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SOCIETY

IDAHO CHAPTER OF THE WILDLIFE SOCIETY ANNUAL MEETING

March 3, 1994
through March 5, 1994
Post Falls, Idaho

IDAHO CHAPTER OF THE WILDLIFE SOCIETY
1994 ANNUAL MEETING - POST FALLS, IDAHO

PROGRAM COORDINATORS

ALAN SANDS - PROGRAM CHAIR

Jack Connelly
Michael Gratson
Tom Hemker

Sam Mattise
Paul Moroz
Bill Mullins

Kerry Reese
Scott Robinson
Gregg Servheen

KEYNOTE SPEAKER

Dr. Fritz Knopf

CHAPTER OFFICERS

Paul Moroz - President
Alan Sands - Vice President
Justin Naderman - Secretary
Geoff Hogander - Treasurer

CORPORATE SPONSORS

Boise Cascade Corporation
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Idaho Chapter of The Wildlife Society
1994 Annual Meeting
Templins Resort Hotel
Post Falls, Idaho

Implementing Ecosystem Management

Wednesday, March 2 (6:00 p.m. - 8:00 p.m.)

6:00 - 8:00 Registration - Main Lobby

Thursday, March 3 (7:00 a.m. - 7:00 p.m.)

7:00 - 8:00 Registration - Main Lobby

Annual Meeting - Merganser Meeting Room

8:00 - 8:10 Welcome - Paul Moroz, President, Idaho Chapter.

8:10 - 8:55 Keynote Address: *Conserving Biological Diversity*.
Dr. Fritz Knopf, National Ecology Research Center,
National Biological Survey, Fort Collins, CO.

8:55 - 10:25 Panel Discussion - *Implementing Ecosystem Management:
Getting Beyond the Rhetoric*.
Chuck Harris, Idaho Department of Fish and Game -
Chairperson; Monica Schwalbach, Forest Service; Allan
Thomas, Bureau of Land Management; Bill Wall, Potlatch
Corporation; Craig Groves, The Nature Conservancy.

10:25 - 10:45 Break

Session A - Ecosystem Health

Chairperson - Michelle McCammon, U.S. Forest Service

10:45 - 11:05 **Forest Health and Wildlife Habitat Management on the Boise
National Forest, Idaho.** John R. Erickson, Boise National
Forest and Dale Toweill, Idaho Department of Fish and
Game.

11:05 - 11:25 **Adaptive Fire Management in Sagebrush Ecosystems.** Bob
Clark and Mike Pellant, Bureau of Land Management.

11:25 - 11:45 **Seedling Survival of Bitterbrush and Sagebrush: The Squaw
Butte Fire Complex.** Samuel N. Mattise and James Olson,
Bureau of Land Management.

11:45 - 1:00 Lunch

Session B - Endangered Species & Waterfowl Ecology

Chairperson - Samuel N. Mattise, Bureau of Land Management

- 1:00 - 1:20 **Wolf Recovery in Idaho.** Ted Koch, U.S. Fish and Wildlife Service.
- 1:20 - 1:40 **Status of Bald Eagles at Wolf Lodge Bay, Coeur d'Alene Lake, Idaho.** Scott Robinson, Bureau of Land Management.
- 1:40 - 2:00 **Duck Nesting Success and Russian Olives at Sterling Wildlife Management Area.** Randall J. Gazda, University of Montana.
- 2:00 - 2:20 **Oxford Slough Duck Nesting Study.** Bradley B. Compton, Idaho Department of Fish and Game; Mike Johnson, U.S. Fish and Wildlife Service; and Daryl Meints and Carl Anderson, Idaho Department of Fish and Game.
- 2:20 - 2:40 **A Totally Biased Status Report on Status of Grizzly Bear Recovery in Central Idaho.** James M. Peek, University of Idaho.
- 2:40 - 3:05 Break
- 3:05 - 5:00 Workshop - *Northern Idaho Amphibians and Reptiles. (Identification and Ecology of Selected Species)*
Dr. Charles Peterson, Idaho State University, and Ted Koch, U.S. Fish & Wildlife Service.
- 3:05 **Introduction.** Charles R. Peterson, Idaho State University and Idaho Museum of Natural History.
- 3:20 **Identification, Ecology, and Status of Selected Species.** Charles R. Peterson, Idaho State University, and Frances Cassirer, Idaho Department of Fish and Game.
- 3:50 **Coordinating Data Collection.** Ted Koch, U.S. Fish and Wildlife Service.
- 4:05 **Sampling Techniques.** Charles R. Peterson, Idaho State University.
- 4:20 **Surveying Reptiles with Drift Fences and Funnel Traps.** Jonathan M. Beck, Idaho State University.
- 4:35 **The Use of Radiotelemetry to Study the Movements and Habitat Use of Western Toads.** Paul. E. Bartelt, Idaho State University.
- 4:20 **Live Specimen Display.**
- 5:00 - 7:00 **No Host Bar - Lounge**
- 7:00 - 9:00 **Idaho Wilderness Legislation Update & Discussion - Lisa Lombardi - Redhead Room**
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Friday, March 4 (8:00 a.m. - 10:00 p.m.)

