IDAHO

DEPARTMENT OF FISH AND GAME

Jerry M. Conley, Director

Project W-168-C-13

Progress Report

FEDERAL AID TO WILDLIFE RESTORATION

Study I, Job 1: Wildlife Research Coordination

Prepared By:

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July 1, 1995 to June 30, 1996

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Boise, Idaho

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STATEWIDE WILDLIFE RESEARCH

STATE: Idaho **TITLE:** Wildlife Research Coordination
PROJECT NO.: W-168-C-13
STUDY NO.: I
JOB: 1

PERIOD COVERED: July 1, 1995 to June 30, 1996

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.

A bull elk mortality model was developed for the general rifle season and a training manual produced for the elk sightability study. Field work for several graduate student projects (Panhandle, Clearwater, and Southeast Regions) was completed and the students will begin preparing their completion reports. A new mule deer project will be initiated in the Southeast Region in FY 97, as well as one or more new graduate student projects.

OBJECTIVES

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

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 **TITLE:** Coeur d'Alene Elk Ecology
PROJECT NO.: W-160-R-23
SUBPROJECT: 23
STUDY NO.: I-III

PERIOD COVERED: July 1, 1995 to June 30, 1996

COEUR D'ALENE ELK ECOLOGY

Study I: Bull elk habitat use

Analysis and elk habitat use data was completed. A manuscript was prepared and submitted to the Journal of Wildlife Management.

Study II: Elk sightability models

A one-hour training video on planning, designing, and conducting elk sightability surveys was produced to ensure proper and consistent application of the sightability technique.

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

A model to predict bull elk mortality during the general rifle season was developed and a manuscript describing this work was prepared and submitted to the Journal of Wildlife Management. A spreadsheet program for application of the model was developed.

Meetings

Date	Purpose	Location
July	Discuss GAP scale analysis for elk herds	Moscow
Oct	Discuss statewide deer and elk research	Moscow
Oct	Discuss GIS database development	CDA
Nov	Interpersonal relation skills	Spokane
Nov	Big game regulations public meeting	St. Maries
Dec	Flight safety training	Boise
Jan	Self-directed work teams	Spokane
Mar	Idaho Wildlife Council	CDA
Apr	Idaho Wildlife Council	CDA
Apr	Commission meeting	Lewiston

Presentations

Leptich, David J., 1995. CDA elk ecology project final review and summary. Bureau of Wildlife regional personnel meeting. Coeur d'Alene, Idaho.

Reports, Publications, Articles

Leptich, D.J., and P. Zager. 1995. Bull elk habitat use. Completion Rep., Project W-160-R, Study I. Idaho Department of Fish and Game, Boise.

Leptich, D.J., and P. Zager. 1995. Elk habitat security characteristics and hunting season mortality rates. Completion Rep., Project W-160-R, Study III. Idaho Department of Fish and Game, Boise.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE: Idaho **TITLE: (**Lochsa) Elk Ecology
PROJECT NO.: W-160-R-23
SUBPROJECT: 31
STUDY NO.: I-III

PERIOD COVERED: July 1, 1995 to June 30, 1996

(LOCHSA) ELK ECOLOGY

Study No. I. Road Closures and Bull Elk Mortality

Job 2: The effects of road closures on elk mortality in north-central Idaho

We investigated hunting season survival rates of bull elk (*Cervus elaphus*) from 1991 through 1995 in 3 treatment areas in north-central Idaho that varied in motorized vehicle access during the 25-day general elk hunting season. In the roaded area (RO), densities of roads open to motorized vehicle use averaged 1.54 km/km^2 (2.49 mi/mi^2), whereas in the managed access area (MA), we reduced open road densities during the general elk season from 2.54 km/km^2 (4.08 mi/mi^2) to 0.56 km/km^2 (0.90 mi/mi^2). In the unroaded area (UN), open road densities averaged only 0.23 km/km^2 (0.37 mi/mi^2). Survival rates averaged 0.497 (0.394-0.625; 95% confidence intervals) in RO, 0.696 (0.603-0.802) in MA, and 0.710 (0.613-0.822) in UN for 231 radio-collared bulls across the 5 years. Thus, road-closures improved bull survival by approximately 20% and survival rates were comparable in areas in the MA and UN areas. Seventy (70) bulls were shot and recovered by hunters, but 9 bulls were mortally wounded and unrecovered by hunters. Differences in survival rates among years were greatest for bulls in RO and least for MA and UN bulls. Survival rates of yearling bulls averaged 0.616 (0.498-0.761), 2.5-yr-old bulls averaged 0.504 (0.394-0.643), and bulls older than 2.5 years averaged 0.721 (0.641-0.810), after statistically eliminating the effect of study area on survival. In addition, 7 bulls were shot and recovered by hunters and 3 bulls were mortally wounded by arrows and unrecovered by hunters during the preceding archery-only season. We conclude that road-closures of the magnitude used during this study can significantly improve bull elk survival rates, leading to higher bull:cow ratios and an older age structure of bulls compared to otherwise similar areas in which most roads are open to motorized vehicle use during the general hunting season. A model is being developed to help predict changes in bull survival rates with management of open and closed road and trail densities, hunter densities, hiding cover, and other factors influencing survival of bulls during the general elk season.

Job 3: The effects of road closures on hunter density, distribution, and success

The effects of road-closures on elk hunter density, success, demographics, opinions, and behaviors were investigated from 1992 through 1995 in north-central Idaho using telephone surveys. This

