IDAHO

DEPARTMENT OF FISH AND GAME

Jerry M. Conley, Director

Project W-168-C-10

Progress Report

FEDERAL AID TO WILDLIFE RESTORATION

Study I, Job 1: Wildlife Research Coordination

Prepared By:

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Wildlife Game and Research Manager

July 1, 1992 to June 30, 1993

September 1993

Boise, Idaho

TABLE OF CONTENTS

Part IV. Program Narrative

State: Idaho Grant Number: W-168-C

Grant Title: Wildlife Management Coordination

A. Need: The Pittman-Robertson coordination grant is currently concerned with the coordination of one research, one surveys and inventories, and six or seven development and management grants; a varying number of land grants that are periodically active; and the Endangered Species Program. The magnitude of the Pittman-Robertson program, as related to the overall wildlife program, makes it necessary to coordinate program activities with non-Federal Aid activities.

B. Objectives: To coordinate the activities of the Pittman-Robertson program in Idaho.

To coordinate the activities of the Pittman-Robertson program with the other activities of the Idaho Department of Fish and Game.

To provide liaison between the Department and the Division of Federal Aid.

The extent and complexity of restoration activities involved in the grants enumerated below require that some vehicle of general direction and coordination by technically trained and experience personnel be provided. This grant is designed to meet that need and, in addition, will provide a competent executive who will select; plan; and, after approval, coordinate the work on additional grants.

To coordinate wildlife research direction within the Bureau of Wildlife and among the various regions and subregions.

To administer the Department's Land Acquisition Program with available Pittman-Robertson funds.

To review and approve management programs and grants on Pittman-Robertson-funded wildlife areas.

C. Justification: The state is now engaged in the following restoration grants:

W-160-R, Wildlife Research
W-168-C, Wildlife Research Coordination
W-170-R, Surveys and Inventories
W-173-D, Land Management
E-3, Grizzly Bear and Caribou Studies

W-159-HS, Hunter Education
W-169-HS, Target Range Development

The Pittman-Robertson program provides for the funding of this coordination grant and for all research, surveys and inventories, or land development grant activities within the Department's Bureau of Wildlife.

D. Status: The Pittman-Robertson program in Idaho represents a major portion of the Department's wildlife management program. At present approximately 60 percent of the Pittman-Robertson budget is devoted to research and surveys and inventories grants; about 35 percent is devoted to development activities. Major land acquisitions anticipated in the near future will be from other state funds.

E. Procedures: The duties of the coordination staff are to coordinate all administrative functions of, and to provide staff assistance to, the Pittman-Robertson program.

The basic administration and coordination channels involved in carrying out the activities of the Pittman-Robertson program are as follows:

The organization of the Idaho Department of Fish and Game represents a line and staff organization. All Pittman-Robertson employees assigned to the coordination grant, as well as the research and surveys and inventories grants, are staff employees. Under this arrangement, the Pittman-Robertson Coordinator and the grant leaders for the research, endangered species, surveys and inventories, and land development grants are directly responsible to the Assistant Chief of the Bureau of Wildlife or the Bureau Chief.

Instructions from the Pittman-Robertson Coordinator must travel up through channels to the Assistant Director, Field Operations; be approved by the Director; and travel down through channels to the Regional Supervisors. It will be the responsibility of the Coordinator to see that Federal Aid grants in the state are productive. The Coordinator will be responsible for furnishing required reports on the conditions of the Federal Aid program within the state and on his own activities.

In carrying out this responsibility, the coordination staff performs the following functions:

1. Reviews Grant Activities

a. Inspects grants periodically to check on progress in relation to planned activities outlined in the annual work plans for each grant. Checks field work against work plans. Checks for improper

operation of grant activities.

b. Reviews engineering documents, coordinates engineering activities and expenditures with Federal Aid Division of the U.S. Fish and Wildlife Service.

c. Exercises continual scrutiny of Pittman-Robertson grant expenditures and budgets to prevent overspending. Reviews expenditures and activities performed and advises grant leaders concerning current staff policies on such matters.

2. Accepts Staff Responsibility of Carrying Out Rules and Regulations of Federal Aid Handbook

a. Provides regulatory orders to all grant leaders and/or regional personnel assigned to Pittman-Robertson grants as governed by the rules and regulations of the Federal Aid in Wildlife Restoration Act.

b. Reviews all grant activities in an effort to prevent unauthorized activities (primarily unauthorized expenditures, but also includes unauthorized management practices).

c. Reviews all necessary personnel documents and reimbursement vouchers submitted to the Division of Federal Aid.

d. Reviews and edits annual reports for all grants.

3. Preparation of Pittman-Robertson Grant Documents

a. Plans and provides administrative assistance and guidance to grant leaders in the preparation of annual work plans for all Pittman-Robertson grants. Edits all such plans and submits these to the U.S. Fish and Wildlife Service for approval.

b. Plans and conducts the preparation of all Grant Proposals, Grant Agreements, and Grant Amendments for all Pittman-Robertson grants. Submits these to the U.S. Fish and Wildlife Service for approval.

c. Provides administrative assistance and guidance in the preparation of individual budgets for each Pittman-Robertson grant. Edits these for submission to the Department of Finance and the U.S. Fish and

Wildlife Service for approval.

d. Attends all Bureau of Wildlife and Pittman-Robertson grant hearings and represents the Bureau of Wildlife staff at such hearings in the absence of the Bureau Chief.

4. Prepares and Submits Administrative Reports and Documents

The employee in this position must possess intimate detailed knowledge concerning all Pittman-Robertson grants and is responsible for summarizing such knowledge in preparing reports to the U.S. Fish and Wildlife Service, various Department reports, and other reports as necessary, including periodic reports to the Idaho State Legislature on Federal Aid expenditures.

a. Prepares annual activities report for the Pittman-Robertson coordination grant.

b. Prepares an annual report on all Pittman-Robertson grants and their activities.

c. Submits the above reports to the Division of Federal Aid, U.S. Fish and Wildlife Service.

d. Prepares the Bureau of Wildlife and coordination grant budgets.

5. Provides Staff Coordination

a. Coordinates grant planning of major activities. Contacts regions and grant leaders regarding staff guidance and coordination of efforts. Coordinates use of Pittman-Robertson property and equipment between Pittman-Robertson grants.

b. Checks, approves, and coordinates all major grant expenditures. Verifies that these are in accordance with the rules and regulations of the Federal Aid in Wildlife Restoration Act. Provides staff assistance to regional personnel and grant leaders in acquisition of items necessary for proper functioning of grants. Coordinates grant expenditures between the regions and the Headquarters' Accounting Section; the Department's Fiscal Officer; the Department's Administrative Officer; and the Division of Federal Aid, U.S. Fish and Wildlife Service.

6. Other Duties

a. Coordinates activities concerning the expenditure of other monies when in connection with Pittman-Robertson grants.

b. Maintains files on all Pittman-Robertson activities.

7. Liaison Activities

a. Maintains close liaison between the Department of Fish and Game and the Division of Federal Aid, U.S. Fish and Wildlife Service.

b. Plans and conducts liaison between the seven Department of Fish and Game regions and the headquarters office concerning matters relating to the Pittman-Robertson program.

c. Represents the Department during Federal Aid inspections, in company with Division of Federal Aid personnel.

