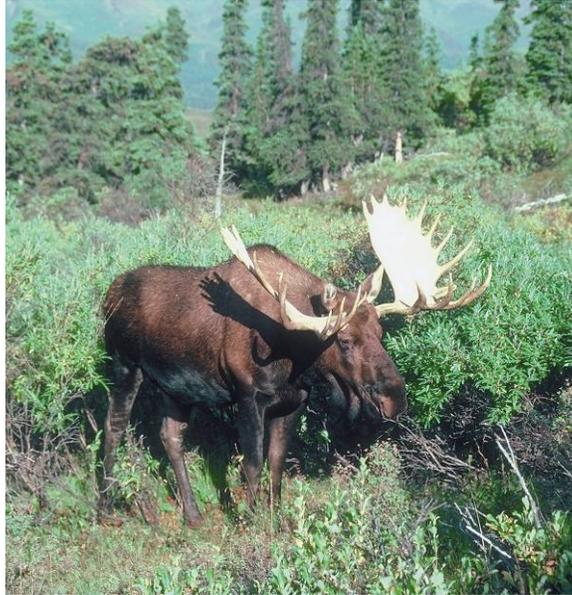


IDAHO DEPARTMENT OF FISH AND GAME

Steven M. Huffaker, Director

Project W-170-R-27

Progress Report



MOOSE

Study I, Job 6

July 1, 2002 to June 30, 2003

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**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Moose Surveys and Inventories</u>
PROJECT:	<u>W-170-R-27</u>		
SUBPROJECT:	<u>1-7</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>I</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>6</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2002 to June 30, 2003</u>		

SHIRAS MOOSE IN IDAHO: STATUS AND MANAGEMENT

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ABSTRACT

Limited data indicate that Shiras moose (*Alces alces shirasi*) occurred in low numbers in Idaho throughout the 19th century. Harvest was allowed in Idaho during 1893-1898, after which seasons were closed. Shiras moose were fully protected in Idaho from 1899-1945. Moose populations increased during the 20th century, and harvest seasons resumed in 1946. Harvest has focused on mature males, allowing continued population growth through the end of the 20th century. Rapid population growth during 1980-2000 resulted in moose dispersing westward from the Rocky Mountains and southward from the Panhandle region of Idaho. The management goal for moose in Idaho is to provide opportunity for recreational hunting and harvest of mature male moose. Although some managers assess moose populations directly by aerial survey, most managers rely on indirect measurements (e.g., hunter success rate and antler spread of harvested bulls) to assess the impact of harvest on moose populations. Other population indicators (e.g., dispersal into previously unoccupied areas, damage to private property) have been used as indicators of social tolerance for expanding moose populations. Where moose have approached the limit of social tolerance, attempts to stabilize or reduce populations by harvest of females and translocation of 'problem' moose have been utilized. A revised statewide population estimate is provided.

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Key Words: Moose, Idaho, Shiras, Controlled harvest, Antler measurements, Management.

Typical moose habitat in Idaho encompasses all timbered western slopes of the Rocky Mountains. In Idaho, moose occupy all western slopes of the Rocky Mountains westward to Hells Canyon and isolated mountain ranges south of Salmon, Idaho along the border with Montana and Wyoming southward to Utah.

Moose are managed as a game animal in Idaho. The Idaho Department of Fish and Game (IDFG) has identified moose as a trophy species, a big game animal whose population is sufficient to support only strictly regulated annual harvest. In addition to regulating harvest, IDFG has responsibility to respond to depredation complaints caused by moose (Toweill 1988). Moose occupied slightly more than half (51 %) of Idaho, an area of 109,668 km² (42,343 mi²), in 2002. Moose are hunted in all administrative regions of Idaho, and in about two-thirds of Idaho's Game Management Units (GMU) (Figure 1). The (relatively recent) expansion of moose in Idaho has allowed the IDFG to increase moose hunting opportunity from <20 % of GMUs during 1946-1982 to >60 % of GMUs by 2000 (Figure 2).

We describe recent range expansion of moose, summarize IDFG harvest data, and provide a revised population estimate for Shiras moose in Idaho.

HISTORIC DISTRIBUTION

The distribution of moose in 2002 was vastly greater than at any previous time in recorded history. Explorers with Merriwether Lewis and William Clark's Corps of Discovery failed to observe moose, although they were informed by native Americans in 1806 that there were "... plenty of moos (sic) to the S.E. of them on the East branch [Salmon River] of Lewis's [Snake] river ..." (Thwaites 1959, vol. 5:99). Journals of the fur trappers and explorers that traveled throughout the western Rocky Mountains between 1806 and 1850 failed to mention the occurrence of moose (Compton and Oldenburg 1994). Houston (1968) concluded that few if any moose occupied the area of Jackson Hole and Yellowstone National Park prior to 1850. Few records of moose in northern Idaho exist prior to 1900.

Moose apparently became established in the area of Yellowstone National Park soon after 1850, and were reported in the Salmon River mountains in 1891 (Merriam 1891). The first hunting season for moose was established in Idaho in 1893, but was closed in 1898 due to concern about dwindling herds. Writing in 1905, Brooks reported that moose occurred in southeastern Idaho in a range bounded by "the eleventh auxiliary meridian on the west and the Fall or Cascade Creek on the east" and by "the southern branch of the Warm River on the north and the Big Robinson on the South" (Brooks 1905:201), an area known as Big Black Mountain or Moose Mountain that "barely measures ten miles in diameter" (Brooks 1905:202). He reported that moose had formerly ranged as far south as Jackson Hole and east of the North Fork of the Snake River in Idaho, Wyoming, and Montana, but that the range had become progressively restricted within the previous decade (1895-1905).

Elimination of moose hunting seasons in Idaho beginning in 1899 may have allowed moose populations to grow. Bailey (1935) reported that there were "numbers" of moose in the Chamberlain Basin and Salmon River watershed in 1902. Davis (1939) reported that Idaho moose numbered about 500 in 1910. Citing reports of increasing moose in the upper Snake River Valley in 1935 and an estimate of 528 moose in national forests of northern Idaho in 1925, Davis (1939) estimated that Idaho had 1,000 moose in 1939.

Thirty permits authorizing the harvest of bull moose in Fremont County only were authorized by IDFG in 1946, and again in 1947. During that period, Fremont County was believed to include

the range of more than half the moose in Idaho (Biladeau 1949). An aerial survey of moose in Fremont County in 1949 yielded observation of 536 moose (Biladeau 1949).

Records from states adjacent to Idaho provide additional indication of moose population expansion. Moose from eastern Idaho apparently expanded southward into Utah by 1906 or 1907, although a population was not considered established until 1947 (Durrant 1952, Utah Division of Wildlife Resources 2000). In similar fashion, moose populations expanded westward from the Priest Lake basin by 1954, establishing a population in northeastern Washington (Poelker 1972). Moose likely crossed Hells Canyon and the Snake River from Idaho into the Blue Mountains of Washington (Ingles 1965) and Oregon (Verts and Carraway 1998), although there is no evidence that these movements resulted in establishment of new populations to date. Moose incursions into Oregon have continued with increasing frequency, with 25 records since 1960, 18 of those since 1990 (Vic Coggins, Oregon Department of Fish and Wildlife, file data, November 2002).

MOOSE MANAGEMENT

Moose are managed by IDFG to provide high quality hunting opportunities and associated recreation, while encouraging expansion of moose populations into suitable habitat in Idaho (Leege et al. 1990). Idaho hunters are limited to a harvest limit of only one Shiras moose in Idaho.

Allocation of Hunt Permits

Harvest of moose is regulated by controlled hunt permits allocated by random draw. Each permit is restricted to either antlered or antlerless moose (hereafter bull or cow) within a particular hunt area. Every hunter is required to have each harvested moose checked by a representative of IDFG.

Hunter demand for moose permits is high. In 1980, IDFG received 25,524 applications for 140 moose permits (Leege et al. 1990), with the result that only one person among 182 applicants obtained a moose hunting permit (at that time, all permittees were limited to harvest of bull moose). To reduce competition, applicants were required to submit funds for the purchase of their permit and tag with their application after 1980, which reduced the number of applicants by over half (from 25,524 to 11,649 in 1981). Increases in the number of permits offered annually has resulted in a higher probability of being drawn for a permit since that time.

Likelihood of drawing a permit for a bull was about 10% from 1990-1999, and has been near 20% since 2000 (Figure 3A). The number of applications for cow permits has expanded rapidly since 1990, when drawing success was similar to that for bulls (about 15%). However, the number of cow permits offered annually has increased even more rapidly, so that by 1999, the number of applicants was less than the number of cow permits available (Figure 3B). Permits not fully subscribed in the annual drawing have been sold on a 'first-come' basis following the drawing. Permittees unsuccessful in harvesting a moose must wait two years before becoming eligible for another moose tag. Regulations are reviewed and permit levels established on alternate, odd-numbered years.

Successful moose hunters must have their animal checked by an IDFG representative within 10 days of the date of kill. Unsuccessful hunters are required to submit their unused moose tag as proof of non-use (failure to do so is presumptive evidence of harvest and exclusion from future draw opportunity).

Most moose hunting in Idaho occurs on public land. A summary of land ownership in areas open to moose hunting (Figure 4) indicates that 94% of the land area is managed by federal or state government. The vast majority of federal and state land in Idaho is open to hunting.

Controlled Harvest

IDFG moose management philosophy is to allow harvest of bulls at levels which will allow populations to continue to expand. Therefore, harvest quotas for bulls (i.e., moose having at least one antler longer than six inches [15.2 cm] long) are limited, and adjusted as necessary to achieve a mean maximum antler spread of harvested bull moose ≥ 35 inches (89 cm). At this harvest level, the mean age of harvested moose is believed to be approximately four years of age (Gasaway et al. 1987).

Harvest of cow moose is designed primarily to reduce moose population growth, promote human health and safety where moose occur in suburban settings, and limit moose depredations.

Moose hunting seasons are long. Hunting seasons for bull moose extend 86 days, from 30 August to 23 November annually. Hunting seasons for cow moose typically extend 40 days (15 October-23 November). Long seasons allow successful applicants maximum opportunity for hunting recreation and opportunity to harvest. One reason cow seasons do not begin until 15 October is to reduce potential orphaned calves.

Since 1990, moose hunters have averaged 5.4-8.2 days of hunting before harvesting a bull moose, and 2.6-5.2 days before harvesting a cow (Figure 5). More days hunting for each bull harvested reflects (1) reduced availability due to lower numbers of bulls versus cows, and (2) great selectivity in choosing a bull to harvest for this once-in-a-lifetime trophy. Mean number of days prior to harvest has stayed relatively constant in the last 12 years for both bulls and cows (Figure 5).

Moose harvest success has ranged from >60% to >80% annually (Figure 6). The most common cause identified by unsuccessful hunters for failure to harvest a moose is lack of participation during the hunting season.

Harvest data are used to monitor the effect of hunting on moose populations. The statewide objective for mean antler spread ≥ 35 inches (89 cm) among all harvested bulls has been in place since 1990, and harvest has been maintained at that level (Figure 7). Maximum antler spread recorded in Idaho has been 60 inches (152 cm), and each year a few moose are harvested that approach this size (Figure 7).

Annual harvest of antlered moose is generally believed to account for 15% of known bulls, although data are limited. Based on file data from the northeastern portion of GMU 1 (personal

communication from Jim Hayden, IDFG), the population of moose was 2.1 moose/km² (0.80 moose/mi²) during February 1993. Bull moose density was 0.62 bull moose km² (0.24 bull moose/mi²) in this area, and bull moose harvest density was 0.10 bull moose/km² (0.04 bull moose/mi²). This equated to an estimated annual hunting mortality rate of 14% [$0.10/(0.10+0.62)$].

Some areas are more heavily exploited. In GMU 2 near the Washington border, annual harvest was estimated to account for 38% of the bull moose present in 1996, and 33% of the bull moose in 2000. Surveys of GMU 2 conducted in February 1996 resulted in an estimate of 0.70 moose km² (0.27 moose/mi²) and 0.21 bull moose/km² (0.08 bull moose/mi²). Harvest accounted for 0.13 bull moose km² (0.05 bull moose/mi²) in 1996, for a harvest rate of 38% [$0.13/(0.13+0.21)$]. Moose populations had increased 1.30 moose/km² (0.50 moose/mi²) in 2000, with an estimated 0.26 bull moose/km² (0.10 bull moose/mi²). Annual harvest accounted for 0.13 bull moose/km² (0.05 bull moose/mi²), yielding an annual harvest rate of 33% [$0.13/(0.13+0.26)$]. Estimates of comparatively higher annual harvest in GMU 2 were reflected in smaller average antler spread from this GMU, although sample sizes are small (personal communication from Jim Hayden, IDFG).

Moose populations and harvests are greatest in northern Idaho (Panhandle and Clearwater regions) and extreme eastern Idaho (Upper Snake and Southeast Idaho) (Figure 1). Among all regions, mean antler spread ranges from 35.4 inches (89.9 cm) in the Salmon region to 37.0 inches (94.0 cm) in the Panhandle region (Figure 8). Mean antler measurements do differ ($P<0.001$) among regions, with the Panhandle and Upper Snake regions being similar and slightly greater than Clearwater and Southeast regions (Figure 8).

Among the moose harvested during seasons designated for antlerless harvest, a portion (3-22%) are males (primarily calves). Since 1990, the portion of antlerless harvest consisting of males has averaged 7.6% (Table 1).

Unregulated Harvest and Mortality

This category includes all recorded annual losses of moose to human activity. Major elements of these types of losses include vehicle accidents and illegal hunter harvest. The extent of these losses is difficult to measure because there is no central repository for this information and reporting is sporadic.

In addition to these causes of mortality, other factors may also impact local moose populations. One of these factors is translocation of moose by IDFG. IDFG has legal responsibility to respond to wildlife depredation concerns (Toweill 1988), and one means of addressing these concerns is translocation of moose within Idaho. Methodology for translocating moose was described by Naderman (1994). Although the number of annual translocations of moose varies annually depending on severity of winter weather, during the winter of 2001-2002, approximately 100 moose were physically relocated away from Idaho Falls and nearby areas in eastern Idaho.

Among 527 moose deaths recorded in Fremont County between 1969 and 1975 (Ritchie 1978), legal harvest accounted for 217 (41%). The balance of losses was comprised of 165 moose illegally harvested (31%), 32 moose allocated to Indian harvest (6%), and 113 moose deaths attributed to natural causes, accidents, and unknown causes (21%).

Research conducted on moose between June 1979 and December 1980 in central Idaho near Elk City (Pierce et al. 1985) documented cause of death for 40 moose. Of these, 10 (25%) were legally harvested. Of the balance, 21 (50%) were illegally harvested, six (15%) were harvested by tribal members, and three (8%) moose deaths were due to accidents and natural causes. Pierce et al. (1985) reported that seven of 20 moose radio-collared by one of the authors (Kuck unpublished) near Soda Springs in southeastern Idaho died during 1978-1981. Six of those animals (86%) were illegally harvested. Pierce et al. (1985) concluded that unregulated harvest from all causes was largely unreported and often underestimated.

A review of all recorded mortality other than legal hunting during the period 1990-2002 revealed that mortality due to vehicle (including train) collisions and illegal harvest were the dominant causes of non-hunting related mortality (Table 2). Mortality due to vehicle collisions is significantly underestimated, since (1) there is no comprehensive effort to collect moose-vehicle collision data, and (2) mortally injured moose capable of moving away from the scene of an accident under their own power are rarely recorded as mortalities. If located, post-mortem cause of death for these animals is usually categorized as either natural or unknown. Given the relatively high likelihood of vehicle accidents going unreported to IDFG and post-collision mortality of moose struck but able to leave the scene of a collision, it is suspected that reported moose mortality due to vehicle collisions may represent half of actual mortality. While losses of approximately 50 moose/year due to collisions have been reported since 1990, annual losses are more likely in the vicinity of 100 moose/year, and increasing as both moose and roads proliferate.

Illegal harvest is also believed to be significantly under-reported. Illegal harvest and wounding of moose by hunters seeking elk and deer are rarely reported by individuals responsible, most of whom are fearful of receiving a citation. Many of the people who illegally harvest moose do so in locales where the potential for discovery is low (private lands, remotes sites, etc.), and such individuals may hide evidence of their activity (Pierce et al. 1985). Although 30-40 illegal kills have been recorded annually statewide since 1990 (Table 2), Pierce et al. (1985) estimated that 5% to 10% of moose populations in two study areas died annually as a result of recorded illegal kills. Annual losses due to illegal harvest are likely increasing as expanding moose populations provide additional opportunities. We believe that annual illegal kill of moose averages 50 moose/region, of 350-400 moose statewide.

In addition to illegal kills, moose in Idaho may also be legally harvested by members of several Indian tribes holding subsistence or harvest treaty rights. Such harvest is rarely reported to IDFG. Since 1990, 97 incidents of moose harvest by Indians have been reliably reported, which accounts for only 7% of all moose mortalities recorded due to causes other than IDFG-regulated harvest (Table 2).

Natural Losses

Loss of moose due to natural causes (predation, disease, accidents, malnutrition, etc.) are rarely reported. Most occur away from human habitations or roads, and many occur during seasons (i.e., winter) when few humans are active in remote portions of moose habitat. Natural mortality of moose older than calves is believed similar to that reported for adult cow moose in Alaska by Ballard et al. (1991), where an annual mortality of 5.2% was recorded. Bangs et al. (1989) recorded a slightly higher rate of mortality (8%), with mortality of animals aged 1-5 years only 3%. Since 1990, natural and unknown-caused moose mortalities account for 299 cases (23%) of all non-harvest mortalities (Table 2). In Idaho, potential predators on moose include black bears (*Ursus americanus*), mountain lions (*Felis concolor*), and wolves (*Canis lupus*). Data relative to predation on moose in Idaho is very scarce; only five of 1,312 known non-harvest mortalities since 1990 have been attributed to predators (Table 2). Mountain lions are suspected as the cause of three of the five recorded predator kills in Idaho (IDFG files).

POPULATION ESTIMATION

Population estimates for moose are difficult, even in relatively small areas, and total counts are impossible over large areas. Helicopter surveys of moose have been used to provide a means of estimating moose numbers over large areas, but to do so, one must assume that moose habitat is sufficiently uniform to allow extrapolation from a small, intensely-surveyed area to a much wider landscape.

The first statewide estimates of Idaho's moose population were 500 moose in 1910, and 1,000 moose in 1939 (Davis 1939). Hatter (1949) reported a population of 1,000 moose in Idaho, based on an aerial survey of moose in Fremont County conducted in 1949. There is no evidence that Hatter considered herds in northern Idaho in his estimate.

Wildlife Managers of IDFG, using a variety of data and input from local Conservation Officers, estimated the moose population in each GMU in Idaho during 1981, 1985, and 1990 (IDFG 1981, Hayden et al. 1985, Leege et al. 1990). Other estimates of Idaho's moose population (Table 3) appear in Karns (1997) and Timmermann and Buss (1995, 1997). With population surveys unavailable, biologists typically employ indices (relative measures of some object such as pellet groups or tracks) to detect trends in populations. Only rarely can such indices be correlated to population number except in a very general sense. In Idaho, statewide population trends are monitored using a combination of aerial survey estimates over small areas, and indices based on mandatory check of hunter harvested moose and antler measurements of bull moose. Since current harvests are inconsistent with published estimates of moose populations in Idaho, we reviewed available data in an effort to derive an updated statewide estimate of Idaho's moose population.

Population Estimate Based on Occupied Range and Population Density

One way to estimate Idaho's moose population is to derive a population density then expand that to population area.