information is important to understand the mechanisms by which road-closures, road densities, hunter densities, and other factors interact to affect elk mortality and harvest rates and what changes in hunters can be expected if road-closures become a major elk harvest management tool. In the roaded area (RO), densities of roads open to motorized vehicle use averaged 1.54 km/km^2 (2.49 mi/mi^2), whereas in the road-closure or managed access area (MA), we reduced open road densities during the general elk season from 2.54 km/km^2 (4.08 mi/mi^2) to 0.56 km/km^2 (0.90 mi/mi^2). In the unroaded area (UN), open road densities averaged only 0.23 km/km^2 (0.37 mi/mi^2). During the 25-day general elk season, hunter density averaged 0.529 $\pm$ 0.8689 (SD) hunter-days/km^2/day (1.372 $\pm$ 2.2502 hunter-days/mi^2/day) in the RO, but only 0.146 $\pm$0.1103 hunter-days/km^2/day (0.377 $\pm$ 0.2857 hunter-days/mi^2/day) in the MA. MA hunter density was similar to the UN in which hunter density averaged 0.188 $\pm$ 0.2478 hunter-days/km^2/day (0.486 $\pm$ 0.6420/mi^2/day). Hunter density did not significantly change from 1992 to 1995 on any area. Hunter success rates averaged 25.0% (44/176) in MA, 12.9% (35/272) in RO, and 32.3% (96/297) in UN. Hunter success remained stable or declined slightly in the MA, declined sharply in the RO, and remained stable in the UN from 1992 to 1995. In general, > 60% of hunters in each study area said road-closures were either "easily acceptable" or "not easy to accept but tolerable" as a method ... "to maintain good numbers of bulls and branch-antlered bulls," but acceptability differed significantly among study areas. More MA hunters than UN hunters and more UN hunters than RO hunters said road-closures were "easily acceptable." A greater percentage of hunters that said road-closures were "easily acceptable" (27.1%; 74/273) than those that said road-closures were "not acceptable" (7.9%; 9/113) lived $\geq$ 80 km ($\geq$ 50 mi) from where they hunted, whereas a greater percentage that said road-closures were "not acceptable" (68.1%; 77/113) than said they were "easily acceptable" (47.2%;129/273) lived $\leq$16 km ($\leq$ 10 mi) from where they hunted. Most hunters (> 55%) on all 3 study areas said "tradition" was the most important reason for choosing the area they hunted, but how they hunted differed among areas. Although most bull elk hunters on all areas only walked while hunting (> 45% all areas), use of "all-terrain-vehicles (ATVs) or motorcycles" was higher among RO (22.7%; 62/273) than MA (10.4%; 14/134) and UN (13.8%; 44/319) hunters and use of "horses, mules, or llamas" was lowest for RO hunters (8.8%; 24/273), intermediate for MA hunters (24.6%; 33/134), and highest for UN hunters (31.9%; 102/319). In MA 11.9% (16/134) of hunters used bicycles, whereas bicycle use was < 1.5% in either RO or UN. We conclude that road-closures were fairly acceptable among hunters and led to lower hunter densities, increased success rates, and increased use of stock and bicycles and decreased use of ATVs or motorcycles while hunting.

Study No. II. Optimum Yield of Elk

Job 1: The effect of harvest on elk population size and composition in Idaho

We initiated an antlerless elk management program in Idaho in 1992 that uses some underlying principles of experimental design to evaluate the effects of different cow harvest rates on elk population dynamics. During the 1992-96 hunting seasons we are attempting to harvest a relatively constant fraction of the antlerless elk population in each of 11 GMUs (3 very low harvest units - 2 to 5% harvest rate; 4 low harvest units - 6 to 10% harvest rate, and 4 moderate harvest units - 14 to 30% harvest rate) using the controlled-hunt permit system. In 1995, target harvest rates were met for 2 units, but not for 2 other units (< 10% harvest rate) in the moderate harvest treatment. For the low harvest treatment units, target harvest rates were met for 2 units, but for 2 others harvests were <

5%. For very low harvest rate treatment units, the harvest met the target for 1 unit, but exceeded the target for the other 2 (> 5%). Harvest rates averaged 4.8 ± 2.3% (SD), 5.5 ± 2.3%, and 11.8 ± 4.9% in very low, low, and moderate treatment units, respectively. Hunter success rates averaged 39.2 ± 11.9% (SD), 36.5 ± 12.2%, and 35.1 ± 5.8% in these same treatment units. Annual growth rates of the cow population in very low, low, and moderate treatment units averaged -3.2%, 17.5%, and 4.2%, respectively. We are also investigating the effect of antlerless harvest rate with data from all Idaho elk units using statewide harvest and population databases. Statewide, elk recruitment (calf:cow ratios) is negatively correlated with cow density. This study will continue with focus on understanding the relationship among elk density, as it is impacted by antlerless harvest rates, habitat, and calf recruitment using an experimental framework and analyses of statewide data.

We are also investigating the effect of antlerless harvest rate with data from all Idaho elk units using statewide harvest and population databases. This study will be continued.

Training, Meetings, and Presentations (M. W. Gratson)

Training - How to Lead a Team; CareerTrack	Spokane, WA
Enforcement - Nonenforcement personnel	Myrtle
Training - Helicopter safety	Boise
Training - CPR and first aid	Lewiston
Training - Inservice training, all IDFG personnel	Boise
Meetings - Elk vulnerability presentation to CAC	Orofino
Open House - Deer and elk regulations	Orofino, Moscow
Meeting - Idaho Chapter, The Wildlife Society (Officer)	Boise
Meeting - Calf mortality and recruitment, with Washington Department of Wildlife	Coeur d'Alene
Meeting - Calf mortality and recruitment, with Oregon Department of Wildlife and USFS Starkey Experimental Forest and Range Station	La Grande, OR
Meeting - Calf mortality and recruitment, predation with Washington State University	Pullman, WA
Meeting - Calf mortality and recruitment with IDFG biologists	McCall
Presentation - Elk and deer sightability	Myrtle
Presentation - Experience with modification of factors influencing changes, Dynamics of Northern Idaho Forests Conference	Coeur d'Alene
Presentation - Managing harvest for sustainable ungulate populations, Second Annual Conference of The Wildlife Society	Portland, OR

Reports and Publications

Gratson, M. W., C. Whitman, and P. Zager. 1995. Lochsa elk ecology. Study I. road closures and bull elk mortality. Job 2. the effects of road closures on elk mortality in north-central Idaho. Job 3. the effects of road closures on hunter density, distribution, and success in north-central Idaho. Study II. Optimum yield of elk. Job 1. The effect of harvest on elk population size and composition in Idaho. Idaho Dep. Fish and Game, Fed. Aid in Wildl. Restor. Job Prog. Rep., Proj. W-160-R-22. 28 pp.