8. Procedures of Land and Access Coordination

a. Coordinate the acquisition program for the Department of Fish and Game, which includes grants from the following sources: surplus state and federal lands, State Land leases, donations, bond act funds, Pittman-Robertson funds, cooperative agreements, and mitigation. Coordinate recommendations from the public, county, state, and federal agencies and the Department for proposed Department land acquisitions under the above programs.

b. Prepare and publish reports and articles describing Department-owned lands and acquisition grants.

c. Coordinate with regions and staff to determine basic development, operation, and maintenance programs and Pittman-Robertson funding for newly-acquired properties. Review and finalize management plans prepared by regions for newly-acquired properties. Ensure that Pittman-Robertson funds are included in management plans.

d. Attends Commission, Agency, Department, county, etc., meetings dealing with matters concerning land acquisition.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE: Idaho **JOB TITLE:** Wildlife Research Coordination
PROJECT NO.: W-168-C-10
STUDY NO.: I
JOB: 1

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

Project supervision was maintained for all wildlife research projects including study plan development, document preparation, report editing, submitting project reports, and budget preparation. Federal aid coordination was provided for all wildlife research, management, and land development projects.

The Idaho Department of Fish and Game is in the process of developing study plans for three new graduate student projects. One project will focus on winter habitat use of bighorn sheep in the McCall subregion and two projects will investigate upland bird habitat use (one on chukar and one on mountain quail) in Region 2.

OBJECTIVES

To plan project work and to provide supervision and administrative support for all P-R funded projects.

Meetings and Presentations

Date	Meeting	Location
07/06/92	Pacific Islands Education Initiative (PIEI)	Honolulu HI
07/08-09/92	PIEI	Pago Pago, Am. Samoa
08/12-13/92	IDFG Commission Meeting	Boise
08/14/92	Sawtooth Science Institute	Ketchum
08/19/92	Physical Fitness Instructor Seminar	Boise

Date	Meeting	Location
08/20-21/92	Regional Conservation Officers-Regional Wildlife Managers Meeting	Boise
10/01/92	IDFG Commission Meeting	Boise
10/05-09/92	Federal Aid Coordinators Meeting	Lake Tahoe NV
10/29/92	New Employee Orientation	Boise
12/09/92	Bear Presentation - Idaho Outfitters and Guides Association	Boise
12/17/92	Bureau of Wildlife-Region 1 Meeting - Nongame	Lewiston
12/18/92	Idaho Dept. of Agriculture - Game Farm Regulations	Boise
12/22/92	Idaho Dept. of Agriculture - Game Farm Regulations	Boise
01/22/93	IDFG Commission Meeting	Boise
01/23/93	Pheasant Workshop	Pocatello
02/04-04/93	IDFG Field Operations Meeting	Boise
02/23-24/93	IDFG Biologists Meeting	Boise
03/16/93	Bear Presentation	Ketchum
03/31/93	IDFG Habitat Biologists Meeting	Boise
04/03/93	Hound Hunter Permit Meeting	Grangeville
04/15/93	IDFG Futures Meeting	Boise
04/16/93	IDFG Commission Meeting	Boise
05/07/93	IDFG Commission Meeting	Boise
05/11-12/93	IDFG Field Operations Meeting	Boise
05/26-27/93	Federal Aid Coordinators Workshop	Portland OR

FINDINGS

Project documentation, budgets, reports, and personnel evaluations were completed for each field project. A general summary of the activities of the research biologists during the year follows.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE:	Idaho	**SUBPROJECT:**	Sage Grouse Ecology
PROJECT NO:	W-160-R-20		
SUBPROJECT:	9	**STUDY TITLE:**	Sage Grouse Response
STUDY:	I		to a Controlled Burn

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

Study I. Sage Grouse Response to a Controlled Burn.

Job 1. Movements, distribution, survival, and reproduction of sage grouse before and after a fire.

The movements, distribution, survival, and reproduction of sage grouse (Centrocercus urophasianus) are being investigated on the upper Snake River Plain of southeastern Idaho. A portion of the study area was burned in late summer 1989. Thus, we are in the post-burn phase of a project aimed at assessing the response of sage grouse to a prescribed burn. A total of 27 sage grouse were trapped and marked during spring 1993. Twenty-six of these birds (96 percent) were equipped with radios. Females nested from <1 to 2 km from the lek on which they were captured (N=4). Nesting success of radio-marked grouse increased varied from 41 to 90% during 1987-93. Although sample sizes were relatively small, survival appeared to remain constant over this same period.

Job 2. The effects of a controlled burn on sage grouse winter and nesting habitat.

The effects of fire on sage grouse winter and nesting habitat on the Big Desert is being investigated. Nest site data were collected on 5 nests during 1993. Sagebrush (Artemisia spp.) canopy cover at nests ranged from 1 to 30% for 1986 through 1993. Similar values were obtained for sagebrush cover at random sites. Vegetation characteristics were also measured for 31 sage grouse winter use sites and 62 sites randomly located throughout the study area.

Meetings and Presentations

Connelly, J. W. 1992. Predation and upland nesting birds. Dept. of Wildlife and Fisheries Lecture, Utah State Univ. Nov. 18. Logan, Utah.

Connelly, J. W., R. A. Fischer, K. P. Reese, A. D. Apa, and W. L. Wakkinen . 1993. Renesting by

sage grouse in southeastern Idaho. Presented at the annual meeting of the Idaho Chapter, The Wildlife Society. March 25-27. Boise, ID.

Hughbanks, D. L., L. R. Irby, and D. K. Koehler. 1993. Assessment of bull elk vulnerability under a spike only regulation. Presented at the annual meeting of the Northwest Section, The Wildlife Society. April 8-9. Missoula, MT.

Schneider, J. W., K. P. Reese, J. W. Connelly, and J. H. Klott. 1993. Winter feeding ecology of Columbian sharp-tailed grouse. Presented at the annual meeting of the Idaho Chapter, The Wildlife Society. March 25-27. Boise, ID.

Ulliman, M. J., K. P. Reese, J. W. Connelly, and J. H. Klott. 1993. Winter habitat ecology of Columbian sharp-tailed grouse. Presented at the annual meeting of the Idaho chapter, The Wildlife Society. March 25-27. Boise, ID.

Publications

Blus, L. J., and J. W. Connelly. 1993. Use of radiotelemetry to determine exposure and effects of organophosphorous insecticides on sage grouse. Proc. Soc. Envir. Toxic. and Chem. In press.

Connelly, J. W. 1992. Trends in the editorial process for publications of The Wildlife Society. Wildl. Soc. Bull. 21:194-199.

Connelly, J. W., R. A. Fischer, A. D. Apa, K. P. Reese, and W. L. Wakkinen. 1993. Renesting by sage grouse in southeastern Idaho. Condor. In press.

Fischer, R. A., A. D. Apa, W. L. Wakkinen , K. P. Reese, and J. W. Connelly. 1993. Nesting-area fidelity of sage grouse in southeastern Idaho. Condor. In press.

Giesen, K. M., and J. W. Connelly. 1993. Guidelines for management of Columbian sharp-tailed grouse habitats. Wildlife Soc. Bull. In press.