Merganser Meeting Room

Session C - Middle Snake Ecological Studies

Chairperson - Allan Ansell, Idaho Power Company

- 8:00 - 8:20 **Avian Community Composition and Densities in the Hagerman Valley.** Kelly D. Wilde and Anthonie M.A. Holthuijzen, Idaho Power Company.
- 8:20 - 8:40 **Bird-Habitat Associations in the Hagerman Valley: Native and Exotic Plant Communities.** Anthonie M.A. Holthuijzen, Idaho Power Company.
- 8:40 - 9:00 **Wintering Waterfowl in the Hagerman Valley.** Von R. Pope and Anthonie M.A. Holthuijzen, Idaho Power Company.
- 9:00 - 9:20 **Predator Scent-Post Surveys in the Hagerman Valley.** Kelly D. Wilde and Anthonie M.A. Holthuijzen, Idaho Power Company.
- 9:20 - 9:40 **Vegetation Response to Regulated River Flows and Environmental Parameters in the Hagerman Valley, Southwestern Idaho.** Vincent Muli Kituku, Idaho Power Company.
- 9:40 - 10:00 **Distribution of Purple Loosestrife (*Lythrum salicaria*) on the Snake River, from Power County to Grandview, Idaho.** Von R. Pope and Nancy K. Cole, Idaho Power Company.

10:00 - 10:30 Break

Session D - Big Game Biology and Management

Chairperson - Lew Brown, Bureau of Land Management (?)

- 10:30 - 10:50 **Antler Morphology of an Introduced Moose Population: Founder Effects and Genetic Diversity.** James G. MacCracken, University of Idaho; Victor Van Ballenberghe, U.S. Forest Service; and James M. Peek, University of Idaho.
- 10:50 - 11:10 **Historic Perspective on Population and Habitat Management of the Lochsa Elk Herd.** Jeff Yeo, James M. Peek, and Karl Chang, University of Idaho.
- 11:10 - 11:30 **Developing New "Sightability" Models for Aerial Surveys of Wildlife Using Multiple Helicopter Types.** Michael W. Gratson, Idaho Department of Fish and Game.
- 11:30 - 1:00 Lunch

1:00 - 3:00 **Panel Discussion - *Forest Ecosystem Health in Southern Idaho.***
 Chairperson - Steve Mealey, Boise National Forest; Leon Neuenschwander, University of Idaho; Jay O'Laughlin, University of Idaho; John Haufler, Boise Cascade Corporation; Cal Groen, Idaho Department of Fish and Game; James M. Peek, University of Idaho.

3:00 - 3:15 **Break**

3:15 - 5:00 **Business Meeting and Announcement of New Officers**

6:00 - 9:00 **Social - Pintail Room**

 6:00 - 7:00 **No Host Bar, Silent Auction**

 7:00 - 8:00 **Dinner, Silent Auction**

 8:00 - 9:00 **Live Auction & Raffle**

9:00 - 1:00 **Music/Dancing - Lounge**

Saturday, March 5 (8:00 a.m. - noon)

Merganser Room

Session E - Upland Game Birds

Chairperson - Jenny Taylor, U.S. Forest Service

8:30 - 8:50 **Productivity and Population Characteristics of Mountain Quail in West-central Idaho.** Patricia Heekin and Kerry Reese, University of Idaho, and Pete Zager, Idaho Department of Fish and Game.

8:50 - 9:10 **Winter Habitat Use of Columbian Sharp-tailed Grouse.** Mark Ulliman and Kerry Reese, University of Idaho; John Connelly, Idaho Department of Fish and Game; and James Klott, Bureau of Land Management.

9:10 - 9:30 **Winter Food Habits of Columbian Sharp-tailed Grouse.** James Schneider and Kerry Reese, University of Idaho; John Connelly, Idaho Department of Fish and Game; and James Klott, Bureau of Land Management.

9:30 - 9:50 **Test of an HSI Model for Columbian Sharp-tailed Grouse.** Scott Gardner and Kerry Reese, University of Idaho, and John Connelly, Idaho Department of Fish and Game.

9:50 - 10:10 **Nest Site Characteristics of Merriam's Wild Turkeys in Idaho.** Frank Edelmann and Kerry Reese, University of Idaho, and Pete Zager, Idaho Department of Fish and Game.

10:10 - 10:40

Break

Session F - Potpourri

Chairperson - Sandra Jacobson, U.S. Forest Service

10:40 - 11:00

The Habitat Improvement Program (HIP); A Six-year Summary.
Tom Hemker, Idaho Department of Fish and Game.

11:00 - 11:20

**Some Aspects of Temperature Biology in Hibernating
Townsend's Big-eared Bats at the Idaho National
Engineering Laboratory.** Robert W. Doering and Barry L.
Keller, Idaho State University.

