

Vol 42 I #5

IDAHO
DEPARTMENT OF FISH AND GAME

Jerry M. Conley, Director

Project No. W-168-C-8

FEDERAL AID TO WILDLIFE RESTORATION

July 1, 1990 - June 30, 1991



PROGRESS REPORT

Study 1, Job 1: Wildlife Research Coordination

Prepared by:

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Assistant Bureau Chief

September, 1991

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PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE: Idaho JOB NAME: Wildlife Research Coordination
PROJECT: W-168-C-8
PERIOD COVERED: July 1, 1990 to June 30, 1991

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.

OBJECTIVES

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

Meetings and Presentations

Meetings

Date	Name	Location
8/21/90	Public mtg. on deer and elk	McCall, ID
8/22	Public mtg. on deer and elk	Lewiston
8/23	Public mtg. on deer and elk	Grangeville
9/11-12	Reg. Wildl. Mgrs. mtg.	Boise
9/21	Commission mtg.	Boise
9/27	Boise River Obs. mtg.	Boise
10/1-4	FA Coord. mtg.	Washington, DC
10/11	Research mtg.	Idaho Falls
10/17	Public mtg.	Lewiston
10/30-31	GAP Analysis Workshop	Moscow
11/6	Research mtg.	Boise
11/13-14	Peregrine Research mtg.	Boise
11/27	Research mtg.	Boise
12/1	Reg. 6 Wildl. Council mtg.	Idaho Falls
12/4	Wolf Recovery mtg.	Boise
12/5	Public mtg.	Boise
1/16/91	Commission mtg.	Boise
1/10-5/1/91	University of Idaho	Moscow

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
SURVEYS AND INVENTORY

STATE: Idaho **PROJECT NO.:** W-160-R-18
Title: Statewide Wildlife Research **STUDY:** I
SUBPROJECT: Bighorn Sheep Ecology **JOB:** 1-3
PERIOD COVERED: July 1, 1990 to June 30, 1991

ABSTRACT

Job 1. Distribution and Inventory

Aerial surveys were conducted on the Owyhee river and Little Jacks creek study areas. Increased numbers were observed for both populations. The total of observed animals increased from 815 observed in 1990 to 984 in 1991. A total of 231 bighorns were counted on the Little Jacks creek study area. This total included 80 rams, 96 ewes, 55 lambs. The ram:ewe:lamb ratio was 83:100:57. Rams greater than or equal to 3/4 curl made up 46% of the ram population. A total of 753 sheep were observed on the Owyhee River survey; 176 rams, 400 ewes and 175 lambs. Density estimates for the surveyed populations were: Little Jacks creek 3.6/sq. mile and Owyhee River 9.2/sq. mile.

Job 2. Sightability

One hundred and twenty-three sightability trials have been completed. The helicopter crew was successful in locating 75 (61%) of the total. Four helicopter aerial surveys of the Little Jack's Creek study area were conducted during past year. Since 1983 bighorn sheep surveys on the Little Jacks creek study area have displayed a variability in the number of ewes observed of $\pm 17\%$ and a variability of rams of $\pm 30\%$.

Job 3. Standardize Survey Techniques

Helicopter and fixed winged airplane disturbance caused radio collared sheep to move long distances (Mean = 3.9 km.). Bighorns commonly moved from the stratification unit before the helicopter arrived. The predictability of estimates of sheep in the stratification units was low (44%). These large scale movements preclude the use of most population estimation techniques. Efforts are being concentrated on developing a sightability model.

PROGRESS REPORT
SURVEYS AND INVENTORY

STATE: Idaho **PROJECT NO.:** W-160-R-18
Title: Statewide Wildlife Research **STUDY:** II
SUBPROJECT: Bighorn Sheep Ecology **JOB:** 1-3
PERIOD COVERED: July 1, 1990 to June 30, 1991

ABSTRACT

Job 1. Habitat Availability

Preliminary habitat mapping has been completed. Fifteen habitat types have been identified in the study area. Field sampling has been conducted in each habitat type to determine cover, slope, aspect and shrub height. Digital Elevation Map (DEM) tapes have been obtained and are being used to describe topography. The number of acres of each habitat type have been determined.

Job 2. Disturbance Factors

Traffic counters placed in Horse Basin and at the mouth of Little Jacks Creek indicated a sporadic flow of traffic. Visitors were few but known uses included: photographing bighorn sheep, hunting, fishing, trapping, riding mountain bikes and motorcycles, four wheeling, camping and escape from the crowds.

Job 3. Habitat Selection

Bighorn sheep and cattle tended to use different parts of the study area. Bighorns generally used the steeper slopes while cattle tended to stay on the flatter terrain. There is potential for competition between cattle and livestock where easy access to water exists. The average distance from bighorn sheep locations to water ranged from 0.6 km in September to 2.0 km in November. Rams and ewes used similar parts of the habitat but rams tended to range further from large vertical faces than did ewes. Ram observations averaged 1.0 km from water and 82 m from escape terrain. Ewe observations averaged 1.2 km from water and 68 m from escape terrain. Rams tended to use the plateaus above the canyon rims more than ewes did. Bighorns used the Wyoming big sagebrush type more than any other. Eighty-two percent of the initial locations was in one of the sagebrush or grass types.