Moose densities in Wyoming, immediately east of Idaho, were estimated using fixed-wing and helicopter surveys designed to produce confidence intervals within 10% (Hnilicka 1994). Estimates averaged 0.29 moose/km² (0.11 moose/mi²) of occupied habitat, and ranged from 0.04-0.52 moose/km² (0.10-1.34 moose/mi²) (Hnilicka 1994). In areas where comparable surveys have been flown in Idaho, comparable moose densities have been recorded. Aerial survey data from the Caribou National Forest of eastern Idaho (IDFG 2002) yielded estimates of moose densities of 0.24-0.40 moose/km² (0.63-1.04 moose/mi²). Similar data obtained from aerial surveys in northern Idaho's Priest River drainage (Hayden, IDFG file data, 2000) indicated that moose densities may reach 0.42 moose/km² (1.1 moose/mi²).

If we assume that Idaho moose densities are bracketed by the minimum density for moose dispersal of 0.2 moose/km² reported by Gasaway et al. 1980 and the average density of 0.29 moose/km² reported in Wyoming, then Idaho would have a statewide moose population between 20,000 and 30,000 moose (0.2 * 109,038 = 21,808 moose, and 0.29 * 109,038 = 31,621 moose). This is based upon an estimated occupied range equal to the area of GMUs now having a moose harvest season (Figure 1).

Population Estimate Based on Harvest and Estimated Mortality

Moose populations remain stable if annual recruitment equals annual losses. Since we know or can estimate annual losses of the male portion of the population, and since we have samples from the population that reflect the relative proportions of males, females, and calves within the population, we can derive a crude but conservative estimate of population size - crude because harvest (the best monitored mortality factor) is dependent on the number of permits issued annually, and conservative since we assume population stability despite evidence that the statewide moose population is expanding.

To derive this estimate, we need to know the proportion of the population comprised of males (34%, based on aerial survey data collected in 2000 and 2002), the number of bull moose removed annually by hunters (733 plus four male calves in 2001), and the proportion of the males removed by harvest (estimated to be 15%). Then, the number of males in the population can be estimated (737/0.15 = 4,913). Since males comprised 34% of the total population, the population can be estimated (4,913/.34 = 14,450). A population of 14,450 moose in Idaho would equate to 0.13 moose/km² (0.34 moose/mi²).

While both of these estimates are crude approximations, we believe they provide bounds on Idaho's moose population, and that Idaho moose conservatively numbered between 15,000 and 25,000 animals in 2002, approximately three times population estimates published in 1990 (Table 3).

MANAGEMENT INFORMATION NEEDS

One of the tools needed by moose managers worldwide is a means of accurately estimating population size. However, since that likelihood seems remote at present, accurate information that allows managers to refine their estimates is important. One of the priority concerns in Idaho

is development of a model that relates maximum antler spread to age of bull moose, utilizing annuli in the teeth of harvested animals.

As moose populations grow and colonize low elevation habitats, information is needed on habitat selection and carrying capacities (both biological and social). Moose managers must be able to assess the potential of occupied range to support a moose population at levels where moose damage to private lands and property is acceptable.

Better understanding of the process of population growth and expansion into unoccupied habitats would improve moose population management. An understanding of minimum moose densities required for population growth and dispersal is also important.

Social data relating to hunter satisfaction with drawing odds and quality of moose harvested is needed. A complaint often heard by IDFG managers is the inability of some hunters to draw a moose tag. Many of those hunters, however, are referring to a bull moose tag and seldom have interest in harvesting a cow.

As moose populations grow, there is increased risk of rapid transfer of disease throughout the population. Moose susceptibility to known parasites and diseases, and potential impacts of new disease agents should be assessed and regularly monitored. Two cases of moose succumbing to *Elaeophora schneideri* in eastern Idaho have been documented, however, no understanding of that parasite's range or prevalence in moose has been determined for Idaho.

Comprehensive data on all causes of mortality other than legal harvest are also needed.

ACKNOWLEDGEMENTS

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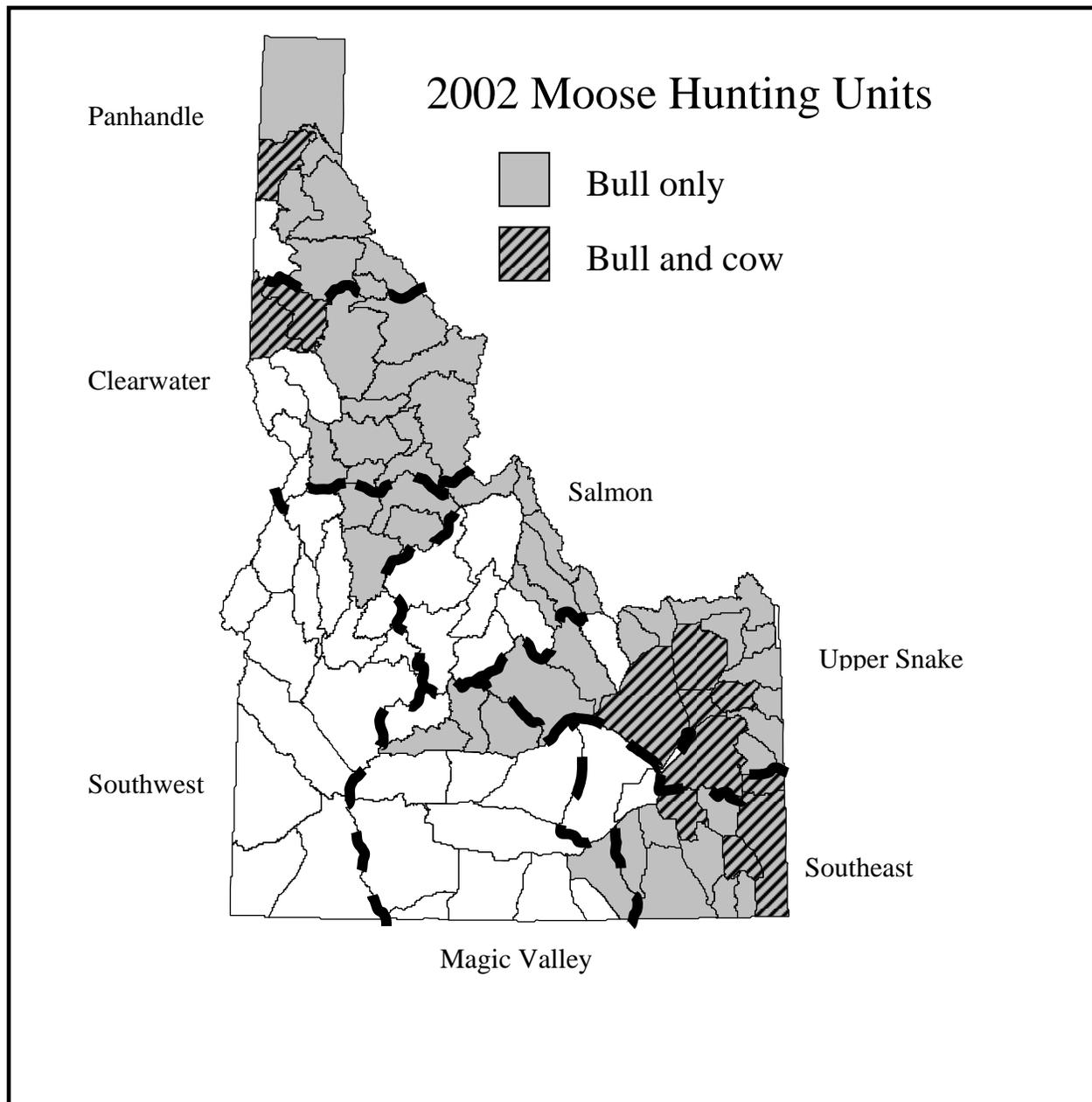


Figure 1. State of Idaho Fish and Game Department administrative regions and Game Management Units showing availability of bull and cow moose permits, 2002.

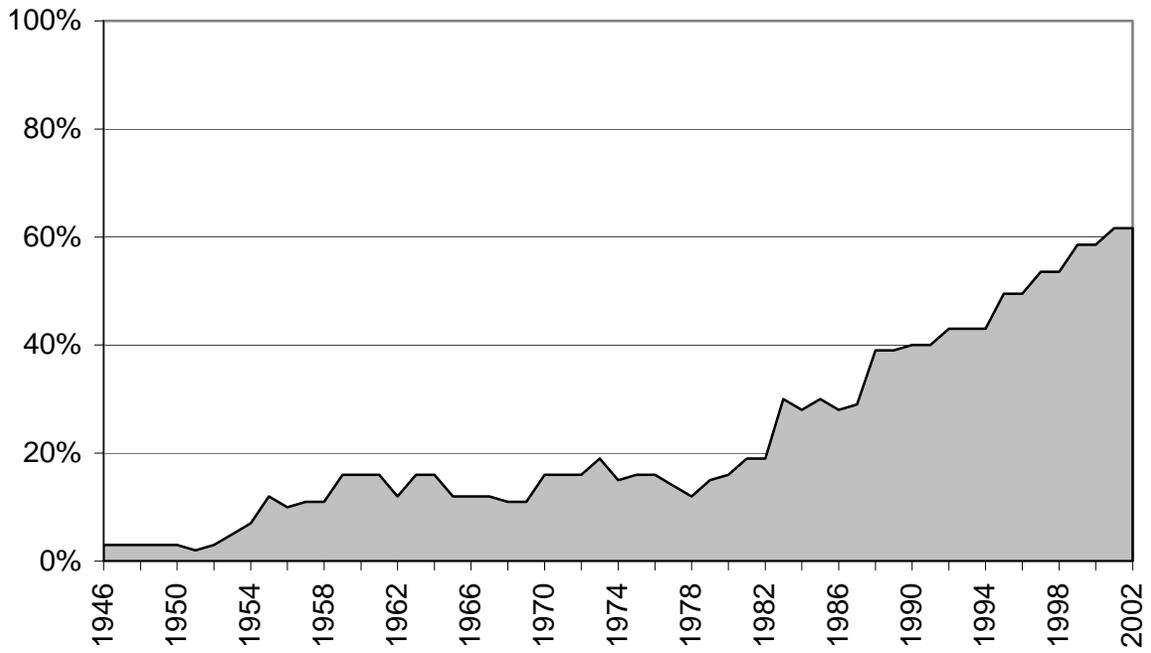


Figure 2. Percent of Game Management Units with moose permits offered, Idaho, 1946-2002.

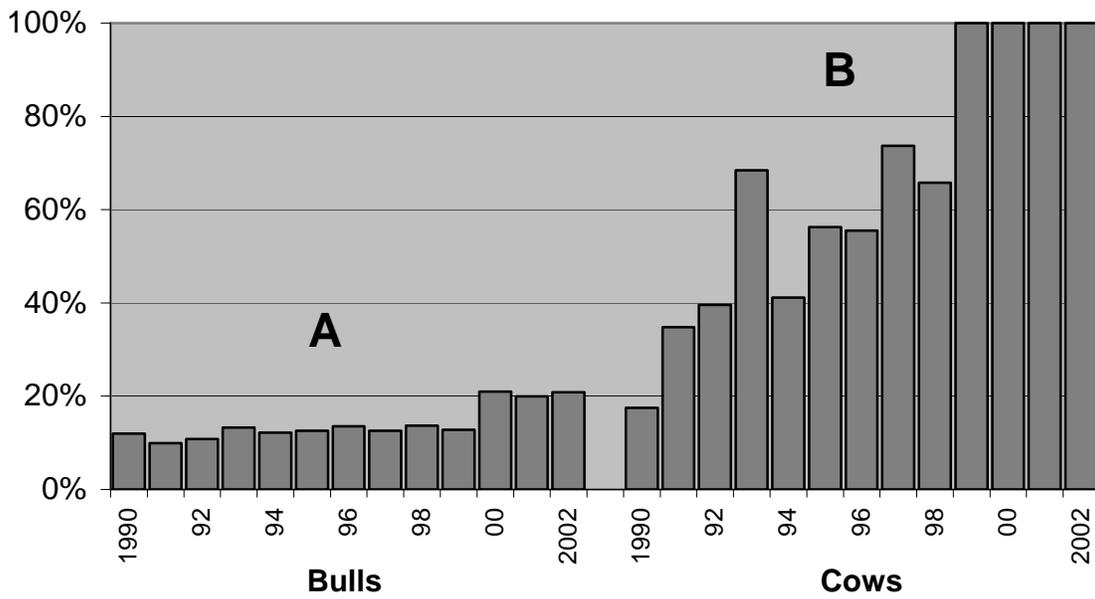


Figure 3. Percent of first-choice applications for bull and cow moose permits being drawn, Idaho, 1990-2002.

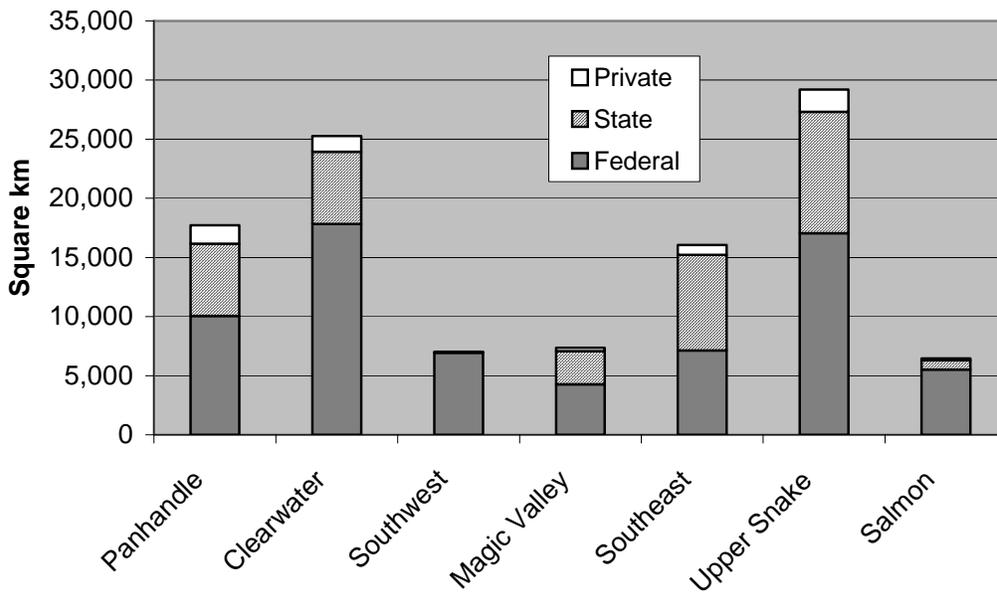


Figure 4. Square km open to moose hunting in Idaho by administrative region, and land ownership, 2002.

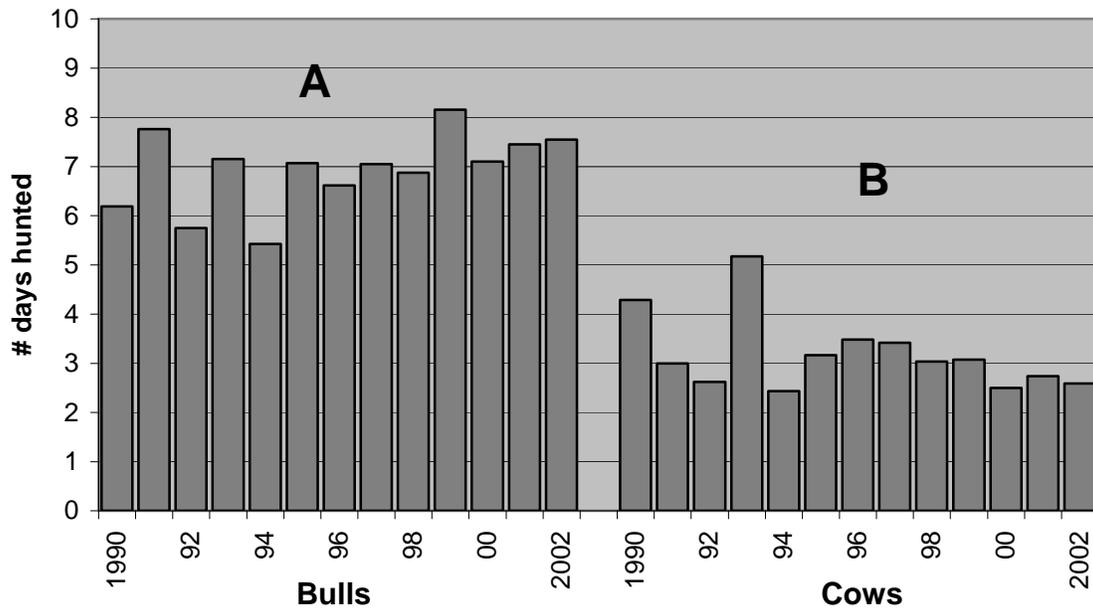


Figure 5. Mean number of days hunted prior to harvest for bull and cow moose, by year in Idaho, 1990-2002.

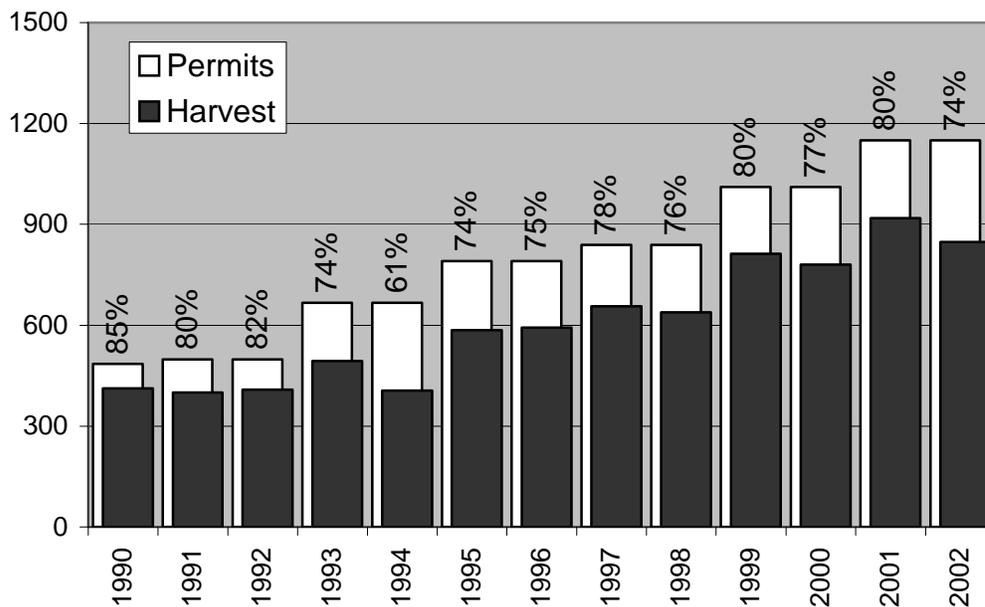


Figure 6. Moose permits and harvest including all zones and tags statewide, Idaho, 1990-2002. Percent harvest success labeled above permits.

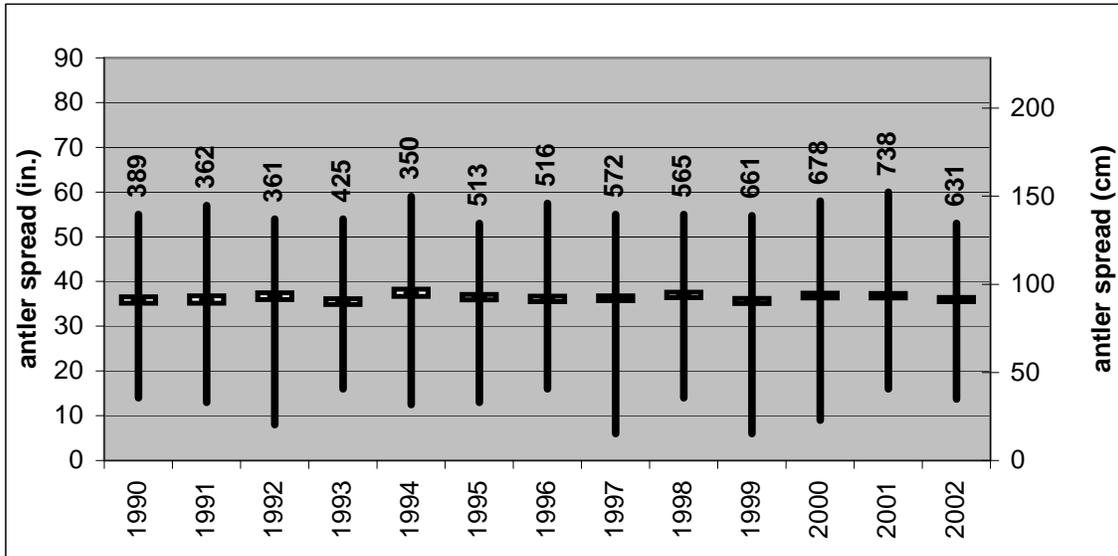


Figure 7. Mean antler spread and 95% confidence interval moose in Idaho, 1990-2002. Sample sizes shown above range, height of wide box is 95% CI.