Meints, D. R., J. W. Connelly, K. P. Reese, A. R. Sands, and T. P. Hemker. 1992. Habitat suitability index procedure for Columbian sharp-tailed grouse. Univ. of Idaho, College of For., Wildl. and Range Bull. No. 55. 17 pp.

Meints, D. R., K. P. Reese, and J. W. Connelly. Nest Site characteristics and reproductive success of Columbian sharp-tailed grouse in southeastern Idaho. J. Wildl. Manage. Submitted.

Musil, D. D., J. W. Connelly, and K. P. Reese. 1993. Movements, survival and reproduction of sage grouse translocated into central Idaho. J. Wildl. Manage. 57:85-91.

Musil, D. D., K. P. Reese, and J. W. Connelly. Nesting and summer habitat use by sage grouse translocated into central Idaho. Great Basin Natur. Submitted.

Robertson, M. D., K. P. Reese, and J. W. Connelly. Movements and distribution of wintering sage grouse in southeastern Idaho. Peer review.

Wakkinen, W. L., K. P. Reese, and J. W. Connelly. 1992. Sage grouse nest locations in relation to leks. J. Wildl. Manage. 56:381-383.

Wakkinen, W. L., K. P. Reese, J. W. Connelly, and R. A. Fischer. An improved spotlighting technique for capturing sage grouse. Wildl. Soc. Bull. 20:425-426.

Wakkinen, W. L., J. W. Connelly, and K. P. Reese. Sage Grouse nest site characteristics in southeastern Idaho. J. Wildl. Manage. Submitted.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE:	Idaho	**SUBPROJECT:**	Statewide Wildlife Research
PROJECT NO.:	W-160-R-20		
SUBPROJECT:	23	**STUDY NAME:**	Coeur d'Alene Elk
STUDY NO.:	I-III		Ecology

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

Study I: Bull elk habitat use.

I am currently monitoring 63 radio-collared elk (35 bulls, 28 cows) in the Coeur d'Alene River drainage. They are monitored once every 7-10 days throughout the year as weather permits. Monitoring effort is increased to 2-3 day intervals during the hunting season.

The cooperative Idaho Department of Fish and Game-U.S. Forest Service elk habitat use study is in its third field season. Approximately 650 ECODATA vegetation plots from elk relocation sites have been completed. This study examines the structure and composition of vegetation at elk use sites as well as physical (aspect, etc.) characteristics of the site. Data analysis will take a multivariate approach to compare elk habitat use between sexes and among seasons. Soil/vegetation mapping is in progress.

Recent (1991) satellite imagery covering the CDA study area has been purchased by the USFS. Unsupervised and supervised classification of forest cover types was completed over the winter. We are currently working on deciding which of several methods will work best to reduce the effects of shadows on the unsupervised classifications. Ground truthing of the data has commenced. A complete digital vegetation map will be available next winter.

Study II: Elk sightability models.

A total of 119 data points or 41.8% of the entire model data base has been contributed by the CDA elk project. These have been incorporated into the model data base and resulted in the addition of snow cover as an independent variable in the model. The current model is: u=1.433 + 0.2041 ln group size - 0.7002 vegetation cover class + 0.0085 snow. The model snow variable is a transformation where: snow = snow cover^3/10,000.

Two publications are forthcoming. The first reports the results of model validation work done at the

Starkey experimental Forest and Range in LaGrande, Oregon. The second is a mathematical treatise on model development and refinement.

This study will come to a close this year. The Aerial Survey software and user's manual will be updated and available in early 1994.

Study III: Elk habitat security characteristics and hunting season mortality rates.

A regional telephone survey of Unit 4 general season elk hunters was conducted this year. The purpose of the survey was to determine hunter densities at a finer scale of resolution than obtainable through the statewide telephone survey. We successfully contacted 220 hunters and recorded nearly 1200 hunter days of effort. The survey will be repeated this year with a sampling goal of 500 successful contacts.

Four elk (2 bulls and 2 cows) were killed during the archery seasons. One of the 2 cows killed during the archery season was killed illegally with a rifle. Eight bull and 4 cow elk were killed during the general rifle season. No elk were killed during the muzzleloader season. Of the 16 elk killed during the 1992 hunting seasons, 13 were legal kills recovered by sportsman, 2 were unrecovered wounding losses, and 1 was killed illegally with a rifle during the archery season and not recovered by the poacher.

Overall Unit 4 mortality rates for 1988 through 1990 combined were 0.52 for bulls and 0.12 for cows. A new hunting season framework initiated in 1991 reduced bull mortality approximately 10 percent. Survival rates among road access treatment areas maintained a trend towards increasing survival with decreasing open road densities. Bull mortality remained $\geq$twice as high in the roaded treatment as it was in the unroaded treatment.

MEETINGS AND PRESENTATIONS

Meetings

Date	Purpose	Location
July	GIS basic training	Moscow
July	USFS - IDFG coordination tour	Clark Fork
July	USFS - IDFG elk vulnerability implementation	Lewiston
July	Wyoming Game, assist with model dev.	Jackson
Aug	USFS discuss ecosystem mgt. approaches	Unit 4
Aug	Drug coordination N. Dist. officers	CDA
Aug	Fitness instructor workshop	Boise
Aug	Region 1&2 research conclave	Priest Lake

Date	Purpose	Location
Sep	Fernan Dist. road closures	CDA
Sep	Discuss Regional phone surveys	Moscow
Sep	Res. & Mgt. various survey needs	Moscow
Sep	Wallace Dist. road closures	Silverton
Oct	Fernan road density info.	CDA
Nov	UI sightability model testing	Moscow
Nov	Dept. GIS coordination	Boise
Nov	UI sightability model testing	Moscow
Dec	UI sightability model testing	Moscow
Dec	Mgt. coordination meeting R-1/Montana	Thompson Falls
Dec	Elk vulnerability working group	Spokane
Jan	IDFG - IPNF road closure practices	CDA
Jan	Fernan Dist. access mgt.	CDA
Jan	UI sightability model testing	Moscow
Feb	RMEF coordination on I&E sign	CDA
Feb	Wildl. research - mgt. coordination	Boise
Mar	GIS training/coor. R-1/Butterfield	CDA
May	Drug coordinator training	Caldwell
May	UI sightability model testing	Moscow
Jun	Nat. Bison Range elk pop. est.	Boise

Presentations

Leptich, David J. 1992. CDA elk project overview. R-1 Reservist Program. Coeur d'Alene, Idaho.

Leptich, David J. 1992. CDA Elk Project mortality studies. USFS - IDFG R-1 coordination tour. Clark Fork, Idaho.

Leptich, David J. 1992. CDA Elk Project mortality studies. R-1 Hunter Education Instructors, Coeur d'Alene, Idaho.

Leptich, David J. 1992. "Idaho Elk Country". Hunters Breakfast, Coeur d'Alene, Idaho.

Leptich, David J. 1993. CDA Elk Project mortality studies. Dept. sponsored sportsmen gatherings. Coeur d'Alene, Idaho.

Leptich, David J. 1993. CDA Elk Project mortality studies. Dept. sponsored sportsmen gatherings. St. Maries, Idaho.

Leptich, David J. 1993. CDA Elk Project mortality studies. Associated logging contractors of Idaho. Post Falls, Idaho.