11:20 - 11:40

**The Role of Containerized Native Plant Species in
Ecosystem Management.** James Kraemer, Silver Springs
Nursery.

11:40 - 12:00

Awards, Closing Remarks

A B S T R A C T S

IDAHO CHAPTER
THE WILDLIFE SOCIETY
1994 ANNUAL MEETING

SESSION A - ECOSYSTEM HEALTH

ASSESSING FOREST ECOSYSTEM HEALTH IN THE INLAND WEST

Steve Mealey, Boise National Forest, Boise, ID.

This paper presents an overview of the conclusions developed by 35 participating scientists and land managers at a scientific workshop held in Sun Valley, Idaho, November 14-20, 1993. The conclusions presented here are those of the authors, but reflect discussions of the entire group, and are based upon conclusions reached by those participants in working groups. The forests of the Inland West are, over wide regions, not healthy. Preventive treatment and management - particularly on the federal lands - is urgently needed. A brief window of opportunity, perhaps 20 years in length, exists. Without timely management intervention, the region is threatened by major ecological setbacks - pest epidemics and uncontrollable wildfires - that will damage resource values and convert large areas into new even-aged forest systems that set the stage for a repeat of the current problems far into the 21st Century. The scientific tools to understand these problems and mitigate them exist today, but are not being applied on the federal forests rapidly enough to meet the urgency of the situation. The current legal and procedural requirements on federal land management agencies impose time delays which, combined with public opposition to timber management, prevent timely management, doom major forest areas to needless loss and damage, and impose large (and perhaps preventable) costs on both local and national economies.

FOREST HEALTH AND WILDLIFE HABITAT MANAGEMENT ON THE BOISE NATIONAL FOREST, IDAHO

John R. Erickson, Boise National Forest, Boise ID, and Dale Toweill, Idaho Department of Fish and Game, Boise, ID.

The National Forest Management Act (NFMA) requires the Forest Service to provide for diversity of plant and animal communities and maintain viable wildlife populations. Changes in forest stand structure, species composition and disturbance patterns within ponderosa pine (Pinus ponderosa)-Douglas fir (Pseudotsuga menziesii) habitat types on the Boise National Forest make it difficult to meet NFMA direction. Three management strategies, including "no action" were evaluated in terms of the risk of wildfire's effects on plant community diversity and distribution, dispersal, and local population viability for the pileated woodpecker (Dryocopus pileatus) and flammulated owl (Otus flammeolus). The no action alternative appeared to have the greatest long-term risk to plant community diversity and wildlife species distribution and dispersal. Landscape analysis that considers the capabilities and risks associated with different management strategies is recommended to meet NFMA direction while responding to diverse public expectations of the Forest.

ADAPTIVE FIRE MANAGEMENT IN SAGEBRUSH ECOSYSTEMS

Bob Clark and Mike Pellant, Bureau of Land Management, Boise ID

Wildland fires in Idaho sagebrush ecosystems have increased by 66 percent since the 1950's and burned area has increased by 75 percent. On some sites the fire return interval has been reduced from about 60 to 110 years prior to Euro-American settlement, to a wildfire every 5 years. Although wildfire is not the only cause, the result is extensive monocultures of annual weeds such as cheatgrass (*Bromus tectorum*) which currently is dominant or co-dominant on about 15 percent of the sagebrush steppe; surveys indicate that uncontrolled expansion of cheatgrass could result in over half of area encompassing the sagebrush steppe and Great Basin sagebrush type being dominated or co-dominated by cheatgrass and associated alien annuals along with loss of the shrub component. Fire management policies must recognize this potential and adapt to the threat by (1) reducing anthropogenic fires; (2) reacting more vigorously to potentially large fires; (3) aggressively pursuing innovative protective measures such as greenstripping; and (4) implementing fuels management programs designed to reduce the severity of wildfires that do occur.

SEEDLING SURVIVAL OF BITTERBRUSH AND SAGEBRUSH: THE SQUAW BUTTE FIRE COMPLEX

Samuel N. Mattise and James Olson, Bureau of Land Management, Boise ID

In August of 1986, wildfires destroyed the shrub component on 50,000 acres of crucial mule deer and elk winter range located on public lands north of Emmett, Idaho. In 1987, a project was initiated to ascertain the best selections of antelope bitterbrush (*Purshia tridentata*) and sagebrush (*Artemisia* sp.) to rehabilitate the area. Seeds were collected from six selections of bitterbrush and three sagebrush. Seedlings were produced in the University of Idaho nursery and planted in 16 experimental plots, 8 bitterbrush and 8 sagebrush. Each plot contained 20 plants per selection with two plots located on each of the four aspects. Seedling survivability recorded by aspect: bitterbrush - South (46%), North (36%), West (5%) and East (0.5%); sagebrush - East (35%), North (27%), South (27%) and West (14%).