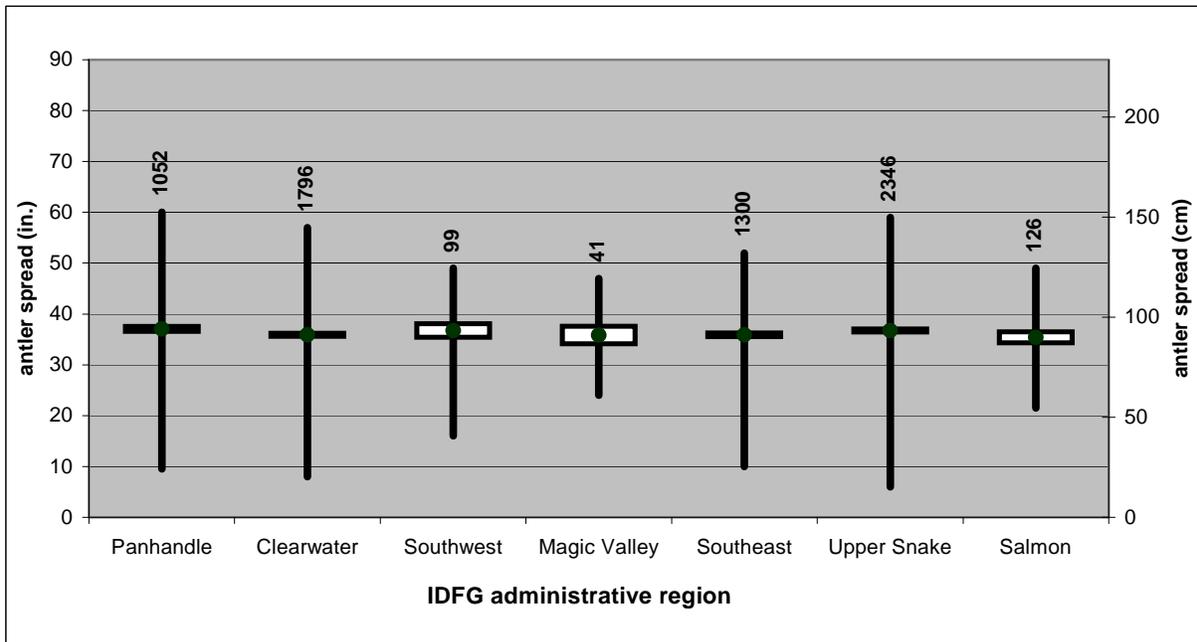


Figure 8. Mean antler spread and 95% confidence interval for moose in Idaho by administrative region, 1990-2002. Sample sizes are shown above range, height of wide bar is 95% CI.

Table 1. Antlerless moose permits, known and unknown sex harvests, and % males in the antlerless harvest, Idaho, 1993-2001.

Year	Antlerless Permits	Total Harvest	Unknown Sex	Known Sex	Males	% Males
1993	65	54	0	54	12	22.2
1994	65	40	0	40	4	10.0
1995	81	63	0	63	5	7.9
1996	81	63	0	63	2	3.2
1997	98	73	0	73	8	11.0
1998	98	66	0	66	4	6.1
1999	123	109	6	103	4	3.9
2000	123	87	0	87	6	6.9
2001	142	93	0	93	4	4.3
Total	876	648	6	642	49	7.6

Table 2. Documented human-caused and natural/unknown moose mortalities not considered legal harvest for Idaho, 1990-2002.

Category	Mortality Factor	Number
Human-caused	Vehicle & train	452
	Illegal kill	416
	Indian harvest	97
	Other human-caused	48
Natural/Unknown	Unknown	177
	Natural mortality	71
	Winter kill	46
	Predation	5

Table 3. Published estimates of moose numbers in Idaho.

Year	IDFG ^a	Karns ^b	Timmermann & Buss ^c
1960		4,100	
1965		4,400	
1970		4,600	
1975		4,700	
1980		4,900	
1981	3,530		
1982			3,600
1985	4,385	5,100	
1990	4,565	5,100	5,500

^a Wildlife Species Management Plans; IDFG 1981, Hayden et al. 1985, Leege et al. 1990.

^b Karns 1997.

^c Timmermann and Buss 1995, 1997.

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Moose Surveys and Inventories</u>
PROJECT:	<u>W-170-R-27</u>		
SUBPROJECT:	<u>1</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>1</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>6</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2002 to June 30, 2003</u>		

PANHANDLE REGION

ABSTRACT

Permit levels in 2002 were unchanged from 2001. However, 2001 represented a 79% increase in permits, improving drawing odds to one in eight compared to one in 14 the prior years. The increased pressure and subsequent harvest may be resulting in a drop in mean bull age and success rates as easily accessed areas are hunted more intensively than in the past. In 2002, three of 152 bulls harvested exceeded 50 inches in antler spread (2%) while in 2001, eight of 120 bulls exceeded 50 inches (4%). Success rates averaged 82% from 1993-2001 and were 73% in 2002. There were 45 unregulated moose mortalities during 2002.

UNITS 1, 2, 3, 4, 6, 7 AND 9

Management Direction

1. Develop an index to moose population trends that does not rely solely on aerial surveys.
2. Place enforcement emphasis on known problem areas of illegal moose kills. Publicize moose poaching arrests and the statewide reward system (CAP) in the media.
3. Develop a program for warning deer and elk hunters that moose are in an area to reduce accidental kills of moose.
4. Continue to examine present controlled hunt boundaries to include areas not now open to hunting and to distribute moose hunters more evenly. Coordinate moose management and permit levels along the Idaho/Washington border with the Washington Department of Fish and Wildlife.
5. Continue collecting information on moose distribution and mortality from Department and other agency personnel and the hunting public.

Background

For many years it was believed that the Panhandle Region provided little suitable moose habitat and that populations would remain relatively low. Open areas and extensive riparian areas that typify moose habitat are not widespread in the Region. Rather, moose often utilize closed canopy timber with interspersed shrub fields and creek bottoms. Presently these populations are steadily expanding where timber harvesting and fire have created early-seral shrub fields.

Historically moose have been managed in Idaho for rapid population increases. Seasons have been set on a bulls-only, controlled-hunt basis with conservative permit levels. Currently moose are also managed on a one-kill-in-a-lifetime basis.

Population Surveys

No surveys were conducted for moose during the study period.

Harvest

In the Panhandle Region, moose hunting is now authorized in Units 1, 2, 3, 4, 6, 7, and 9 with an 86-day season for bull moose and a 40-day season for antlerless moose (Table 1). Eleven controlled hunts were authorized in the Panhandle Region in 2002 with a total of 220 permits. One hundred sixty-one permit holders completed the mandatory report stating that they were successful in bagging a bull for a success rate of 73% (Table 2). All units have shown an increase in permits over the past 10 years, with Unit 1 having the largest number of permits (Table 3).

Controlled Hunt Odds

Most areas of Idaho have permits available for a variety of big game species. By forcing a choice between moose and other big game permits, the Department has been successful in substantially improving drawing odds across most of the state. In the Panhandle, the only big game species managed under a permit system is moose, making drawing odds poor for moose.

Interest in moose hunting in the Panhandle Region has been high since moose hunting began. The increase in moose permits offered for 2001-2002 has been greater than the increase in applicants, resulting in an improvement in the odds of drawing a permit. In 2002, the combined odds of drawing a moose permit were one in eight, representing an improvement from previous years when drawing odds were in the mid-teens.

Other Mortalities

Enforcement records of moose illegal mortalities were added to the existing database of moose mortalities for prior years. During the past eight years, 30 to 64 moose mortalities have been detected each year, in addition to controlled hunt harvest (Table 4). The bulk of these were illegal kills with road-kills contributing significantly. During this reporting period, forty-five moose mortalities were documented in the Panhandle Region in addition to controlled hunts, 15

of which were illegal kills. The Coeur d'Alene Indian Tribe regulates moose harvest on ceded lands under agreement with the State of Idaho. In coordination with state goals, the tribe planned to increase tribal harvest to 10 bull moose on ceded lands during 2002. Final tribal harvest is unknown at this time, but is estimated to be 10 animals based on prior success rates. Tribal harvest remains a negligible impact to moose herd dynamics in the Panhandle.

Management Implications

Recent aerial surveys allowed permit numbers to be increased from 123 to 220 for the 2001 and 2002 seasons. The number of applicants remained approximately the same, so drawing odds improved substantially, with one in eight applicants drawing a permit. Success rates in 2002 dropped to 73% from an average of 82% in previous years (1993-2001). The effort required to harvest a moose was relatively unchanged from previous years. Three of the 156 bulls checked were measured at 50 inches or greater maximum antler spread, which represents a decrease from previous years. However, large bulls are still available, with 23 bulls over 45 inches in size.

This year's data reflects the second year of a more aggressive moose management program. During 2001, hunt areas were combined into larger hunts, and permit levels were increased substantially, including a conservative cow moose hunt in Unit 2. This system allowed much higher hunter participation (+79% compared to 2000) with an associated improvement in drawing odds (one permit per 14 applicants in 2000 vs. one permit per eight applicants in 2001 and 2002). Our expectation was that mean bull age and bull moose density would decrease somewhat during the next few years as easily accessed areas were hunted more intensively than in the past. The drop in the number of large bulls (>50 inches spread) and the decrease in success rates may reflect such a change in the easily-accessed portion of the moose population.

Table 1. 2002 season structure for controlled moose hunts in the Panhandle Region.

Hunt Area	Season		Permits	Open For
	Dates	Length		
1-1	30 August-23 November	86 days	60	Antlered
1-2	30 August-23 November	86 days	30	Antlered
1-3	30 August-23 November	86 days	25	Antlered
1-4	30 August-23 November	86 days	40	Antlered
2	30 August-23 November	86 days	20	Antlered
2	15 October-23 November	40 days	5	Antlerless
3	30 August-23 November	86 days	5	Antlered
4	30 August-23 November	86 days	10	Antlered
6	30 August-23 November	86 days	10	Antlered
7	30 August-23 November	86 days	10	Antlered
9	30 August-23 November	86 days	5	Antlered

Table 2. Summary of moose harvest and drawing odds in the Panhandle Region, 1993-present.

Year	Permits	Harvest		% Success	Days/ Hunter ^a	First Choice Applicants	Drawing Odds
		M	F				
1993	83	69	0	83	9.3	1,361	1:16.4
1994	83	63	0	76	8.5	1,430	1:17.2
1995	100	84	0	84	10.3	1,529	1:15.3
1996	100	74	0	74	7.4	1,516	1:15.2
1997	103	85	0	83	9.7	1,837	1:17.8
1998	103	91	0	88	8.6	1,623	1:15.8
1999	123	100	0	81	10.8	2,001	1:16.3
2000	123	106	0	86	8.6	1,765	1:14.3
2001	220	176	5	82	8.9	1,799	1:8.2
2002	220	156	5	73	8.4	1,703	1:7.7

^a From 1993-1995, data are from a telephone survey of all hunters. Beginning in 1996, data are from mandatory check of successful hunters only.

Table 3. Summary of moose harvest and drawing odds by Hunt Area in the Panhandle Region, 1993-present.

Hunt Area	Year	Permits	Harvest		% Success	Days/ Hunter ^a	First Choice Applicants	Drawing Odds	
			M	F					
1	1993	59	51	0	86	11.8	990	1:16.8	
	1994	59	45	0	76	8.1	1,026	1:17.4	
	1995	74	63	0	85	11.3	1,106	1:14.9	
	1996	74	56	0	76	7.9	1,081	1:14.6	
	1997	74	64	0	86	10.2	1,109	1:15.0	
	1998	74	67	0	91	8.4	1,050	1:14.2	
	1999	88	68	0	77	12.1	1,324	1:15.0	
	2000	88	75	0	85	8.6	812	1:9.2	
	2001	155	120	0	77	8.6	828	1:5.3	
	2002	155	103	0	66	9.2	1,065	1:6.9	
	2	1993	4	4	0	100	7.0	125	1:31.3
		1994	4	3	0	75	2.3	120	1:30.0
1995		5	5	0	100	4.8	116	1:23.2	
1996		5	5	0	100	5.0	129	1:25.8	
1997		10	9	0	90	9.0	230	1:23.0	
1998		10	10	0	100	14.0	225	1:22.5	
1999		10	10	0	100	9.6	298	1:29.8	
2000		10	10	0	100	6.4	162	1:16.2	
2001		25 ^b	20	5	100	8.2	211	1:8.4	
2002		25 ^c	20	5	100	5.0	205	1:8.2	
3 & 4	1993	4	3	0	75	4.5	57	1:14.3	
	1994	4	4	0	100	7.3	60	1:15	
	1995	4	3	0	75	9.3	57	1:14.3	
	1996	4	4	0	100	10.0	86	1:21.5	
	1997	4	2	0	50	2.7	104	1:26.0	
	1998	4	3	0	75	9.1	87	1:21.8	
	1999	5	4	0	80	4.3	29	1:5.8	
3	2000	5	4	0	80	11.3	27	1:5.4	
	2001	5	5	0	100	7.2	35	1:7.0	
	2002	5	5	0	100	10.8	49	1:9.8	
	4	1999	5	4	0	80	8.0	110	1:22.0
2000		5	5	0	100	9.5	68	1:13.6	
2001		10	9	0	90	12.0	108	1:10.8	
2002		10	7	0	70	10.0	122	1:12.2	
6	1993	4	3	0	75	3.0	92	1:23.0	
	1994	4	4	0	100	2.5	101	1:25.3	
	1995	5	5	0	100	10.3	156	1:31.2	
	1996	5	5	0	100	7.8	124	1:24.8	
	1997	5	4	0	80	7.0	175	1:35.0	
	1998	5	5	0	100	12.0	181	1:36.2	
	1999	5	5	0	100	11.8	154	1:38.0	
	2000	5	4	0	80	8.3	121	1:24.2	
	2001	10	7	0	70	11.0	132	1:13.2	
	2002	10	8	0	80	4.1	147	1:14.7	
7	1993	8	5	0	63	8.4	56	1:7.0	
	1994	8	4	0	50	14.5	87	1:10.9	

Table 3. Continued.

Hunt Area	Year	Permits	Harvest		% Success	Days/ Hunter ^a	First Choice Applicants	Drawing Odds
			M	F				
9	1995	8	4	0	50	11.9	68	1:8.5
	1996	8	2	0	25	2.5	46	1:5.8
	1997	5	4	0	80	9.0	60	1:12.0
	1998	5	1	0	20	17.7	48	1:9.6
	1999	5	4	0	80	6.5	56	1:11.2
	2000	5	3	0	60	8.8	34	1:6.8
	2001	10	10	0	100	11.8	108	1:10.8
	2002	10	10	0	100	9.4	57	1:5.7
	1993	4	3	0	75	4.5	41	1:10.3
	1994	4	3	0	75	7.8	40	1:10.0
	1995	4	4	0	100	6.7	26	1:6.5
	1996	4	2	0	50	5.0	50	1:12.5
	1997	5	2	0	40	9.5	44	1:8.8
	1998	5	5	0	100	10.6	32	1:6.4
	1999	5	5	0	100	7.4	30	1:6.0
	2000	5	5	0	100	9.2	41	1:8.2
	2001	5	5	0	100	8.0	61	1:12.2
2002	5	5	0	100	10.0	40	1:8.0	

^a From 1993-1995, data are from a telephone survey of all hunters. Beginning in 1996, data are from mandatory check of successful hunters only.

^b Includes five antlerless permits (five killed) with 13 applicants.

^c Included five antlerless permits (five killed) with 18 applicants.

Table 4. Summary of all known moose mortalities in the Panhandle Region, excluding controlled hunts, 1994-present.

Year	Mortality Agent						Total
	Indian Harvest	Illegal Kill	Road Kill	Natural	Train Kill	Other	
1994	2	14	7	1	1	5	30
1995	2	42	5	3	0	12	64
1996	4	16	16	3	10	5	54
1997	2	12	9	3	4	2	32
1998	2	35	5	4	0	2	48
1999	2	24	20	4	1	3	54
2000	2	16	15	1	3	1	38
2001	9	22	8	0	0	3	42
2002	10 ^a	15	20	0	0	0	45

^a Estimate. The Coeur d'Alene Indian Tribe issued 10 bull moose permits on ceded lands during 2001 and 2002. Final tribal harvest not available for 2002.

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Moose Surveys and Inventories</u>
PROJECT:	<u>W-170-R-27</u>		
SUBPROJECT:	<u>2</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>1</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>6</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2002 to June 30, 2003</u>		

CLEARWATER REGION

ABSTRACT

Based upon mandatory harvest report data, Clearwater Region hunters harvested 151 antlered moose in 40 antlered-only controlled hunts and an additional eight antlerless moose in two controlled hunts for antlerless moose in 2002. A total of 270 (262 antlered, eight antlerless) permits were available across the Region and hunters reported a harvest success rate of 57%. Antlered and antlerless success rates were 55% and 100%, respectively. Drawing odds ranged from 1:1.0 (Hunt Areas 17-3, 17-4, and 20-3) to 1:14.3 (Hunt Area 8A-1).

UNITS 8, 8A, 10, 10A, 12, 14, 15, 16, 17, 19, AND 20

**CONTROLLED HUNT AREAS 8, 8A, 10-1, 10-2, 10-3, 10-4, 10-5, 10-6,
10A-1, 10A-2, 10A-3, 10A-4, 10A-5, 12-1, 12-2, 12-3, 12-4, 12-5, 12-6,
14-1, 14-2, 15-1, 15-2, 15-3, 15-4, 16-1, 16-2, 16A-1, 16A-2,
17-1, 17-2, 17-3, 17-4, 17-5, 19-1, 19-2, 20-1, 20-2, 20-3, AND 20-4**

Management Direction

Moose populations will be allowed to increase in units where habitat conditions will support expansion. Legal harvest will continue primarily for antlered bulls. Antlerless moose hunting opportunity will be continued in those areas where population control measures are considered necessary. Moose harvest will be increased where feasible and decreased where necessary. Known mortalities will be documented and information on numbers and distribution will be obtained from big game mortality report forms and from the mandatory harvest checks.

Moose populations large enough to support hunts are found in all big game management units in the Region except Units 11, 11A, 13, and 18. Management units are divided into controlled hunts to disperse hunters and to direct harvest to specific areas.

Moose have been hunted with controlled hunts on a bulls-only and once-in-a-lifetime basis (if permittee is successful in harvesting a moose). However, in 1999, two antlerless moose hunts (Hunt 8-2 with four permits, and Hunt 8A-2 also with four permits) were initiated to increase

hunting opportunity, address high cow moose densities, and minimize the potential for moose-automobile collisions in these areas. Hunting season lengths for moose in the Clearwater Region were 86 days for antlered moose hunts and 40 days for antlerless moose hunts (Table 1). Since 1986, persons applying for moose permits have been prohibited from applying for any other controlled hunt to improve drawing odds. Additionally, unsuccessful permittees must wait two years before applying for another controlled moose hunt. Permit levels are based on trends in antler spread of harvested moose and hunter success rates of recent permittees in the respective controlled hunts.