Gratson, M. W., and P. Zager. 1995. Lochsa elk ecology. Study III. Job 1. develop an elk sightability model for the Bell 206 Jet Ranger helicopter. Idaho Dep. Fish and Game, Fed. Aid in Wildl. Restor. Job Completion Rep., Proj. W-160-R-22. 15 pp.

Gratson, M. W., W. A. Wall, and B. K. Johnson. In review. Modifying aerial survey models for other aircraft. J. Wildl. Manage. 00:000-000.

Meetings and Presentations (Pete Zager)

Date	Purpose	Location
July	Skalski - population monitoring and surveys	Lewiston
August	Group 2000 Open House	Lewiston
	Group 2000 Open House	Grangeville
September	Scott Tomson committee meeting	Missoula
	Caribou Recovery Team meeting	Spokane
October	UI Wildlife Resources - coordinate student projects	Moscow
	Enforcement training	Myrtle
	UI Wildlife Resources - re IDFG research direction	Moscow
November	IDFG Research staff re direction and mission	Boise
	Helicopter safety training	Boise
	CAC Open House	Lewiston
	CAC Open House	Grangeville
January	IDFG Personnel meeting	Myrtle
	CAC Open House	Lewiston
	Data evaluation team meeting	Boise
	Hells Canyon Sheep Project meeting	Boise
	CAC Open House	Grangeville
	Data evaluation team meeting	Twin Falls
February	Data evaluation team meeting	Idaho Falls
	WSU Wildlife Biology class	Pullman
	UI and WSU wildlife faculty re elk research	Moscow

Date	Purpose	Location
March	Data evaluation team meeting	Boise
	Bighorn Sheep disease - Caine Vet Center	Caldwell
April	Commission meeting	Lewiston
	UI faculty candidate - Meretsky	Lewiston
	UI faculty candidate - Hargis	Moscow
May	Species Planning meeting	Boise
	Garton et al. re elk calf recruitment project	Lewiston
	Data evaluation team meeting	Lewiston
	UI faculty candidate - Lomolino	Lewiston
	UI faculty candidate - Murray	Moscow
	Jeff Copeland thesis defense	Moscow
	Forest Products Industry biologists	Lewiston
	UI faculty candidate - Merrill	Lewiston
	Starkey Elk Project staff re elk research	LaGrande
	George LaBar (UI Dept. Chair)/Region 2	Lewiston
	Bighorn Sheep summit	Pittsburgh Landing
	Potlatch Corp. re cooperative projects	Lewiston
June	ISTS	Boise
	Elk Team meeting	McCall

Reviewed Manuscripts For

Journal of Wildlife Management,
Southeast Association of Fish and Wildlife Agencies, and
International Association for Bear Research and Management.
Also served as an Associate Editor for the International Association for Bear Research and Management proceedings.

Reports and Publications

Compton, B.B., P. Zager, G.L. Servheen. 1995. Survival and cause-specific mortality of translocated caribou. Wildl. Soc. Bull. 23:490-496.

Gratson, M.W., and P. Zager. 1995. Lochsa elk ecology. Study III. Job. Compl. Rep., Fed. Aid Wildl. Restor., Proj. W-160-R-22, Subproj. 31. Idaho Dep. Fish and Game, Boise.

Gratson, M.W., D.J., P. Zager, and C. Whitman. 1995. Locsha elk ecology. Study I and II. Job. Prog. Rep., Fed. Aid Wildl. Restor., Proj. W-160-R-22, Subproj. 31. Idaho Dep. Fish and Game, Boise.

Hayes, S.G., D.J. Leptich, E.O. Garton, and P. Zager. 199-. Sexual segregation and seasonal habitat selection of elk in northern Idaho. in review.

Heekin, P.E., K.P. Reese, and P. Zager. 1996. Fall/winter mountain quail ecology. Job Prog. Rep., Proj. W-160-R-22. Subproj. 44. Idaho Dep. Fish and Game, Boise.

Heekin, P.E., C.A. Vogel, and P. Zager. 1995. In quest of the mountain quail. Idaho Wildl. 15:4-8.

Leptich, D.J., E.O. Garton, B.K Johnson, and P. Zager. 199-. Elk sightability model validation at the Starkey Experimental Forest and Range, Oregon. in review.

Leptich, D.J., S.G. Hayes, and P. Zager. 1995. Coeur d'Alene elk ecology. Study I and III. Job. Compl. Rep., Fed. Aid Wildl. Restor., Proj. W-160-R-22, Subproj. 23. Idaho Dep. Fish and Game, Boise.

Leptich, D.J., S.G. Hayes, and P. Zager. 199-. Elk mortality in the Coeur d'Alene drainage on northern Idaho. in review.

Leptich, D.J., and P. Zager. 1996. Coeur d'Alene elk ecology. Study V and VI. Job. Compl. Rep., Fed. Aid Wildl. Restor., Proj. W-160-R-23, Subproj. 23. Idaho Dep. Fish and Game, Boise.

Lindbloom, A., K. Reese, and P. Zager. 1995. Seasonal habitat use, population characteristics, and management of chukar partridge (*Alectoris chukar*) in north-central Idaho. Job Prog. Rep., Proj. W-160-R-22. Subproj. 43. Idaho Dep. Fish and Game, Boise.

Secord, M., P. Zager, and D. Pletscher. 199-. White-tailed deer use of clearcuts in northern Idaho. in review.

Tomson, S., K. Foresman, and P. Zager. 1995. Pine marten ecology. Job Prog. Rep., Proj. W-160-R-22. Subproj. 46. Idaho Dep. Fish and Game, Boise.

Warren, C.D., J.M. Peek, G.L. Servheen, and P. Zager. 1996. Movements and habitat use of two ecotypes of translocated caribou in Idaho and British Columbia. Conserv. Bio. 10:547-553.