Zager, Pete., Michael. W. Gratson, and David. J. Leptich. 1993. Application of the Idaho Elk Mortality Model: A Workshop. Northwest Section Meeting of The Wildlife Society. Missoula, Montana.

Leptich, David J. 1993. Natural History of the Mammals of Idaho. North Idaho College. Coeur d'Alene, Idaho.

Leptich, David J. 1993. Wildlife Awareness. Kindergarten Day Camp. Hayden Lake, Idaho.

REPORTS, PUBLICATIONS, ARTICLES

Leptich, D.J., and P. Zager. 1993. Bull elk habitat use. Prog. Rep., Project W-160-R, Study I. Idaho Department of Fish and Game, Boise.

Leptich, D.J., and P. Zager. 1993. Elk habitat security characteristics and hunting season mortality rates. Prog. Rep., Project W-160-R, Study III. Idaho Department of Fish and Game, Boise.

Leptich, D.J., and P. Zager. 1993. Elk sightability. Prog. Rep., Project W-160-R, Study II. Idaho Department of Fish and Game, Boise.

Leptich, D. J., J. W. Unsworth, and M. W. Gratson. 1993. Idaho is elk country. Idaho Wildlife 13(1):4-8.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE:	Idaho	**TITLE:**	Statewide Wildlife Research
PROJECT NO.:	W-160-R-20		
SUBPROJECT:	28	**SUBPROJECT:**	McCall Turkey Ecology Project
STUDY NO.:	I		

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

Study I. Document Wild Turkey Habitat Use and Productivity in Southwestern Idaho

Job 1. Productivity and habitat use of wild turkey in southwestern Idaho

Field work was completed and reported on during the last reporting period. The student attended classes, analyzed data, and began the writing of his thesis during this reporting period.

PROGRESS REPORT
SURVEYS AND INVENTORY

STATE:	Idaho	**TITLE:**	Statewide Wildlife Research
PROJECT NO:	W-160-R-20		
SUBPROJECT:	29	**SUBPROJECT:**	White-tailed Deer/ Forest Management Relations
STUDY NO.:	I		

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

During the winters of 1990-91 and 1991-92, the winter habitat selection patterns of white-tailed deer in the Priest Lake watershed of northern Idaho was studied. A total of 25 radio-collared deer were monitored on 4 geographically distinct winter ranges within the watershed. White-tailed deer displayed a strong preference for low elevation ($\leq$ 820 m), densely forested sites with mean tree ages ranging from 65 to 91 years. All study animals avoided non-forested sites and selected stands of mature timber with overstory canopy coverages exceeding 80%. Preferred winter habitats of whitetails in the Priest Lake drainage were predominated by Douglas-fir and grand fir overstory trees with an admixture of lodgepole pine, western red cedar, and western hemlock. On all winter ranges, understory plant communities were depauperate and characterized by shade tolerant species. Of the 25 study animals, 24 were migratory. Spring dispersals peaked in mid-march following a period of increasing temperatures and reduced snow depths. Migrations ranged from 6.8 to 59.1 km. The average distance traveled was 27.3 km (S.D. = 16.4). All migrating animals moved northward to higher elevations. A sample of 14 clearcut-logged sites was selected to evaluate spring and summer use of clearcuts by white-tailed deer in the Priest Lake drainage. Spring pellet-group surveys were made during mid-June and summer surveys were carried out in early September. The relationship of deer use to the structural and vegetative characteristics of these units is presently being evaluated. Preliminary findings indicate that deer use declined significantly from spring to summer. The structure and composition of seral plant communities was found to be highly variable between units and no correlation between unit age and pellet density was found.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE:	Idaho	**JOB TITLE:**	Statewide Wildlife Research
PROJECT NO.:	W-160-R-20		
SUBPROJECT:	31	**STUDY NAME:**	Lochsa Elk Ecology
STUDY NO.:	I-III		

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

Study No. I: Road Closures and Bull Elk Mortality.

Jobs 2, 3: The effects of road closures on elk mortality and hunter density, distribution, and success in north-central Idaho.

We are investigating bull elk (Cervus elaphus) hunting mortality in relation to hunter density, distribution, and success in three treatment areas that vary in motorized vehicle access during the general (rifle) elk hunting season. In the roaded area, road densities are moderate to high and roads are open to motorized vehicles during the general hunting season. In the managed access area, road densities are moderate to high, but roads are closed to motorized vehicles during the general elk season, to test the hypothesis that road closures will result in higher survival rates of bulls than in otherwise similar areas. In the unroaded area, road densities are low and roads are open to motorized vehicles. Of 46 radio-collared bull elk available for harvest during the 1992 archery and general elk seasons: 10 (21.7%) were harvested during the general season and recovered (two unreported); five (10.9%) were mortally wounded and unrecovered by hunters (one during the archery season); one (2.2%) dropped its collar during the archery season; and the remaining 30 (65.2%) bulls survived both hunting seasons. Estimates of fall survival rates of bulls in 1992 (July 29-December 1) were 0.63 for those in the roaded area, 0.67 for those in the managed access area, and 0.80 for those in the unroaded area. These results, though preliminary, suggest that wounding loss was a significant mortality factor in 1992, as in previous years and in other areas in Idaho, and that survival rates of bull elk in the managed access area were comparable to those in the roaded area. Preliminary analyses of relative hunter densities during the general elk season were 0.0204, 0.1579, and 0.0746 hunter-days/mi^2/day in the roaded, managed access, and unroaded treatment areas, respectively. These data suggest that the managed access area may be attracting hunters.

Study No. II: The effects of cow elk harvest rates on elk population dynamics in Idaho.

Job 1: The effects of cow elk harvest rates on elk population dynamics in Idaho.

We initiated an antlerless elk management program in Idaho that uses (1) some underlying principles of experimental design to evaluate harvest rate effects of current management, alternatives, and underlying assumptions about ecological and socioeconomic processes, and (2) simple modeling exercises to clarify functional relationships, formulate alternative hypotheses, and ultimately predict harvest rate effects. During the hunting seasons of 1992-1996 we will attempt to harvest a relatively constant fraction of the antlerless elk population in each of 11 game management units (three control units - 2 to 5% harvest, four low harvest rate units - 6 to 10% harvest, four high harvest rate units - 14 to 30% harvest) using a permit system. We attempted to obtain geographic clusters of units across Idaho each with control, low, and high harvest rate treatments. Assigning treatments to units was not entirely random because of conflicts with other management goals in some units. Harvest rates will be verified using a statewide big game harvest telephone survey. Harvest rate effects will be estimated by biennial helicopter surveys of elk population sizes and sex and age composition. We have thus far encountered four major challenges with our management experiment. (1) The lack of complete randomization of treatment levels leads to uncertain Type I and II error probabilities and the potential for treatment bias. To investigate treatment bias, we first looked at the relationships between treatment level (harvest rate) and an index of elk density, and treatment level and an index of recruitment. There were no significant relationships between harvest rate and adult female elk density or harvest rate and calf:cow ratios, either pre-treatment or using the 1992 harvest rate estimates ($\underline{P} > 0.10$). (2) A problem directly related to treatment bias, because of nonrandomization, is our ability (or inability) to obtain target harvest rates. Harvest rates depend on hunter success, which is highly variable. For eight of the 11 units in our management experiment, the mean difference in hunter success between 1991 and 1992 was 0.16 (SD = 0.15, range 0.03 to 0.41), although the mean difference between target harvest rates and 1992 estimates was only 0.05 (SD = 0.03, range 0.02 to 0.13). (3) Our biennial aerial surveys of elk populations will require 25% to 46% more flying time than normally would be the case for the 11 units that we have initially included in the program. Because of recent budget considerations, and our more frequent monitoring design, aerial surveys of elk populations in some of our units are at risk. If these units are not flown it may reduce our ability to obtain good estimates of the relationship between harvest rate and population effects. (4) Finally, with our current experimental design there are limitations on our ability to identify mechanisms of population response to harvest rate. However, we think it will initially be sufficient to understand what environmental and socioeconomic factors covary with population responses in order to predict what responses will occur.