Some moose populations in the Clearwater Region are found in climax vegetative cover. Summer feeding habits tend to be nocturnal in open, wet meadows, while diurnal activity is limited to adjacent forested areas. Logging may reduce habitat for these populations. Winter habitat selection favors subalpine fir and pacific yew plant communities. Other populations are adapted to seral plant communities, except in winter. These populations seem to be expanding in areas where extensive habitat manipulation has resulted in seral brushfields. Winter ranges appear to be timbered areas where yew-wood thickets are several hundred years old. Creating openings in these timber stands through logging may impact moose by eliminating these yew-wood thickets. The effects on moose of the recent expansion in wolf numbers within the Region is as yet undetermined.

Population Surveys

Moose in the Clearwater Region are usually counted incidental to elk surveys. Consequently, many moose are not counted because these surveys are seldom flown at elevations where moose normally winter and because moose tend to prefer dense subalpine fir plant associations for winter habitat where they are less conspicuous. As a result, no comparative population data have been collected on a regular basis on moose throughout the Region.

During aerial surveys for elk in Unit 17 in January 1995, four search units within the elk survey area and seven additional search units outside of the area were flown specifically for moose. These search units were located on the north side of the lower Selway River and were delineated to assess moose densities using the moose sightability model (Unsworth et al. 1994, Beta 3 version). Sixteen moose (five cows, nine bulls, one calf, and one unclassified) were observed in Hunt Area 17-3, for an estimate of 36 ± 20 moose (eight cows, 18 bulls, two calves, eight unclassified). Outside of the sightability survey area, 22 moose were observed (seven cows, eight bulls, three calves, and four unclassified). Additionally, in Unit 16A, 19 moose (four cows, 10 bulls, and five unclassified) were observed incidental to elk surveys.

During January 2000, a moose sightability survey was conducted across Hunt Areas 15-1, 15-2, 15-6, and 15-7 (north of State Highway 14 and west of the American River drainage) concurrent with elk surveys in Unit 15. The objectives of the survey were to 1) obtain an adult population estimate to evaluate future population changes, and 2) to obtain a sex composition/bull population estimate as a baseline to evaluate the future effect(s) of recent permit increases. Contiguous hunt areas were selected where permits were recently increased to 10 in each area, in a sufficiently small area that could be surveyed with available budget constraints (13 hours of flight time) and still be adequate to obtain estimates with low sampling variances. In search

units already selected for the elk survey, additional funds were expended to fly to higher elevations beyond those normally surveyed for elk. Furthermore, additional flight time was used to fly a large sample of the remaining subunits.

Twenty-six moose (seven cows, nine bulls, two calves, eight unclassified) were observed from a Hughes 500C helicopter during the survey. Sex classification was not always possible due to heavy vegetative cover and the lack of antlers on some moose. These data were initially analyzed with the moose sightability model (Unsworth et al. 1994, Beta 3 version). The results were an unexpected estimate of 614 ± 481 moose at the 90% CI level that was extrapolated from the 26 observed moose (corrected to 31 with the sampling design).

Further examination of the moose model revealed that during its development, only four moose were in cover greater than 70%. As a result, each moose is corrected to a range of 1.04 to 7.83 moose when observed in the first four cover classes (0-71% cover), but corrected to 34.38 moose in cover class 5, and to 100.0 moose in cover class 6 (90-100% cover). This effect is amplified when visibility declines and the intercept is decreased when the Hughes 500 helicopter is used for the survey. Therefore, the three moose observed in greater than 70% cover during the Unit 15 survey contributed greatly to the total estimate. Considerations for avoiding this concern in future surveys might include conducting surveys at a time of year when they are found in less cover, or earlier in the winter (December) when antlers are consistently present to improve classification efforts.

Harvest

Harvest levels, hunter success, and hunter days expended for 2002 were determined from mandatory harvest reports (Table 2). Hunt areas in Units 12, 15, and 17 were combined and/or renamed in 2001 and one new hunt area was added in Unit 10 (10-6) in 2001. Permit numbers were adjusted in the Region to respond to changes in hunter success rates and/or antler spread with a net loss of 22 permits. The 270 moose permits that were available in 2002 resulted in a reported harvest of 151 antlered moose and eight antlerless moose. Mortality reports from some permittees were unaccounted for and were not used in calculating hunter success. Twenty permits were not filled during the controlled hunt drawing process due to lack of interest (three permits in Unit 12, 11 permits in Unit 17, two permits in Unit 19, and four permits in Unit 20) but were sold as left-overs. The 2002 cumulative success rate (57%) was slightly lower than the average (59%) for the past five-year period (1998-2002). Success rates for antlered and antlerless moose were 55% and 100%, respectively. Drawing odds ranged from 1:1.0 (Hunt Areas 17-3, 17-4, and 20-3) to 1:14.3 (Hunt Area 8A-1).

Reported moose mortalities resulting from other than legal harvest during controlled hunts have varied considerably by unit (Table 3). Unit 15 continues to average the highest number of reported mortalities in the Region outside of scheduled hunts, followed by Units 10A and 12. It is likely that the level of mortality is considerably higher than reported for the Clearwater Region, particularly with respect to the 'Indian Harvest' and 'Illegal Kill' categories.

Climatic Conditions

The Clearwater Region experienced weather conditions in 2002-2003 that were considered near normal. Snowpack in the Clearwater Basin was 97% of average (October through March) while the Salmon River Basin averaged 100% for the same time period. Snowfall was later than usual in the Region with little accumulation at the lower elevations for any duration of time. This allowed big game populations to forage and move easily and probably had a positive effect on big game survival.

Management Implications

Permit levels will continue to be allocated based on trends in antler spread of harvested moose and hunter success rates of recent permittees. Numbers of permits may be increased or decreased as dictated by harvest data. Permit numbers were decreased (-22) in the Clearwater Region in 2001; more substantial decreases in the near future are not anticipated.

All areas need more intensive work to determine population levels, trends, and habitat selection and use. Some moose populations are increasing and seem to respond favorably to extensive habitat alteration by silvicultural practices. However, other populations may be displaced or eliminated because they cannot adapt to habitat changes, particularly where yew-wood thickets are eliminated through logging and where increased road densities make moose more vulnerable to illegal and Indian harvest.

LITERATURE CITED

Unsworth, J. W., F. A. Leban, D. J. Leptich, E. O. Garton, and P. Zager. 1994. Aerial Survey: User's Manual, Second Edition, Idaho Department of Fish and Game, Boise, ID. 84 pp.

Table 1. 2002 season structure for controlled moose hunts in the Clearwater Region.

Hunt Area	Season		Permits	Open For
	Dates	Length		
8	30 August-23 November	86 days	6	Antlered
8	15 October-23 November	40 days	4	Antlerless
8A	30 August-23 November	86 days	6	Antlered
8A	15 October-23 November	40 days	4	Antlerless
10-1	30 August-23 November	86 days	6	Antlered
10-2	30 August-23 November	86 days	3	Antlered
10-3	30 August-23 November	86 days	8	Antlered
10-4	30 August-23 November	86 days	4	Antlered
10-5	30 August-23 November	86 days	4	Antlered
10-6	30 August-23 November	86 days	3	Antlered
10A-1	30 August-23 November	86 days	9	Antlered
10A-2	30 August-23 November	86 days	8	Antlered
10A-3	30 August-23 November	86 days	3	Antlered
10A-4	30 August-23 November	86 days	7	Antlered
10A-5	30 August-23 November	86 days	5	Antlered
12-1	30 August-23 November	86 days	3	Antlered
12-2	30 August-23 November	86 days	13	Antlered
12-3	30 August-23 November	86 days	7	Antlered
12-4	30 August-23 November	86 days	7	Antlered
12-5	30 August-23 November	86 days	9	Antlered
12-6	30 August-23 November	86 days	6	Antlered
14-1	30 August-23 November	86 days	7	Antlered
14-2	30 August-23 November	86 days	6	Antlered
15-1	30 August-23 November	86 days	20	Antlered
15-2	30 August-23 November	86 days	15	Antlered
15-3	30 August-23 November	86 days	5	Antlered
15-4	30 August-23 November	86 days	20	Antlered
16-1	30 August-23 November	86 days	7	Antlered
16-2	30 August-23 November	86 days	10	Antlered
16A-1	30 August-23 November	86 days	5	Antlered
16A-2	30 August-23 November	86 days	2	Antlered
17-1	30 August-23 November	86 days	7	Antlered
17-2	30 August-23 November	86 days	3	Antlered
17-3	30 August-23 November	86 days	2	Antlered
17-4	30 August-23 November	86 days	5	Antlered
17-5	30 August-23 November	86 days	5	Antlered
19-1	30 August-23 November	86 days	4	Antlered
19-2	30 August-23 November	86 days	8	Antlered
20-1	30 August-23 November	86 days	5	Antlered
20-2	30 August-23 November	86 days	4	Antlered
20-3	30 August-23 November	86 days	2	Antlered
20-4	30 August-23 November	86 days	3	Antlered

Table 2. Summary of moose harvest and drawing odds by Hunt Area in the Clearwater Region, 1993-present.

Hunt Area	Year	Permits	Harvest		% Success	Days/ Hunter ^a	First Choice Applicants	Drawing Odds	
			M	F					
8	1993	2	2	0	100	6.5	16	1:8.0	
	1994	2	2	0	100	7.0	16	1:8.0	
	1995	4	3	0	75	12.8	55	1:13.8	
	1996	4	3	0	75	15.3	41	1:10.3	
	1997	4	3	0	75	7.0	41	1:10.3	
	1998	4	4	0	100	17.6	44	1:11.0	
	1999	10	6	4	100	8.7	61	1:6.1	
	2000	10	5	3	80	5.1	34	1:3.4	
	2001	10	5	3	80	7.1	35	1:3.5	
	2002	10	6	4	100	5.4	52	1:5.2	
	8A	1993	2	2	0	100	12.5	46	1:23.0
		1994	2	2	0	100	20.0	42	1:21.0
1995		4	4	0	100	15.5	58	1:14.5	
1996		4	3	0	75	7.8	65	1:16.3	
1997		4	2	0	50	9.5	84	1:21.0	
1998		4	4	0	100	5.5	93	1:23.3	
1999		10	6	4	100	5.2	154	1:5.4	
2000		10	6	4	100	3.5	76	1:7.6	
2001		10	5	4	90	4.1	104	1:10.4	
2002		10	5	4	90	4.6	93	1:9.3	
10		1993	19	17	0	89	8.8	159	1:8.4
		1994	19	11	0	58	7.9	119	1:6.3
	1995	23	14	0	61	7.6	114	1:5.0	
	1996	23	16	0	70	7.3	124	1:5.4	
	1997	23	16	0	70	8.4	134	1:5.8	
	1998	23	14	0	61	6.7	151	1:6.6	
	1999	23	16	0	70	11.1	149	1:6.5	
	2000	23	13	0	57	4.0	112	1:4.9	
	2001	28	17	0	61	6.4	91	1:3.3	
	2002	28	14	0	50	9.3	86	1:3.1	
	10A	1993	9	8	0	89	5.9	82	1:9.1
		1994	9	7	0	78	10.5	58	1:6.4
1995		23	21	0	91	8.3	184	1:8.0	
1996		23	19	0	83	9.9	155	1:6.7	
1997		23	20	0	87	13.2	201	1:8.7	
1998		23	14	0	61	9.8	151	1:6.6	
1999		34	21	0	62	8.7	194	1:5.7	
2000		34	29	0	85	11.9	134	1:3.9	
2001		32	28	0	88	6.8	116	1:3.6	
2002		32	26	0	81	7.9	130	1:4.1	
12		1993	52	40	0	77	6.6	287	1:5.5
		1994 ^b	52	26	0	50	7.1	266	1:5.1
	1995	64	37	0	58	5.9	258	1:4.0	
	1996	64	33	0	52	5.2	201	1:3.1	
	1997 ^c	64	29	0	45	5.0	258	1:4.0	
	1998 ^b	64	27	0	42	5.6	172	1:2.7	

Table 2. Continued.

Hunt Area	Year	Permits	Harvest		% Success	Days/ Hunter ^a	First Choice Applicants	Drawing Odds
			M	F				
14	1999 ^b	61	29	0	48	6.0	191	1:3.1
	2000 ^b	61	31	0	51	6.3	119	1:2.0
	2001	45	16	0	36	3.0	70	1:1.6
	2002	45	24	0	53	4.5	58	1:1.3
	1994	6	5	0	83	3.8	76	1:12.7
	1995	10	10	0	100	6.6	111	1:11.1
	1996	10	10	0	100	5.7	113	1:11.3
	1997	10	9	0	90	3.9	161	1:16.1
	1998	10	8	0	80	6.0	124	1:12.4
	1999	10	9	0	90	7.9	157	1:15.7
	2000	10	9	0	90	4.5	100	1:10.0
15	2001	13	11	0	85	3.5	124	1:9.5
	2002	13	11	0	85	5.3	120	1:9.2
	1993	41	37	0	90	9.0	376	1:9.2
	1994	41	39	0	95	7.9	329	1:8.0
	1995	51	44	0	86	7.8	408	1:8.0
	1996	51	43	0	84	7.1	337	1:6.6
	1997	51	37	0	73	6.8	346	1:6.8
	1998	51	44	0	86	8.7	287	1:5.6
	1999	60	50	0	83	7.5	386	1:6.4
	2000	60	44	0	73	8.2	212	1:3.5
	2001	60	34	0	57	8.9	256	1:4.3
16	2002	60	35	0	58	8.5	176	1:2.9
	1993	10	9	0	90	6.4	71	1:7.1
	1994	10	10	0	100	6.6	103	1:10.3
	1995	14	12	0	86	3.8	90	1:6.4
	1996	14	9	0	64	5.4	65	1:4.6
	1997	14	10	0	71	10.2	94	1:6.7
	1998	14	11	0	79	6.3	79	1:5.6
	1999	14	14	0	100	6.5	89	1:6.4
	2000	14	13	0	93	6.2	78	1:5.6
	2001	17	10	0	59	6.3	65	1:3.8
	2002	17	11	0	65	5.4	40	1:2.4
16A	1993	5	4	0	80	5.8	20	1:4.0
	1994	5	3	0	60	15.7	43	1:8.6
	1995 ^d	7	6	0	86	6.9	38	1:5.4
	1996	7	2	0	29	2.0	41	1:5.9
	1997	7	5	0	71	5.0	33	1:4.7
	1998	7	5	0	71	8.2	43	1:6.1
	1999	7	5	0	71	7.8	21	1:3.0
	2000	7	3	0	43	8.7	21	1:3.0
	2001	7	6	0	86	4.3	13	1:1.9
	2002	7	3	0	43	14.3	14	1:2.0
	17	1993	31	17	0	55	8.7	64
1994		31	13	0	42	8.7	61	1:2.0
1995		35	13	0	37	7.9	66	1:1.9
1996		35	8	0	23	3.3	45	1:1.3

Table 2. Continued.

Hunt Area	Year	Permits	Harvest		% Success	Days/ Hunter ^a	First Choice Applicants	Drawing Odds
			M	F				
19	1997	35	11	0	31	5.4	37	1:1.1
	1998	35	4	0	11	4.3	26	1:1.0
	1999	35	11	0	31	4.5	55	1:1.6
	2000 ^b	35	12	0	34	5.8	23	1:1.0
	2001	22	2	0	9	4.5	25	1:1.1
	2002	22	9	0	41	6.5	14	1:1.0
	1993	12	10	0	83	6.8	52	1:4.3
	1994	12	8	0	67	6.8	34	1:2.8
	1995	14	8	0	57	5.5	71	1:5.1
	1996	14	9	0	64	4.3	44	1:3.1
	1997	14	9	0	64	6.9	156	1:11.1
	1998	14	10	0	71	3.4	37	1:2.6
	1999	14	7	0	50	3.7	42	1:3.0
	2000	14	7	0	50	5.6	29	1:2.1
20	2001	12	2	0	17	14.0	15	1:1.3
	2002	12	4	0	33	5.0	6	1:1.0
	1993	12	7	0	58	11.6	38	1:3.2
	1994	12	7	0	58	8.9	44	1:3.7
	1995	14	5	0	36	8.6	48	1:3.4
	1996	14	7	0	50	3.6	57	1:4.1
	1997	14	6	0	43	4.0	34	1:2.4
	1998	14	8	0	57	12.1	43	1:3.1
	1999	14	6	0	43	3.8	41	1:2.9
	2000	14	5	0	36	11.4	23	1:1.6
2001	14	5	0	36	8.4	17	1:1.2	
2002	14	4	0	29	4.5	14	1:1.0	

^a From 1993-1995, data are from a telephone survey of all hunters. Beginning in 1996, data are from mandatory check of successful hunters only.

^b Some permits not sold.

^c One permittee returned tag prior to season start.

^d Failure to make contact with two permittees during telephone survey of hunters; therefore, harvest estimate and days hunted were taken from the big game mandatory report.

Table 3. Summary of all known moose mortalities by Unit in the Clearwater Region, excluding controlled hunts, 1993-present.

Unit/ Year	Mortality Agent						Total
	Indian Harvest	Illegal Kill	Road Kill	Natural	Train Kill	Other	
8							
1993	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0
1995	0	0	1	0	0	0	1
1996	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
8A							
1993	0	1	1	0	0	0	2
1994	1	0	0	0	0	0	1
1995	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	1	0	0	0	0	1
2000	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
10							
1993	0	1	0	0	0	0	1
1994	0	0	0	0	0	0	0
1995	1	0	0	0	0	0	1
1996	0	1	0	0	0	1	2
1997	0	1	0	0	0	0	1
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	0	0	1	0	0	1
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
10A							
1993	2	3	1	0	0	0	6
1994	0	1	0	0	0	0	1
1995	2	0	0	0	0	0	2
1996	0	1	1	0	0	0	2
1997	0	2	0	0	0	0	2
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	4	4
2000	0	2	0	0	0	0	2
2001	0	1	0	0	0	0	1
2002	0	0	0	0	0	0	0

Table 3. Continued.

Unit/ Year	Mortality Agent						Total
	Indian Harvest	Illegal Kill	Road Kill	Natural	Train Kill	Other	
12							
1993	1	1	2	0	0	0	4
1994	0	0	1	0	0	0	1
1995	0	1	3	0	0	1	5
1996	2	0	2	0	0	3	7
1997	0	1	1	0	0	2	4
1998	0	0	0	0	0	0	0
1999	2	0	0	0	0	2	4
2000	0	0	0	1	0	0	1
2001	0	0	1	0	0	0	1
2002	0	0	1	0	0	0	1
14							
1993	0	3	0	0	0	0	3
1994	0	2	0	0	0	0	2
1995	0	1	1	1	0	0	3
1996	0	1	0	0	0	0	1
1997	0	0	0	0	0	0	0
1998	2	0	0	0	0	1	3
1999	2	0	0	0	0	0	2
2000	0	3	0	0	0	0	3
2001	1	0	0	0	0	0	1
2002	0	2	1	0	0	0	3
15							
1993	2	8	0	0	0	2	12
1994	0	7	1	1	0	2	11
1995	3	1	2	3	0	1	10
1996	2	2	0	3	0	1	8
1997	1	12	1	2	0	0	16
1998	3	2	3	0	0	2	10
1999	1	0	0	0	0	2	3
2000	5	3	0	3	0	0	11
2001	0	6	1	0	0	1	8
2002	2	8	1	0	0	1	12
16							
1993	1	7	1	0	0	0	9
1994	1	0	0	0	0	0	1
1995	0	1	0	0	0	0	1
1996	0	2	1	0	0	0	3
1997	0	1	0	0	0	0	1
1998	1	0	0	0	0	1	2
1999	1	0	0	0	0	0	1
2000	0	0	0	0	0	0	0
2001	0	2	1	0	0	0	3
2002	0	3	0	0	0	1	4

Table 3. Continued.