Zager, P., L. S. Mills, W. Wakkinen, and D. Tallmon. 1996. Woodland caribou -- a conservation dilemma. Endangered Species Update 12:1-4.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE: Idaho **TITLE:** Mule Deer Ecology
PROJECT NO.: W-160-R-23
SUBPROJECT: 35
STUDY NO.: II-IV

PERIOD COVERED: July 1, 1995 to June 30, 1996

MULE DEER ECOLOGY

Study II: Mule Deer Mortality

Deer (n=387) were radio collared on three study areas during 1992-96. Overall survival rates varied between winters (X^2 = 40.859, df = 3, P < 0.001) (Table 1). With both sexes and all age classes combined, survival rates were 58% in the winter of 1992-93, 87% during the winter of 1993-94, 79% during the winter of 1994-95, and 83% during the winter of 1995-96. Doe survival rates did not vary among the four winters (X^2 = 2.939, df = 3, P = 0.401). A greater percentage of bucks died during the winter of 1992-93 and 1995-96 (X^2 = 15.802, df = 3, P = 0.001) than during 1993-94 or 1994-95 (Table 1). Fawn survival varied among the four winters (X^2 = 42.170, df = 3, P < 0.001) (Table 1). Survival rates were similar among study areas during 1992-1993 (X^2 = 0.191, df = 2, P = 0.909) and 1995-96 (X^2 = 3.470, df = 2, P = 0.176), but were different during 1993-94 (X^2 = 9.773, df = 2, P = 0.008) and during 1994-95 (X^2 = 10.661, df = 2, P = 0.005). Most of the difference in 1993-94 was due to differences in fawn survival; 44% of the fawns survived on the Owyhee study, while the Bennett Mountain and Blacks Creek study areas had 90% fawn survival (X^2 = 14.069, df = 2, P = 0.001). Fawn survival again showed the most variation in the winter of 1994-95 (Table 1). During winter 1993-94, buck survival did not vary significantly among study areas (X^2 = 0.021, df = 2, P = 0.990). This pattern held in 1994-95 (X^2 = 2.340, df = 2, P = 0.310) and in 1995-96 (X^2 = 0.357, df = 2, P = 0.836). Doe survival was similar among study areas during the winter of 1993-94 (X^2 = 0.360, df = 2, P = 0.835), but varied during 1994-95 (X^2 = 10.143, df = 2, P = 0.006) and in 1995-96 (X^2 = 6.188, df = 2, P = 0.045). I calculated annual survival rates for the periods 6/1 to 5/31 of the following year (Table 2). Annual rates did not vary by study area for bucks (X^2 = 1.291, df = 2, P = 0.524). Annual rate did vary for does (X^2 = 10.105, df = 2, P = 0.006). Annual rates varied among years for bucks (X^2 = 20.367, df = 2, P < 0.001) and does (X^2 = 7.693, df = 2, P = 0.021). I calculated summer survival rates for the period 6/1 to 8/31 (Table 2). Summer rates did not vary among years (X^2 = 3.984, df = 2, P = 0.136). Summer rates did not vary among study areas (X^2 = 4.283, df = 2, P = 0.117). Summer survival rates were also similar for bucks (99%) and does (97%) (X^2 = 1.345, df = 1, P = 0.246). During fall (9/1 to 11/30) survival rates varied between years (X^2 = 9.428, df = 2, P = 0.009), sexes (X^2 = 37.783, df = 1, P < 0.001), but not among study areas (X^2 = 2.271, df = 2, P = 0.321) (Table 2).

Study III: Mule Deer Sightability

One hundred fifty-eight sightability data points were collected on the Owyhee, Blacks Creek, and Bennett Mountain study areas. These data were combined with 255 data points from southeast Idaho (Ackerman 1988). A sightability model has been developed. This model was added to the sightability software and the manual was updated. To determine the best timing for sightability surveys, 4 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. The raw data have been summarized.

Study IV: Mule Deer Harvest Estimation

I used fishery access point methods to estimate deer harvest. I estimated the total deer harvest in Unit 40 to be 294 (224 - 364, 90% CI), 548 (325 - 769, 90% CI), and 410 (276 - 543, 90% CI) in 1993, 1994, and 1995, respectively. The telephone survey estimated a harvest of 398 in 1993, 542 in 1994, and ___ in 1995. I used the previous year's check station results to restratify subunits for the following survey.

Meetings and Presentations

Month	Purpose	Location
July	Clint Gray's Thesis Defense	Bozeman
	Biologist Meeting	Boise
August	Region 3/ Fishery Bureau Meeting	Nampa
	Region 3/ Enforcement Training	Nampa
November	Research Meeting	Boise
	Preference Points	Boise
	Public Meeting	Caldwell
December	Preference Points	Jerome
	POS'M Training	Nampa
	Greg Milner's Defense	Bozeman
January	Personnel Meeting	Nampa
	TRD Meeting	Boise
	TRD Meeting	Hagerman
February	TRD Meeting	Idaho Falls
March	TRD Meeting	Boise

Month	Purpose	Location
	Idaho Chapter of the Wildlife Society	Boise
	Commission Meeting	Idaho Falls
April	TRD Meeting	Lewiston
May	Planning Meeting	Garden City
June	ISTS	Boise
	Mule Deer Presentation	Kamloops
	Mule Deer Presentation	Juntura

Reports, Publications, Articles

Bishop, C. J., and J. W. Unsworth. 1996. Study I: Region 4 Mule Deer Fawn Mortality. Job Completion Report, Project W-160-R-23. Idaho Dept. Fish and Game, Boise. 23 pp.

Cooper, A., and J. W. Unsworth. 1996. Study I: Harvest and Population Modeling. Job Completion Report, Project W-160-R-23. Idaho Dept. Fish and Game, Boise. 37 pp.

Unsworth, J. W. 1996. Mule Deer Ecology. Study II: Mule Deer Mortality. Job Progress Report, Project W-160-R-23. Idaho Dept. Fish and Game, Boise. 10 pp.

Unsworth, J. W. 1996. Mule Deer Ecology. Study III: Mule Deer Sightability. Job Progress Report, Project W-160-R-23. Idaho Dept. Fish and Game, Boise. 8 pp.

Unsworth, J. W. 1996. Mule Deer Ecology. Study IV: Mule Deer Harvest Estimation. Job Progress Report, Project W-160-R-23. Idaho Dept. Fish and Game, Boise. 10 pp.

