

THE STATUS AND MANAGEMENT OF MOOSE IN IDAHO

Bradley B. Compton¹ and Lloyd E. Oldenburg²

¹Idaho Department of Fish and Game, 1345 Barton Road, Pocatello, ID 83204; ²Idaho Department of Fish and Game, P.O. Box 25, 600 S. Walnut, Boise, ID 83707

ABSTRACT: A review of historical accounts, field observations, harvest information, and limited aerial survey data indicate that Idaho's moose (*Alces alces shirasi*) population has increased substantially over the past 150 years. The majority of this increase appears to have occurred during the last 2 decades. Hunting was allowed from 1893-98, but was prohibited from 1899 through 1945. Since 1946, hunting has been by controlled permit only. Currently, 44% of game management units offer hunting opportunity primarily for antlered animals with a limited number of antlerless permits. Annual harvest has increased 1,950% since 1946. Management philosophy is directed at providing a high-quality hunting experience with opportunity for harvesting a mature bull. Specific objectives are identified in 5-year management plans. Field observations, aerial surveys, hunter success rates, and antler measurements of harvested bulls are used to develop harvest regulations. Moose populations are expected to continue increasing in the future. Maintaining suitable habitat; mitigating for impacts from an increasing human population, timber management, road building, livestock grazing, and mining will require additional efforts in the future along with better population information.

ALCES VOL. 30 (1994) pp.57-62

Historical and current status of moose in Idaho is difficult to quantify because of dispersed-low density populations, large geographic distribution, heavily forested habitats, and limited monitoring resources. However, a qualitative assessment can be made using historical accounts, incidental observations, limited aerial surveys, and harvest parameters.

HISTORICAL PERSPECTIVE

During the early 1800's, moose were apparently uncommon in Idaho. In 1806 Native Americans informed the Lewis and Clark expedition that moose could be found in portions of the Salmon River drainage (Thwaites 1959). However, many fur trappers including Osborne Russell (Haines 1955), Angus Ferris (Auerbach 1940), Donald Mackenzie (Clements 1969), and Peter Skene Ogden (Rich 1950) travelled the eastern and southeastern portions of Idaho and, while noting several big game animals, failed to mention moose. Similarly, few if any moose were believed to exist in the Yellowstone and Jackson Hole areas of Wyoming prior to 1850

(Houston 1968). Moose emigrating from Montana may have provided the source for populations in Idaho and Wyoming (Curtright 1969, Koch 1941, Spaulding 1956, Schladweiler 1974).

Moose apparently increased during the late 1800's and early 1900's because the first hunting season was established in 1893 in eastern Idaho. However, by 1898 concern for populations resulted in closing these general hunts. By the late 1920's, moose were considered abundant in portions of eastern, northern, and northcentral Idaho (IDFG 1968). Hunting resumed in 1946 in eastern Idaho under a controlled permit system. Controlled hunts were initiated in northcentral Idaho in 1954 and in northern Idaho in 1957.

Between 1970 and 1976 Ritchie (1978) conducted the most extensive ecological study of moose in Idaho to date. This study occurred in Fremont County of eastern Idaho and was prompted by a approximately 55% decline in aerial trend counts between the years 1950 and 1970. Objectives of the study were to determine the causes of the population decline and to develop management guide-

lines. During that study unregulated harvest (poaching and harvest by Native Americans) nearly equalled regulated harvest and comprised 197 of 527 (37%) known moose mortalities. The relative impact of unregulated harvest probably was underestimated due to low detection of this type of mortality. Ritchie (1978) stated "Most of the mortality detected during this study was man-caused, and it may be more than coincidental that a major decline closely followed the resumption of legal moose hunting. I suspect that the psychological effect upon the public of having a huntable surplus of moose may have resulted in increased moose poaching and incidental kill."

Beginning in the late 1970's moose populations are believed to have increased dramatically. Ritchie (1978) speculated that changing either-sex elk seasons in 1976 to antlered-only across a majority of the state resulted in reduced incidental moose harvest. Increasing moose populations and continuing westward colonization by moose currently provide hunting opportunity in nearly half of the state.

