for 6 females was 5.0 ± 2.95 km and for 6 males was 1.9 ± 0.98 km. For the 1992-93 winter to date, radioed birds have been located predominantly in mountain shrub and chokecherry, with occasional locations in mixed shrub and sagebrush.

WINTER FEEDING ECOLOGY OF COLUMBIAN SHARP-TAILED GROUSE.

JAMES W. SCHNEIDER, Dept. Fish Wildl. Res., Univ. of Idaho, Moscow ID 83843.
KERRY P. REESE, Dept. Fish Wildl. Res., Univ. of Idaho, Moscow ID 83843.
JOHN W. CONNELLY, Idaho Dept. Fish and Game, Pocatello, ID 83204.
JAMES H. KLOTT, Bureau of Land Management, Twin Falls, ID 83301.

Our study addresses several aspects of the little known winter feeding ecology of the Columbian sharp-tailed grouse. Preliminary results of microhistologically-analyzed fecal samples collected during the mild winter of 1992 revealed some interesting food choices. In January, the diet (n=7) consisted of 79.9% forbs, 16.7% grasses, and only 3.4% shrubs. Alfalfa was the predominate food item at 35.0%. In February, forbs comprised 39.0%, grasses 15.0%, and shrubs 46.0% of the diet (n=11). Rabbitbrush was the most used food item comprising 38.8% of the monthly diet. These preliminary results are not consistent with what is currently known about the birds winter feeding habits.

BROOD-REARING HABITAT OF MERRIAM'S WILD TURKEYS IN SOUTHWESTERN IDAHO.

JOHN O'NEILL, Dept. Fish Wildl. Res., Univ. of Idaho, Moscow, ID 83843.
KERRY P. REESE, Dept. Fish Wildl. Res., Univ. of Idaho, Moscow, ID 83843.

Merriam's wild turkeys were radio-tracked in Adams County during the 1992 brood-rearing season. Twenty-eight brood locations were identified and habitat characteristics were measured at each location. These habitat characteristics also were measured at dependent-random sites and tested for differences to identify which habitat features may be important for Merriam's wild turkeys.

SURVIVAL AND REPRODUCTION OF INTRODUCED AND RESIDENT MERRIAM'S WILD TURKEYS IN WESTERN IDAHO.

FRANK EDELMANN, Dept. Fish Wildl. Res., Univ. of Idaho, Moscow, ID 83843.
KERRY P. REESE, Dept. Fish Wildl. Res., Univ. of Idaho, Moscow, ID 83843.
JOHN O'NEILL, Dept. Fish Wildl. Res., Univ. of Idaho, Moscow, ID 83843.
PETE ZAGER, Idaho Dept. Fish and Game, Lewiston, ID 83501.

Resident and introduced Merriam's wild turkeys were radio-tracked through nesting and brood-rearing periods of 1992 to determine reproduction and survival rates. Reproduction and survival rates of introduced turkeys were then compared to those of resident turkeys to determine what contribution introduced turkeys might make to the productivity of turkey populations in western Idaho.

SESSION F - POTPOURRI

MOVEMENTS OF LEPUS CALIFORNICUS AT THE IDAHO NATIONAL ENGINEERING LABORATORY.

ADAM T. PORTH, Dept. of Biol. Sci., Idaho State University, Pocatello, ID 83209.

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Movements are important in understanding the ecology of the black-tailed jackrabbit (Lepus californicus). Several studies have described the home ranges and local movements of black-tailed jackrabbits and incidentally mention long distance or seasonal movements. Any movements away from a jackrabbit's home range is considered a long distance movement. The maximum distances moved by radio-collared jackrabbits ranged from 0.13 km to 30 km. The maximum distances moved in the fall were greater than those in summer ($p = 0.033$), and the frequency of long distance movements was greater in the fall.

WINTERING AND NESTING SITE USE BY LONG-EARED OWLS IN THE SNAKE RIVER BIRDS OF PREY AREA.

HELEN ULMSCHNEIDER, U.S. Fish Wildl. Ser., Boise, ID 83705.

I have monitored, trapped and banded both breeding and wintering long-eared owls in the Snake River Birds of Prey Area since 1988 to gather basic demographic data on this species. Preliminary conclusions are: (1) some owls both winter and breed in the area and often at the same site; (2) very few juveniles return to winter or breed where they were born; (3) some owls move between roosts within a winter and between winters, but a few owls have high site fidelity; (4) different sites are favored as communal roosts in different winters; and (5) many more owls winter in a site than subsequently breed there. My hypothesis is that many of the wintering owls breed in the surrounding mountains.

MUTUALISM IN THE HINTERLANDS: LINKING WATCHABLE WILDLIFE AND RURAL ECONOMIC OPPORTUNITIES THROUGH BED, BREAKFAST, AND BINOCULARS.

MARK HILLIARD, Bureau of Land Management, Boise ID

Many rural communities face uncertain or declining economic futures because of changing public attitudes toward historically exploitive uses of natural resources, such as logging and livestock grazing practices. Re-evaluation of what constitutes "sustainable" levels of harvest and/or use will likely reduce future total commodity production in many areas, with associated reductions in the total economic base historically supporting those communities. Though not a panacea, amenity resource development associated with wildlife viewing can, if strategically planned, provide opportunities for economic diversification and community stabilization.

POSTER SESSION

CHEATGRASS INVASION OF SHRUBSTEPPE VEGETATION: EFFECT ON BREEDING BIRDS IN SOUTH-CENTRAL IDAHO.

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Cheatgrass (Bromus tectorum) is an exotic, fire-adapted annual grass that threatens to dominate up to 25,000,000 ha primarily in the Intermountain West. Vegetative communities being replaced are characterized by sagebrush (Artemisia spp.), and perennial grasses of genera such as Agropyron, Poa, Festuca, Oryzopsis, Elymus and Stipa. In native vegetation in south-central Idaho, breeding bird densities range from 3.7 - 8.1 birds/ha and include 8-12 species. As this habitat is degraded by burning and cheatgrass invasion, densities decline to around 1 bird/ha while species richness drops to as low as one. Species that began to be negatively affected included the sage grouse (Centrocercus urophasianus), loggerhead shrike (Lanius ludovicianus), Vesper sparrow (Poocetes gramineus), sage sparrow (Amphispiza belli), brewer's sparrow (Spizella breweri), and Western meadowlark (Sturnella neglecta). The only species to persist in severely altered habitat is the horned lark (Eremophila alpestris).

STATUS OF MOUNTAIN QUAIL IN THE INTERMOUNTAIN WEST.

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Mountain quail (Oreortyx pictus) populations in the intermountain region of Washington, Oregon and Nevada have declined significantly during the last 20-30 years. In Idaho, their distribution has declined by over 90%. Hunting was closed in 1984 after harvest declined 96% from 1950's to the 1970's. Declines may be related to losses of riparian habitat quantity and quality. Currently, this species is receiving increased attention from sportsmen and management agencies. A research and management program is underway.

CURRENT RESEARCH ON MOUNTAIN QUAIL IN IDAHO.

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As a result of severe population declines over the past several decades, the Bureau of Land Management and Idaho Department of Fish and Game are sponsoring research into the ecology of mountain quail (Oreortyx pictus). The current study is designed to investigate the movements, habitat use patterns, and population characteristics of mountain quail in west-central Idaho. During the 2 field seasons, quail will be trapped, measured, weighed and radio-collared. Radio-tracking will be used to locate nest sites and roost sites, and physical and vegetal characteristics of nesting and brood-rearing habitat will be collected.