SESSION B - ENDANGERED SPECIES AND WATERFOWL ECOLOGY

WOLF RECOVERY IN IDAHO

Ted Koch, U.S. Fish and Wildlife Service, Boise, ID

Wolf recovery in Idaho is apparently at the point where wolf recovery in Montana was in the mid-1980's, immediately previous to documentation of the first known pack of wolves in the state. Results of the three-phase monitoring program (detection, confirmation, monitoring) for 1993 and earlier

indicate that lone wolves exist in the state. Existence of pairs of wolves have been confirmed twice within the last three years, and groups of two or more wolves periodically occur. If two breeding packs of wolves are not confirmed as existing in central Idaho this year, the USFWS plans to reintroduce wolves from Canada in October, 1994.

STATUS OF BALD EAGLES AT WOLF LODGE BAY, COEUR D'ALENE LAKE, IDAHO

Scott R. Robinson, Bureau of Land Management, Coeur d'Alene, ID

Abstract: The Bureau of Land Management (BLM) has monitored Bald Eagles at Wolf Lodge Bay on Coeur d'Alene Lake since 1974. Twenty years of observation data were examined and sorted into 1 count per week for a standard 12 week period from mid-November through early February. During this 20 year period, November 17 has been the average arrival date of eagles in the study area. The number of eagles increased (average=33) to an average peak date of December 30 and slowly declined afterwards as they migrated out of the area. The local newspaper, radio, and television media started reporting this annual event during the 1970s. In 1991, the BLM began sponsoring public viewing of Bald Eagles. Our objectives were (1) to ensure a secure distance between people and eagles and (2) to promote environmental education about the Bald Eagle. Our experience has been overwhelming with 10,000+ eagle watchers from Christmas day through New Year's Day 1993/94.

DUCK NEST SUCCESS AND RUSSIAN OLIVES AT STERLING WILDLIFE MANAGEMENT AREA

Randall J. Gazda, University of Montana, Missoula MT; John W. Connelly, Idaho Department of Fish and Game, Pocatello, ID; and I.J. Ball, University of Montana, Missoula, MT

We evaluated duck nest success during 1992-93 at Sterling Wildlife Management Area (SWMA) in southeastern Idaho. Our study area was 654 ha and contained 78 active magpie (*Pica pica*) nests (12/km²) in 1992 and 103 active nests (16/km²) in 1993. Virtually all magpie nests were in Russian olive trees (*Elaeagnus angustifolia*). Duck nest success was significantly higher ($P < 0.05$) in 1992 than in 1993 (7.3% vs. 2.7%). However, in both years nest success was far below the 15-20% level needed for waterfowl population maintenance. Predation caused 99% of all duck nest mortality. Most (71%) predation on artificial nests occurred during full daylight hours (0700 - 2000), a pattern consistent with the idea that birds were the primary nest predators. Because of the high density of breeding magpies and broad distribution of Russian olives, we suggest that the SWMA may lack any area that provides reasonable security from nest predation by magpies.

OXFORD SLOUGH DUCK NESTING STUDY

Bradley B. Compton, Idaho Department of Fish and Game, Pocatello, ID; Mike Johnson, U.S. Fish and Wildlife Service, Pocatello, ID; and Daryl Meints and Carl Anderson, Idaho Department of Fish and Game, Pocatello, ID

We initiated an upland duck nesting study at the Oxford Slough Waterfowl Production Area in southeastern Idaho to gather baseline information and provide a comparable data set to a similar study being conducted at the Sterling Wildlife Management Area. The Oxford area was chosen for its lack of Russian olives (*Elaeagnus angustifolia*) and apparent low population of magpies (*Pica pica*). Twenty-eight duck nests were located within 145 ha of primarily herbaceous upland habitat for a detectable nesting density of 0.19/ha. Mayfield nest success was 0.49 for 29 nests and predation accounted for 69% of all unsuccessful attempts. Mallards (*Anas platyrhynchos*) and teal (*Anas cyanoptera* or *discors*) were the most common upland nesting waterfowl, and accounted for 55% of the detected nests. Chronology of nest initiation and hatching were estimated.

A TOTALLY BIASED STATUS REPORT ON STATUS OF GRIZZLY BEAR RECOVERY IN CENTRAL IDAHO

James M. Peak, University of Idaho, Moscow ID

The chapter appendix to the recovery plan for grizzlies covering the central Idaho area has been published, and hearings held in conjunction with preparation of that chapter and also by the Idaho Legislative Grizzly Bear Oversight Committee have been held. A general consensus on recovering grizzlies in the Selway-Bitterroot Wilderness Area has developed. Differences in approaches among the several groups, including the oversight committee, ROOTS (a timber-based organization headquartered in Lewiston), Bennett Lumber Company, the Northern Chapter of the Sierra Club, the Greater Yellowstone Coalition, and the Blue Ribbon Coalition will be presented and a completely objective review of these various positions will be presented.