MANAGEMENT PHILOSOPHY

Since 1981, Idaho's management of wildlife has been guided by species-specific 5-year planning documents. Major management issues are identified and addressed incorporating input from Department personnel and the public. These documents are then reviewed for approval by the Idaho Fish and Game Commission. The current moose management philosophy is to provide a high-quality hunting experience. Emphasis is placed on providing conservative permit levels with the opportunity to harvest a mature bull (IDFG 1990). Specific objectives are to increase populations, including use of trapping and translocation; increase permit levels where possible; improve permit drawing odds; improve habitat conditions; mitigate depredations; decrease illegal harvest; and improve

data collection efforts. Additionally, nonconsumptive values of moose are considered during decision making.

DATA COLLECTION

Idaho's moose data collection efforts have evolved over time. Historically, incidental observations and field reports were used to make management decisions. Currently this data is used to monitor distribution and colonization of new areas. However, observations of this type provide little reliable sex/age class, abundance, production, and mortality information. Aerial surveys, both fixed-wing and rotary-wing, have been conducted in Idaho dating back to 1949. These surveys have been primarily used in eastern and southeastern Idaho because of higher population densities and lower forest canopy levels. Historically this data provided trend information on minimum known counts, sex and age ratios, and relative abundance of small and large bulls. Because standard aerial surveys tend to underestimate the true population with unknown levels of accuracy and precision (Caughley 1974, Samuel *et al.* 1987), current emphasis is placed on survey techniques that estimate visibility bias. The "sightability" techniques developed for elk (Samuel *et al.* 1987) and moose (Anderson 1994), and the technique developed by Gasaway *et al.* (1986) in Alaska have been used experimentally since 1991. While these techniques appear to be promising, none have been validated for moose in Idaho.

By far the largest data set Idaho has on moose is that obtained from harvest. Permit levels, harvest, and hunter success rates have been recorded since 1946. Prior to 1979, harvest was estimated via hunter report cards, and since then has been estimated by telephone survey. Beginning in 1982 the Department instituted a mandatory check requirement for all moose hunters. The mandatory check provides additional information on hunter success and data on sex, age, and antler

measurements.

Most hunting opportunity in Idaho has been for antlered moose; however, limited either-sex opportunity occurred periodically from 1950 through 1990. Beginning in 1991, hunters were issued either antlered or antlerless permits to better manage the sex-ratio of the harvest. In 1994, 65 of 669 (10%) permits offered were for antlerless animals. Season length and timing have varied over the years, but the trend has been toward increasing season length. The 1994 season length was 86 days from August 30 through November 23.

Permits and corresponding harvest have increased substantially since controlled hunting began (Fig. 1). Thirty permits were offered in 1946 increasing to 669 in 1994, with the majority of the increase occurring after 1981. Harvest has ranged from 24 in 1947 to 585 in 1993. Hunter success rates have remained fairly static and ranged between 51% and 100% with an overall rate of 81% (8,490 permits/6,919 moose) from 1946 through 1993.

Consistent with permit and harvest levels, the amount of area in Idaho with moose hunting opportunity has substantially increased since 1946 (Fig. 2). Since 1959, the

spatial management of wildlife, including moose, has been by Game Management Units (GMUs). Since 1946, the number of GMUs with moose hunting opportunity has ranged from 2% in 1951 to 44% at the present. Hunting opportunity from 1946 through 1958 was calculated based on 1959 GMUs. Percentage of GMUs with hunting opportunity is somewhat ambiguous given that the number of GMUs within the state has changed over time, ranging from 80 in earlier years to 100 at the present. However, the magnitude of change in percentage of GMUs with opportunity is much greater than can be explained by changes in the number of GMUs. To the contrary, the number of GMUs (denominator) has increased over time, thus "reducing" the relative amount of area with hunting opportunity (numerator).