PROGRESS REPORT
SURVEYS AND INVENTORY

STATE: Idaho **TITLE:** Canada Goose Ecology
PROJECT NO.: W-160-R-23
SUBPROJECT: 37
STUDY NO.: I-III

PERIOD COVERED: July 1, 1995 to June 30, 1996

CANADA GOOSE ECOLOGY

Study I: Evaluation of Population Trend and Harvest Estimates

Weekly spring breeding pair counts (SBPC), during March, April, and May were conducted on the Snake, Payette, and Boise Rivers during 1993-95. 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, and determine the problems associated with the survey technique and interpreting the results. Peak pair numbers were observed during the 4/05-4/20 period for all three survey areas. Comparisons of data generated on research flights were made to similar data collected by the Southwest Region management personnel on their regularly scheduled Spring BPC surveys. Several potential reasons for the high variances observed in Regional SBPC surveys were identified.

A random-stratified population estimation technique was used to assess Canada goose fall and spring populations. Fall population estimates (not corrected for visibility bias) were 16,631 $\pm$ 6,435 (CV=19.7%) in 1994 and 10,397 $\pm$ 2,617 (CV=12.6%) in 1995. Spring breeding populations were estimated during two surveys in 1996, as 3,460 $\pm$ 369 (CV=5.3%) and 3,664 $\pm$ 528 (CV=7.2%).

Three hundred and thirty-one locally-produced Canada geese have been equipped with neck-collar-mounted radio transmitters and U. S. Fish and Wildlife Service (USFWS) aluminum leg bands and then released since 1993. Radio-collared geese were monitored through the 1995 hunting season. Survival of radio-collared geese was 61% for adults and 37% for young during 1995-96. Harvest rates of radio-collared geese were highest during the first 3 weeks and last 4 weeks of the season.

Study II: Factors Affecting Mortality Rates

Field work was limited to the capture and banding of locally-produced Canada geese. Approximately 763 geese were banded during the spring of 1996 in southwestern Idaho. Habitat use areas were determined for fall, winter, and spring periods.

Study III: Identification of Subpopulations

This study was canceled during this reporting period due to high cost and to avoid a duplication of USFW Service research efforts.

Meetings and Presentations

Date	Purpose	Location
July	Owyhee Co. Historical Soc.	Murphy
January	Ducks Unlimited	Boise
	Oregon F&G, USFWS, SW Region Mtg.	Nampa
April	SW Region Pers. Mtg.	Boise
May	Phys. Ass. & Firearms Trng.	Boise
	Idaho F&G Commission Mtg.	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. 48 pp.

Bodie, W. L. 1993. No One Knows Where The Wild Goose Goes. Idaho Wildlife. Idaho Department of Fish and Game. 13(6):10-11.

Bodie, W. L. and L. E. Oldenburg. 1994. A Standardized Technique for Bighorn Sheep Aerial Surveys. Bienn. Symp. North. Am. Wild Sheep and Goat Counc. 9:65-68.

McCoy, M. W., W. L. Bodie, and E. L. Taylor. 1994. An Observation of Out-of-Season Breeding in California Bighorn Sheep. Great Basin Naturalist. 55(2) 181-182.

Bodie, W. L., O. E. Garton, E. L. Taylor, and M. W. McCoy. 1995. A Sightability Model for Bighorn Sheep in Desert Habitats, J. Wildl. Manage. 59(4) 834-840.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE: Idaho **TITLE:** Chukar Ecology
PROJECT NO.: W-160-R-23
SUBPROJECT: 43
STUDY NO.: I

PERIOD COVERED: July 1, 1995 to June 30, 1996

CHUKAR ECOLOGY

Thirty-three chukar partridge (*Alectoris chukar*) were trapped during January-May 1996. Twenty-nine chukars were fitted with backpack-mounted radio transmitters, while 2 chukars died from depredation in the traps and 2 died from handling stress. Fifty-six percent of the radio-collared birds were preyed upon, and the survival rate from midwinter to late-summer was 32%. Habitat use data was gathered on 274 bird locations, of which 177 were seasonal flush sites, 46 brood sites, 16 nest sites, and 35 trap sites. Micro-habitat data was gathered on 14 nests. The availability of yellow starthistle was determined and mapped on 7.5 minute series topographic maps. Final data analyses will begin in the fall of 1996 and a final report will be completed by summer 1997.

A modification of a quail restraining device (Demaso and Peoples 1993) was developed, tested, and proven successful for mounting backpack transmitters on chukars. Furthermore, backpack-mounted radio transmitters proved to be more suitable for chukar partridge than the necklace-mounted transmitters used the previous field season.

Reports

Lindbloom, A., K. Reese, and P. Zager. 1995. Seasonal habitat use, population characteristics, and management of chukar partridge (*Alectoris chukar*) in north-central Idaho. Job Prog. Rep., Proj. W-160-R-22. Subproj. 43. Idaho Dep. Fish and Game, Boise.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE: Idaho **TITLE:** Mountain Quail Ecology
PROJECT NO: W-160-R-23
SUBPROJECT: 44
STUDY NO.: I

PERIOD COVERED: July 1, 1995 to June 30, 1996

MOUNTAIN QUAIL ECOLOGY

Field work continued in the Riggins area during the reporting period. Eighty-three mountain quail (14 adult and 69 juvenile) were captured between September 18 and December 22, 1995. Blood samples were drawn for sex determination. Thirty-two birds were fitted with transmitters and monitored. Data pertaining to survival, covey size, associations, movements, and habitat use were collected. Field work concluded in late February 1996. Data analysis is underway and a final report will be submitted during FY97.

Reports

Heekin, P.E., K.P. Reese, and P. Zager. 1996. Fall/winter mountain quail ecology. Job Prog. Rep., Proj. W-160-R-22. Subproj. 44. Idaho Dep. Fish and Game, Boise.

Heekin, P.E., C.A. Vogel, and P. Zager. 1995. In quest of the mountain quail. Idaho Wildl. 15:4-8.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE: Idaho **TITLE:** Bighorn Sheep Winter Habitat Use
PROJECT NO.: W-160-R-23
SUBPROJECT: 45
STUDY NO.: I

PERIOD COVERED: July 1, 1995 to June 30, 1996

BIGHORN SHEEP WINTER HABITAT USE

Study I: Winter Habitat Use Patterns of Bighorn Sheep in Big Creek

Six bighorn ewes were captured and fitted with radio collars in the Big Creek Drainage. Bighorn sheep were monitored from January to April. Fecal analyses has been returned from Colorado State University and food habits have been determined. Activity of bighorn sheep seems to decline during nocturnal hours; however, small sample size precludes any definite conclusions as to time spent moving-feeding, resting, and standing alert.