Study No. III: Elk Sightability Model for the Bell 206 Jet Ranger Helicopter.

Job 1: Elk sightability model for the Bell 206 Jet Ranger helicopter.

Aerial surveys are an important method for estimating the abundance of big game species. A major problem of many surveys, however, is that it is unknown what fraction of animals is not observed. Logistic regression models that correct for visibility bias during aerial surveys of elk have recently been developed for use with the Hiller UH-12E and Bell 47 helicopters. We initiated a project to develop a regression model that would correct for visibility bias when using a Bell 206 Jet Ranger, a widely available helicopter. To estimate the time and effort that will be required to develop a new model, Potlatch Corporation and the Idaho Department of Fish and Game conducted an aerial survey of elk at the Starkey Experimental Forest using the Jet Ranger. Raw counts were used with the regression models developed for the Hiller UH-12E and Bell 47 helicopters. Using version 3.02 of the Hiller and Bell 47 models, our estimate of the total elk population at the Starkey Experimental Forest was 331 $\pm$ 81 (Hiller model) and 326 $\pm$ 78 (Bell 47 model), or 112.6% and 110.9%, respectively, of the "known" population of 294 elk. A method to develop a regression model using these kinds of data, rather than radio-collared animals, is being investigated.

TRAINING, MEETINGS, AND PRESENTATIONS

Nonenforcement training	Lewiston
North Idaho Research	Priest Lake
Public meeting - Clearwater Resource Coalition - Roads and Trails Committee (preliminary results of hunter survey given)	Orofino
New Employees tour	Idaho
Big Game Research and Management meeting with U of I.	Moscow
Biologist meeting (and short presentation on ARM)	Boise
Animal restraint and immobilization trng	Boise
IDFG-USFS (Clearwater, Nez Perce) elk habitat effectiveness meetings	Grangeville, Orofino
IDFG-USFS (Clearwater, Nez Perce) elk vulnerability meeting (short presentation on research results)	Orofino
Enforcement ride-along trng	Mex Mtn, Lochsa
Red pepper mace trng	Lewiston
Elk vulnerability meeting (5 states and USFS and Timber companies	Spokane
Idaho Chapt. The Wildlife Society (paper presentation antlerless elk study and Adaptive Resource Management)	Boise

Northwest Section The Wildlife Society
(workshop presentation elk vulnerability
model and application) Missoula
N. Amer. Wildl. and Nat. Resourc. Conf.
(paper presentation antlerless elk study
and Adaptive Resource Management) Washington

REPORTS, PUBLICATIONS, AND ARTICLES

Gratson, M. W., and P. Zager. 1993. Road closures and bull elk mortality. Idaho Dep. Fish and Game, Fed. Aid in Wildl. Restor. Job Prog. Rep., Proj. W-170-R-19. 24pp.

Gratson, M. W., and P. Zager. 1993. The effects of cow elk harvest rates on elk population dynamics in Idaho. Idaho Dep. Fish and Game, Fed. Aid in Wildl. Restor. Job Prog. Rep., Proj. W-170-R-20. 19pp.

Gratson, M. W., and P. Zager. 1992. Elk sightability model for the Bell 206 Jet Ranger helicopter. Idaho Dep. Fish and Game, Fed. Aid in Wildl. Restor. Job Prog. Rep., Proj. W-160-R-19. 6pp.

Gratson, M. W., J. W. Unsworth, P. Zager, and L. Kuck. (in press). Initial experiences with adaptive resource management for determining appropriate antlerless elk harvest rates in Idaho. Trans. 58th N. Amer. Wildl. and Nat. Resour. Conf. (1993). 10pp.

Gratson, M. W. 1993. Sexual selection for increased male courtship and acoustic signals and against large male size at sharp-tailed grouse leks. Evolution 47:691-696.

Leptich, D., J. Unsworth, and M. Gratson. 1993. Idaho is elk country: a three-way partnership helps keep it that way. Idaho Wildlife. Winter 1993:4-8.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE:	Idaho	**PROJECT:**	Statewide Wildlife Research
PROJECT NO.:	W-160-R-20		
SUBPROJECT:	32		
STUDY NO.:	I	**SUBPROJECT:**	Mountain Quail Ecology

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

Mountain quail (Oreortyx pictus) numbers in Idaho have been declining over the past several decades. As a result, the species has been classified as a "Species of Special Concern" by the Idaho Department of Fish and Game; the Bureau of Land Management in Idaho and Region 4 of the U.S. Forest Service have designated the mountain quail as a "Sensitive Species" (Moseley and Groves 1990). The mountain quail has also been included on the list of "Wildlife Species of Concern in Idaho" by the Boise Area Office of the U.S. Fish and Wildlife Service (Boccard 1980). Consequently, land and wildlife management agencies, such as the Idaho Department of Fish and Game and the Bureau of Land Management, have identified the need to collect information on the ecology of mountain quail in Idaho in order to develop management strategies that will prevent further decline in their numbers, and to restore birds in appropriate areas. Various aspects of mountain quail ecology have been studied in California; however, the habitat in California is significantly different than mountain quail habitat in Idaho. No comprehensive study has been conducted on the habitat use patterns, movements, and population characteristics of Idaho mountain quail. Such a study is needed before managers can adequately assess the impacts of land use practices on mountain quail habitat and populations.

The study area includes several drainages and draws off the Little Salmon River in the southwest corner of Idaho County, Idaho. The objectives of this study are: to document the daily and seasonal movements and home ranges of mountain quail; to collect information on productivity and survival rates; to document habitat use patterns; to determine physical and vegetal characteristics of nesting and brood-rearing habitats; and to develop recommendations designed to maintain or enhance mountain quail habitat and populations.