Maximum antler spread of harvested male moose and percentage hunter success are used to monitor the relative exploitation of Idaho moose populations. Although not all antler information was available, a statewide sample showed no discernable trend in average maximum antler spread from 1986 through 1993 (Table 1). Although individual GMUs may vary, overall state average antler spreads

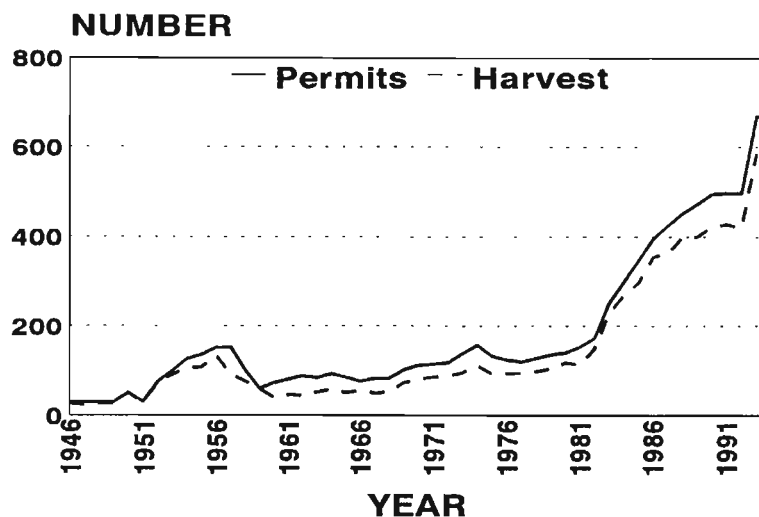


Fig. 1. Moose permit and harvest levels in Idaho, 1946 through 1994.

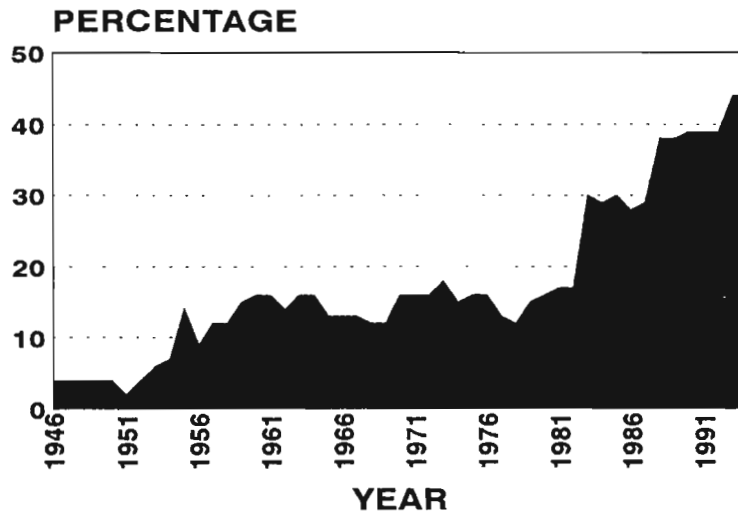


Fig. 2. Percentage of Game Management Units (GMU's) with moose hunting opportunity in Idaho, 1946 - 1994. GMU's were first established in 1959; percentages from 1946 through 1958 were based on 1959 maps.

during 1986-93 do not suggest a declining male age structure.

CONCLUSIONS

Based on available information it is apparent that moose populations in Idaho have increased substantially since historical times. Field observations, used to monitor distribution and colonization, have and continue to indicate an increasing population throughout the state. Interpretation of the current trend indicates that most of the suitable habitat in the state will be occupied in the near future. Increasing hunting opportunity and harvest, combined with stable high hunter success

rates and average maximum antler spreads, are consistent with either stable or increasing populations.

Past, current, and future management has and will attempt to balance biological and sociological objectives. Biological management will be directed at encouraging expansion of populations both passively and actively. Conservative permit levels allow for passive population growth, and translocation will be used to actively expand populations. Unregulated harvest has been and is expected to be a major mortality factor with moose (Ritchie 1978, Kuck 1984). New and additional methods of reducing this mortality fac-

Table 1. Average maximum antler spread, standard deviation, and 95% confidence interval from a sample of bull moose harvested in Idaho, 1986 - 1993.

YEAR	SAMPLE SIZE	AVERAGE SPREAD (cm)	S.D. (cm)	95% CI (cm)
1986	214	92.7	18.5	90.2 - 95.3
1987	213	94.5	19.6	91.9 - 97.0
1988	59	98.8	15.8	94.7 - 102.9
1989	289	89.4	17.9	87.4 - 91.4
1990	246	98.3	13.2	96.5 - 100.1
1991	213	96.0	12.1	94.5 - 97.5
1992	293	94.5	18.1	92.5 - 96.5
1993	195	91.7	15.6	89.4 - 94.0

tor should be addressed. Sociological management has and will continue to focus on maintaining high quality hunting opportunity, increasing permit levels, and increasing the odds of drawing a permit to hunt moose. Nonconsumptive values and opportunities will most likely gain increased attention in the future. To meet these challenges, better population information will be required.