Meetings and Presentations

<u>Date</u>	<u>Name</u>	<u>Location</u>
Jul	State firearms Ins. Training	Ketchum
	Research Proj. Coordination	Boise
	HIP mtg. reviewed pheasant Res.	Jerome
	Boise Int. Agen. Fire Cent.	Boise
Nov	Research Proj. Cord. Mtg.	Boise
	State Research Mtg.	Boise
Dec	BLM-IDFG Grazing Mtg.	Boise
	Bighorn/Cattle Utah St.	Logan UT
	Bighorn Grad.Stu. Mtg.(J.Bissonette)	Logan UT
	Reg. 3 Physical Fitness	Boise
	Firearms Trng.-Glock	Boise
Feb	W.S. Ida. Chp.	Boise
	RIII Dist. Mtg.	Boise
	RIII - BLM Coord.	Boise
	RIII Pers. Mtg.	Boise
	UofI/Oz Garton Sight.mod dev.	Moscow
Mar	Admin. Mtg.	Boise
Apr	Hunt. Saft.	Boise
	Study Coord.	Boise
	CPR Trng.	Boise
	Phys. Ass. & Firearms Trng.	Boise
May	Research Coord. Mtg. (BLM)	Boise

Reports, Publications, Articles

- Bodie, W.L., E. Taylor and M. McCoy. 1989. Bighorn Sheep Ecology. Prog. Rept., Project W-160-~~R~~-17, Idaho Department of Fish and Game, Boise.
- _____. 1990. Status and Distribution of California Bighorn Sheep in Idaho. Proc. Northern Wild Sheep and Goat Council 1990: In Press.

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE: Idaho **PROJECT NO.:** W-160-R-18
TITLE: Statewide Wildlife Research **STUDY:** I
SUBPROJECT: Southcentral Idaho **JOB:** 2
Pheasant Ecology

PERIOD COVERED: July 1, 1990 to June 30, 1991

ABSTRACT

Job 2. Pheasant Recruitment and Survival

A recruitment study of a ring-necked pheasant population in Gooding County, Idaho was initiated in February 1990. Forty-eight radio collared hens were followed through spring dispersal, nesting and brood-rearing periods. Twenty-eight were local hens and 20 were transplanted wild hens. Data were collected on hen survival, nest success, and brood survival to develop a recruitment model for the population. Overall hen survival for the monitoring period was 0.452. The main causes and times for hen mortality were by predation just after release and during the spring dispersal period, and by swathing during nest incubation. Canine predation was the most common type of predation. Total nest success for the reproductive period was 32% and hen success was 54%. A recruitment model indicated an increase of 8% in the population. Local hens had two times the survival rate of transplanted hens. Transplanted hens were two times more likely to hatch a nest than local hens.

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE: Idaho **PROJECT NO.:** W-160-R-18
TITLE: Statewide Wildlife Research **STUDY:** I
SUBPROJECT: Southwestern Idaho **JOB:** 1
Pheasant Ecology
PERIOD COVERED: July 1, 1990 to June 30, 1991

ABSTRACT

Job 2. Pheasant Recruitment and Survival

A recruitment study of a ring-necked pheasant population in Canyon County, Idaho was initiated in February 1990. Fifty-seven radio collared hens were followed through spring dispersal, nesting and brood-rearing periods. Data were collected on hen survival, nest success, and brood survival to develop a recruitment model for the population. Initial results estimate fall recruitment to be 0.741 juvenile hens for each hen entering the breeding season. Better survival estimates are needed to fully evaluate population trends. Data were also collected on nest success in relation to nest site selection and habitat availability. Early nest attempts in grain fields were most successful, producing more broods than all other cover types combined.

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE: Idaho **PROJECT NO.:** W-160-R-18
TITLE: Statewide Wildlife Research **STUDY:** I
SUBPROJECT: Ecology of Merriam's wild Turkey in Southwestern Idaho **JOB:** 1
PERIOD COVERED: July 1, 1990 to June 30, 1991

ABSTRACT

Job 1. Ecology of Merriam's wild turkeys

The knowledge of habitat use by wild turkeys is limited. Past wild turkey research has focused on the eastern United States. Few studies have been conducted on the Merriam's subspecies, particularly in non-native habitat. Quantitative data on nesting habitat, brood rearing habitat, and roosting habitat sites are lacking. My study will provide a detailed assessment of physical and vegetative characteristics of these habitats, as well as use and availability data, seasonal movements, home range, and poult and hen survival. Since Merriam's subspecies is not indigenous to Idaho, results from this study will be useful in managing critical habitat components and providing guidelines for evaluating potential introduction sites.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH
RESEARCH COORDINATION REPORT
LOCHSA ELK ECOLOGY

STATE: Idaho JOB TITLE: Statewide Wildlife Research
PROJECT: W-160-R-18
SUBPROJECT: 22 STUDY NAME: Lochsa Elk Ecology
PERIOD COVERED: July 1, 1990 to June 30, 1991

ABSTRACT

Study No. I. Bull Elk Habitat Use.