Unit/ Year	Mortality Agent						Total
	Indian Harvest	Illegal Kill	Road Kill	Natural	Train Kill	Other	
16A							
1993	1	5	0	0	0	0	6
1994	0	1	0	0	0	0	1
1995	0	0	0	0	0	0	0
1996	0	2	0	0	0	0	2
1997	0	0	0	0	0	1	1
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
17							
1993	0	0	0	0	0	0	0
1994	0	0	0	0	0	3	3
1995	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	1	1
1999	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	0	1	0	0	0	1
19							
1993	0	2	0	0	0	0	2
1994	0	1	0	0	0	0	1
1995	1	0	0	0	0	0	1
1996	0	0	0	0	0	0	0
1997	0	0	0	0	0	1	1
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	1	0	0	0	0	1
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
20							
1993	0	0	0	0	0	0	0
1994	0	1	0	0	0	0	1
1995	3	0	0	0	0	0	3
1996	0	0	0	0	0	1	1
1997	0	1	0	0	0	1	2
1998	0	1	0	0	0	0	1
1999	0	0	0	0	0	0	0
2000	0	1	0	0	0	0	1
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Moose Surveys and Inventories</u>
PROJECT:	<u>W-170-R-27</u>		
SUBPROJECT:	<u>3, McCall</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>I</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>6</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2002 to June 30, 2003</u>		

SOUTHWEST REGION, MCCALL

ABSTRACT

Two moose were harvested in Hunt Area 19A in 2002. Two moose were harvested in Hunt Areas 20A-1, 20A-2, and 20A-3, combined, during the 2002 season. Seven permits were issued in these three areas combined in 2002. Hunter success for these three hunt areas combined was 28%. Both permit holders harvested a moose in Hunt Area 25. Two moose were harvested in Hunt Area 26 in 2002. No population trend or herd composition surveys were conducted in Units 19A, 20A, 25, or 26 during the reporting period.

UNITS 19A, 20A, 25, AND 26

CONTROLLED HUNT AREA 20A

Management Direction

Management will be consistent with the statewide management direction delineated in the 1991-1995 Moose Management Plan (pages 15-17).

Background

Moose observations have been increasing in Units 19A, 20A, 25, and 26. As a result, a two-permit hunt was initiated in Unit 20A in 1983. Further increases in moose sightings led to subdivision of the unit in 1995 into three hunt areas, 20A-1, 20A-2, and 20A-3, consisting of two, three, and two permits, respectively. This increase in moose observations in Unit 26 led to the establishment of a two-permit hunt in 1997. Consequently two new hunts, Hunt Area 19A and Hunt Area 25, were created in 1999 consisting of two permits each.

Population Surveys

No moose population surveys were conducted during the reporting period.

Harvest Characteristics

Moose hunting seasons last 86 days in Units 19A, 20A, 25, and 26 (Table 1). Harvest data are generated through a mandatory hunter report requirement. Both permit holders harvested a moose in Hunt Area 19A (Table 2). One moose was harvested in each of Hunt Areas 20A-1 and 20A-2 in 2002. No moose were harvested in Hunt Area 20A-3 in 2002. Hunter success was 28% for all three hunt areas combined. Both permit holders harvested a moose in Hunt Area 25. Two moose were harvested in Hunt Area 26 in 2002.

Management Implications

Because reliable population data are not available and difficult to generate, permit levels have been conservative. The frequency and location of reports indicate pioneering populations exist in game management units adjacent to or near Units 20A and 26 (e.g., 19A, 24, 25). Two, 2-permit moose hunts were implemented in Units 19A (Hunt Area 19A) and 25 (Hunt Area 25) in 1999. All areas need intensive data collection to determine population levels, trends, and habitat selection.

Table 1. 2002 season structure for controlled moose hunts in the Southwest Region.

Hunt Area	Season		Permits	Open For
	Dates	Length		
19A	30 August-23 November	86 days	2	Antlered
20A-1	30 August-23 November	86 days	2	Antlered
20A-2	30 August-23 November	86 days	3	Antlered
20A-3	30 August-23 November	86 days	2	Antlered
25	30 August-23 November	86 days	2	Antlered
26	30 August-23 November	86 days	2	Antlered

Table 2. Summary of moose harvest and drawing odds by Hunt Area in the Southwest Region, 1995-present.

Hunt Area	Year	Permits	Harvest		% Success	Days/Hunter ^a	First Choice Applicants	Drawing Odds
			M	F				
19A ^b	1999	2	2	0	100	18.5	39	1:19.5
	2000	2	1	0	50	-	17	1:8.5
	2001	2	1	0	50	-	18	1:9.0
	2002	2	2	0	100	9.5	19	1:9.5
20A	1995	7	7	0	100	3.7	38	1:5.4
	1996	7	4	0	57	2.8	38	1:5.4
	1997	7	5	0	71	5.2	26	1:3.7
	1998	7	3	0	43	3.0	19	1:2.7
	1999	7	4	0	57	2.8	14	1:2.0
	2000 ^c	7	2	0	29	15.0	19	1:2.7
	2001 ^d	10	3	0	30	4.7	10	1:1.0
	2002	7	2	0	28	-	8	1:1.1
	25 ^b	1999	2	2	0	100	8.5	38
2000		2	1	0	50	-	9	1:4.5
2001		2	2	0	100	8.5	15	1:7.5
2002		2	2	0	100	5.0	17	1:8.5
26 ^e	1997	2	2	0	100	1.5	23	1:11.5
	1998	2	1	0	50	7.0	19	1:9.5
	1999	2	1	0	50	2.0	14	1:7.0
	2000	2	0	0	0	-	5	1:2.5
	2001	2	2	0	100	3.5	4	1:2.0
2002	2	2	0	100	3.5	3	1:1.5	

^a For 1995, data are from a telephone survey of all hunters. Beginning in 1996, data are from mandatory check of successful hunters only.

^b Hunt established in 1999.

^c Three permit holders opted for a rain-check tag in 2001.

^d Includes three rain-check tag recipients from the 2000 hunting season.

^e Hunt established in 1997.

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Moose Surveys and Inventories</u>
PROJECT:	<u>W-170-R-27</u>		
SUBPROJECT:	<u>4</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>I</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>6</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2002 to June 30, 2003</u>		

MAGIC VALLEY REGION

ABSTRACT

The frequency of observations suggest moose have increased in the Big Wood River and Trail Creek areas of Units 48 and 49, and in all of Unit 56. Legal harvest was authorized in the Magic Valley Region for the first time in 1999 in Unit 56. Beginning in the fall of 2001, harvest was authorized in Units 44, 48, and 49. Seven permits were issued in 2002 for the two hunt areas and five hunters were successful.

UNITS 43, 44, 45, 46, 47, 48, 49, 52, 52A, 53, 54, 55, 56, AND 57

Management Direction

Follow statewide management direction; allow established populations to expand; transplant moose where feasible; and increase effort to record sightings and mortalities.

Background

Prior to 1990, transient moose were recorded from throughout the Magic Valley Region, but there were no viable, resident populations. In recent years, moose numbers in the Region have increased as a result of natural ingress and transplants, and viable populations, capable of sustaining limited harvest, occur in Units 44, 48, 49 and Unit 56.

Population Surveys

Aerial population surveys for moose have not been conducted in the Region. In recent years, observations indicate increasing numbers of moose along Willow Creek in Unit 44, the Big Wood River in Unit 48 and in the Trail Creek drainage on the Units 48-49 border. The increase in moose numbers is primarily the result of movement of moose from Unit 50. Moose released in Unit 44 probably contributed to an increase in moose population in this unit. During the 2002-2003 reporting period, observations suggested there were 100+ moose in the Willow Creek, Big Wood, and Trail Creek areas. Populations in the Sublett area (Unit 56) appear to be stable and observations are common.

Harvest Characteristics

Hunting season length for antlered moose in both hunt areas in the Magic Valley Region were 86 days in 2002 (Table 1). Two permits were offered for the second time in Hunt Area 44 (includes part of Unit 44 and all of Units 48 and 49) in 2002. Only one permit holder was successful in harvesting an adult bull moose and it was taken in Unit 48 (Table 2). Five antlered permits were again offered in Hunt Area 56 (includes Units 56, 73, and 73A). Four bulls were harvested with two taken in Unit 56 and two in Unit 73 (Table 2).

No other sources of moose mortality were reported in the Region during the reporting period.

Trapping And Transplanting

In 1981-1982, the Department identified that suitable, unoccupied moose habitat existed in Units 43 and 44 and requested that the Sawtooth National Forest conduct an environmental analysis for the establishment of a moose population on the Fairfield Ranger District. Upon completion of the analysis in 1983, arrangements were made to translocate “problem” moose from urban areas in the Upper Snake and Southeast Regions to Units 43 and 44. During the period from March 1986 through June 2000, 31 moose (six adult or yearling bulls, 16 adult or yearling females, seven male calves, and two female calves) were released.

No moose were released in the Region during this reporting period.

Management Implications

Efforts to reintroduce moose in Units 43 have not been successful in establishing a moose population in this unit. Most of the released moose have been illegally killed or have moved from the area. However, numerous moose observations were made in Unit 43 during the 2001-2002 winter while Department employees were conducting elk feeding operations and sightability surveys.

The Big Wood River moose population (Units 48 and 49) is expanding and has potential for additional growth. Human-moose conflicts in the Big Wood River Valley were minimal during the reporting period and public support remains strong for moose population expansion in this area.

Table 1. 2002 season structure for controlled moose hunts in the Magic Valley Region.

Hunt Area	Season		Permits	Open For
	Dates	Length		
44	30 August-23 November	86 days	2	Antlered
56	30 August-23 November	86 days	5	Antlered

Table 2. Summary of moose harvest and drawing odds by Hunt Area in the Magic Valley Region, 1999-present.

Hunt Area	Year	Permits	Harvest		% Success	Days/ Hunter	First Choice Applicants	Drawing Odds
			M	F				
44 ^a	2001	2	2	0	100	3.8	9	1:4.5
	2002	2	1	0	50	1.0	13	1:6.5
56	1999	5	5	0	100	16.0	28	1:5.6
	2000	5	5	0	100	3.8	21	1:4.2
	2001	5	4	1	100	19.2	31	1:6.2
	2002	5	4	0	80	3.0	31	1:6.2

^a Hunt established in 2001.

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Moose Surveys and Inventories</u>
PROJECT:	<u>W-170-R-27</u>		
SUBPROJECT:	<u>5</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>I</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>6</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2002 to June 30, 2003</u>		

SOUTHEAST REGION

ABSTRACT

The number of moose permits did not change from 2001; 150 antlered-only and 70 antlerless-only. Mandatory harvest reports identified a minimum of 127 antlered and 38 antlerless moose harvested. Data for controlled hunt area 56 (Units 56, 73, and 73A) are reported under the Magic Valley Region-subproject 4.

UNITS 66A, 70, 71, 72, 73, 73A, 74, 75, 76, 77, AND 78

**CONTROLLED HUNT AREAS 66A-1, 66A-2, 70, 71-1, 71-2, 71-3, 72, 73, 73A,
74, 75-1, 75-2, 76-1, 76-2, 76-3, 76-4, 76-5, 76-6, 77, 78**

Management Direction

Management direction for moose in the Southeast Region follows that for the state in general; to provide "high-quality" hunting and other moose-related recreational opportunities. Consequently, permit levels are conservative, and hunter success is high relative to hunts for other cervid species. For antlered-only hunts, emphasis is on providing each hunter with the opportunity to harvest a mature bull moose. Antlerless-only moose hunting is also offered due to relatively high moose populations. Nonconsumptive values of moose are also important.

The 1991-1995 Moose Management Plan established the goals of providing high-quality moose hunting and other moose-related recreational experiences for as many people as possible, assisting the expansion of moose populations into available habitat, and increasing permit numbers where possible.

Background

Prior to the 1950s, there were too few moose in the Southeast Region to justify harvest. The first hunt for moose in the Region was held in 1959 when five antlered-only permits were issued for a portion of Unit 76. With continued growth of the population, harvest has increased to recent levels of over 150 moose in 11 units. Illegal moose harvest may be substantial (Kuck and

Ackerman 1984), although reporting of these cases is sporadic. The Department issued a small number of permits for any moose in several units from 1975 to 1990. An average of 80% of that harvest was antlered moose. In 1991, antlerless-only hunts were instituted in Units 66A and 76. Since 1991, permits have been issued for antlered or antlerless-only moose. Antlerless moose hunts start later than antlered hunts to provide more time for calf development.

Portions of the Region continue to be colonized by moose, and populations apparently are increasing. Notably, moose appear to be expanding in Units 73 and 73A.

Population Surveys

Moose aerial surveys were conducted in two units in 2002. During January 2002, search units were flown in Hunt Area 66A and Hunt Area 76-3.

In Hunt Area 66A, 19 search units were stratified as high, medium, or low likelihood of moose and 13 search units were flown for sightability. One hundred fifty-two moose were counted in these 13 search units consisting of 75 cows, 48 bulls, and 29 calves (Table 1). Estimates of 219 (± 31) total moose including 105 (± 15) cows, 75 (± 18) bulls, and 39 (± 9) calves were generated using the Hiller-Siloy Wyoming-based model (Unsworth et al. 1994). Overall herd composition was estimated as 48% cows, 34% bulls and 18% calves. The population estimate of 219 in 2002 was 23% lower than the estimate of 285 in 1995, however 90% confidence intervals overlap. Average moose seen were 3.0 in low units, 16.0 in medium units, and 18.5 in high units. Search units were likely well-stratified for the survey.

In Hunt Area 76-3, 13 search units were stratified as high or low likelihood of moose and 10 search units were flown for sightability. One hundred three moose were counted in these 10 search units consisting of 41 cows, 48 bulls, and 14 calves (Table 1). Estimates of 174 (± 40) total moose including 71 (± 20) cows, 78 (± 20) bulls, and 25 (± 8) calves were generated using the Hiller-Siloy Wyoming-based model. Overall herd composition was estimated as 41% cows, 45% bulls and 14% calves. The population estimate of 174 in 2002 was very close to the 167 estimated in 1995. Average moose seen was 9.8 in low units and 11.2 in high units. Search units may need to be re-stratified or have stratification by moose likelihood deleted in future surveys.

Harvest Characteristics

Hunting season lengths for antlered and antlerless moose remained at 86 days (30 August-23 November) and 40 days (15 October-23 November), respectively, in 2002 (Table 2). Two hundred twenty permits (150 antlered and 70 antlerless) were issued. A telephone survey to estimate total harvest was not conducted. Minimum reported harvest was available through a mandatory mortality report of successful hunters. Reported harvest totaled 165; 127 antlered and 38 antlerless moose (Table 3).

Minimum overall hunter success rate for the Region was 75%; 54% for antlerless-only permits and 85% for antlered-only permits (Table 3). Mean participation days are much lower for those

with antlerless-only tags; selectivity in choosing a bull to fill an antlered-only tag is probably a factor.

Other sources of moose mortality are illegal, Indian harvest, natural, road-kills, and other. For the 2002-2003 reporting period, three non-harvest mortalities were reported. (Table 4). Reporting of non-hunting mortalities is very low; perhaps less than half of the known non-hunting mortalities reach Department records.

Climatic Conditions

Winter 2002-2003 snow depths were significantly below the 30-year average, with snow levels at 50-70% of average in most drainages. Average temperature during the winter was similar to the 30-year norm.

Habitat Conditions

Succession of aspen stands into conifer may negatively affect moose habitat in the future. Treatment to retard succession may slow potential decreases. Development and disturbance associated with mining and timber harvest in the eastern portion of the Region continued. Livestock grazing and other development of riparian areas impact moose habitat in many parts of the Region.

Management Implications

Aerial surveys, using sightability models such as Anderson (1994) and Unsworth et al. (1994), and the mandatory check of moose harvested provide the majority of information available for management. Conservative permit levels likely allow for passive population expansion and growth, particularly in those areas being newly colonized.

Relatively high drawing odds for antlered-only permits indicate strong demand for moose hunting opportunity. Antlerless-only drawing odds are generally 1:1 or less; however, left-over permits sell quickly.

Moose also have high nonconsumptive values for viewing by the public. Their relative abundance and general lack of fear of humans make them easy for people to observe.

During the spring and early summer, an average of between five and 30 moose wander into the city of Pocatello. These are nearly always yearlings or two-year olds and are most often hazed back into the surrounding hills or captured and translocated to more suitable habitat.

LITERATURE CITED

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- Kuck, L. and B. Ackerman. 1984. Impacts of illegal harvest on big game. Pages 363-373 in L. Kuck (ed.) Cooperative Wildlife Study, Phase 2: Mining Impacts Studies. Idaho Department of Fish and Game. Boise, Idaho. 399 pp.
- Unsworth, J. W., F. A. Leban, D. J. Leptich, E. O. Garton, and P. Zager. 1994. Aerial survey: user's manual, second edition. Idaho Department of Fish and Game, Boise, ID 84 pp.

Table 1. Total observed moose by sex/age class, and model estimates of moose from aerial surveys in the Southeast Region, 1993-present.

Hunt Area/ Year	Observed		Estimate	
	Total	Bull:Cow:Calf	Total	Bull:Cow:Calf
76-1, 2				
1994	90	42:100:42	432	26:100:50
2000	286	74:100:42	510±83	74:100:42
76-3, 4				
1993	104	76:100:37	192	76:100:36
1997	89	85:100:44	190	100:100:53
76-5, 6				
1991	136	49:100:60	-	-
1995	121	55:100:40	167±22	54:100:34
2002	103	117:100:34	174±40	110:100:35
76				
1999	140	100:100:62	583±146	99:100:60
66A				
1995	159	69:100:49	285±60	67:100:43
2002	152	64:100:39	219±31	71:100:37

Table 2. 2002 season structure for controlled moose hunts in the Southeast Region.

Hunt Area	Season		Permits	Open For
	Dates	Length		
66A	30 August-23 November	86 days	30	Antlered
66A	15 October-23 November	40 days	15	Antlerless
70	30 August-23 November	86 days	5	Antlered
71-1	30 August-23 November	86 days	5	Antlered
71-1	15 October-23 November	40 days	5	Antlerless
71-2	30 August-23 November	86 days	5	Antlered
71-2	15 October-23 November	40 days	5	Antlerless
72	30 August-23 November	86 days	5	Antlered
74	30 August-23 November	86 days	5	Antlered
75	30 August-23 November	86 days	10	Antlered
75	15 October-23 November	40 days	5	Antlerless
76-1	30 August-23 November	86 days	25	Antlered
76-1	15 October-23 November	40 days	20	Antlerless
76-2	30 August-23 November	86 days	20	Antlered
76-2	15 October-23 November	40 days	10	Antlerless
76-3	30 August-23 November	86 days	20	Antlered
76-3	15 October-23 November	40 days	10	Antlerless
77	30 August-23 November	86 days	10	Antlered
78	30 August-23 November	86 days	10	Antlered

Table 3. Summary of moose harvest and drawing odds by Hunt Area in the Southeast Region, 1993-present.