The 1993 field season, January through August, included several phases of activity: searching for and obtaining permission to set up new trapping sites, trapping and measuring birds, radiotracking, and habitat work. Between 17 February and 24 May, 103 traps, in 32 areas, were set up. Thirty-eight mountain quail were trapped, banded, weighed, and measured. Of those, 33 quail were radio-collared. The birds' movements were monitored from March through August, and 13 nests were

located. During July and August, physical and vegetal measurements were taken at all nest sites, random dependent sites associated with nests, and random independent sites, for a total of 39 habitat plots completed. The availability of habitats will be compared against the proportion of use they receive. Chi-square goodness of fit, t-tests, linear regression, and nonparametric procedures will be used in analysis of the data.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE:	Idaho	**PROJECT TITLE:**	Statewide Wildlife Research
PROJECT NO.:	W-160-R-20		
SUBPROJECT:	33	**SUBPROJECT:**	Cottonwood Turkey Ecology
STUDY NO.:	I		

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

Though Merriam's wild turkeys were first introduced into Idaho in the early 1960s, information on turkeys in Idaho is minimal. This study will provide quantitative data and analysis of habitat use, reproduction and survival to aid in the management of Merriam's turkeys and their habitat. During the 1993 field season, 35 Merriam's wild turkey hens were radio-marked and monitored to determine 1) movement patterns and timing, 2) winter habitat use, 3) nest sites, 4) reproductive parameters, 5) brood-rearing habitat use, and 6) survival. Radio-marked turkeys consisted of 19 adult hens, and 16 juveniles. Turkeys were located a total of 238 times throughout the 1993 field season. Turkeys were located in wintering habitat 49 times. Hens moved an average of 24.9 km (range 1.3-36.2 km), between trap site and nests. Twenty-nine nests were located and their habitat characteristics were sampled. These nests also revealed an overall 90% nesting attempt rate, 68% nest success and a mean clutch of 10.5 eggs. Hens with broods were located 88 times with brood-rearing habitat characteristics sampled at 9 of these sites. Of the 35 turkeys radio-marked in 1993, 22 with functioning transmitters remain in the study area. Data is currently being prepared for analysis and expected completion is June 1994.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE:	Idaho	**SUBPROJECT:**	Mule Deer Ecology
PROJECT NO.:	W-160-R-20		
SUBPROJECT NO.:	35	**STUDY NAME:**	Implementation of study plan
STUDY:	II		

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

Subproject 35. Mule Deer Ecology

During 1992-93, a study plan was completed and the study was initiated. Three study areas were identified. Mule deer (n=143) were radio collared and mortality was monitored. Fifty-five deer died between 12-10-92 and 6-30-93. Fifty-eight sightability data points were collected on the Owyhee, Blacks Creek, and Bennett Mountain study areas. A preliminary sightability model was developed. Four surveys were flown during winter and 4 additional surveys were flown during spring, 1991-92, in the Wolf Creek and Deer Creek drainages of Unit 11 to determine the most appropriate season to survey mule deer populations. A graduate project was initiated in the Boise River drainage to determine summer/fall habitat use and how habitat use may be affected by fire.

Meetings and Presentations:

MONTH	MEETING	LOCATION
Jul	Access Management (USFS)	Nampa
Jul	Elk Vulnerability (USFS)	Emmett
Aug	Elk Vulnerability (USFS)	Nampa
Aug	Presentation to Deer Hunters of Idaho	Boise
Aug	Elk Vulnerability (USFS)	St. Anthony
Aug	Access Management (USFS)	Boise
Aug	Deer/Livestock (BLM)	Boise
Aug	Deer/Livestock (BLM & ICA)	Boise

MONTH	MEETING	LOCATION
Aug	Deer/Livestock (ICA)	Boise
Sep	Elk Vulnerability (USFS)	St. Anthony
Sep	Presentation on Elk Vul. (USFWS)	Boise
Oct	Presentation on Mule Deer (Boise Radio)	Boise
Oct	Presentation (New Employees)	Nampa
Feb	Research/Management (IDFG)	Boise
Mar	Montana State Graduate Committee	Bozeman
Mar	Region 5 Wildlife Council	Pocatello
Apr	Admin Coor. Meeting (IDFG)	Nampa
Apr	Presentation to Elmore Co. Wildl.	Glen's Ferry
Apr	Commission Meeting (IDFG)	Boise
May	Elk Workshop	Bozeman
May	Archery Hunting Workshop	Bozeman

Reports, Publications, Articles:

Samuel, M. D., R. K. Steinhorst, E. O. Garton, and J. W. Unsworth. 1992. Estimation of wildlife population ratios incorporating survey design and visibility bias. J. Wildl. Manage. 56:718-725.

Groves, C. and J. W. Unsworth. 1993. Wapiti and warblers: integrating game and nongame management in Idaho. Pages ____ *in* d. Finch and P. Stangel eds., Proceedings of the workshop on management of neotropical migratory birds. September 21-25, 1992, Estes Park, Colorado.

Gratson, M. W., J. W. Unsworth, P. Zager, and L. Kuck. 1993. Initial experiences with adaptive resource management for determining appropriate antlerless elk harvest rates in Idaho. Trans. N. A. Wildl. & Nat. Res. Conf. 58:1-10.

Milner, G., and J. W. Unsworth. 1993. Region 3 mule deer habitat use. Job Completion Report, Project W-160-R-20. 10 pp.

Gray, C., and J. W. Unsworth. 1993. Region 4 mule deer habitat use. Job Completion Report, Project W-160-R-20. 10 pp.

Unsworth, J. W., L. Kuck, M. D. Scott, and E. O. Garton. 1993. Elk mortality in the Clearwater drainage of northcentral Idaho. J. Wildl. Manage. 57:495-502.

_____. 1993. Rocky mountain elk ecology. Study III: Elk habitat security characteristics and hunting season mortality rates. Job Completion Report, Project W-160-R-18. Idaho Dept. Fish and Game, Boise. 41 pp.

_____. 1993. Rocky mountain elk ecology. Study I: Bull elk habitat use. Job Completion Report, Project W-160-R-18. Idaho Dept. Fish and Game, Boise. 27 pp.

_____. 1993. Mule deer ecology. Study plan 1992-1997. Job Completion Report, Project W-160-R-19. Idaho Dept. Fish and Game, Boise. 27 pp.

_____. 1993. Mule deer ecology. Study plan 1992-1997. Job Completion Report, Project W-160-R-19. Idaho Dept. Fish and Game, Boise. 26 pp.

_____. 1993. Mule deer ecology. Study I: Study design and implementation. Job Progress Report, Project W-160-R-19. Idaho Dept. Fish and Game, Boise. 3 pp.

_____. 1993. Mule deer ecology. Study II: Mule deer sightability. Job Progress Report, Project W-160-R-19. Idaho Dept. Fish and Game, Boise. 8 pp.

_____. 1993. Mule deer ecology. Study I: Mule deer mortality. Job Progress Report, Project W-160-R-19. Idaho Dept. Fish and Game, Boise. 8 pp.

PROGRESS REPORT
SURVEYS AND INVENTORY

STATE:	Idaho	**TITLE:**	Statewide Wildlife Research
PROJECT NO:	W-160-R-20		
SUBPROJECT:	36	**SUBPROJECT:**	Region 5 Upland Bird Study
STUDY NO.:	I		

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

Study No. I. The effects of predation on upland nesting game birds.