Habitat use by elk (Cervus elaphus) on the Lochsa study area was evaluated using 4227 aerial relocations of radio-collared animals. Cover types were not used in proportion to their availability ($P < 0.05$). Timber was preferred during summer and fall and shrubfields were preferred during spring and winter. Habitat use patterns varied among cow, yearling bull, and 2.5+ year-old bull elk during summer, fall, and winter, but not during spring. Use of topography varied among cow, yearling bull, and 2.5+ year-old bull elk during winter with bulls using more upper slopes and ridge tops than cow elk. Use of aspect varied among cow, yearling bull, and 2.5+ year-old bull during summer, fall, and winter. Bull elk used steeper terrain than cows during fall.

Study No. II. Elk Sightability.

JOB 1:

During this period we collected sightability data on 57 groups of elk. This data was added to the original model of Samuel et al. (1987) and model coefficients changed slightly, but with little affect on population estimates. No additional independent variables entered the original sightability model (Samuel et al. 1987). Sex of elk was not a significant independent variable. The new coefficients are incorporated in the manual: Elk Sightability Surveys - A Practical Approach

JOB 2:

Elk Sightability Model Validation at the National Bison Range, Montana: We estimated the elk population on the National Bison Range (NBR), Montana using aerial surveys corrected with a sightability

model. Four surveys were flown during winter and spring 1988. Our estimates compared favorably with an independent ground count conducted by NBR personnel. We estimated 159±11 and 117±26 elk on the first and fourth surveys, respectively. These compare to NBR estimates of 152 and 125 elk for the same dates. Animals were removed from the population between surveys and we were able to statistically detect a 17% reduction in population size. This paper has been published in Wildlife Society Bulletin 18:113-115.

Elk Sightability Surveys - A Practical Approach: A manual detailing the methodology of conducting sightability surveys was developed. The manual includes sections on safety, survey design, flying methods, and the use of computer software for data analysis.

Study No. III. Elk habitat Security Characteristics and Hunting Season Mortality Rates.

Elk (Cervus elaphus) (N=122) were monitored during the 1986, 1987, 1988, 1989, and 1990 hunting seasons to determine habitat use and mortality rates. Habitat components were used disproportionately by elk. Closed timber was used more than in proportion to its availability and open timber and shrubfields were used less than in proportion to their availability during August, September and October. Shrubfields were used in proportion to availability during November. Percentage use of topography, aspect, and slope are presented. Sixty-nine mortalities occurred during this period: 4 archery wounding losses, 7 rifle wounding losses, 3 poaching losses, 43 recovered rifle kills, 2 recovered archery kills, and 10 other mortalities. Seasonal mortality rates are calculated.

Meetings

Date	Purpose	Location
July		
	Road closure project - FS/IDFG	Lewiston
	Grizzly bear and caribou monitoring - U of Wash	Bonnors Ferry
	Elk population monitoring - U of Wash	Coeur d'Alene
	Interagency Grizzly Bear Committee - USFWS	Lewiston
	Starkey Research staff - USFS	LaGrande
	Elk mgmt/vulnerability mtg - interagency	Umatilla NF
August		
	Caribou Recovery Team - USFWS	Coeur d'Alene
	Elk research team - IDFG	Moscow
	Road closure project - IDFG	Lewiston
	White-tailed deer project - Nez Perce NF	Grangeville
	Road closure project - Clwtr. Resour. Coalition	Orofino
	Elk hunter survey - U of Montana	Kamiah
	Species plans public meeting	Grangeville
	Elk hunter survey - U of Montana	Kamiah
	White-tailed deer project - Irby - MSU	Elk City
	Species plans public meeting	Coeur d'Alene

