

## THE DALL SHEEP AND ITS MANAGEMENT IN ALASKA

by

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Before discussing factors of sheep management in Alaska, it might be desirable to give a brief summary of the known life history of the Dall sheep (*Ovis dalli*) for those unfamiliar with it. This species inhabits the alpine zones of Alaska's mountains south through the Kenai and Alaska Ranges to approximately the 60th parallel. They range north through the Brooks Range to the Sadlerochit and Shublik Mountains at about 69°30' north latitude, and west to approximately 165° of longitude in the DeLong Mountains north of Kotzebue. Their range includes the following mountain ranges in Alaska: the Kenai Mountains, the Chugach Range, the Talkeetna Mountains, the Wrangell Mountains, the Tanana Hills and White Mountains north and east of Fairbanks and the Brooks Range.

They breed from mid-November through mid-December with local variations. Winter conditions are well established in their mountain habitat by this time. Sheep usually winter in alpine zones although in some local areas they may descend into the brush zone or even into timbered areas. In general, these animals are dependent upon and become restricted to the high, windblown ridges where vegetation is available.

With the spring thaw, sheep move down to the lower slopes, alpine valleys and, in some places, even into the timber to feed on the early green vegetation. They follow the melting snowline upward as summer progresses and generally spread over their entire range in late summer and early fall. In at least one area, migration from winter to summer range takes place, but in general the movement appears to be one of spreading over their range in summer and retreating to the smaller, snowfree areas in winter.

Lambing commences in mid-May and continues until mid-June, again with local time variations as yet unexplained. A single lamb is the rule, with twins being very rare. Murie considered an average good lambing rate to be about 50 lambs per 100 ewes (Murie 1944). Rates we have observed during aerial surveys vary greatly indicating wide differences between herds and years.

As with other sheep species, rams segregate themselves into "bachelor" groups during the spring and summer, joining the ewe bands for the rut and remaining with them through the winter probably because of the restricted available range.

Although Dall sheep utilize natural mineral licks extensively during the summer, the importance of these licks to sheep and to their distribution is not yet understood but is currently under study.

Predation by wolves has been cited as a major mortality factor (Murie 1944). It appears, however, that predators normally have little effect on sheep populations unless the animals are already jeopardized by such things as overcrowding or severe winters. Accidental deaths caused by falling from icy cliffs or snowslides in winter take a limited toll and provide scavengers with easy meals. Such "kills" are often blamed on wolves which may have fed upon them.

Disease and parasitism have not yet been demonstrated to cause important losses in Dall sheep populations, although "lumpy-jaw" (probably necrotic stomatitis) may do so locally and needs more investigation.

The major cause of sheep population declines in Alaska appears to be inclement winter weather. This species has adapted physiologically and behaviorly to the cold, dry snow and frequent high winds of Alaska's interior mountains. As long as snow remains cold and dry, the wind blows it off exposed ridges, piling it deep on lee slopes and in valleys. Sheep are dependent upon these exposed ridges for their winter feed. Deep, wet snows which do not blow away and thawing and refreezing conditions which sheathe the alpine vegetation in ice or an impenetrable snow crust severely restrict the food supply and/or mobility of the sheep. Documented herd declines appear to have been directly caused by severe winters. The severity of winter-initiated die-offs is related to herd size and range condition.

The last recorded large-scale population decline in Alaska occurred in the early 1930's (Murie 1944) and apparently was statewide in scope. Sheep numbers remained low for a time, then began to increase. Comparable aerial counts reflect population rises during the past two decades in a number of representative areas, and it is assumed that statewide populations have followed this trend. Several examples of this trend are listed below:

AREA	YEAR	ESTIMATED HERD SIZE
Kenai Peninsula	1949	350
	1968	2,220
Boulder Creek, Talkeetna Mountains	1949	45
	1968	460
Peters Creek area, Chugach Mountains	1949	54
	1969	403
McKinley Park	1949	795
	1968	3,500

The best understood sheep herds in the state are several on the Kenai Peninsula where repetitive counts have been made over a number of years. These show steady rises in numbers until the present time. It is possible that some of these relatively isolated herds are approaching the maximum carrying capacity of their range, and at least one (that on Surprise Mountain) suffered a limited die-off during the winter of 1969-70, probably caused by severe snow conditions.

Fortunately, competition with man for habitat has been slight so far in Alaska. Because sheep spend most of their lives in the rugged alpine regions, which are little suited to man's development, serious competition is not likely to occur in the foreseeable future. Consequently, Alaska's wild sheep are free of some of the major problems faced by their southern cousins.