Hunt Area	Year	Permits	Harvest		% Success	Days/ Hunter ^a	First Choice Applicants	Drawing Odds
			M	F				
66A	1993	35	24	9	94	7.3	206	1:5.9
	1994	35	22	10	91	4.9	232	1:6.6
	1995	42	28	9	88	7.4	294	1:7.0
	1996	42	24	8	76	4.1	231	1:5.5
	1997	42	26	7	79	7.7	247	1:5.9
	1998	42	22	8	71	4.7	232	1:5.5
	1999	42	22	12	81	5.2	273	1:6.5
	2000	42	27	7	81	5.7	194	1:4.6
	2001	45	24	12	80	4.1	220	1:4.9
	2002 ^b	45	29	12	91	ND	190	1:6.3
70	1993	5	3	0	60	7.5	19	1:3.8
	1994	5	5	0	100	5.5	8	1:1.6
	1995	5	4	0	80	11.6	36	1:7.2
	1996	5	3	0	60	6.0	10	1:2.0
	1997	5	4	0	80	21.0	29	1:5.8
	1998	5	5	0	100	6.0	16	1:3.2
	1999	5	4	0	80	11.3	30	1:6.0
	2000	5	4	0	80	20.0	21	1:4.2
	2001	5	4	0	80	11.8	15	1:3.0
	2002	5	5	0	100	ND	30	1:6.0
71	1993	10	10	0	100	10.4	39	1:3.9
	1994	10	10	0	100	9.1	66	1:6.6
	1995	10	10	0	100	5.9	49	1:4.9
	1996	10	8	0	80	5.8	73	1:7.3
	1997	10	9	0	90	8.1	52	1:5.2
	1998	10	9	0	90	6.8	54	1:5.4
	1999	15	6	4	67	6.1	75	1:5.0
	2000	15	7	4	73	11.0	42	1:2.8
	2001	20	9	5	70	7.1	54	1:2.7
	2002 ^b	20	7	3	50	ND	25	1:1.3
72	1993	5	5	0	100	2.3	29	1:5.8
	1994	5	5	0	100	4.7	21	1:4.2
	1995	5	5	0	100	5.2	32	1:6.4
	1996	5	3	0	60	6.0	27	1:5.3
	1997	5	5	0	100	3.0	28	1:5.6
	1998	5	4	0	80	5.8	34	1:6.8
	1999	5	5	0	100	6.8	47	1:9.4
	2000	5	5	0	100	5.4	26	1:5.2
	2001	5	5	0	100	1.8	39	1:7.8
	2002	5	5	0	100	ND	31	1:6.2
74	1993	5	5	0	100	4.5	38	1:7.6
	1994	5	2	0	40	11.0	11	1:2.2
	1995	5	5	0	100	5.2	16	1:3.2
	1996	5	3	0	60	2.3	22	1:4.4
	1997	5	3	0	60	23.3	18	1:3.6
	1998	5	3	0	60	12.0	25	1:5.0

Table 3. Continued.

Hunt Area	Year	Permits	Harvest		% Success	Days/ Hunter ^a	First Choice Applicants	Drawing Odds	
			M	F					
75	1999	5	2	0	40	4.3	19	1:3.8	
	2000	5	4	0	80	13.7	12	1:2.4	
	2001	5	4	0	80	34.7	16	1:3.2	
	2002	5	3	0	60	ND	16	1:3.2	
	1993	5	3	0	60	8.3	22	1:4.4	
	1994	5	4	0	80	14.0	30	1:6.0	
	1995	5	5	0	100	19.3	36	1:7.2	
	1996	5	4	0	80	9.3	27	1:5.3	
	1997	15	8	5	87	5.2	48	1:3.2	
	1998	15	9	2	73	8.9	36	1:2.4	
	1999	15	10	4	93	8.9	41	1:2.7	
	2000	15	5	4	60	3.8	28	1:1.9	
76	2001	15	10	4	93	7.1	26	1:1.7	
	2002 ^b	15	9	2	73	ND	26	1:1.7	
	1993	85	54	20	87	9.0	344	1:4.0	
	1994	85	56	19	88	7.0	380	1:4.5	
	1995	94	46	23	73	10.3	420	1:4.5	
	1996	94	50	26	81	4.4	447	1:4.8	
	1997	84	48	19	80	5.3	375	1:4.5	
	1998	84	40	18	69	6.4	345	1:4.1	
	1999	84	42	29	85	7.0	480	1:5.7	
	2000	84	45	19	76	5.6	249	1:3.0	
	2001	105	51	27	74	4.8	326	1:3.1	
	2002 ^b	105	57	21	74	ND	307	1:4.7	
77	1993	5	4	0	80	17.0	5	1:1.0	
	1994	5	5	0	100	13.0	29	1:5.8	
	1995	7	6	0	86	18.6	21	1:3.0	
	1996	7	4	0	57	11.5	26	1:3.7	
	1997	7	6	0	86	7.3	20	1:2.9	
	1998	7	4	0	57	6.3	28	1:4.0	
	1999	7	6	0	86	14.2	28	1:4.0	
	2000	7	7	0	100	7.1	12	1:1.7	
	2001	10	8	0	80	7.6	24	1:2.4	
	2002	10	4	0	40	ND	25	1:2.5	
	78	1993	5	5	0	100	9.0	26	1:5.2
		1994	5	5	0	100	15.6	32	1:6.4
1995		7	6	0	86	15.0	28	1:4.0	
1996		7	6	0	86	13.8	58	1:8.3	
1997		7	6	0	86	21.7	32	1:4.6	
1998		7	7	0	100	11.0	34	1:4.9	
1999		7	7	0	100	10.4	33	1:4.7	
2000		7	7	0	100	13.9	16	1:2.3	
2001		10	9	0	90	10.9	27	1:2.7	
2002		10	8	0	80	ND	36	1:3.6	

^a From 1993-1995, data are from a telephone survey of all hunters. Beginning in 1996, data are from mandatory check of successful hunters only.

^b Applicants and drawing odds for antlered hunts only.

Table 4. Summary of all known moose mortalities in the Southeast Region, excluding controlled hunts, 1993-present.

Year	Mortality Agent						Total
	Indian Harvest	Illegal Kill	Road Kill	Natural	Train Kill	Other	
1993	0	0	2	0	0	0	2
1994	0	0	1	0	0	0	1
1995	1	10	1	1	0	7	20
1996	1	2	5	0	1	1	10
1997	0	1	1	3	0	3	8
1998	0	1	1	0	1	3	6
1999	0	1	4	3	0	0	8
2000	0	4	2	1	0	2	9
2001	1	1	3	0	0	4	9
2002	0	1	2	1	0	1	5

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Moose Surveys and Inventories</u>
PROJECT:	<u>W-170-R-27</u>		
SUBPROJECT:	<u>6</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>I</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>6</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2002 to June 30, 2003</u>		

UPPER SNAKE REGION

ABSTRACT

Hunting season lengths for antlered and antlerless moose remained at 86 days (30 August-23 November) and 40 days (15 October-23 November), respectively, in 2002 (Table 1). Twenty controlled hunts with 353 permits were offered for antlered moose in the Upper Snake Region in 2002. These totals represent no change from 2001 levels. A total of 259 antlered moose were harvested (73% hunter success) as determined by mandatory harvest reports. The mean antler spread for all antlered hunts combined was 34.83 inches (N = 256, range 19.00-48.00 inches). Drawing odds for all moose hunts combined were 1:3.8 and ranged from 1:1.3 (Hunt Area 60A) to 1:8.3 (Hunt Area 50).

No population surveys were conducted specifically for moose during this reporting period due to fiscal constraints. However, 456 moose were counted incidental to deer and elk surveys in Units 51 (13), 60A (250), 67 (18), and 69 (175), on winter range.

A dry summer, followed by a winter with low snowfall, resulted in a low number of nuisance and depredation complaints during the 2002-2003 winter. One depredation complaint was received during this reporting period. The involved moose were eating stored hay and this incident was resolved with translocation of offending animals. The depredation was reported in Unit 63A. A total of three moose were darted and translocated.

UNITS 59, 59A

CONTROLLED HUNT AREA 59

Description: Hunt Area 59 - All of Units 59 and 59A.

Background

Former Hunt Areas 59 and 59A were combined in 1993 to form the current Hunt Area 59. Twenty-two antlered-only permits were offered in 2002 (Table 2). Prior to 1993, two hunts with a total of 12 antlered-only permits were offered in these units. Former Hunt Area 59 had been

open continuously since 1974 with permit levels fluctuating between four and eight with over 90% hunter success reported. Hunt Area 59A was closed in 1978 after one moose was harvested in the preceding four years. In 1983, this hunt was reopened and two permits were issued annually through 1988 with 100% hunter success. Four permits were issued each season from 1989-1992 with 100% hunter success. Permit levels have increased steadily since that time.

Population Surveys

A moose trend count was flown most recently in Units 59 and 59A on 17-18 December 1994. A Bell Model G47 Soloy helicopter was used to fly the survey. Counting conditions were good, with eight or more inches of relatively new snow cover present over the entire area. All probable moose habitat was surveyed. A total of 179 moose (129 in Unit 59 and 50 in Unit 59A) with a bull:cow:calf ratio of 44:100:54 was counted on the survey. Of the 40 bulls counted, 13 were classified as yearlings, 20 as adults, and seven had already shed antlers.

Few previous data are available for comparison. Prior to this count, no surveys had been conducted in Unit 59 since 1984 (64 total moose), and Unit 59A had never been surveyed specifically for moose. However, during deer and elk sightability surveys conducted in 1991-1992, 1993-1994, and 1999-2000, moose were counted on an incidental basis. In 1991-1992, 46 moose were counted in Unit 59 and 71 in Unit 59A. In 1993-1994, a total of 49 moose were observed in Unit 59 and 46 in Unit 59A (unclassified). The 1999-2000 survey resulted in a total count of 90 moose, including 10 bulls, 19 cows, 13 calves, and 48 unclassified.

Harvest Characteristics

Table 2 summarizes controlled hunt harvest data from 1992 to present. No telephone survey of moose permit holders has been conducted since 1995. Harvest estimates have been derived from mandatory harvest reports from 1996 to present and are not directly comparable with previous telephone survey estimates. Twenty-two permits for antlered moose were offered in 2002 and 20 animals were harvested for an 91% hunter success rate. Mean antler spread was 34.13 inches (N = 20) and ranged from 20.00-46.00 inches.

Statewide drawing odds have improved substantially in most units due to regulation changes implemented in 1986. In 2002, drawing odds were 1:5.6 in Hunt Area 59.

All known nonhunting moose mortalities for Units 59 and 59A from 1992 through 2002 are summarized in Table 3. Known illegal kill was a serious problem in the early 1980s when it nearly equaled controlled harvest, but has been of little significance based on documented mortalities in recent years.

Climatic Conditions

Spring and summer temperatures were slightly higher than average while precipitation was well below normal. Fall and winter temperatures were near normal with snow depths well below average. Precipitation has again dropped well below average since mid-March.

Habitat Conditions

Habitat consists primarily of conifer/sagebrush ecotones and aspen. Riparian areas are limited and discontinuous. Habitat extends down major drainages that have willows. Improving riparian zone management would increase habitat quality and quantity in this area.

Depredations, Trapping, and Transplanting

No depredations, trapping, or translocation operations occurred during this reporting period.

Management Implications

General observations indicate the moose population in these units is increasing. Permit levels have increased steadily and will continue to be adjusted in response to data analysis.

UNITS 64, 65, AND 67

CONTROLLED HUNT AREAS 64, 65, 67-1, 67-2

Description: Hunt Area 64 - All of Unit 64.

Description: Hunt Area 65 - All of Unit 65.

Description: Hunt Area 67-1 - That portion of Unit 67 north and west of State Highway 31.

Description: Hunt Area 67-2 - That portion of Unit 67 south and east of State Highway 31.

Background

All of Unit 64 except the Canyon Creek drainage, Unit 65, and Unit 67 north and west of State Highway 31 have been open to moose hunting since 1974. In 1983, this area (old Hunt Area 364) was split along unit boundaries into three separate hunts. Increasing moose populations allowed a steady increase in permit levels until 1987. A new Hunt Area, 67-2, was created in 1983, and allowed the harvest of moose in that portion of Unit 67 previously closed.

Hunting opportunity has increased in these units from one hunt with two permits during the early 1980s to five hunts with 74 permits (64 permits for antlered moose and 10 for antlerless) in 2001 (Table 2).

Population Surveys

Moose were counted in Units 64, 65, and 67 incidental to elk surveys during the 2000-2001 winter. A total of 120 moose were observed (31 in Unit 64, 42 in Unit 65, and 47 in Unit 67). Moose were counted in Unit 67 incidental to deer composition surveys during the 2001-2002 winter. A total of 18 moose were observed.

Historically, moose populations appeared to be increasing in these units prior to the winter of 1988-1989. Forage was impacted by two years of drought and moose shifted their distribution to

lower elevation agricultural and urban areas. Moose appeared to be in poor condition and significant winter losses likely occurred.

During the winter of 1992-1993, moose were first counted incidental to elk sightability surveys. Totals of 48, 26, and 90 moose were counted in Units 64, the western portion of 65, and 67, respectively. Most animals counted were unclassified. Moose were also counted incidental to elk sightability surveys during the 1995-1996 winter. Totals of 36, 101, and 60 moose were observed in Units 64, 65, and 67, respectively. Again, most animals were not classified. Moose were again counted incidentally during the 1997-1998 winter. Totals of 67, 30, and 88 (largely unclassified) moose were counted in Units 64, western 65, and 67, respectively.

Harvest Characteristics

Hunters harvested 38 antlered moose on 64 permits (59% hunter success rate) and eight antlerless moose on 10 permits (80% hunter success) in 2002 (Table 2). No telephone survey of moose permit holders has been conducted since 1995. Harvest estimates have been derived from mandatory harvest reports from 1996 to present, and are not directly comparable with previous telephone survey estimates. Telephone survey results for years prior to 1996 are shown in Table 2. Drawing odds ranged from 1:2.5 in Hunt Area 64 to 1:3.3 in Hunt Area 67 in 2002. Mean antler spreads were 33.29 (N = 12, range 25.5-42.00), 34.03 (N = 8, range 25.50-46.00), 36.28 (N = 8, range 26.5-44.5), and 37.78 (N = 10, range 30.25-45) for Hunt Areas 64, 65, 67-1, and 67-2, respectively. Table 3 summarizes all known nonhunting moose mortalities in Units 64, 65, and 67 from 1993 to 2002.

Climatic Conditions

Spring and summer weather conditions during 2002 were warmer and significantly drier than normal. Winter precipitation was far below normal and temperatures were normal. Weather conditions for the spring of 2003 have been characterized by periods of both higher and lower than normal temperatures and low precipitation levels.

Habitat Conditions

Conifer with interspersed aspen and narrow riparian areas make up the majority of moose habitat in this area. Mountain mahogany on south-facing ridges provides important winter moose habitat in Units 65 and 67. In Unit 64, moose are found wintering primarily in stream bottom willow/aspen/dogwood communities.

Depredations, Trapping, and Transplanting

No moose depredation complaints were received from Units 64, 65, and 67 during this reporting period.

Management Implications

It is unknown if the fewer moose counted incidental to recent elk and deer surveys, compared to 1998, is a reflection of population change or differences in distribution due to mild wintering conditions. A 1989 aerial survey found approximately half the number of moose censused in 1985. A shift in moose distribution resulting from the drought and severe winter conditions was partially responsible for the low count. Also mortality during the 1988-1989 winter was above normal. Permit levels were maintained for the 1989 and 1990 seasons, but were adjusted in 1991 in response to data analysis. Moose populations appear to have rebounded rapidly to levels at or above those present prior to the 1988-1989 die-off. Consequently, permit levels increased in 1993, 1995, 1997, and again in 1999. Additionally, an antlerless-only hunt was initiated in Unit 64 in 1993.

UNITS 66, 69

CONTROLLED HUNT AREAS 66-1, 66-2, 69-1, 69-2, 69-3

- Description: Hunt Area 66-1 - That portion of Unit 66 north of main Bear Creek EXCEPT the Pritchard Creek and Garden Creek drainages.
- Description: Hunt Area 66-2 - That portion of Unit 66 south of main Bear Creek.
- Description: Hunt Area 69-1 - That portion of Unit 69 west of the Grays Lake-Long Valley-Bone-Iona Road.
- Description: Hunt Area 69-2 - That portion of Unit 69 east of the Grays Lake-Long Valley-Bone-Iona Road EXCEPT the Antelope and Granite Creek drainages.
- Description: Hunt Area 69-3 - That portion of Unit 69 within the Antelope Creek and Granite Creek drainages, and that portion of Unit 66 within the Pritchard Creek and Garden Creek drainages.

Background

Five hunts, with a total of 90 antlered-only permits and three hunts with 25 antlerless permits, were offered in Units 66 and 69 in 2002 (Table 2). The moose population in these units increased at a fairly rapid rate during the late 1970s when populations elsewhere in the Upper Snake Region were decreasing or remaining static. Moose populations appeared to have continued to increase, particularly in the west half of Unit 69.

Hunts 366 and 369 were split in 1981 to create four hunts (366-1, 366-2, 369-1, and 369-2). This resulted in a 50% increase in permit levels from 1980 (16 to 24). A new hunt (369-3) was created in 1984 from adjacent portions of Hunts 366-1 and 369-2.

Hunt 369-1 was changed from antlered-only to either-sex in 1986 to address landowner concerns over depredations in grain fields. Either-sex permits were not effective in harvesting antlerless moose. No female moose were harvested. As a result, this hunt was changed back to antlered-only in 1991. However, beginning in 1993, an antlerless-only hunt (369-4) was initiated. This hunt had 10 permits and included all of Unit 69. In 1999, Unit 66 was added to this hunt, permits were increased to 20, and it was renumbered Hunt Area 66-3. This antlerless hunt was

restructured again in 2001. Unit 66 was dropped from the hunt area and Unit 69 was split into three Hunt Areas (69-1, 69-2 and 69-3) that correspond to the like-numbered antlered hunts.

Population Surveys

No population surveys have been conducted in these units specifically to monitor moose populations. However, moose were counted incidentally during deer and elk sightability surveys in 1992, 1994, 1995, 1997, 1999, 2000, and 2002 (not all subunits were surveyed).

A total of 60 moose (most unclassified) were counted in Unit 66 in 2000. Other recent totals include 35 in 1999, 62 in 1997, 32 in 1995, 98 in 1994, and 26 in 1992. In Unit 69, 257 moose were tallied in 2000. This total included six bulls, 39 cows, 38 calves, and 174 unclassified moose. Other recent totals include 121, 168, 231, and 193 in 1992, 1995, 1997, and 1999, respectively. A total of 175 moose were counted during deer surveys in Unit 69 in 2002 (107 during composition flights and 68 during trend flights).

Harvest Characteristics

Table 2 summarizes controlled hunt harvest since 1993. No telephone survey of moose permit holders has been conducted since 1995. Harvest estimates have been derived from mandatory harvest reports from 1996 to present, and are not directly comparable with previous telephone survey estimates. Eight hunts with a total of 129 permits were offered in these two units in 2002. A total of 83 antlered moose were harvested on 104 permits (80% success). An additional 17 antlerless moose were harvested on the 25 permits (68% success) offered in Hunt Areas 69-1, 69-2 and 69-3. Drawing odds have improved significantly as a result of regulation changes implemented in 1986 and are shown in Table 2. Mean antler spreads were 33.48 (N = 13, range 27.00-42.25), 36.25 (N = 16, range 31.75-47.50), 34.28 (N = 23, range 25.00-42.00), 34.32 (N = 20, range 19.00-46.00), and 32.34 (N = 11, range 23.75-39.5) for Hunt Areas 66-1, 66-2, 69-1, 69-2, and 69-3, respectively.

A summary of all known nonhunting mortalities is presented in Table 3.

Climatic Conditions

Spring and summer weather conditions during 2002 were warmer and significantly drier than normal. Winter precipitation was below normal and temperatures were slightly below average. The spring of 2003 has had average temperatures with below normal precipitation.

Habitat Conditions

Hunt Area 66 is characterized by conifer/aspen habitats with narrow canyon bottom riparian areas which support moderate willow/dogwood communities. Hunt Area 69 is primarily aspen/sagebrush and private agricultural land. Moose may be migrating from adjacent areas to winter on the Tex Creek Management Area.

Depredations, Trapping, and Transplanting

No moose depredation complaints were received from Units 66 or 69 during this reporting period.

Management Implications

Steadily increasing moose populations in these units have resulted in an increase in permit levels in all of these hunts since the early 1990s. Additionally, an antlerless-only hunt has been offered since 1993.

UNITS 60, 60A, 61, 62, 62A

CONTROLLED HUNT AREAS 60, 60A, 61-1, 61-2, 61-3, 62, 62A

Description: Hunt Area 60 - All of Unit 60.

Description: Hunt Area 60A - That portion of Unit 60A south and east of the North Fork (Henrys Fork) Snake River and that portion within one mile north and west of the North Fork Snake River.