September		
	Enforcement training	Lewiston
	Turkey & mtn. quail projects - Reese - U of I	Moscow
	Animal restraint workshop	Pullman
	McComas Meadows land exchange - USFS	Grangeville
October		
	Region 1 personnel re caribou project	Coeur d'Alene
	Bear Plan meeting	Coeur d'Alene
	Commission public hearing	Lewiston
	Commission meeting	Lewiston
	Elk hunter survey - U of Montana	Lewiston
	Gap Analysis Workshop - U of I	Moscow
November		
	Unsworth committee meeting - U of I	Moscow
	NPNF Challenge/Cost Share agreements - USFS	Grangeville
	Road closure project - USFS	Lewiston
	Research section meeting	Boise
December		
	Warren thesis defense - U of I	Moscow
	White-tailed deer project - USFS	Priest Lake
	Caribou Recovery Team meeting	Spokane
	Sightability test - Wash Dept Wildl	Spokane
	International Mountain Caribou Technical Cmte	Spokane
	NPNF Challenge/Cost Share agreements - USFS	Grangeville
January		
	Selway Face burn monitoring	Lewiston
	Road closure project - USFS	Orofino
	USFS/IDFG coordination	Lewiston
	White-tailed deer project - USFS	Grangeville
	White-tailed deer project - USFS	Priest Lake
	White-tailed deer project - Pletscher - U Mont	Missoula
	Elk hunter survey - U of Montana	Missoula
	Mountain quail project - USFS/BLM/UI	Lewiston
	Project management workshop	Spokane
February		
	Unsworth Ph.D. program - U of I	Moscow
	Turkey & mtn quail projects - U of I	Moscow
	Region 6 research	Boise
	Idaho Chapter, The Wildlife Society	Boise
	Mountain quail project - BLM	Cottonwood
	Region 2/BOW re reorganization	Lewiston
March		
	Caribou Recovery Team - USFWS	Sandpoint
	Road closure project - USFS	Lewiston
April		
	Western Black Bear Workshop	Yosemite
	Elk Vulnerability Symposium	Bozeman

White-tailed deer project - Irby - MSU
USFWS coordination - USFWS

Bozeman
Unit 15

May

Jones thesis defense - U of I
USFS/IDFG coordination meeting

Moscow
Billy Creek

June

USFS/Wash Dept Wildl/IDFG coordination
Elk hunter survey - elk research personnel
Caribou Recovery Team meeting

Priest Lake
Moscow
Post Falls

Presentations

North Idaho white-tailed deer investigations. Idaho Chapter of The Wildlife Society meeting, Boise.

Comparing two methods of calculating survival rates. Elk Vulnerability Symposium, Bozeman.

Publications and Reports

Leptich, D.J., and P. Zager. 1990. Bull elk habitat use. Prog. Rep., Project W-160-R, Study I. Idaho Dept. of Fish and Game, Boise.

_____, and _____. 1990. Elk habitat security characteristics and hunting season mortality rates. Prog. Rep., Project W-160-R, Study III. Idaho Dept. of Fish and Game, Boise.

_____, and _____. 1991. Elk sightability. Prog. Rep., Project W-160-R, Study II. Idaho Dept. of Fish and Game, Boise.

Zager, P., and D.J. Leptich. 1991. Comparing two methods of calculating survival rates. in L.J. Lyon (ed.). Elk vulnerability symposium. Bozeman, MT. (in press.)

Leptich, D.J., and P. Zager. 1991. Road access management effects on elk mortality rates. in L.J. Lyon (ed.). Elk vulnerability symposium. Bozeman, MT. (in press.)

Yuan, M., and P. Zager. 1991. The relationships between successful and unsuccessful elk hunters. in L.J. Lyon (ed.). Elk vulnerability symposium. Bozeman, MT. (in press.)

I also refereed 2 manuscripts for the Journal of Wildlife Management.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH
RESEARCH COORDINATION REPORT
LOCHSA ELK ECOLOGY

STATE: Idaho JOB TITLE: Statewide Wildlife Research
PROJECT: W-160-R-18
SUBPROJECT: 22 STUDY NAME: Lochsa Elk Ecology
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Meetings and Presentations

Date	Name	Location
Jul	Road Closure Project (USFS)	Lewiston
Jul	Elk Species Plan	Moscow
Jul	Elk Research Meeting	Coeur d'Alene
Aug	Road Closure Project (Presentation)	Kamiah
Aug	Elk Research Meeting	Moscow
Aug	Road Closure Project	Lewiston
Aug	Road Closure Project (Presentation)	Orofino
Aug	Road Closure Project (Presentation)	Lowell
Sep	Road Closure Project (Presentation)	Kamiah
Sep	Elk Species Plan	Boise
Sep	Enforcement Training	Lewiston
Sep	Elk Species Plan	Boise
Oct	Elk Species Plan	Lewiston

Meetings and Presentations cont.

Oct	Elk Species Plan	Lewiston
Nov	Lochsa Elk Study (Presentation)	Moscow
Nov	Road Closure Project	Lewiston
Nov	Road Closure Project (Presentation)	Grangeville
Nov	Research/Management Meeting	Boise
Feb	Wildlife Bureau/Region Meeting	Lewiston
Mar	Elk Study (Presentation)	Kooskia
Mar	Elk Vulnerability Symposium (Presentation)	Bozeman, MT
Apr	Elk Species Plan	Boise

Reports, Publications, Articles: (James W. Unsworth)

Unsworth, J. W. 1990. Bull elk habitat use. Prog. Rep., Project W-160-R-14, Study I. Idaho Dept. Fish and Game, Boise.

_____. 1991. Elk sightability. Completion Rep., Project W-160-R-14, Study II. Idaho Dept. Fish and Game, Boise.

_____. 1991. Elk habitat security characteristics and hunting season mortality rates. Prog. Rep., Project W-160-R-14, Study III. Idaho Dept. Fish and Game, Boise.