Hunting regulations in Alaska have allowed only the taking of Dall sheep rams with horns of three-quarter-curl or larger. The hunting season traditionally runs from August 1 to September 20 in the Arctic, and from August 10 to September 20 throughout the remainder of the state. Resident sheep hunters are not required to have tags or guides in order to hunt, but nonresidents (with certain exceptions) must obtain a \$50 sheep tag and the services of a licensed guide before they can pursue a Dall ram. The guide requirement has variously been imposed then waived over the years, but is presently in effect. There is some question as to its constitutionality, but this has not been tested in court yet. The only other statewide restriction on sheep hunting is that hunters who fly in may not hunt on the same day that they are airborne.

All sheep hunters are required to obtain, fill out and turn in to the Department a free hunter report card showing, among other items, whether or not they killed a ram and where it was taken. Return of hunter report cards has run about 90 percent of those issued since 1963, when these cards first came into widespread use. The annual sheep harvest has, therefore, been assessed with a reasonable degree of accuracy during recent years, and has remained fairly constant between about 900 and 1200 rams reported taken each year.

Because only adult rams may be taken, hunting has had little recognizable effect on populations. Several herds on the Kenai Peninsula are near highways and are therefore easily accessible to hunters. Almost every legal ram is taken from these herds each year, yet upward population trends in these hunted areas closely resemble that of a nearby herd which has been completely protected from hunting. Although no harmful effects have yet been demonstrated, it is possible that such extensive removal of adult rams may have some long-term effect on reproduction. This situation is currently under study. Throughout most of the state, hunting pressure is considerably lighter than on these Kenai herds and has had little noticeable biological effect upon the sheep populations.

To date, there has been little public interest in hunting ewe sheep. In fact, public opinion presently appears to be fairly strong against any general either-sex hunting for sheep. A very limited experimental ewe hunt conducted during 1970, the first of its kind to be undertaken in Alaska, stirred up considerable public criticism. A research program in association with that hunt is designed to determine the effects of either-sex hunting on a sheep herd. Until it can be ascertained that either-sex hunting is either beneficial or harmless to the herds, there seems little reason to alter the present ram-only regulations in the face of public opposition.

Because of Alaska's great size and the remoteness of most of our sheep hunting country, light planes are the only practical means by which hunters can reach game country in much of the state. Aircraft are as essential to the Alaskan hunter as are the pack horse in the Rockies, the canoe in the Northwoods lake country or the jeep in Hawaii.

Use of aircraft, as with any equipment, is occasionally abused. Infrequently reports are received of planes herding sheep past waiting shooters (I won't use the term "hunters"). This practice is illegal, of course, but such violations are very difficult to halt.

A common misuse of the plane is searching for large rams prior to hunting. Sheep are unnecessarily harassed in this manner, and sometimes they are actually, intentionally or unintentionally, frightened at the very time they are being stalked by foot hunters. Some people undoubtedly locate rams from the air, land nearby (in the few places where this is possible) and commence hunting immediately despite the regulation prohibiting hunting on the same day as being airborne.

Unfortunately, no game regulations are 100 percent effective in any state, and violations do occur. When such violations are witnessed and the word gets out (not usually with any identifying names or numbers) the public is led to believe such abuses are common practice and angrily condemns the use of airplanes.

The so-called "aircraft hunting" of sheep in Alaska has been receiving increased attention by the public both within and outside the state. There is actually no such thing as "aircraft hunting" of sheep. Shooting from an airplane is definitely a violation of the law and has been reported only rarely.

The most common problem with the airplane is congestion rather than violation. The many fly-in hunters are limited to relatively few suitable bush airstrips or lakes. This leads to considerable hunter concentration, especially in popular areas. The backpack or horse-pack hunter gets particularly discouraged and angry when, after a long pack into a lonely, remote sheep range, he suddenly finds one or more planes swooping in to nearby gravel bars after a short flight. This regularly spoils the hunt for the "traditional" hunter who got into sheep country the hard way.

To help alleviate congestion and reduce mechanical competition for the foot hunter, a large area near Anchorage has been closed to transportation involving hunting by any motor-powered vehicle during the sheep season. A few people hunt this area by pack horse, but it is primarily utilized by backpackers. The idea was received favorably by the public and now two similar areas are proposed for the Fairbanks vicinity. These will differ slightly in that they will be closed to all but foot hunting during the early part of the season, then opened to all legal forms of transportation for the remainder of sheep and other big game seasons to allow harvest of other species.

Obviously, restricting an area to use by the foot hunter alone is practical only where it is readily accessible to the foot hunter. It would help nobody to close remote hunting grounds to aircraft access since the foot hunter could not reach them. As human populations and hunting pressure increase, such zoning of accessible hunting areas in time and space for restricted access or hunting method will probably increase in scope.