Description: Hunt Area 61-1 - That portion of Unit 61 west of East Dry Creek and the Yale-Kilgore Road.

Description: Hunt Area 61-2 - That portion of Unit 61 east of East Dry Creek and the Yale-Kilgore Road and west of U.S. Highway 191-20 and south and west of State Highway 87.

Description: Hunt Area 61-3 - That portion of Unit 61 north and east of State Highway 87 and north and east of U.S. Highway 191-20 EXCEPT that portion enclosed by the Big Springs Loop Road and U.S. Highway 191-20.

Description: Hunt Area 62 - All of Unit 62.

Description: Hunt Area 62A - All of Unit 62A.

Background

Eight hunts with a total of 130 antlered-only and 15 antlerless-only permits were offered in 2002 (Table 2).

During the 1970s, the moose population in Fremont County was thought to be declining and experiencing high levels of illegal mortality and Indian harvest. As a result, in 1977, all moose hunts in Fremont County were closed. After a boundary change to include only Clark County, Hunt 361-1 was the only hunt open from 1977 to 1982.

The population had increased by 1983. A winter aerial survey conducted in 1983 counted moose in numbers slightly below the highs of the early 1950s. The Island Park area is the only area where counts were clearly lower than those in the 1952-1956 period. In response to the population recovery, eight controlled hunts were opened in 1983 in Fremont County.

A new hunt was established in Unit 60A in 1986. The hunt area consists of agricultural land and the riparian zone along the Henrys Fork of the Snake River. Many residences and farms occur in the area. The moose population within this corridor has been increasing. Annual depredation and nuisance complaints of moose in agriculture fields and near towns and residences have been received, resulting in expanded antlerless-only hunting opportunity. Permits were reduced by approximately 50% on the Island Park caldera portion of the Region in 1991 as a result of significant winter mortality during the 1988-1989 winter, but have been steadily increasing since as populations continue to grow.

Population Surveys

A population survey was conducted in Unit 62 and a portion of 62A during December 2000. The survey in 62A was not completed because of fiscal constraints. The final population estimate for Unit 62 was 366 moose (180 cows, 109 bulls, and 77 calves; Table 4). This total compares to fixed wing censuses of 228 and 97 moose observed during 1989 and 1990, respectively.

Most of the area was surveyed by airplane from November 1989 through February 1990. Survey results indicated that moose populations had decreased substantially since the previous winter. Moose appeared to be in poor condition prior to the 1988-1989 winter following two years of drought, and significant winter losses probably occurred. Survey results are shown in Table 5.

A helicopter survey was conducted along the North Fork Snake River corridor between St. Anthony and the Highway 33 bridge in Hunt Area 60A in December 1991. Only the riparian corridor was searched, so this should be considered a minimum count. A total of 37 moose were observed, including two bulls, 21 cows, and 14 calves.

Moose have been counted incidental to deer and elk sightability surveys in Unit 60A on a fairly regular basis. However, moose distribution varies greatly from year to year and, since not all search units are surveyed, the usefulness of this information is questionable.

In 2003, a total of 65 moose were counted incidental to deer composition surveys and 185 incidental to trend surveys. The majority of these animals were unclassified. Other recent totals for Unit 60A include 387 in 2002, 473 in 2000, 585 in 1998, 340 in 1997, 219 in 1996, 272 in 1995, 360 in 1994, 187 in 1993, and 312 in 1991.

Harvest Characteristics

Table 2 summarizes controlled hunt harvest and drawing odds for these units. No telephone surveys of moose permit holders have been conducted since 1995. Therefore, 1996-2002 harvest estimates have been derived from mandatory harvest reports and are not directly comparable with previous telephone survey estimates. One hundred thirty antlered-only moose permits were issued in 2002, resulting in the harvest of 96 animals (74% success) based on mandatory harvest reports. In addition, six moose were harvested on the 15 antlerless-only permits (40% success) in Hunt Area 60A. Mean antler spreads for individual hunts were 34.39 (N = 22, range 21.50-48.00), 34.43 (N = 4, range 28.25-41.50), 31.64 (N = 14, range 26.75-37.00), 35.81 (N = 14, range 27.00-41.25), 36.36 (N = 14, range 29.25-41.50), 37.50 (N = 11, range 26.00-46.00), and

37.22 (N = 17, range 29.00-45.00) for Hunt Areas 60, 60A, 61-1, 61-2, 61-3, 62, and 62A, respectively.

Beginning in 1984, all known nonhunting moose mortalities were categorized by mortality agent and unit. Table 3 summarizes these records for Units 60, 60A, 61, 62, and 62A from 1993 through 2002.

Climatic Conditions

Spring and summer weather conditions during 2002 were much warmer and drier than normal. Winter precipitation was below the long-term average and temperatures were near normal. The spring of 2003 came early. Temperatures have been near normal while precipitation has been below average.

Depredations, Trapping, and Transplanting

No complaints were received regarding moose eating stored hay crops during this reporting period.

Management Implications

The increase in desert-wintering moose has led to increased depredations and nuisance complaints during average to severe winters. Mortality during the 1988-1989 winter resulted in significant population declines. However, moose populations have rebounded rapidly to levels above those present prior to the 1988-1989 die-off. Consequently, permit levels have been increased accordingly.

UNITS 50, 51, 58, 63, 63A

CONTROLLED HUNT AREAS 50, 51, 63

Description: Hunt Area 50 - All of Unit 50.

Description: Hunt Area 51 - All of Unit 51.

Description: Hunt Area 63A - All of Units 63 and 63A.

Background

In early 1980, six moose were released near the North Fork of the Big Lost River (Unit 50). Most initially remained close to their release site, but there has been egress to other areas. Reproduction has occurred, and additional transplants have augmented this population. An antlered-only hunt in Unit 50 was initiated in 1993.

A moose hunt was opened in Unit 51 in 1999 as a result of an increasing number of moose being sighted incidentally during deer and elk sightability surveys and ground observations.

A significant population of moose exists in Unit 63A. Moose utilize the riparian habitat along the North and South Forks of the Snake River and associated sloughs, and depredation and nuisance complaints occur on a fairly regular basis. Moose distribution in Unit 63 is centered around the Mud Lake WMA-Camas NWR area.

Hunt Area 50 was initiated in 1993 and had two permits until 1997 when it was increased to four. Hunt Area 51 was opened in 1999 with two antlered-only permits. Hunt Area 63A was initiated in 1987 with three antlered-only permits. Permit levels were increased to five in 1989 and eight in 1990. In 1991, permit levels were increased to 10 and split into two hunts, 63A-1 antlered only, and 63A-2 antlerless only, with five permits each. Unit 63 was added to Hunt Area 63A in 1999. The -1 and -2 designation was dropped for the two hunts in Hunt Area 63A prior to the 2001 season. Permit levels have continued to increase in both the antlered and antlerless hunts in Hunt Area 63A.

Population Surveys

No population surveys were conducted during this reporting period. However, moose were counted incidentally during elk sightability surveys in Unit 50 in 1999 and 2000 and in Unit 51 in 2003. A total of 13 moose were counted in Unit 51 in 2002, including three bulls, five cows, two calves, and three unclassified animals in 2003. A total of 11 moose were counted in Unit 50, including two bulls, two cows, three calves, and three unclassified animals in 2000. Six moose were observed in Unit 50 in 1999. Eighteen moose were observed in Unit 51 in 1999, including seven bulls, two cows, two calves, and seven unclassified animals.

Harvest Characteristics

Controlled hunt harvest and drawing odds are summarized in Table 2. A total of 23 antlered-only permits were issued in these units in 2002, resulting in the harvest of 23 animals (100% success) based on mandatory harvest reports. No telephone harvest survey has been conducted on moose permit holders since 1995. Therefore, caution should be exercised when comparing 1996-2001 mandatory harvest report results with earlier telephone survey data. In addition, nine moose were harvested on 14 antlerless-only permits (64% success) in Hunt Area 63A.

Mean antler spreads for these hunts were 37.00 (N = 6, range 26.00-44.50), 37.25 (N = 2, range 34.00-40.50), and 29.88 (N = 15, range 19.00-42.00) for Hunt Areas 50, 51, and 63A, respectively, in 2001.

All known nonhunting mortalities for these units since 1993 are summarized in Table 3.

Climatic Conditions

Spring and summer weather conditions during 2002 were warmer and much drier than normal. Winter precipitation was below normal and temperatures were near normal. The spring of 2003 has seen the return of below average precipitation levels.

Habitat Conditions

Habitats within these units are quite varied. In Unit 50, extensive willow bottoms provide good summer and winter habitat, and the moose population appears to be increasing and ranging throughout the coniferous zone in summer.

Habitat in Units 51 and 58 are limited to discontinuous willow riparian areas. Habitat in Unit 63 is almost entirely desert and is unsuitable for moose except areas on and adjacent to Mud Lake WMA and Camas NWR. Habitat in Unit 63A consists primarily of the Snake River riparian zone adjacent to private residential and agricultural lands.

Depredations, Trapping, and Transplanting

During this reporting period, one moose-related depredation complaint was received from Unit 63A. The complaint involved concerns over damage to stored hay and was resolved through moving three offending animals. These animals were released in Unit 60A.

Management Implications

A new hunt was initiated in Unit 50 in 1993 and in Unit 51 in 1999. The populations in Unit 63 and 63A appear to be increasing and are causing numerous nuisance and depredation problems in some years. Permit increases were implemented beginning in 1993, and the antlerless hunt will be continued.

Table 1. 2002 season structure for controlled moose hunts in the Upper Snake Region.

Hunt Area	Season		Permits	Open For
	Dates	Length		
50	30 August-23 November	86 days	6	Antlered
51	30 August-23 November	86 days	2	Antlered
59	30 August-23 November	86 days	22	Antlered
60	30 August-23 November	86 days	26	Antlered
60A	30 August-23 November	86 days	8	Antlered
60A	15 October-23 November	40 days	15	Antlerless
61-1	30 August-23 November	86 days	20	Antlered
61-2	30 August-23 November	86 days	15	Antlered
61-3	30 August-23 November	86 days	22	Antlered
62	30 August-23 November	86 days	20	Antlered
62A	30 August-23 November	86 days	18	Antlered
63A	30 August-23 November	86 days	15	Antlered
63A	15 October-23 November	40 days	14	Antlerless
64	30 August-23 November	86 days	18	Antlered
64	15 October-23 November	40 days	10	Antlerless
65	30 August-23 November	86 days	16	Antlered
66-1	30 August-23 November	86 days	20	Antlered
66-2	30 August-23 November	86 days	22	Antlered
67-1	30 August-23 November	86 days	15	Antlered
67-2	30 August-23 November	86 days	15	Antlered
69-1	30 August-23 November	86 days	25	Antlered
69-1	15 October-23 November	40 days	10	Antlerless
69-2	30 August-23 November	86 days	25	Antlered
69-2	15 October-23 November	40 days	10	Antlerless
69-3	30 August-23 November	86 days	12	Antlered
69-3	15 October-23 November	40 days	5	Antlerless

Table 2. Summary of moose harvest and drawing odds by Hunt Area in the Upper Snake Region, 1993-present.

Hunt Area	Year	Permits	Harvest		% Success	Days/ Hunter ^a	First Choice Applicants	Drawing Odds	
			M	F					
50	1993	2	2	0	100	10.5	13	1:6.5	
	1994	2	2	0	100	3.0	20	1:10.0	
	1995	2	2	0	100	5.5	26	1:13.0	
	1996	2	2	0	100	4.5	20	1:10.0	
	1997	4	3	0	75	5.0	38	1:9.5	
	1998	4	3	0	75	6.0	41	1:10.3	
	1999	6	4	0	67	17.3	60	1:10.0	
	2000	6	5	0	83	2.6	44	1:7.3	
	2001	6	6	0	100	4.7	53	1:8.8	
	2002	6	6	0	100	11.3	50	1:8.3	
	51	1999	2	1	0	50	13.0	22	1:11.0
		2000	2	2	0	100	1.5	7	1:3.5
2001		2	1	0	50	3.0	16	1:8.0	
2002		2	2	0	100	5.5	4	1:2.0	
59	1993	15	13	0	87	8.5	136	1:9.1	
	1994	15	14	0	93	4.7	161	1:10.7	
	1995	16	16	0	100	4.4	155	1:9.7	
	1996	16	15	0	94	6.6	117	1:7.3	
	1997	16	14	0	88	7.1	132	1:8.3	
	1998	16	15	0	94	2.8	152	1:9.5	
	1999	20	20	0	100	6.1	172	1:8.6	
	2000	20	19	0	95	4.8	110	1:5.5	
	2001	22	19	0	86	-	88	1:4.0	
	2002	22	20	0	91	6.7	124	1:5.6	
60	1993	15	14	0	93	3.8	82	1:5.5	
	1994	15	15	0	100	3.3	138	1:9.2	
	1995	16	16	0	100	5.4	131	1:8.2	
	1996	16	14	0	88	5.9	143	1:8.9	
	1997	16	13	0	81	4.7	163	1:10.2	
	1998	16	15	0	94	5.5	178	1:11.1	
	1999	24	22	0	92	5.0	223	1:9.3	
	2000	24	20	0	83	3.1	127	1:5.2	
	2001	26	26	0	100	-	145	1:5.6	
	2002	26	22	0	85	6.7	164	1:6.3	
60A	1993	16	6	8	88	4.2	44	1:2.8	
	1994	16	6	10	100	3.1	47	1:2.9	
	1995	16	6	8	88	2.1	35	1:2.2	
	1996	16	6	7	81	4.5	45	1:2.8	
	1997	16	5	6	69	2.3	38	1:2.4	
	1998	16	6	3	56	1.8	46	1:2.9	
	1999	16	6	3	56	4.4	33	1:2.1	
	2000	16	5	5	63	1.9	25	1:1.6	
	2001	23	8	13	91	-	30	1:1.3	
	2002	23	4	6	43	3.5	31	1:1.3	

Table 2. Continued.

Hunt Area	Year	Permits	Harvest		% Success	Days/ Hunter ^a	First Choice Applicants	Drawing Odds
			M	F				
61	1993	33	33	0	100	6.2	193	1:5.8
	1994	33	32	0	97	4.0	297	1:9.0
	1995	36	34	0	94	5.6	323	1:9.0
	1996	36	34	0	94	6.5	282	1:7.8
	1997	45	41	0	91	3.8	327	1:7.3
	1998	45	40	0	89	5.3	290	1:6.4
	1999	60	55	0	92	4.7	398	1:6.6
	2000	60	54	0	90	5.4	263	1:4.4
	2001	57	48	0	83	-	295	1:5.2
	2002	57	42	0	74	7.0	247	1:4.3
62	1993	10	10	0	100	9.5	83	1:8.3
	1994	10	10	0	100	8.2	89	1:8.9
	1995	11	10	0	91	4.9	123	1:11.2
	1996	11	7	0	64	2.9	79	1:7.2
	1997	12	10	0	83	3.4	103	1:8.6
	1998	12	10	0	83	6.7	74	1:6.2
	1999	18	16	0	89	7.1	115	1:6.4
	2000	18	10	0	56	9.1	57	1:3.2
	2001	20	19	0	95	-	79	1:4.0
	2002	20	11	0	55	11.0	77	1:3.9
62A	1993	10	9	0	90	9.5	106	1:10.6
	1994	10	10	0	100	1.7	114	1:11.4
	1995	11	11	0	100	5.0	119	1:10.8
	1996	11	9	0	82	2.3	129	1:11.7
	1997	12	12	0	100	4.7	142	1:11.8
	1998	12	12	0	100	4.6	104	1:8.7
	1999	18	17	0	94	7.2	160	1:8.9
	2000	18	16	0	89	2.8	110	1:6.2
	2001	18	18	0	100	-	102	1:5.7
	2002	18	17	0	94	7.8	99	1:5.5
63A	1993	20	9	8	85	10.0	50	1:2.5
	1994	20	9	9	90	5.2	54	1:2.7
	1995	20	9	8	85	3.2	88	1:4.4
	1996	20	8	9	85	3.6	51	1:2.6
	1997	22	10	9	86	4.5	78	1:3.5
	1998	22	6	8	64	5.1	55	1:2.5
	1999	26	12	10	85	5.8	78	1:3.0
	2000	26	10	11	81	4.0	39	1:1.5
	2001	29	11	13	83	-	44	1:1.5
	2002	29	15	9	83	3.3	57	1:2.0
64	1993	17	13	4	100	4.7	74	1:4.4
	1994	17	12	5	100	5.0	115	1:5.8
	1995	18	13	5	100	9.6	105	1:5.8
	1996	18	10	4	78	7.8	105	1:5.8
	1997	24	11	7	75	3.7	84	1:3.5
	1998	24	12	5	71	4.9	98	1:4.1
	1999	33	15	15	91	5.2	128	1:3.9

Table 2. Continued.

Hunt Area	Year	Permits	Harvest		% Success	Days/ Hunter ^a	First Choice Applicants	Drawing Odds
			M	F				
65	2000	33	17	10	82	4.0	66	1:2.0
	2001	28	16	9	89	-	67	1:2.4
	2002	28	12	8	71	6.5	69	1:2.5
	1993	8	7	0	88	8.6	39	1:7.8
	1994	8	8	0	100	9.1	73	1:9.1
	1995	9	9	0	100	7.6	45	1:5.0
	1996	9	6	0	67	7.2	51	1:5.7
	1997	12	10	0	83	2.6	63	1:5.3
	1998	12	10	0	83	5.7	38	1:3.2
	1999	16	10	0	63	9.7	75	1:4.7
	2000	16	11	0	69	5.5	36	1:2.3
66	2001	16	13	0	81	-	45	1:2.8
	2002	16	8	0	50	6.6	48	1:3.0
	1993	20	18	0	90	8.7	134	1:6.7
	1994	20	18	0	90	5.3	133	1:6.7
	1995	24	21	0	88	6.1	181	1:7.5
	1996	24	20	0	83	4.1	142	1:5.9
	1997	28	25	0	89	4.0	146	1:5.2
	1998	28	26	0	93	4.8	136	1:4.9
	1999	60	34	18	87	5.1	255	1:4.3
	2000	60	36	19	92	4.7	154	1:2.6
	2001	42	40	0	95	-	133	1:3.2
67	2002	42	29	0	69	7.4	162	1:3.9
	1993	12	10	0	83	3.1	73	1:6.1
	1994	12	10	0	83	12.1	61	1:5.1
	1995	13	11	0	85	6.2	68	1:5.2
	1996	13	8	0	62	4.0	98	1:7.5
	1997	20	14	0	70	7.2	81	1:4.1
	1998	20	14	0	70	3.9	93	1:4.7
	1999	30	24	0	80	9.5	76	1:2.5
	2000	30	23	0	77	4.8	100	1:3.3
	2001	30	26	0	87	-	63	1:2.1
	2002	30	18	0	60	7.4	100	1:3.3
69	1993	36	26	10	100	7.4	198	1:5.5
	1994	36	25	9	94	3.4	262	1:7.3
	1995	39	29	10	100	5.8	269	1:6.9
	1996	39	28	8	92	4.6	289	1:7.4
	1997	49	33	13	94	4.2	372	1:7.6
	1998	49	31	13	90	3.3	349	1:7.1
	1999 ^b	50	44	0	88	5.3	440	1:8.8
	2000 ^b	50	48	0	96	5.8	249	1:5.0
	2001	87	54	17	82	-	312	1:3.6
	2002	87	54	17	82	6.1	299	1:3.4

^a From 1993-1995, data are from a telephone survey of all hunters. Beginning in 1996, data are from mandatory check of successful hunters only.

^b Unit 66 added to old Hunt Area 69-4 and renamed 66-3 in 1999.

Table 3. Summary of all known moose mortalities by Hunt Area in the Upper Snake Region, excluding controlled hunts, 1993-present.