_____, F. A. Leban, G. A. Sargent, E. O. Garton, M. A. Hurley, and J. R. Pope. 1991. Aerial Survey: User's Manual. Idaho Department of Fish and Game, Boise, ID. 54pp.

_____ and L. Kuck. 1991. Bull elk vulnerability in the Clearwater drainage of north-central Idaho. Pages ??-?? in L. J. Lyon ed. Proceedings of the elk vulnerability symposium. Bozeman, MT. ???pp.

Rybarczyk, W. B. and J. W. Unsworth. 1991. Elk sightability as a tool for implementing management change. Pages ??-?? in L. J. Lyon ed. Proceedings of the elk vulnerability symposium. Bozeman, MT. ???pp.

Kuck, l. and J. W. Unsworth. 1991. Accommodating hunter desires through hunting regulations in Idaho. Pages ??-?? in L. J. Lyon ed. Proceedings of the elk vulnerability symposium. Bozeman, MT. ???pp.

PROGRESS REPORT

COORDINATION REPORT

STATE: Idaho PROJECT NO.: W-160-R-18
TITLE: Statewide Wildlife Research STUDY: 1 - 4
SUBPROJECT: Coeur d'Alene elk ecology JOB: 1 - 4
PERIOD COVERED: July 1, 1990 to June 30, 1991

Abstract

Study 1. Bull elk habitat use.

I am currently monitoring 54 radio-collared elk (27 bulls, 27 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 study plan for the cooperative Idaho Department of Fish and Game - U.S. Forest Service elk habitat use study was completed this winter. 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. Field work to characterize vegetation structure and composition at elk use sites was initiated in June and will continue through September.

I was able to secure GIS capability for the CDA elk project through outside funding. The EPPL7 GIS software package has been installed. I am currently working towards the development of the geographic data base for the CDA Unit 4 study area.

Study 2. Elk sightability.

The second field season of sightability model data collection was completed in February 1991. Fifty of the 151 sightability subunits in Unit 4 were sampled. This included 8 (100%) high elk density, 10 (67%) moderate elk density, and 32 (25%) low elk density subunits. Forty-five new model data points were collected for a total of 64 data points or 27.8% of the entire model data base contributed by the CDA elk project. These additional data have been incorporated into the model and resulted in a slightly more conservative model with lower overall variances. The new model produced a Unit 4 population estimate of 4089 elk with a 90% C.I. of ± 759 animals or 18.6% of the point estimate. Arrangements to validate the model results on a population of elk

with known size, sex, and age structure have been made with personnel at the Starkey Experimental Forest in LaGrande, Oregon.

Study 3. Habitat security characteristics and hunting season mortality rates.

Data collection for the elk hunter survey, being conducted in cooperation with the University of Montana, to assess hunting pressure in Unit 4 was completed. During the 1989 and 1990 general elk seasons in Unit 4, 2070 survey were distributed to Unit 4 hunters and 1271 were returned for a 59% response rate. Analysis is ongoing and a final report from the University of Montana is expected this coming winter. These results will be incorporated into hunter success and elk mortality models.

No elk were killed during the muzzleloader season, 1 bull elk was killed during the archery season, and 8 bull elk were killed during the general rifle season. No radio collared cow elk were harvested during the 1990 elk seasons in Unit 4. All elk taken during the hunting season were legal kills recovered by sportsmen and turned in to Department personnel. In addition one bull died of unknown natural causes and 1 cow elk was poached after the close of the season.

Overall Unit 4 mortality rates for 1988 and 1990 combined were 0.52 for bulls and 0.12 for cows. Survival rates among road access treatment areas showed a trend towards increasing survival with decreasing open road densities. Bull mortality was twice as high in the roaded treatment as it was in the unroaded treatment and this difference was significant (t-test, $P < 0.05$).

Study 4. Mandatory check data analysis.

Project completed in 1989. Inactive for this reporting period.

Meetings and Presentations

<u>Date</u>	<u>Purpose</u>	<u>Location</u>
Aug	IDFG game mgt. discuss research direction	CDA
Aug	Zager, Unsworth discuss 5-year study plan	Moscow
Aug	USFS discuss hunting season press release	CDA
Aug	USFS discuss/demo ecodata methods	Fernan Dist.
Aug	Big game reg. public mtg.	Sandpoint
Sept	Big game reg. public mtg.	St. Maries
Sept	Lyon, discuss coop habitat use study plan	Missoula
Oct	USFS road closures Fernan Dist.	CDA
Oct	USFS road closures Wallace Dist.	Silverton
Nov	Keenan, discuss eco/pac software	Moscow
Nov	Unsworth, discuss elk project direction	Moscow
Nov	IDFG ann. research section mtg.	Boise
Dec	Western forestry conference	CDA
Dec	Johnson, model validation at Starkey	LaGrande
Dec	Harrington, acquiring GIS for CDA project	CDA
Jan	UM, discuss hunter survey project	Missoula
Mar	IDFG bureau coordination mtg.	CDA
Mar	CPR and first aid training	CDA
Mar	Garton, Update model data base	Moscow
Apr	USFS access and sales Fernan Dist.	CDA
Apr	Elk vulnerability symposium	Bozeman
Apr	Williams, Fed. Aid tour	Unit 4
Apr	IDFG grizzly bear research	CDA
Apr	IDFG caribou research	Bonnors Ferry
Apr	USFS coop habitat study	CDA
June	Free fishing day	CDA
July	Animal restraint training	Moscow
July	Kuck, Hayden CDA project review	Unit 4

Presentations

Leptich, David J. 1990. Elk hunting season mortality and access management. Western Forestry Conference. December 1990. Coeur d' Alene, Idaho.