SESSION C - MIDDLE SNAKE RIVER ECOLOGICAL STUDIES

AVIAN COMMUNITY COMPOSITION AND DENSITIES IN THE HAGERMAN VALLEY

Kelly D. Wilde and Anthonie M.A. Holthuijzen, Idaho Power Co., Boise, ID

From 1987-1992, 597 surveys (495 km) were conducted of 38 line transects; 25 were placed in riparian and 13 in upland habitat. Transects averaged 840 m. Surveys were conducted in winter, spring, fall, and winter. During avian surveys and other field activities 190 species were recorded. Species diversity was highest in spring (169 species), followed by the fall (n=130), summer (n=120), and winter (n=95). The 4 most common species in riparian habitat were the mallard, American coot, black-billed magpie, and red-winged

blackbird. In upland habitat 3 species were common, namely, black-billed magpie, western meadowlark, and white-crowned sparrow. For each season, bird densities were higher in riparian than upland habitat. Over all seasons averaged, bird densities were 22 times higher in riparian than upland habitat.

BIRD-HABITAT ASSOCIATIONS IN THE HAGERMAN VALLEY: NATIVE AND EXOTIC PLANT COMMUNITIES

Anthonie M.A. Holthuijzen, Idaho Power Co., Boise, ID

From 1987-1992, 597 surveys were conducted of 38 line transects; 25 were placed in riparian and 13 in upland habitat. Plant species composition, cover, and density were measured at each transect. Bird transects were classified in 6 riparian and 4 upland vegetation associations using TWINSpan. Bird diversity generally was highest in the coyote willow (*Salix exigua*)-Russian olive (*Elaeagnus angustifolia*) vegetation associations and lowest in the netleaf hackberry (*Celtis reticulata*) and waterbirch (*Betula occidentalis*) vegetation associations. Relationships between avian communities and vegetation associations were weak. Poor avian species-habitat relationships for riparian habitat were attributed to a fine-grained environment. Moderately strong relationships were found for upland habitat, suggesting close proximity of upland transects to riparian habitat.

WINTERING WATERFOWL IN THE HAGERMAN VALLEY

Von R. Pope and Antonie M.A. Holthuijzen, Idaho Power Co., Boise, ID

During the winters of 1989-1991, wintering waterfowl was surveyed at monthly intervals from October through March. The most common species was the American coot, followed by mallard, American wigeon, goldeneye, and bufflehead. Numbers of waterfowl rapidly increased from October through November, peaked in December, then declined through March. Only 15% of the waterfowl was found in the free-flowing reach, which comprised 66% of the entire surveyed reach. Water velocity appeared to be the most important variable, showing the highest correlation with waterfowl spatial distribution, composition, and numbers. Concentration areas were in Upper and Lower Salmon Falls reservoirs and near Thousand Springs. These areas have a well developed littoral zone and provide security to resting and feeding waterfowl. Development of the river corridor for housing or recreation would cause disturbance to wintering waterfowl.

PREDATOR SCENT-POST SURVEYS IN THE HAGERMAN VALLEY

Kelly D. Wilde and Antonie M.A. Holthuijzen, Idaho Power Co., Boise, ID

Eleven scent-post transects, each consisting of 10 track-plots placed at about 300 m intervals, were operated for 3 consecutive nights in the fall of 1991 and 1992. Six transects were placed in upland and five in riparian habitat. Most visits (n=922) were by non-target species (small and medium sized mammals and birds). Of the target species (n=116 visits), the most numerous visitor

was the coyote (48%), followed by the striped skunk (19%), raccoon (17%), mink (6%), red fox (3%), weasel (3%), and bobcat (3%). One kit fox print and visual observation was made downstream of the Bliss Power Plant. Visitation rate indices and composition of the carnivorous community was within the expected range and species assemblage, respectively, based on data from the Western Predator Survey, conducted during 1973-1981.

VEGETATION RESPONSE TO REGULATED RIVER FLOWS AND ENVIRONMENTAL PARAMETERS IN THE HAGERMAN VALLEY, SOUTHWESTERN IDAHO

Vincent Muli Kituku, Idaho Power Co., Boise, ID

In this study, the effects of regulated river flows, soil and topographic factors are investigated on riparian vegetation parameters (density, cover and diversity) which are important for wildlife along the Snake River in the Hagerman Valley. Parameters of three general vegetation lifeforms (herbaceous, shrub and tree) and individual species are considered in relation to seasonal (winter, summer and spring) flows. Preliminary analyses show significant positive correlation between mean seasonal flows and tree lifeform cover. Both shrub and herbaceous lifeforms are not significantly influenced by flow fluctuations, but their cover values are positively and moderately correlated with relative percent slope. Parameters of individual tree species generally show better relationships with flow variables while individual herbaceous and shrub species show strong relationships with both flow and environmental factors.

DISTRIBUTION OF PURPLE LOOSESTRIFE (*LYTHRUM SALICARIA*) ON THE SNAKE RIVER, FROM POWER COUNTY TO GRANDVIEW, IDAHO

Von R. Pope and Nancy K. Cole, Idaho Power Co., Boise, ID

Purple loosestrife is a noxious weed threatening the integrity of wetlands throughout the United States. Idaho Power Company (IPC) has been involved in efforts to map the distribution of purple loosestrife along the Snake River since 1990. To date, IPC has coordinated inventories for 212 miles of the Snake River. The result of our field work has heightened agency and private interests in controlling purple loosestrife along the Snake River across Idaho.