Little is known about the nesting success of ground nesting birds in much of the intermountain west. The impact of Russian olives (Elaeagnus angustifolia) that have recently spread throughout the intermountain west on native wildlife is also not well understood. The objective of this study is to understand the relationship of predators and habitats to the nesting success of upland nesting birds. A search of management subunits documented 79 active magpie (Pica pica) nests in 1992 and 103 in 1993. During the 1992 field season, 179 duck nests and 38 nests of miscellaneous species were located, mapped, and monitored. Thus far in 1993, 141 duck and 37 miscellaneous nests have been located, mapped, and monitored. The Mayfield method was used to estimate nest success for ducks and in both years success was <10%. Most nest losses appeared to be caused by magpie predation.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE:	Idaho	**TITLE:**	Statewide Wildlife
PROJECT NO.:	W-160-R-20		Research
SUBPROJECT:	37		
STUDY NO.:	I-II	**SUBPROJECT:**	Canada Goose Ecology

PERIOD COVERED: January 1, 1993 to June 30, 1993

ABSTRACT

Study I

Weekly spring breeding pair counts (SBPC), during March, April, and May were conducted on the Snake, Payette, and Boise Rivers. These surveys were conducted to ascertain the peak period of breeding pair numbers, describe the breeding distribution, determine the amount of variation inherent in this type of survey, give the researcher experience in conducting the surveys, and to determine the problems associated with the survey technique and interpreting the results. Peak pair numbers were observed during the 4/19-4/27 period for all 3 survey areas. Comparisons of data generated on research flights were made to similar data collected by Region 3 management personnel on their regularly scheduled SBPC surveys. Several potential reasons for the high variances observed in Regional SBPC surveys were identified.

One hundred and thirty locally produced Canada geese were equipped with neck-collar-mounted radio transmitters and U. S. Fish and Wildlife Service aluminum leg bands and then released.

Study II

Field work was limited to the capture and banding of locally-produced Canada geese. A total of 1,831 geese was banded during the spring of 1993 in southwestern Idaho.

Meetings and Presentations

Date	Purpose	Location
July	State firearms Ins. Training	Boise
	Research Proj. Coordination	Boise
Nov	Research Proj. Cord. Mtg.	Boise

Date	Purpose	Location
March	W.S. Ida. Chp.	Boise
	RIII Dist. Mtg.	Boise
March	RIII - BLM Coord.	Boise
	RIII Pers. Mtg.	Boise
	UofI/Oz Garton Sight. mod dev.	Moscow
April	Phys. Ass. & Firearms Trng.	Boise

Reports, Publications, Articles

Bodie, W.L. 1993. Canada Goose Ecology In Southern Idaho. A Problem Analysis and Study Plan. Cmpt. Rpt. W-160-R-20. Idaho Department of Fish and Game. Boise. 48pp.

Bodie, W. L. 1993. No One Knows Where The Wild Goose Goes. Idaho Wildlife Review. Idaho Department of Fish and Game. In Press.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE:	Idaho	**SUBPROJECT:**	Elk/Livestock Impacts on Riparian Vegetation
PROJECT NO.:	W-160-R-20		
SUBPROJECT:	38	**STUDY NAME:**	Implementation of Study Plan
STUDY NO.:	II		

PERIOD COVERED: January 1, 1993 to June 30, 1993

ABSTRACT

Elk and cattle forage use was estimated on the Lee Creek allotment using utilization transects and pellet group counts. Sixty-four transects were established in three cover types within four pastures in April and June. Transects were read June 28, July 7-17, August 6-16 and September 2. Analysis of data collected during the June 28 and July sampling periods is not yet complete.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE:	Idaho	**SUBPROJECT:**	Sand Creek Bull Elk Mortality Study
PROJECT NO.:	W-160-R-20		
SUBPROJECT:	39	**STUDY NAME:**	Effects of Hunting Season Regulations on Bull Elk
STUDY NO.:	I		

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

The vulnerability of bull elk (Cervus elaphus) to hunting mortality has increased in many elk herds across the western United States due to reductions in habitat security. Wildlife managers dealing with low habitat security in areas open to general bull hunting have attempted to increase male elk survival with regulations that limit harvest to either some minimum or maximum antler size. This study evaluates the efficacy of restricting harvest to spike-antlered, yearling bulls while maintaining a general hunting season.

To determine the mortality rates of yearling male elk under the new regulation, 86 male calves were captured and fitted with radio collars in March of 1991-1992. During the general season, the mortality rate of radioed, yearling, bull elk in areas open to hunting was 28% (14 of 50) in 1991-1992. None of the radio-marked, branch-antlered yearlings and only 1 radio-collared, 2-year-old bull were illegally killed. The mortality rates of bull elk under the spike-only regulation were lower than previously reported levels for the Sand Creek elk herd. The winter composition counts also indicated that the spike-only regulation succeeded in increasing the survival rate of bull elk. I attempted to determine the cause of the increase in bull survival by comparing hunter numbers and yearling bull mortality under the any-antlered bull regulation to hunter numbers and yearling bull mortality under the spike-only regulations. Both hunter numbers and yearling bull elk mortality decreased with the implementation of the spike-only season. I also compared hunting pressure and habitat use among yearling bulls which survived the general hunting season and yearling bulls which were harvested during the general seasons. Yearling bull behavior and hunter perceptions appeared to influence vulnerability more than either habitat use or hunting pressure under the spike-only regulation.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE:	Idaho	**SUBPROJECT:**	White-tailed Deer Ecology
PROJECT NO.:	W-160-R-20		
SUBPROJECT:	40	**STUDY NAME:**	Mortality Rates of Region 2
STUDY NO.:	I		White-tailed Deer

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

White-tailed Deer Mortality Rates:

Annual survival rates of white-tailed deer in north-central Idaho have been monitored since 1990. The survival rate for adult male deer has declined significantly from .69 to .44 and the survival distribution is also significantly different. Though 59% of the buck mortalities were related to natural factors, the lower male survival in 1992 was accompanied by increased hunting-related mortality.

Female deer survival ranged between .66 and .70. More females died as a result of natural mortality factors than due to hunting-related causes.

Current male and female white-tailed deer survival rates are comparable to Unit 1 and several other studies where natural and hunting-related factors play different roles.

Meetings and Presentations

Date	Purpose	Location
July	Elk vulnerability meeting with the Forest Service	Lewiston
Aug	Black bear plan meeting	Boise
	North Idaho wildlife research enclave	Priest Lake
Sep	Dan Johnson - timber industry biologist	Lewiston
	Region 1 & 2 and research biologists - common concerns	Moscow
	Bitterroot grizzly bear recovery meeting	Myrtle
	Region 2/Admin coordination	Lewiston

Date	Purpose	Location
Nov	Region 1 & 2 biologists - common concerns	Moscow
	Bonners Ferry "City Fathers" - caribou	Bonners Ferry
	Caribou recovery plan public meetings (2)	Bonners Ferry
	Bart Butterfield re elk mortality model and GIS	Boise
	Thomas Baumeister thesis defense	Bozeman
	Dave Verbhyla re elk mortality model and GIS	Moscow
	Bitterroot grizzly bear recovery	Missoula
Dec	Steve Hayes' committee meeting	Moscow
	Elk Vulnerability Working Group	Spokane
Jan	WTD presentation to Idaho State Bowhunters	Orofino
Feb	Caribou recovery plan meeting with USFWS	Portland
	Caribou recovery team meeting	CDA
	IDFG biologists meeting	Boise
Mar	Pubic meeting re mountain tag	Lewiston
	Natural Resources Bureau meeting	Lewiston
Apr	TWS meeting - elk mortality workshop	Missoula
	Caribou recovery team meeting	CDA
	Bill Wall (Potlatch biologist) re coop projects	Lewiston
May	S Fk Flathead River grizzly bear project review	Kalispell
Jun	Jim Unsworth thesis defense	Moscow

Reports, Publications, Articles

Baumeister, T., and P. Zager. 1993. Region 2 white-tailed deer habitat use. Fed. Aid Wildl. Restor., Job Prog. Rep., Proj. W-160-R. Idaho Dep. Fish and Game, Boise.