Leptich, David J. 1991. CDA Elk Project- preliminary results of the mortality and sightability studies. Wildlife Bureau Coordination meeting. March 1991. Coeur d' Alene, Idaho.

Leptich, David J. 1991. Road access management effects on elk mortality and population dynamics. Elk vulnerability symposium. April 1991. Bozeman, Montana.

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Leptich, David J. 1991. Unit 4 elk mortality slide show. CDA bowman. May 1991. Coeur d' Alene, Idaho.

Reports, Publications, Articles

- Leptich, D.J., and P. Zager. 1990. 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. 1991. 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. 1991. Elk sightability. Prog. Rep., Project W-160-R, Study II. Idaho Department of Fish and Game, Boise.
- Leptich, D.J., and P. Zager. 1991. Road access management effects on elk mortality and population dynamics. Proceedings: Elk vulnerability symposium. Bozeman, Montana. In press.
- Zager, P. and D.J. Leptich. 1991. Comparing two methods of calculating elk survival rates. Proceedings: Elk vulnerability symposium. Bozeman, Montana. In press.

STATE: Idaho PROJECT NO: W-160-R-18
TITLE: Statewide Wildlife Research STUDY: I
SUBPROJECT: Sage Grouse Ecology JOB: 1 and 2
PERIOD COVERED: July 1, 1990 to June 30, 1991

ABSTRACT

Study No. 1. 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 274 sage grouse were trapped and marked during spring 1991. Fifty-two of these birds (19 percent) were equipped with radios. Females nested from < 1 to > 20 km from the lek on which they were captured (N=24, \bar{x} =3.6 km). Nesting success of radio-marked grouse increased varied from 43 to 90% during 1987-91. 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 34 nests during 1991. Sagebrush (Artemisia spp.) canopy cover at nests ranged from 1 to 30% for 1986 thru 1991. 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.

STATE: Idaho PROJECT NO: W-160-R-18
TITLE: Statewide Wildlife Research STUDY: II
SUBPROJECT: Sage Grouse Ecology JOB: 1 and 2
PERIOD COVERED: July 1, 1990 to June 30, 1991

ABSTRACT

Study No. 2. An Evaluation of a Sage Grouse Transplant.

Job 1. Movements, survival, productivity and habitat use of transplanted sage grouse.

During 1986 and 1987, the Idaho Department of Fish and Game, in cooperation with the U.S. Forest Service, translocated 196 wild sage grouse into the Sawtooth Valley, Idaho, to augment the declining resident population. Forty-four grouse were equipped with solar powered radio-transmitters to aid monitoring of movements, reproduction, survival, and habitat use. A masters thesis that reports on the results of this research has been completed and a final report was included in the FY89 Job Progress Report.

Job 2. Effects of transplanting sage grouse on a resident population of sage grouse.

This job was completed during FY89 and a final report was included in the FY89 Job Progress Report. Monitoring of this population has been turned over to the Salmon Sub-Region.

Meetings and Presentations

Apa, A. D., K. P. Reese and J. W. Connelly. 1991. Predation rates on actual and simulated nests of Columbian sharp-tailed grouse in southeastern Idaho. Presented at the annual meeting of the Idaho Chapter of The Wildlife Society. February 7-9, Boise, ID.

Connelly, J. W. 1990. Sage grouse use of nest sites in southeast Idaho. Presented at the Biennial Grouse Group Meeting. Aug. 15-17. Salida, CO.

Connelly, J. W. 1990. Pesticides and upland game. R. O. Butler lecture, South Dakota State Univ. Oct 30. Brookings, SD.

Connelly, J. W. 1990. The ecology and management of sage grouse. R. O. Butler lecture, South Dakota State Univ. Oct. 31. Brookings, SD.

- Connelly, J. W. 1990. Natural resource agencies in the western states: administrative organization and job opportunities. R. O. Butler lecture, South Dakota State Univ. Nov. 1. Brookings, SD.
- Connelly, J. W. and L. J. Blus. 1990. Pesticides and upland game: a review. Presented at the Symposium on Pesticides in Natural Systems. Dec. 11-12. Corvallis, OR.
- Connelly, J. W. 1991. Sage and sharp-tailed grouse research in Idaho: present status and future direction. Presented at the annual meeting of the Northwest Section of the Wildlife Society. April 18-20, Silverdale, WA.
- Robertson, M. D., K. P. Reese and J. W. Connelly. 1991. Habitat characteristics of sites used by wintering sage grouse. Presented at the annual meeting of the Idaho Chapter of The Wildlife Society. February 7-9. Boise, ID.