SESSION D - BIG GAME BIOLOGY AND MANAGEMENT

ANTLER MORPHOLOGY OF AN INTRODUCED MOOSE POPULATION: FOUNDER EFFECTS AND GENETIC DIVERSITY

James G. MacCracken, University of Idaho, Moscow, ID; Victor Van Ballenberghe, U.S. Forest Service, Anchorage, AK; and James M. Peek, University of Idaho, Moscow, ID

Between 1949-58, 23 moose (*Alces alces gigas*) were translocated to the Copper River Delta, Alaska. The population grew rapidly ($\lambda \approx 1.28$) and hunting began in 1960. Skewed age and sex ratios during the first few years, combined with breeding dominance hierarchies, suggested a possible genetic founder effect. The high harvest of males in 1960 and 1962 probably produced a second genetic bottleneck. Antler spread, lack of brow palmation, number of brow tines, and frequency of atypical antlers appeared to reflect low genetic diversity. In addition, lower than expected pregnancy and twinning rates suggested that high levels of inbreeding reduced fitness. Computer simulations were used to estimate inbreeding coefficients, track incestuous matings, and develop guidelines to optimize augmentation of the population through future translocations.

HISTORIC PERSPECTIVE ON POPULATION AND HABITAT MANAGEMENT OF THE LOCHSA ELK HERD

Jeff Yeo, Wilderness Research Center and James M. Peek, Department of Fish and Wildlife Resources, University of Idaho, Moscow, ID; and Karl Chang, Department of Geography, University of Idaho, Moscow, ID

The Lochsa elk herd is one of the principal elk herds of the northern Rockies. Its management and the management of its habitat has contributed significantly to our knowledge of elk management in northern Idaho and elsewhere. Elk may have occupied the Lochsa River drainage for several thousand years and certainly for the last several centuries. Following extensive fires in the early third of this century, the Lochsa elk population increased rapidly. Road building activities in the drainage were not significant until the mid-1930's and extensive timber harvest did not begin until the 1950's. The distribution of these land management activities has not been uniform throughout the drainage, rather timber harvest and road building have been concentrated in the eastern and western portions of the drainage. Elk population declines in the 1960's, combined with old burns succeeding to vegetation which provided less elk forage, prompted management agencies to initiate prescribed burning of elk winter ranges. Our data indicate a significant relationship between elk harvest and the area burned (and its distribution) by prescribed fire. We continue analyses of the relationships between elk harvest and habitat fragmentation resulting from timber harvest and fire. Although we have accumulated a substantial data record of elk population and habitat management, we find that the data commonly gathered by state wildlife agencies and federal land management agencies is not sufficient to determine the effects of land management activities on this elk population.

DEVELOPING NEW "SIGHTABILITY" MODELS FOR AERIAL SURVEYS OF WILDLIFE USING MULTIPLE HELICOPTER TYPES

Michael W. Gratson, Idaho Department of Fish and Game, Lewiston, ID

Visibility bias during aerial surveys of ungulate populations results in animals going undetected. The development of logistic regression models that correct for visibility bias using some helicopter types has led to relatively precise and unbiased estimates of population size and sex and age composition. These models have been developed using radio-collared animals, a process that is costly and time-consuming. I conducted a laboratory experiment using papercups and groups of paperclips to test whether new models for other helicopter types could be developed by aerially surveying known size ungulate herds. My presumption was that there should be no differences in parameter coefficients among models for different helicopter types, rather, only differences in the constant term in the linear multiple regression. I present the results of this experiment.

SESSION E - UPLAND GAME BIRDS

PRODUCTIVITY AND POPULATION CHARACTERISTICS OF MOUNTAIN QUAIL IN WEST-CENTRAL IDAHO.

Patricia Heekin and Kerry Reese, University of Idaho, Moscow, ID, and Pete Zager, Idaho Department of Fish and Game, Lewiston, ID

Mountain quail were trapped in 1992 and 1993 in west-central Idaho, and data was collected on sex and age ratios. Of 104 birds trapped, 75 were radio-collared and were located 2 to 3 times per week. Twenty-four nests were located over the 2 years, and data on clutch size, egg success, nest success, and hen success will be presented. The unusual nesting pattern of 4 pairs of mountain quail found in 1993 will also be discussed.

WINTER HABITAT USE OF COLUMBIAN SHARP-TAILED GROUSE.