Beecham, J.J., and P. Zager. 1992. Black bear species plan. Idaho Dep. Fish and Game, Boise.

Compton, B.B., P. Zager, and G. Servheen. 1993. Survival and cause-specific mortality of translocated woodland caribou. ms. to be submitted to JWM or WSB.

_____, _____, and J.R. Skalski. 1992. Selkirk Mountains woodland caribou census

technique -- methodology and recommendations. Idaho Dep. Fish and Game, Boise.

Edelmann, F., K.P. Reese, and P. Zager. 1992. Ecology of Merriam's wild turkeys in westcentral Idaho. Fed. Aid Wildl. Restor., Job Prog. Rep., Proj. W-160-R. Idaho Dep. Fish and Game, Boise.

Heekin, P.E., M. Sands, C. Connell, and P. Zager. 1992. Mountain quail ecology. Fed. Aid Wildl. Restor., Job Prog. Rep., Proj. W-160-R. Idaho Dep. Fish and Game, Boise.

Gratson, M.W., and P. Zager. 1993. Lochsa elk ecology. Study III. Elk sightability model for the Bell 206 Jet Ranger helicopter. Fed. Aid Wildl. Restor., Job Prog. Rep., Proj. W-160-R. Idaho Dep. Fish and Game, Boise.

_____, and _____. 1993. Lochsa elk ecology. Study II. Optimum yield of elk. Fed. Aid Wildl. Restor., Job Prog. Rep., Proj. W-160-R. Idaho Dep. Fish and Game, Boise.

Gratson, M.W., J.W. Unsworth, and P. Zager. 1993. Lochsa elk ecology. Study I. Road closures and bull elk mortality. Fed. Aid Wildl. Restor., Job Prog. Rep., Proj. W-160-R. Idaho Dep. Fish and Game, Boise.

_____, _____, _____, and L. Kuck. 1993. Initial experiences with adaptive resource management for determining appropriate antlerless elk harvest rates in Idaho. N. Amer. Wildl. Nat. Resourc. Conf. 58:000-000.

Leptich, D.J., and P. Zager. 1992. Coeur d'Alene elk ecology project. Study I. Bull elk habitat use. Fed. Aid Wildl. Restor., Job Prog. Rep., Proj. W-160-R. Idaho Dep. Fish and Game, Boise.

_____, and _____. 1992. Coeur d'Alene elk ecology project. Study II. Elk sightability models. Fed. Aid Wildl. Restor., Job Prog. Rep., Proj. W-160-R. Idaho Dep. Fish and Game, Boise.

_____, and _____. 1992. Coeur d'Alene elk ecology project. Study III. Elk habitat security characteristics and hunting season mortality rates. Fed. Aid Wildl. Restor., Job Prog. Rep., Proj. W-160-R. Idaho Dep. Fish and Game, Boise.

Pauley, G., J.M. Peek, and P. Zager. 1993. Predicting white-tailed deer habitat use in northern Idaho. J. Wildl. Manage. 57:000-000.

Secord, M., S. Winslow., and P. Zager. 1992. White-tailed deer/forest management relations. Fed. Aid Wildl. Restor., Job Prog. Rep., Proj. W-160-R. Idaho Dep. Fish and Game, Boise.

USFWS. 1994. Recovery plan for woodland caribou in the Selkirk Mountains. Portland, OR. (team leader and plan author).

Wakkinen, W., and P. Zager. 1992. Selkirk Mountains grizzly bear ecology project. Ann. Rep., Threatened and Endangered Species Proj. E-7-4. Idaho Dep. Fish and Game, Boise.

_____, B.B. Compton, P. Zager, and L. Allen-Johnson. 1992. Selkirk Mountains caribou transplant: December 1991 - December 1992. Ann. Rep., Threatened and Endangered Species Proj. E-7-4. Idaho Dep. Fish and Game, Boise.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE:	Idaho	**SUBPROJECT:**	Region 3 Mule Deer Habitat Use
PROJECT NO.:	W-160-R-20		
SUBPROJECT:	41	**STUDY NAME:**	Habitat Use by Owyhee Mule Deer
STUDY:	I-II		

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

Subproject 41. Region 3 Mule Deer Habitat Use.

During 1992-93, a study plan was completed and the study was initiated. Mule deer (n=48) were radio collared and habitat use monitored. Fifteen mule deer have been intensively monitored from the ground to determine micro-habitat use. Random plots have been evaluated to determine habitat availability. Pellet groups have been collected to determine seasonal food habits. Livestock distribution and stocking rates have been monitored.

Meetings and Presentations:

None.

Reports, Publications, Articles:

Milner, G., and J. W. Unsworth. 1993. Region 3 mule deer habitat use. Job Completion Report, Project W-160-R-20. 10 pp.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE:	Idaho	**SUBPROJECT:**	Region 4 Mule Deer Habitat Use
PROJECT NO.:	W-160-R-20		
SUBPROJECT:	42	**STUDY NAME:**	Habitat Use by Camas Mule Deer
STUDY NO.:	I-II		

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

Subproject 42. Region 4 Mule Deer Habitat Use.

During 1992-93, a study plan was completed and the study was initiated. Mule deer (n=56) were radio collared and mortality was monitored. Seventeen mule deer have been intensively monitored from the ground to determine micro-habitat use. Random plots have been evaluated to determine habitat availability. Pellet groups have been collected to determine seasonal food habits. Livestock distribution and stocking rates have been monitored.

Meetings and Presentations:

None.

Reports, Publications, Articles:

Gray, C., and J. W. Unsworth. 1993. Region 4 mule deer habitat use. Job Completion Report, Project W-160-R-20. 10 pp.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE: Idaho
PROJECT NO.: W-160-R-20
SUBPROJECT: 43
STUDY NO.: I

SUBPROJECT: Wolverine Ecology
STUDY NAME: Wolverine Ecology and Habitat Use in Central Idaho

PERIOD COVERED: May 1, 1993 to June 30, 1993

ABSTRACT

Data on home range size, habitat characteristics, daily movements, denning activity, scent marking, food habits, and morphological and population characteristics were collected on 13 individual wolverines (Gulo gulo) on the Sawtooth, Challis, and Boise National Forests. Two wolverines were monitored since March 1992. Eleven individual wolverines were captured and instrumented with intraperitoneal implant or collar radio transmitters during the winter of 1993. Two-hundred seventy three relocations were obtained for all study animals. Habitat characteristics and proximity to disturbance factors were measured for each wolverine location. The initial perception of habitat use is a close association with high elevation cirque basins. Monitoring tracks and remote camera systems proved effective in documenting wolverine presence at carrion bait stations in winter.

Submitted by:

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John Beecham
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Federal Aid Coordinator

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

_____

Tom Reinecker
Chief, Bureau of Wildlife