Publications

- Connelly, J. W. and L. J. Blus. 1991. Effects of pesticides on upland game: a review of herbicides and organophosphate and carbamate insecticides. Pp. 92-97 in M. Marsh, ed. Proceedings of the conference: Pesticides in natural systems - how can their effects be monitored? U. S. Environmental Protection Agency, Region 10, Seattle, WA.
- Connelly, J. W., W. L. Wakkinen, A. D. Apa, and K. P. Reese. 1991. Sage grouse use of nest sites in southeastern Idaho. J. Wildl. Manage. 55:522-525.
- Wakkinen, W. L., K. P. Reese, J. W. Connelly, and R. Fischer. 1991. Improved spotlighting technique for trapping sage grouse. J. Wildl. Manage. Submitted.
- Wakkinen, W. L., K. P. Reese and J. W. Connelly. 1991. Sage grouse nest locations in relation to leks. J. Wildl. Manage. Submitted.
- Musil, D. D., J. W. Connelly and K. P. Reese. Dispersal, survival and reproduction of sage grouse translocated into central Idaho. J. Wildl. Manage. Submitted.

STATE: Idaho PROJECT NO: W-160-R-18
TITLE: Statewide Wildlife Research STUDY: I
SUBPROJECT: Columbian Sharp-Tailed Grouse JOB: 1
PERIOD COVERED: July 1, 1990 to June 30, 1991

ABSTRACT

The seasonal movements, habitats and nesting ecology of Columbian sharp-tailed grouse (Tympanuchus phasianellus columbianus) were examined on two different Wildlife Management Areas (WMA's). These WMA's contained several different habitat types.

Three radioed grouse from the spring trapping period of 1988 survived through February of 1989. Grouse were again trapped and marked on both study areas between mid-March and early May 1989. Over the two years of the study, total of 52 birds (32 females, 20 males) were captured and equipped with radios. Fifty-three percent (N=32) of the females followed through the breeding season were successful nesters. This includes renesting attempts. The mean distance from trap site to nest site (N=16) was 1.2 km for initial nest attempts and 3.6 km for renesting attempts. Vegetation data were collected on 23 nests and compared to 23 dependent and 116 independent random sites. Grass height was significantly greater ($P \geq 0.05$) at successful nest sites compared to unsuccessful sites. A masters thesis that reports on the results of this research has been completed and a final report was submitted during FY91.

Publications

Meints, D. R., K. P. Reese, and J. W. Connelly. Movements, habitat use and productivity of Columbian sharp-tailed grouse in southeastern Idaho. Peer review.

Thesis

Meints, D. R. 1991. Seasonal movements, habitat use and productivity of Columbian sharp-tailed grouse in southeastern Idaho. M. thesis, Univ. of Idaho, Moscow. 74pp.

STATE: Idaho PROJECT NO: W-160-R-18
TITLE: Statewide Wildlife Research STUDY: I
SUBPROJECT: Effects of the Conservation JOB: 1
Reserve Program on Wildlife
PERIOD COVERED: July 1, 1990 to June 30, 1991

ABSTRACT

Mule deer (Odocoileus hemionus) and upland game bird use of Conservation Reserve Program (CRP) fields in southeastern Idaho were studied in 1989 and 1990. Mule deer and sharp-tailed grouse (Tympanuchus phasianellus) selected CRP fields over croplands in winter. Sharp-tailed grouse selected CRP fields over cropland and rangeland in summer, especially for brood habitat. Sharp-tailed grouse, pheasants (Phasianus colchicus), and gray partridge (Perdix perdix) disproportionately selected patches of native habitat within CRP fields. Mourning doves (Zenaida macroura) selected against cropland in summer. Few game bird nests were found. This project was completed and a final report was submitted during FY91.

STATE: Idaho PROJECT NO: W-160-R-18
TITLE: Statewide Wildlife Research STUDY: I
SUBPROJECT: Bighorn Sheep Research JOB: 1
PERIOD COVERED: July 1, 1990 to June 30, 1991

ABSTRACT

A study to establish baseline values for factors which may affect or lead to die-offs of a bighorn sheep (*Ovis canadensis*) population in east-central Idaho was initiated during winter 1988-89. Fourteen sheep were equipped with radios and an additional 6 sheep were radio-marked in the winter of 1989-90. Animals movements were monitored from January through June when movements to summer range began. The average distance moved from winter to summer range for rams and ewes was 19.8 km and 29.5 km, respectively. Six major plant communities occurred on the sheep's winter range. Vegetation canopy coverage, shrub density and production, and grass production were estimated in each community type. These data have been analyzed and a final report is being completed.