Locations and observations of bighorn sheep indicate they may select grassland and talus habitats during the winter. Field work has been completed and the thesis (Completion Report) has not been completed as of this date.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE: Idaho **TITLE:** Pine Marten Ecology
PROJECT NO.: W-160-R-23
SUBPROJECT: 46
STUDY: I

PERIOD COVERED: July 1, 1995 to June 30, 1996

PINE MARTEN ECOLOGY

Nine "new" and 2 previously captured pine marten (*Martes americana*) were captured and radio-collared during June-July 1996. Nontarget species were rarely captured. Five (3 males and 2 females) of these animals died, apparently from starvation or sickness. Telemetry indicates that inter-sexual home ranges are not exclusive, whereas intra-sexual home ranges were much more so. More than 500 radio locations are being used to evaluate habitat use patterns. Marten are feeding on small mammals, huckleberries (*Vaccinium globulare*), and yellow jackets and hornets. We also trapped small mammals to assess prey abundance. A final report will be submitted during FY97.

Reports

Tomson, S., K. Foresman, and P. Zager. 1995. Pine marten ecology. Job Prog. Rep., Proj. W-160-R-22. Subproj. 46. Idaho Dep. Fish and Game, Boise.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE: Idaho **TITLE:** Upland Game Ecology
PROJECT NO: W-160-R-23
SUBPROJECT: 47
STUDY: I-II

PERIOD COVERED: July 1, 1995 to June 30, 1996

UPLAND GAME ECOLOGY

Study I. Pheasant Response to Intensive Habitat Management

The second full field season of investigating the response of ring-necked pheasants (*Phasianus colchicus*) to intensive habitat management in Bingham and Gooding Counties was begun in 1996. Within our study areas, >391 acres of food plots were established and >9,300 trees were planted in shelterbelts. Eighty-nine individual pheasants were captured by mist nets or walk-in traps within the two counties. Mortality rates of 36%for pheasants captured in winter and spring and followed through June 30 were documented during this field season. Females had considerably lower survival rates (48%) than males (89%). Survival rates were higher in treatment areas (75%) than control areas (50%). Crowing counts and territorial mapping suggested generally higher breeding populations in control areas than treatment areas in Gooding County and higher breeding populations in treatment than control areas for Bingham County. These results suggest that habitat management is more effective in areas with lower quality habitat and pheasant population density, such as Bingham County, than in areas with relatively good pheasant habitat and higher numbers of pheasants in parts of the county, such as Gooding County.

Study II: Pheasant response to predator management

The second full field season of investigating the response of ring-necked pheasants (*Phasianus colchicus*) to predator management in Bingham and Gooding Counties was begun in 1996. Roadside surveys, scent stations, and trapping indicated that striped skunk (*Mephitis mephitis*), red fox (*Vulpes vulpes*), and feral cats were the most common mammalian predators in both counties. These predators were trapped and removed from treatment areas during late winter and early spring 1996. Survival rates for pheasants season trapped during the winter and spring and monitored through June 30 were 51%. These rates were similar in both treatment (48%) and control (52%) areas. Both crowing counts and territorial mapping suggested that pheasant breeding populations may have been somewhat higher in the predator removal areas compared to the control areas in Bingham Counties. However, these differences could be related to other factors (e.g., pesticides) that may have differed between areas but were not easily detected.

Meetings and Presentations

Compton, B. B., and J. W. Connelly. 1996. The effects of exploitation on sage grouse: implications from a stochastic model. Presented at annual meeting of the Idaho Chapter, The Wildlife Society. March 6-8. Boise, ID.

Connelly, J. W. 1995. Columbian sharp-tailed grouse: on the road to recovery? Graduate student lecture, South Dakota State Univ. Nov. 13. Brookings, SD.

Connelly, J. W., and K. P. Reese. 1995. Columbian sharp-tailed grouse: on the road to recovery? Presented at the annual meeting of the Wildlife Society. September 12-17. Portland, OR.

Connelly, J. W., and B. B. Compton. 1996. Trends in sage grouse populations in southern Idaho: do we have a crises? Presented at annual meeting of the Idaho Chapter, The Wildlife Society. March 6-8. Boise, ID.

Gardner, S. C., K. P. Reese, and J. W. Connelly. 1995. Ecology of reintroduced Columbian sharp-tailed grouse in southern Idaho. Presented at the annual meeting of the Idaho Chapter, The Wildlife Society. March 9-11. Idaho Falls, ID

Gardner, S. C., K. P. Reese, and J. W. Connelly. 1996. Evaluation of a Columbian sharp-tailed grouse reintroduction with a test of a habitat suitability index model. Presented at annual meeting of the Idaho Chapter, The Wildlife Society. March 6-8. Boise, ID.

Leonard, K. M., K. P. Reese, and J. W. Connelly. 1996. Sage grouse on the upper Snake River plain: changes from the 50's to the 90's. Presented at annual meeting of the Idaho Chapter, The Wildlife Society. March 6-8. Boise, ID.

Nohrenberg, G. , K. P. Reese, and J. W. Connelly. 1996. The effects of habitat improvement programs and predator management on ring-necked pheasant populations in southern Idaho. Presented at annual meeting of the Idaho Chapter, The Wildlife Society. March 6-8. Boise, ID.

Reese, K. P., J. W. Schneider, and J. W. Connelly. 1995. Do Columbian sharp-tailed grouse substitute hard seeds for grit in winter? Presented at the annual meeting of the Idaho Chapter, The Wildlife Society. March 9-11. Idaho Falls, ID

Sands, A. R., and J. W. Connelly. 1995. A conservation program for Columbian sharp-tailed grouse. Presented at the 21st meeting of the Prairie Grouse Tech. Council. August 28-31. Medora, ND.