Mark Ulliman and Kerry Reese, University of Idaho, Moscow, ID; John Connelly, Idaho Department of Fish and Game, Pocatello, ID; and James Klott, Bureau of Land Management, Twin Falls, ID

Winter habitat use of the Columbian sharp-tailed grouse (Tympanuchus phasianellus columbianus) is poorly understood. Our study, in southeastern Idaho, sought to quantify characteristics of their winter habitat and to document their movement patterns, home range size, and habitat use. Preliminary results indicate that during 1992 radio-marked birds inhabited lower elevations ($\bar{x}=1550$ m, slope $\bar{x}=4.0^\circ$), while during 1993, they were located at higher elevations ($\bar{x}=1770$ m, slope $\bar{x}=17.0^\circ$). During 1992, 68% of telemetry locations were in CRP, while in 1993, 58% were in shrub stands.

Use-availability analysis will be presented. Distance moved from lek of capture to winter habitat was significantly greater for females (\bar{x} =5.0 km) than males (\bar{x} =1.9 km) in 1992 (p =0.03) however, the difference was not significant in 1993 (p =0.13). No significant differences have been found in home range size within or between years for males and females.

WINTER FOOD HABITS OF COLUMBIAN SHARP-TAILED GROUSE

James Schneider and Kerry Reese, University of Idaho, Moscow, ID; John Connelly, Idaho Department of Fish and Game, Pocatello, ID; and James Klott, Bureau of Land Management, Twin Falls, ID

Results of Columbian sharp-tailed grouse (Tympanuchus phasianellus columbianus) fecal analysis from the winters of 1992 and 1993 have revealed some interesting differences in mild and near normal winter food habits. During January and February of 1992, shrubs comprised 3.4% and 46.0% of the diet, grasses 16.7% and 15.0%, while forbs comprised 80.0% and 39.0%, respectively. In 1993, 2 separate populations of sharptails demonstrated radically different feeding patterns. Pocatello Valley sharptails fed on "typical" winter forage. During January and February, shrubs comprised 92.8% and 95.9% of the diet, while grasses and forbs represented only 7.2% and 3.3%, respectively. In the Curlew Valley, 82.7% and 86.6% of the diet in January and February, respectively, were gnat galls found on sagebrush, while 14.0% and 13.4% were shrubs. Our results are not consistent with what is currently known about Columbian sharp-tailed grouse winter food habits.

TEST OF AN HSI MODEL FOR COLUMBIAN SHARP-TAILED GROUSE

Scott Gardner and Kerry Reese, University of Idaho, Moscow, ID, and John Connelly, Idaho Department of Fish and Game, Pocatello, ID

An HSI model, based on resident populations, has recently been developed to systematically identify and rank potential release sites for Columbian sharp-tailed grouse (Tympanuchus phasianellus columbianus) reintroductions. Because habitat use by introduced birds may differ from resident birds, we tested the validity of this model on reintroduced grouse. Sixty-seven grouse were released in south-central Idaho during spring, 1992 and 1993. Preliminary survival, movement, and habitat data were collected from 42 radio-marked birds. Of these, 50% and 66% died in 1992 and 1993, respectively, by the end of August. Mean dispersal distance was 11.4 ± 8.2 km in 1992 and 10.4 ± 5.8 in 1993. A final release is planned for spring, 1994.

NEST SITE CHARACTERISTICS OF MERRIAM'S WILD TURKEYS IN IDAHO

Frank Edelman and Kerry Reese, University of Idaho, Moscow, ID, and Pete Zager, Idaho Department of Fish and Game, Lewiston, ID

Because little is known about the nesting habitat of Merriam's wild turkeys (*Meleagris gallapavo merriami*) in Idaho, nest sites of radio-marked hens were located during 1992 and 1993 near Cottonwood, ID. Structural and physiographic characteristics were sampled at nest and random sites and compared to determine and describe characteristics important for suitable nesting habitat. A difference detected with MANOVA and multiple comparisons revealed that overstory canopy closure was different between nest (=89%) and random sites (=78%). This difference corresponds with 95% of nests being at the base of overstory trees, which influenced canopy closure measurements, and suggests that guard structures may be an important characteristic in addition to canopy closure.

SESSION F - POTPOURRI

THE HABITAT IMPROVEMENT PROGRAM (HIP); A SIX-YEAR SUMMARY

TOM HEMKER, Idaho Dept. Fish and Game, Boise, ID

The Idaho Department of Fish and Game began the Habitat Improvement Program (HIP) in 1987 to improve game bird habitat. Income during the first 6 years totaled \$1.52 million for upland bird and \$1.85 for waterfowl projects. About 1850 upland bird projects and 969 waterfowl projects were signed during the 6-year period. These projects covered nearly 50,000 acres of habitat and included \$1.63 million in cost-share funds from cooperators. About 90% of the projects have occurred on private land but nearly 35% of the total acreage has been on public land. Seventy-eight percent of the projects benefited pheasants, 51% gray partridge, 33% quail, 6% chukar, 27% goose, and 44% ducks. The importance of personal contact with private landowners to the Department's image cannot be over emphasized. The legislation establishing HIP expires in 1995 and legislation to reauthorize funding will be introduced.

SOME ASPECTS OF TEMPERATURE BIOLOGY IN HIBERNATING TOWNSEND'S BIG-EARED BATS AT THE IDAHO NATIONAL ENGINEERING LABORATORY.