Ultimately, the status of moose in Idaho depends on habitat suitability. Continuing pressures from timber management, road building, mining, livestock, urban sprawl, and an increasing human population will have to be mitigated to preserve adequate habitat. Additionally, changes in predator-prey systems (Van Ballenberghe 1987), introduction of *Parelaphostrongylus tenuis* (Anderson 1964), or fire suppression and the subsequent succession of forests (Kuck 1984) may play important roles in Idaho's future moose status and management.

REFERENCES

- ANDERSON, C.R. 1994. A sightability model for moose developed from helicopter surveys in western Wyoming. M.S. Thesis. Univ. of Wyoming. Laramie. 70pp.
- ANDERSON, R.C. 1964. Motor ataxia and paralysis in moose calves infected experimentally with *Pneumostrongylus tenuis* from a white-tailed deer. *Path. Bet.* 2:360-376.
- AUERBACH, H.S. (Ed.) 1940. Life in the Rock Mountains 1830-1835 by Warren Angus Ferris. Rocky Mountain Book Shop, Salt Lake City. 284 pp.
- CAUGHLEY, G. 1974. Bias in aerial survey. *J. Wildl. Manage.* 38: 921-933.
- CLEMENTS, L.J. 1969. A collection of upper Snake River Valley history plus a complete biography of Andrew Henry. 81 pp. mimeo.
- CURTRIGHT, P.R. 1969. Lewis and Clark: pioneering naturalists. Univ. Ill. Press, Urbana. 506 pp.
- GASAWAY, W.C., S.D. DUBOIS, D.J. REED, and S.J. HARBO. 1986. Estimating moose population parameters from aerial surveys. *Biol. Papers No. 22*, Univ. Alaska. 108 pp.
- HAINES, A.L. (Ed.) 1955. Osborne Russell's journal of a trapper. Univ. of Nebraska Press, Lincoln. 191 pp.
- HOUSTON, D.B. 1968. The Shiras moose in Jackson Hole, Wyoming. *Grand Teton Nat. Hist. Assoc. Tech. Bull.* 1. 110 pp.
- IDFG (IDAHO DEPARTMENT OF FISH and GAME). 1968. A century of Idaho wildlife. *Idaho Wildl. Rev.* 20:3-9.
- . 1990. Species Management Plan 1991-1995: Moose. Idaho Dept. Fish and Game, Boise. 22 pp.
- KOCH, E. 1941. Big game in Montana from early historical records. *J. Wildl. Manage.* 5:358-370.
- KUCK, L. (Ed.) 1984. Cooperative wildlife-phosphate study - summary and management recommendations. Idaho Dept. Fish and Game, Boise. 30 pp.
- RICH, E.E. (Ed.) 1950. Peter Skene Odgen's snake country journals 1824-25 and 1825-26. Hudson's Bay Record Society, London. 283 pp.
- RITCHIE, B.W. 1978. Ecology of moose in Fremont County, Idaho. *Wildl. Bull. No. 7*. Idaho Dept. Fish and Game, Boise. 33 pp.
- SAMUEL, M.D., E.O. GARTON, M.W. SCHLEGEL, and R.G. CARSON. 1987. Visibility bias in elk surveys. *J. Wildl. Manage.* 51:622-630.
- SCHLADWEILER, P. 1974. Ecology of Shiras moose in Montana. Fed. Aid Job Final Rept. Nos. W-98-R and W-120-R. Montana Dept. Fish, Wildl. and Parks, Helena. 100 pp.
- SPAULDING, K.A. (Ed.) 1956. The fur hunters of the far west. Univ. of Oklahoma Press, Norman. 304 pp.
- THWAITES, R.G. (Ed.) 1959. Original journals of the Lewis and Clark expedition,

1804-1806. Antiquarian Press Ltd., N.Y.
7 volumes.

VAN BALLEMBERGHE, V. 1987. Effects
of predation on moose numbers: a review
of recent North American studies. Swed-
ish Wildl. Res. Suppl. 1:431-460.