Schneider, J. W., K. P. Reese, J. W. Connelly, J. H. Klott, and B. B. Davitt. 1995. Winter food habits of Columbian sharp-tailed grouse in southeastern Idaho. Presented at the annual meeting of the Wildlife Society. September 12-17. Portland, OR.

Ulliman, M. J., K. P. Reese, and J. W. Connelly. 1995. Winter ecology of Columbian sharp-tailed grouse in southeastern Idaho. Presented at the annual meeting of the Idaho Chapter, The Wildlife Society. March 9-11. Idaho Falls, ID.

Publications

Apa, A. D., K. P. Reese, and J. W. Connelly. In press. An evaluation of nest placement theory using artificial and Columbian sharp-tailed grouse nests. Oikos.

Blus, L. J. and J. W. Connelly. 1995. Use of radiotelemetry to determine exposure and effects of organophosphorus insecticides on sage grouse. Proc. Soc. Envir. Toxic. and Chem. Pellston Workshop.

Connelly, J. W., K. P. Reese, R. A. Fischer, and W. L. Wakkinen. In press. Effects of fire on a sage grouse breeding population in southeastern Idaho. Conserv. Biol.

Crowely, C. M., and J. W. Connelly. 1996. Sage grouse population and habitat trends in southeastern Idaho and southwestern Montana. Idaho Dept. Fish and Game, Pocatello. 205 pp.

Fischer, R. A., K. P. Reese, and J. W. Connelly. 1996. The impacts of fire on sage grouse brood habitat in southeastern Idaho. J. Range Manage. 49:194-198.

Fischer, R. A., K. P. Reese, and J. W. Connelly. In press. The influence of vegetal moisture content and nest fate on timing of female sage grouse migration. Condor.

Fischer, R. A., W. L. Wakkinen, K. P. Reese, and J. W. Connelly. In press. Effects of prescribed fire on movements of female sage grouse from breeding to summer ranges. Wilson Bull.

Musil, D. D., K. P. Reese, and J. W. Connelly. 1994. Nesting and summer habitat use by sage grouse translocated into central Idaho. Great Basin Natur. 54:228-233.

PROGRESS REPORT
SURVEYS AND INVENTORY

STATE: Idaho **TITLE:** Southeast Region Upland Bird Study
PROJECT NO: W-160-R-23
SUBPROJECT: 48
STUDY NO.: I

PERIOD COVERED: July 1, 1995 to June 30, 1996

SOUTHEAST REGION UPLAND BIRD STUDY

Study I. The Effects of Predation on Upland Nesting Game Birds

Russian olive trees (*Elaeagnus angustifolia*) were removed from one-half of the Sterling Wildlife Management Area (SWMA) located in southeastern Idaho. This process was completed to determine if removal of this tree species as nest sites for black-billed magpies (*Pica pica*), a potential duck nest predator, would increase duck nest success on the treated area. Duck nest searches resulted in the discovery of 263 nests in 1995 and 325 nests in 1996, >50% of which were those of mallards (*Anas platyrhynchos*). Duck nest success on the treatment area was nearly 2 times higher than that which occurred on the control area, in both 1995 and 1996. Percentage of duck nests destroyed by avian predators did not differ when results between the 2 areas were compared. About twice as many magpie nests were found in the control area as in the treatment area in both years. Distribution and density of nests did not change in the control area, but did change in the treatment area. All magpie nests in the control area were built in Russian olive trees and experienced an overall fledgling nest success of 72%, and 59% in 1996. Nests were primarily built in big sage brush (*Artemisia tridentata*) on the treatment area and had 52% fledgling nest success in 1995 and 71% in 1996. Results obtained from artificial nests with timers indicate that >66% and >50% of the predated nests were destroyed during daylight hours in 1995 and 1996, respectively. This implies that the majority of nests were destroyed by magpies. Artificial nests marked with willows were destroyed at the same percentage as those nests not marked with willows. This indicates that duck nest predators were not using willow sticks as cues to locate marked nests. Cameras located at artificial nests photographed magpies, striped skunks (*Mephitis mephitis*), and raccoons (*Procyon lotor*), verifying the existence of these nest predators on the SWMA. Data gathered 2 years after Russian olive trees were removed from a portion of the SWMA indicate this technique alone may not be sufficient to increase duck nest success to the 30% objective level that is desired for the SWMA. However, more time may have to elapse before a substantial increase concerning duck nest success is realized as a result of Russian olive tree removal.

Presentations

Connelly, J. W. !995. Nesting waterfowl, predation and Russian olives in southeastern Idaho. Graduate student lecture, South Dakota State University. November 14. Brookings, SD.

Publications

Gazda, R. J., I. J. Ball, and J. W. Connelly. Duck nesting success and predation in southeastern Idaho. Peer review.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE: Idaho **TITLE:** Southwest Region Big Game Modeling
PROJECT NO.: W-160-R-23
SUBPROJECT: 49
STUDY: I

PERIOD COVERED: July 1, 1995 to June 30, 1996

SOUTHWEST REGION BIG GAME MODELING

The student investigator is in the process of finishing up his study proposal and is starting to collect the data. He will need to construct a model of hunter behavior.

Meetings and Presentations

None.

Reports, Publications, Articles

Cooper, A., and J. W. Unsworth. 1996. Study I: Harvest and population modeling. Job Completion Report, Project W-160-R-23. Idaho Dept. Fish and Game, Boise. 37 pp.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE: Idaho **TITLE:** Region 4 Mule Deer Fawn Mortality
PROJECT NO.: W-160-R-23
SUBPROJECT: 50
STUDY: I

PERIOD COVERED: July 1, 1995 to June 30, 1996

REGION 4 MULE DEER FAWN MORTALITY

Cause-specific mortality rates for wintering mule deer (*Odocoileus hemionus*) fawns will be determined using standard radio telemetry techniques on 3 study areas in southwest Idaho, 1995-1997. Fawn mortality rates will be compared between each study area and between males and females. Early winter fawn weights will be recorded and compared with mortality rates. Bitterbrush (*Purshia tridentata*) and cheatgrass brome (*Bromus tectorum*) will be sampled and analyzed for nutritional content to determine if differences in quality of forage exist among the study areas and whether these differences correlate with survival. Ground and aerial locations of each radio-collared fawn will be obtained throughout the study to determine habitat, weather, and fawn activity data. The specific cause of death for each fawn mortality will be determined as accurately as possible. Thus, the impact of predation, nutritional stress, and all other causes upon survival will be determined. Data collected through this study will be used to develop a mule deer fawn mortality model.