Robert W. Doering and Barry L. Keller, Idaho State University, Pocatello, ID

To evaluate the thermal energetics of hibernating Townsend's big-eared bat (*Plecotus townsendii*) under natural conditions, we monitored environmental changes within several natural hibernacula and measured body temperatures (T_b) of free-ranging bats. T_bs and body weights were obtained manually from selected bats throughout hibernation. Continuous monitoring of the physical environment has shown that hibernacula are more varied and dynamic than

previously observed. Seasonal variation in temperature patterns with caves produce fluctuations in available habitat. Successful hibernacula have available temperatures below deep soil temperature. Bats choose environmental temperatures (T_e) between 3.0 C and 0.0 C, though higher temperatures are available. Body temperatures seem to cluster around some low thermal minimum with T_b closely linked to T_e throughout the hibernation season.

THE ROLE OF CONTAINERIZED NATIVE PLANT SPECIES IN ECOSYSTEM MANAGEMENT.

James Kraemer, Silver Springs Nursery, Moyie Springs, ID

The production of high quality containerized native plants is a key element in successful ecosystem management. Useful niches native plant species can fill as well as planning considerations for the land manager from a growers perspective will be discussed.

WORKSHOP ON AMPHIBIANS AND REPTILES OF NORTHERN IDAHO

SURVEYING REPTILES WITH DRIFT FENCES AND FUNNEL TRAPS

J. M. Beck, Department of Biological Sciences, Idaho State University, Pocatello ID; K.D. Wilde, Idaho Power Company, Boise ID; C.R. Peterson, Department of Biological Sciences, Idaho State University, Pocatello, ID; and A.M.A. Holthuijzen, Idaho Power Company, Boise ID

We used drift fences and funnel traps to survey reptiles in the Birds of Prey Natural Area in southwestern Idaho during the spring and summer of 1993. We used a capital "T" drift fence design comprised of four 7.5 m sections of 51 cm high galvanized flashing. Each array had six funnel traps constructed of 0.32 cm (1/8th inch) hardware cloth, with funnel traps placed at the breaks between the sections and at the ends of each section. We designed the traps to allow access from a door in the top of the trap. Thus, traps did not have to be removed from the array each time an animal was removed from a trap, and traps could stay in contact with the substrate. We provided soil and a cardboard cover inside each trap, and added an additional wood or cardboard cover over each trap. To further reduce trap mortality, we checked each trap every third day. We captured representatives of all snake species occurring in the area, and representatives of all but two of the lizard species potentially occurring in the area. We found drift fences with funnel traps to be an effective way of sampling reptiles in southwestern Idaho.

THE USE OF RADIO TELEMETRY TO STUDY THE MOVEMENTS AND HABITAT USE OF WESTERN TOADS.

Paul E. Bartelt and Charles R. Peterson, Department of Biological Sciences, Idaho State University, Pocatello, ID

We used miniature radio transmitters to determine the movement patterns and habitat use of adult western toads (*Bufo boreas*) at two sites on the Targhee National Forest. The 1.7 g transmitters each had a 7 cm whip antenna and were temperature sensitive. All transmitters were attached around the waist of the toads by a plastic belt. Since May of 1993, we have telemetered a total of 11 toads for different lengths of time. From May until September we located each animal every two to three days, and at least once per month during hibernation. We flagged the location of each toad and later recorded the coordinates with a geographic positioning system. Microhabitat measurements included air temperature, humidity, and the amounts of different types of cover (e.g., litter, herbaceous, shrub). We used a geographic information system to map the movements of the toads in relation to macrohabitat features (i.e., cover types) digitized from aerial photos. The males did not travel far from the breeding pond, but the females traveled up to 2.5 km from the breeding sites. The females' movements did not appear to be dependent upon the presence of standing water. We most often found the toads under logs, litter, or rodent burrows, especially at edges between macrohabitat types. We believe that radio telemetry will provide an effective technique for studying the habitat relationships of many frogs and toads. The results from such studies should improve our understanding of their habitat requirements and provide information critical to their conservation and restoration.

POSTER SESSION

BIODIVERSITY MONITORING USING AN INTELLIGENT AUTOMATED MONITORING SYSTEM.

Paul H. Patrick, Anthonie M. Holthuijzen, Narayan Ramani, Ron Sheehan, William G. Hanson and John W. Huckabee. Ontario Hydro, Toronto, Ontario, Canada, Idaho Power Company, Boise, ID, and Electric Power Research Institute, Palo Alto, CA

Collecting data on rare or difficult to survey organisms is labor intensive. To collect consistent, high-quality auditory wildlife data an Automated Intelligent Monitoring System is being developed. The proto-type recorder is an intelligent, multi-channel audio-band recorder. Acoustic data are stored digitally. Pattern recognition software analyzes data in both time history and frequency domain, extracts pertinent statistical information, and reduces and verifies data. System development will include relative abundance estimation of calling organisms, incorporation of an ultrasonic band, refinement of software, and miniaturization of hardware.