Unit/ Year	Mortality Agent						Total
	Indian Harvest	Illegal Kill	Road Kill	Natural	Train Kill	Other	
50							
1993	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	1	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
51							
1993	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	1	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
58							
1993	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	1	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
59							
1993	0	0	0	0	0	1	1
1994	0	0	1	0	0	1	2
1995	1	0	0	0	0	0	1
1996	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0
1998	0	0	2	0	0	0	2
1999	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
59A							
1993	0	1	0	0	0	0	1
1994	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0

Table 3. Continued.

Unit/ Year	Mortality Agent						Total
	Indian Harvest	Illegal Kill	Road Kill	Natural	Train Kill	Other	
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
60							
1993	0	0	0	0	0	1	1
1994	0	0	5	0	0	0	5
1995	0	0	2	0	0	0	2
1996	0	0	4	0	0	3	7
1997	0	0	8	0	0	0	8
1998	0	0	1	0	0	0	1
1999	0	0	6	0	0	0	6
2000	0	1	4	0	0	0	5
2001	0	0	7	0	0	0	7
2002	0	0	6	1	0	1	8
60A							
1993	0	0	0	0	0	0	0
1994	0	1	2	0	0	0	3
1995	0	0	1	0	0	2	3
1996	1	0	0	0	0	1	2
1997	0	0	0	1	0	0	1
1998	0	1	1	0	0	0	2
1999	0	0	1	0	0	0	1
2000	0	0	0	0	0	1	1
2001	0	3	0	0	0	3	6
2002	0	0	0	0	0	0	0
61							
1993	1	1	3	0	0	0	5
1994	0	0	19	1	0	1	21
1995	0	0	6	1	0	2	9
1996	1	0	7	0	0	5	13
1997	0	1	7	3	0	2	13
1998	0	0	5	0	0	4	9
1999	0	0	7	1	0	1	9
2000	1	0	6	0	0	0	7
2001	0	0	1	0	0	2	3
2002	0	0	3	2	0	1	6
62							
1993	0	0	0	0	0	0	0
1994	0	0	2	0	0	0	2
1995	0	0	2	0	0	0	2
1996	0	0	4	0	0	2	6
1997	0	0	4	0	0	1	5
1998	0	0	3	1	0	0	4
1999	0	1	2	0	0	0	3
2000	0	1	1	0	0	0	2
2001	0	0	1	0	0	0	1
2002	0	0	0	0	0	0	0

Table 3. Continued.

Unit/ Year	Mortality Agent						Total
	Indian Harvest	Illegal Kill	Road Kill	Natural	Train Kill	Other	
62A							
1993	0	0	1	0	0	0	1
1994	0	0	2	0	0	2	4
1995	0	0	0	0	0	1	1
1996	0	0	4	0	0	2	6
1997	1	1	2	2	0	0	6
1998	0	0	1	0	0	0	1
1999	0	1	1	1	0	1	4
2000	0	0	0	0	0	0	0
2001	0	0	1	0	0	0	1
2002	0	0	0	0	0	0	0
63							
1993	0	1	2	0	0	0	3
1994	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0
1996	0	0	1	0	0	0	1
1997	0	0	0	0	0	0	0
1998	0	0	3	0	0	0	3
1999	0	0	0	1	0	0	1
2000	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
63A							
1993	0	0	1	0	0	2	3
1994	0	0	0	1	0	0	1
1995	1	0	0	0	0	0	1
1996	0	0	3	1	0	1	4
1997	0	1	0	0	0	0	1
1998	0	0	0	0	0	0	0
1999	0	0	4	0	0	0	4
2000	0	0	2	0	0	1	3
2001	0	0	0	0	0	1	1
2002	0	0	4	0	0	0	4
64							
1993	0	1	0	0	0	0	1
1994	0	6	1	0	0	2	9
1995	0	0	0	0	0	2	2
1996	0	0	4	0	0	0	4
1997	0	0	1	1	0	1	3
1998	0	0	2	0	0	0	2
1999	0	0	0	0	0	1	1
2000	0	0	2	0	0	0	2
2001	0	0	1	0	0	2	3
2002	0	0	0	0	0	0	0
65							
1993	0	2	0	0	0	0	2
1994	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0
1996	0	0	0	0	0	1	1
1997	0	0	3	0	0	0	3
1998	0	0	4	0	0	1	5

Table 3. Continued.

Unit/ Year	Mortality Agent						Total
	Indian Harvest	Illegal Kill	Road Kill	Natural	Train Kill	Other	
1999	0	0	1	0	0	0	1
2000	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
66							
1993	0	1	0	0	0	0	1
1994	0	0	0	0	0	0	0
1995	0	2	1	0	0	0	3
1996	0	1	0	0	0	0	1
1997	0	3	0	0	0	0	3
1998	0	0	0	0	0	0	0
1999	2	1	1	1	0	0	5
2000	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0
67							
1993	0	0	0	0	0	0	0
1994	0	1	2	1	0	0	4
1995	0	0	2	0	0	0	2
1996	0	0	3	0	0	0	3
1997	0	0	2	0	0	1	3
1998	0	0	3	0	0	2	5
1999	0	1	0	0	0	0	1
2000	1	0	4	0	0	0	5
2001	0	0	0	0	0	0	0
2002	0	0	2	0	0	1	3
69							
1993	0	1	0	0	0	0	1
1994	0	1	2	0	0	0	3
1995	0	1	1	1	0	0	3
1996	0	0	0	0	0	1	1
1997	0	1	0	2	0	0	3
1998	0	1	0	0	0	0	1
1999	0	0	3	1	0	0	4
2000	0	1	0	1	0	2	4
2001	0	0	0	1	0	1	2
2002	0	0	0	0	0	1	1

Table 4. Aerial survey of moose in Hunt Area 62.

2000-2001	Observed	Estimated ($\pm 90\%$ CI)
Total Moose	332	366 \pm 16
Cows	164	180 \pm 9
Bulls	98	109 \pm 8
Calves	70	77 \pm 5
Bulls:Cows:Calves	60:100:43	61:100:43

Table 5. Aerial survey of moose in Hunt Areas 60, 60A, 61, and 62.

Inclusive Location	1990-1991		1991-1992	
	Bulls:Cows:Calves	Total	Bulls:Cows:Calves	Total
Middle to N Leigh Creek	67:100:83	15	-	0
Wiggleton Hollow to Johns Creek	56:100:56	19	-	7
N Fork Badger Creek to Bitch Crk	72:100:56	41	-	6
Bitch Creek to Conant Creek	7:100:68	49	56:100:67	20
Conant Creek to Fall River	-	14	27:100:55	20
Fall River Ridge to Cave Falls Rd	36:100:43	80	-	28
Cave Falls Rd to Fish Creek Rd	-	10	56:100:22	16
Fish Creek to Moose Creek	-	24	-	19
Warm River Hatchery to Survey Draw	17:100:67	11	-	5
Buffalo River	-	2	-	2
Macks Inn/Big Springs Henrys Lake Flat	42:100:52	59	-	19
Henrys Lake	22:100:56	16	-	19
Henrys Fork to Hatchery Butte west of Warm River	32:100:60	102	-	14
Humphrey to Spencer	73:100:55	25	-	14
Spencer to Rattlesnake Creek	25:100:75	24	-	23
Corral Creek to Spring Creek	5:100:47	29	-	7
West Camas Drainage	-	14	-	29
East Camas Drainage	-	9	-	4
Big Bend Ridge	14:100:105	88	22:100:122	68
Desert, east of Sand Creek	-	6	-	8
Desert, Red Rd to Sand Creek Rd ^a	100:100:100	85	65:100:41	50
Junipers and Hook of Sands ^a	118:100:44	103	33:100:67	18
Chokecherry Ridge and Second Sands ^a	69:100:45	63	72:100:36	48
Total		888		444

^a Moose counted in conjunction with helicopter deer survey, 18 December 1988.

**PROGRESS REPORT
SURVEYS AND INVENTORY**

STATE:	<u>Idaho</u>	JOB TITLE:	<u>Moose Surveys and Inventories</u>
PROJECT:	<u>W-170-R-27</u>		
SUBPROJECT:	<u>7</u>	STUDY NAME:	<u>Big Game Population Status,</u>
STUDY:	<u>I</u>		<u>Trends, Use, and Associated</u>
JOB:	<u>6</u>		<u>Habitat Studies</u>
PERIOD COVERED:	<u>July 1, 2002 to June 30, 2003</u>		

SALMON REGION

ABSTRACT

Two controlled hunts with 14 total permits for antlered moose occurred in the Salmon Region during 2002. Twelve of 14 hunters harvested moose (86% hunter success). Interest in moose permits fell somewhat in 2002; 76 applicants selected Salmon Region hunts as first choices (draw odds = 1:5.4).

UNITS 21, 21A, 29, 30, 30A, AND 37A

CONTROLLED HUNT AREAS 21, 29

Background

Habitats in these units range from riparian river bottoms to sagebrush grasslands on rolling foothills up through ponderosa pine and Douglas-fir forests to lodgepole pine and spruce-fir forests at higher elevations. Willow shrub communities usually associated with moose habitat are not common. Portions of these units contain extensive cliff and rock talus areas at both low and high elevations. Topography is moderately to very rugged. Units 21 and 21A are in one of the higher precipitation zones in the Salmon Region, creating productive commercial forestlands. As a consequence, timber harvest is a dominant activity in at least the North Fork Salmon River drainage. Logging roads are common.

Units 21, 21A, 30, and 30A border areas in Montana where moose are common. Migrants from Montana may well have formed the initial nucleus for populations in units bordering Montana. Cross-border movements are no doubt common in this area. No information exists on historical moose numbers other than an increase in moose sightings in recent years, primarily in the North Fork Salmon River drainage. As a result, Hunt Area 21 (Units 21 and 21A) was initiated in 1990 with three permits (Table 1). Similar increases in moose sightings resulted in establishment of Hunt Area 29 (Units 29 and 37A) in 1991 and Hunt Area 30 (Units 30 and 30A) in 1993. Hunt Area 30 was incorporated into Hunt Area 29 in 1999.

Population Surveys

Because of dense cover, low moose densities, and solitary habits of moose, formal population surveys are ineffective in occupied moose habitat in the Salmon Region. Incidental observations of moose are recorded during aerial surveys for other ungulates. During 2002-2003 surveys, observers counted 56 moose.

Harvest Characteristics

Harvest and hunter information was compiled from Big Game Mortality Reports (BGMRs), which hunters must complete within 10 days of harvest; antlers of males must be presented to an IDFG representative. Permit levels (Table 1) and season structure (Table 2) were unchanged from 2001. Fourteen antlered-moose permits were allocated between two controlled hunts in the Salmon Region for 2002. Twelve of 14 hunters harvested moose (86% success). Of 136 permits issued since 1990, 125 hunters (92%) have taken a moose (Table 1). Antler spread of moose harvested during the 2002 season ranged from 30 to 42 inches ($x = 35.3$ in.). Since 1995, average spread ranged from 33.5 to 37.4 inches.

Five moose deaths were attributed to four causes of nonhunting mortality during the reporting period (Table 3). Nonhunting mortality ranged from one to four moose per year from 1993 to 2001.

Climatic Conditions

Rainfall during the summer months in 2002 was above average, with cool, wet weather during early summer. Vegetative growth generally appeared above average, particularly at higher elevations. Winter conditions were quite mild with temperatures well above normal and snow accumulation at lower elevations well below average. Animals, therefore, entered winter in average to above average body condition, then encountered a mild winter, which should have produced relatively high overwinter survival. Snow pack (as measured at higher elevations) was slightly above average by late winter. Onset of spring weather and associated plant phenology was apparently delayed by approximately 1-2 weeks. Water-year precipitation has been near average.

Habitat Conditions

Intensive logging operations in primary moose range of Units 21 and 21A generally have enhanced moose habitat by encouraging forb and shrub production in cutover areas. However, positive impacts may eventually be counter-balanced by negative effects of increased road access and loss of mature, dense-canopy forest stands used by moose for winter cover.

Capture and Translocation

No moose capture or translocation operations were conducted in the Salmon Region during the reporting period (Table 4). Opportunities exist to expand moose populations in Units 36 and 36B via capture and translocation.

Management Implications

Intensive population or habitat data will not be available for this area in the foreseeable future. Management will be based on moose sighting reports, incidental field observations of moose, and data from moose harvest and miscellaneous mortalities.

Table 1. Summary of moose harvest and drawing odds by Hunt Area in the Salmon Region, 1993-present.

Hunt Area	Year	Permits	Harvest		% Success	Days/Hunter ^a	First Choice Applicants	Drawing Odds
			M	F				
21	1993	3	3	0	100	12.5	26	1:8.7
	1994	3	2	0	67	7.0	10	1:3.3
	1995	4	3	0	75	18.0	30	1:7.5
	1996	4	4	0	100	8.5	22	1:5.5
	1997	4	4	0	100	4.8	17	1:4.2
	1998	4	4	0	100	4.5	18	1:4.5
	1999	4	4	0	100	17.3	21	1:5.3
	2000 ^b	4	2	0	67	4.0	10	1:2.5
	2001 ^b	5	4	0	80	16.3	15	1:3.8
	2002	4	2	0	50	10.5	15	1:3.8
29	1993	3	3	0	100	21.3	18	1:6.0
	1994	3	3	0	100	2.0	30	1:10.0
	1995	5	4	0	80	4.5	62	1:12.4
	1996	5	5	0	100	7.4	41	1:8.2
	1997	5	5	0	100	6.6	45	1:9.0
	1998	5	4	0	80	2.7	44	1:8.8
	1999	10	9	0	90	3.7	103	1:10.3
	2000	10	9	0	90	4.9	70	1:7.0
	2001 ^c	10	12	0	100	6.7	87	1:8.7
	2002	10	10	0	100	7.9	61	1:6.1
30	1993	3	3	0	100	6.0	10	1:3.3
	1994	3	3	0	100	6.0	14	1:4.7
	1995	3	3	0	100	2.0	31	1:10.3
	1996	3	2	0	67	4.0	19	1:6.3
	1997	3	3	0	100	3.0	27	1:9.0
	1998 ^d	3	3	0	100	8.3	30	1:10.0

^a From 1993 to 1995 data are from a telephone survey of all hunters. Beginning in 1996 data are from mandatory check of successful hunters only.

^b One permit was deferred from 2000 until 2001 season because of wildfires.

^c Two hunters mistakenly harvested bulls in Hunt Area 29.

^d Hunt Area 30 combined with Hunt Area 29 after 1998.

Table 2. 2002 season structure for controlled moose hunts in the Salmon Region.

Hunt Area	Season		Permits	Open For
	Dates	Length		
21	30 August-23 November	86 days	4	Antlered
29	30 August-23 November	86 days	10	Antlered

Table 3. Summary of all known moose mortalities by Hunt Area in the Salmon Region, excluding controlled hunts, 1993-present.

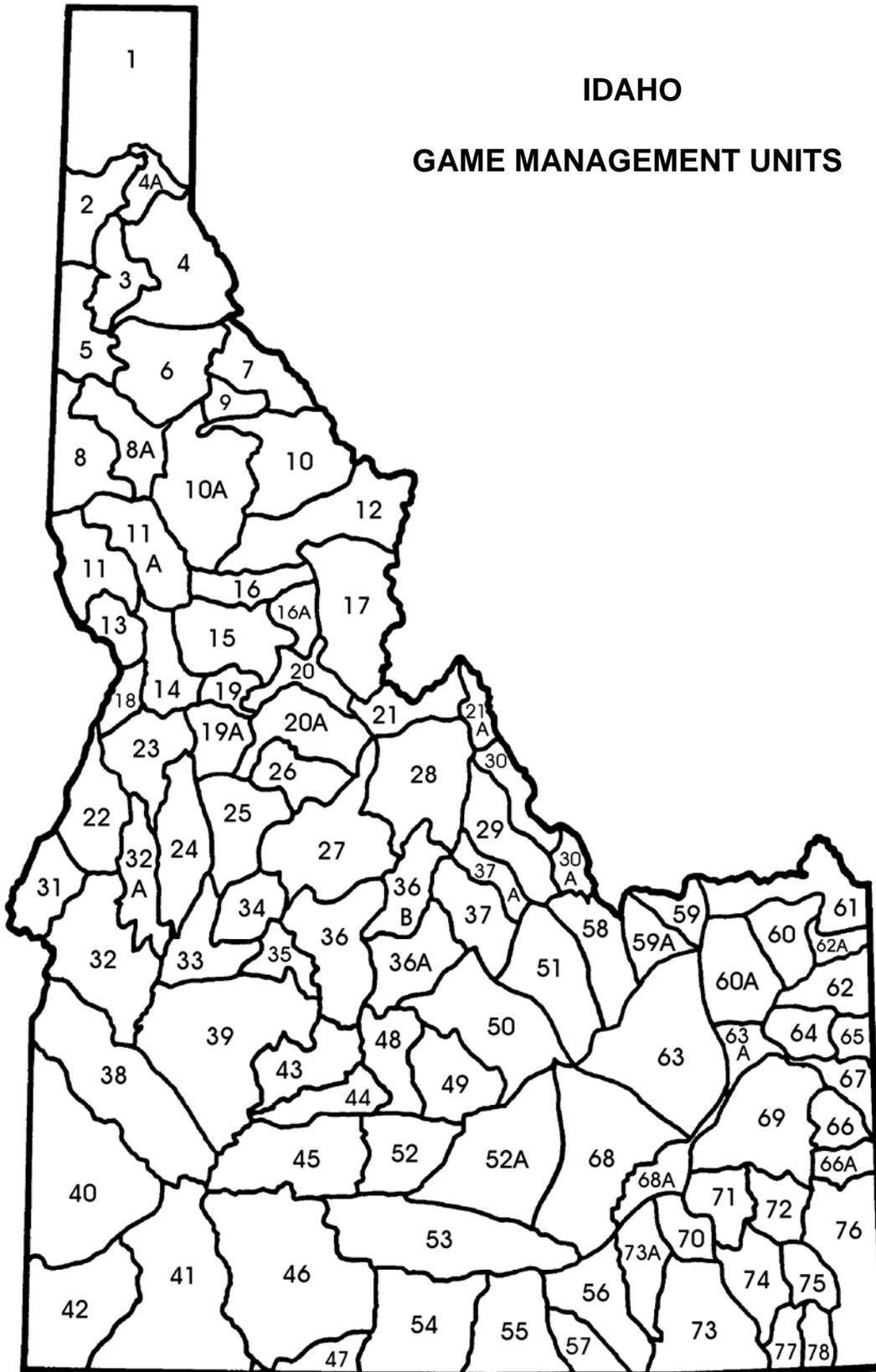
Unit/ Year	Mortality Agent						Total
	Indian Harvest	Illegal Kill	Road Kill	Natural	Train Kill	Other	
21, 21A							
1993	0	1	0	0	0	0	1
1994	0	0	1	0	0	0	1
1995	0	0	0	1	0	0	1
1996	0	0	0	0	0	0	0
1997	0	0	0	1	0	0	1
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0
2001	0	2	1	0	0	0	3
2002	0	0	1	0	0	0	1
29, 37A							
1993	0	0	0	1	0	0	1
1994	0	1	0	0	0	0	1
1995	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0
1997	0	1	0	0	0	0	1
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0
2002	0	1	0	1	0	1	3
30, 30A							
1993	0	0	0	0	0	0	0
1994	0	0	0	1	0	0	1
1995	0	0	0	1	0	0	1
1996	0	0	0	0	0	2	2
1997	0	0	1	0	0	0	1
1998	0	1	0	0	0	2	3
1999	0	0	1	0	0	1	2
2000	0	0	2	0	0	0	2
2001	0	0	1	0	0	0	1
2002	0	1	0	0	0	0	1

Table 4. Summary of moose translocation in the Salmon Region, 1993-present.

Date	Capture site	Release site	Adults		Calves		Total
			M	F	M	F	
2/93	Units 60, 60A, 62 in various locations	Unit 36: Valley Cr.	1	2	0	0	3
		Unit 36: Decker Flat	0	2	1	0	3
		Unit 36: Gold Cr.	0	2	0	0	2

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.