Meetings and Presentations

The Wildlife Society - March 1996, Boise.

Reports, Publications, Articles

Bishop, C. J., and J. W. Unsworth. 1996. Study I: Region 4 Mule Deer Fawn Mortality. Job Completion Report, Project W-160-R-23. Idaho Dept. Fish and Game, Boise. 23 pp.

PROGRESS REPORT
STATEWIDE WILDLIFE RESEARCH

STATE: Idaho
PROJECT NO.: W-160-R-23
SUBPROJECT: 52
STUDY NO.: I
TITLE: Blue Grouse/Livestock Grazing Relationships

PERIOD COVERED: July 1, 1995 to June 30, 1996

BLUE GROUSE/LIVESTOCK GRAZING RELATIONSHIPS

Study I: The Relationship of Blue Grouse Productivity and Livestock Grazing Intensity

Job 1: Develop a study plan to assess the effects of livestock grazing intensity on survival, production, and nesting success of Blue Grouse in southwestern Idaho.

A study plan has been developed by the graduate student and submitted as a completion report.

Submitted by:

John Beecham
John Beecham
Wildlife Game and Research Manager

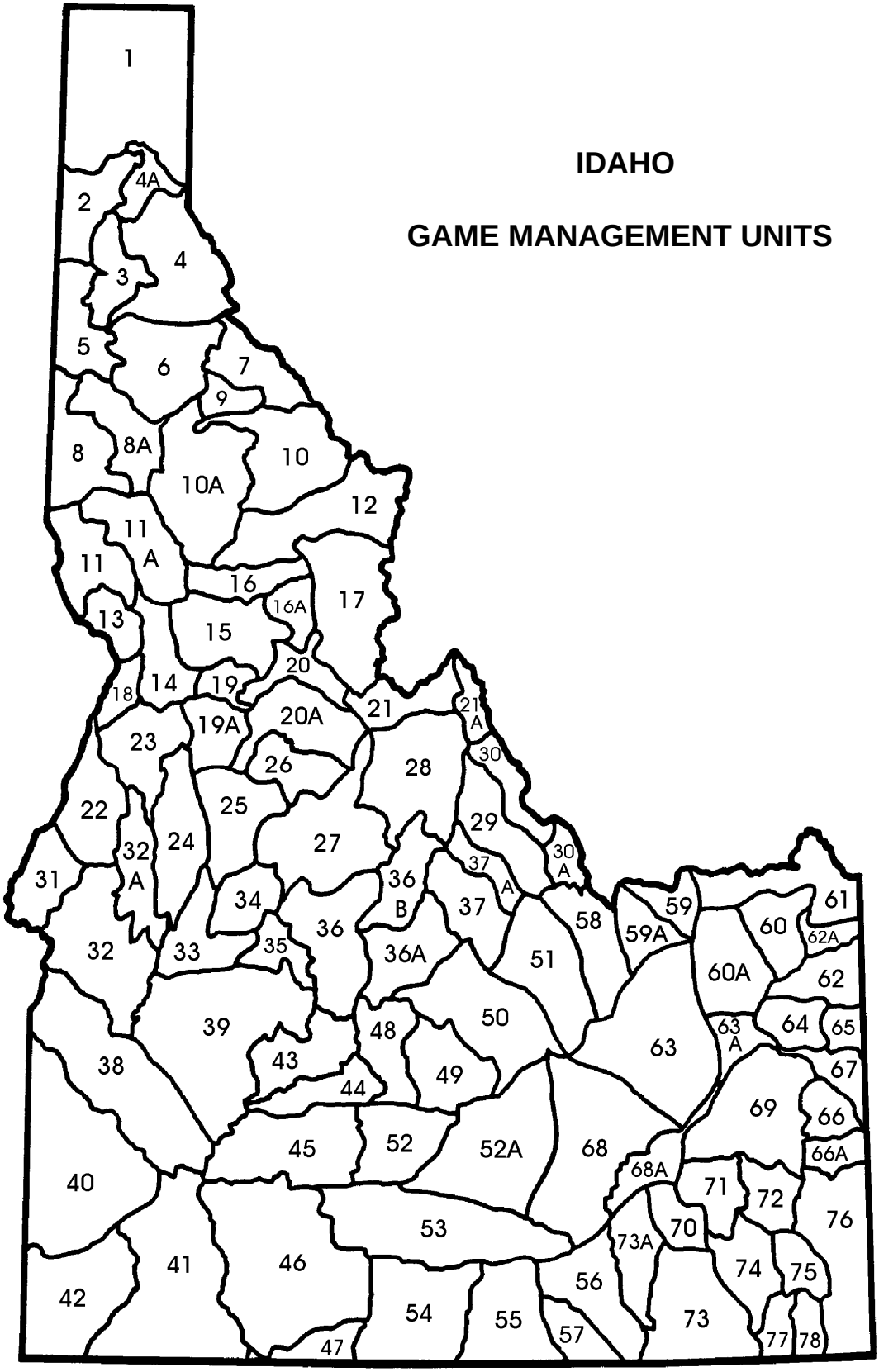
Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

Tom Reinecker
Tom Reinecker, Chief
Bureau of Wildlife

IDAHO

GAME MANAGEMENT UNITS



FEDERAL AID IN WILDLIFE RESTORATION

The Federal Aid in Wildlife Restoration Program consists of funds from a 10% to 11% manufacturer's excise tax collected from the sale of handguns, sporting rifles, shotguns, ammunition, and archery equipment. The Federal Aid program then allots the funds back to states through a formula based on each state's geographic area and the number of paid hunting license holders in the state. The Idaho Department of Fish and Game uses the funds to help restore, conserve, manage, and enhance wild birds and mammals for the public benefit. These funds are also used to educate hunters to develop the skills, knowledge, and attitudes necessary to be responsible, ethical hunters. Seventy-five percent of the funds for this project are from Federal Aid. The other 25% comes from license-generated funds.