Meetings and Presentations

Ballard, G. L. and J. M. Peek. 1991. Habitat use of the Rocky Mountain bighorn sheep in Morgan Creek, east-central Idaho. Presented at the annual meeting of the Idaho Chapter of The Wildlife Society. February 7-9, Boise.

STATE: Idaho PROJECT NO: W-160-R-18
TITLE: Statewide Wildlife Research STUDY: I
SUBPROJECT: Mule Deer Ecology JOB: 1
PERIOD COVERED: July 1, 1990 to June 30, 1991

ABSTRACT

Study No. 1. Mule Deer Population Identification

Job 1. Mule deer population identification

I used radio telemetry to study movements and migrations of mule deer (Odocoileus hemionus hemionus) in southeastern Idaho during 1985-89, because this information is necessary to best manage this resource. I tested the hypotheses that there was no difference in migration distance between sexes; individual mule deer used the same summer and winter range areas in successive years; and mule deer occupying a particular summer range migrated to a commonly shared winter range. Migration between summer and winter ranges averaged 19.7 km and did not differ ($P \geq 0.05$) between sexes. Twenty-six percent of the marked deer were not migratory. Deer from 1 summer range migrated to 6 discrete winter ranges and the overall migration pattern formed a complex web among the winter and summer ranges. Deer showed high fidelity to summer ranges; 100% of the females ($n = 27$) and 92% of the males ($n = 12$) used the same summer range during each year they were monitored. Fidelity to winter ranges was lower than for summer ranges. Distance between centers of activity during successive winters averaged 1.4 km ($n = 38$ deer) and did not differ ($P \geq 0.05$) between males ($n = 12$) and females ($n = 26$). During 2 relatively mild winters, 48% and 9% of marked migratory deer did not use winter range habitat. Documentation of the migratory patterns of mule deer is essential in defining populations and helps wildlife managers select appropriate management strategies.

STATE: Idaho PROJECT NO: W-160-R-18
TITLE: Statewide Wildlife Research STUDY: III
SUBPROJECT: Mule Deer Ecology JOB: 1 and 2
PERIOD COVERED: July 1, 1990 to June 30, 1991

ABSTRACT

Study No. 1. Mule Deer Security.

Job 1. Security aspects of mule deer ranges.

ABSTRACT

I used radio telemetry to monitor habitat selection, movements, and survival of 49 female and 49 male mule deer during the summer and fall over 1-4 hunting seasons each. Twenty-seven percent of the deer were non-migratory while the remainder migrated between seasonal ranges. I examined the security provided by the habitat and developed a model to describe the security based on vegetation, terrain and access. I identified 3 different strategies mule deer used in response to hunting. Deer exhibited strong fidelity towards the behavior patterns used and seasonal home ranges selected during each year monitored. Survival rates were calculated by sex, habitat security and response to hunting. Survival rates were lower for bucks than does ($P \leq 0.05$) and survival rates differed with respect to habitat security and response to hunting in most cases. Over 40% of migratory deer of each sex left their summer home range and moved ($\bar{x} = 17.7$ km) to separate hunting season ranges. Deer which moved had a higher survival than those deer using the same low security habitats which did not move ($P \leq 0.04$). Home range size was calculated for 160 summer ranges, and 124 combined summer-hunt periods for all deer. Also 38 annual home ranges for non-migratory deer were calculated. Generally hunting ranges were smaller than summer ranges and males had larger home ranges than does, ($P \leq 0.05$) except that there was no difference between size of hunting range or summer range in more secure habitats ($P \leq 0.05$) or between sexes for hunting season ranges in lower security habitat ($P = 0.44$). The habitat security model help in estimating vulnerability of deer to hunting and aids in identifying areas and habitat components most vital to providing security to mule deer populations.

Job 2. Hunting and habitat security influence on mule deer behavior and mortality.

Mortality rates of 109 Rocky Mountain mule deer (Odocoileus hemionus hemionus) were studied in southeastern Idaho from 1985 through 1989. Estimated fall populations increased by 81% during this period.

Hunting survival rates of bucks, 0.35, were lower than for does, 0.79, ($\underline{P} \leq 0.01$). Non hunting survival of bucks, 0.96, was higher than for does, 0.88, ($\underline{P} \leq 0.03$). Annual buck survival, 0.29, was lower than doe survival, 0.72, ($\underline{P} \leq 0.0003$). Doe hunting survival rates were correlated with population and population/hunter effort ($\underline{P} \leq 0.10$) although buck survival was not correlated with population or with hunter effort ($\underline{P} \geq 0.10$). There was no difference in survival of 2-1/2 year old bucks and bucks \geq 3-1/2 years old ($\underline{P} \geq 0.45$). Doe survival did not differ between weekend days or week days ($\underline{P} \geq 0.14$) but buck survival was lower on weekends than on weekdays ($\underline{P} \leq 0.001$). Population growth was stabilized by increasing the antlerless season from 5 to 26 days and implementing 2nd antlerless only tags.

Submitted by:



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