Several areas in Alaska are entirely closed to the taking of sheep. Mt. McKinley National Park is one such area that provides the nonhunting public an opportunity to observe a large herd of sheep under relatively natural, unhunted conditions. This herd is also available for limited scientific study subject to the rules of the U. S. National Park Service. The Sheep Mountain Closed Area, on a small mountain adjacent to the Glenn Highway northeast of Anchorage, is also closed to the taking of sheep and provides an excellent opportunity to view them from the main highway. A third, the Cooper Landing Closed Area on the Kenai Peninsula, contains a herd of some 300 sheep, many of which are easily visible from a main highway at all seasons. The latter two sanctuaries are under control of the Alaska Department of Fish and Game. They not only provide the opportunity to readily view and photograph sheep, but also give the game manager and scientist unhunted "control" herds for study purposes.

Comparatively little research has been conducted on the life history, ecology and management of the Dall sheep and it is not as well understood as many other species. The Department of Fish and Game now has several dynamic and imaginative studies underway which should add greatly to our knowledge of this species. One such study being conducted in the Alaska Range south of Fairbanks entails trapping and marking sheep at a large natural mineral lick, then monitoring their movements to determine the area served by the lick as well as the movement pattern of the sheep. Use of this lick is also being studied in an attempt to determine its importance to sheep.

Another ongoing study consists of measuring a large number of horns taken by hunters to determine whether real size and growth differences exist between major habitats and if so to try to learn what factors affect horn growth.

A third study, recently initiated on the Kenai Peninsula, is designed to provide information on the basic life history of Dall sheep, on the effects of intensive ram harvest and, especially, on the effects of either-sex harvest. It involves comparing three isolated but nearby herds, all of which have had similar recent growth rates and all of which may be approaching the point of overpopulation. One herd is being reduced by one-third using a public either-sex hunt and a winter collecting program. The 60 specimens taken periodically throughout the winter should reveal much about reproductive physiology, food habits, physical condition and diseases and parasites. This herd will be maintained for five years at about 60 percent of its pre-experiment level by controlled annual either-sex hunts.

A second herd is in the Cooper Landing Closed Area, mentioned before as being closed to sheep hunting. This herd will provide an un hunted "control" for comparison with the other two. The third herd is intensively hunted and each year nearly every ram of three-quarter-curl or greater is removed by hunters.

Population trends, productivity and survival of these three herds are being compared in conjunction with the range condition and climate on the three areas.

These studies should provide considerable information of direct value to the future management of this species in Alaska. Other sheep programs conducted by the State include the previously mentioned harvest monitoring program and routine inventory surveys which reveal trends in distribution and abundance of sheep throughout the state.

In summation, I believe that Alaska's Dall sheep populations are presently in good condition and are generally on the increase. Man-made problems of biological significance are relatively minor in importance. Weather-related natural crashes have occurred in the past and could occur again but we do not have the knowledge or means to prevent them yet. The State has an active sheep research/management program which hopefully will give us the knowledge by which we can understand and possibly dampen such natural population fluctuations, and which will enable us to adequately handle man-made problems as they occur.

#### LITERATURE CITED

Murie, Adolph. 1944. The Wolves of Mount McKinley. U. S. Nat. Park Service, Fauna Series No. 5. 238 pp.

#### DISCUSSION

Question by Dale Jones, USFS, New Mexico

QUESTION: Did you find any difference in the plant composition between the areas which were windswept and subject to sheep use and those which are snow-covered?

ANSWER: We don't know yet, but we are trying to get into a long term range study this year. Incidentally, I am trying to find a range ecologist to come help me set it up. This would be on a contract basis.

REPLY BY JONES: Concerning the closure of the areas for backpacking, was this closure a state regulation?

REPLY BY NICHOLS: Yes. It was done through our Board of Commissions which closed it through our regulations.

QUESTION BY GUS SWANSON, CSU: Could you explain the objective of the experiment where you are trying to reduce the population from 300 to 200 animals?

REPLY BY NICHOLS: The major objective is to determine the effect of either-sex hunting which has never been done up there. The public is more or less against it, but as it stands with the ram only, we are not managing sheep. Nature is managing the sheep and we are only harvesting the rams. Perhaps in some accessible areas, we can produce more rams by either-sex hunting if it works the same as in deer and other species. So, we are trying to reduce this herd quite drastically by the collection program as well as the hunting program to determine whether or not there will be any effect on reproduction, survival and range trends.

QUESTION BY DWIGHT SMITH, CSU: We recently had a study in Colorado of hunted and unhunted herds. It was found that perhaps one of the adverse effects of hunting is related to the disturbance of the animals resulting in their changing some of their essential ranges. In the herd you mentioned, where they are taking all the 3/4-curl rams, have you detected any change in the ranges?

ANSWER BY NICHOLS: In this case there is no way they can change their range. They are not completely typical because they are on isolated mountains and not in a continuous range. Therefore they are held to their present range. Maybe in other areas of heavy hunting they have moved somewhat but right outside Anchorage, where hunting has been heavy, they seem to occupy almost the entire traditional range.