Management update and summary: Alaskan Dall's Sheep 2020

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ABSTRACT: The Dall's sheep (*Ovis dalli dalli*) management scene in Alaska has been vibrant over the last fifty years. Management and research investments in Alaska's Dall's sheep are presently beyond anything envisioned in the past. These changes followed decades of advocacy by hunter interest groups, plus a high-profile, controversial resident preference movement, and heightened interest in Dall's sheep health. Derivatives of these experiences include the re-discovery and review of forty-year-old management plans based on hunter-desired experiences, and the formation of a resident hunter special-interest group. Although Alaska has never recorded a bighorn pneumonia-type die off, continent-wide interest in *Mycoplasma ovipneumoniae* (*M. ovi.)* prompted the Alaska Department of Fish and Game (ADF&G) to initiate a statewide, interspecific survey to define the presence (or absence) of *M. ovi.* antigens and DNA fragments in Alaska's wildlife. *M. ovi.* DNA fragments (defined as an Alaska-endemic strain) have been found primarily in caribou (*Rangifer tarandus*), but are also widespread in Dall's sheep. *M. ovi.* DNA fragments have also been identified in Alaskan mountain goats (*Oreamnos americanus*). Speculation on the origin of Alaska-endemic *M. ovi*. DNA fragments sparked a review of historic domestic sheep and goat imports to Alaska from the beginning of the 1900s. Tens of thousands of domestic sheep and goats were imported during the last century with some being trailed through (but not ranged in) the heart of Dall's sheep habitats. The Alaska Chapter of the Wild Sheep Foundation's aggressive advocacy of *M. ovi.*-free domestic sheep and goats in modern Alaska drove negotiations between ADF&G and the Department of Environmental Conservation that appear poised to require screening for non-endemic *M. ovi.* DNA fragments prior to import of domestic sheep and goats to Alaska. This paper will describe the past and present situation in more detail.

Biennial Symposium of Northern Wild Sheep and Goat Council 22:49-56; 2020

KEY WORDS: Dall's sheep, harvest management *Mycoplasma ovipneumoniae*, ram harvest rate

UPDATE

General Wild Sheep Management History

Historically, wild bighorn sheep, having been virtually extirpated with colonization of the American West, were an uncommon landscape feature in the U.S.A. when modern wildlife management emerged over the first third of the 20th century. Consequently, mid-20th century wild sheep biologists struggled to foster agency interest in managing wild sheep on par with the dominant cervid/ursid/small game axis that drove the development of wildlife biology and management (Toweill and Geist 1999).

As wild sheep began to recover from the depredations of predation, competition with domestic livestock (exacerbated by domestic disease introduction), and human cultural evolution, the human-perceived status of wild sheep began to rise. First, predator reductions designed to facilitate domestic livestock operations in the American West lowered resistance to wild sheep population growth. As populations increased, wild sheep eventually came to be seen as another revenue-producing opportunity by state and provincial wildlife managers. As interest (both public and financial) increased, so did the status of wild sheep in the perception of managers concerned about the economic costs of management. This

status increase was enhanced by interest in ram hunting fostered by the outdoor press, most famously Jack O'Conner (see for example: O'Connor, J. 1974. Sheep and Sheep Hunting. Winchester Press. 308pp.)

Alaska Dall's Sheep Management History

This appreciation was slow in coming to Alaska where robust populations of Dall's sheep were taken for granted. Subsistence and market hunting for Dall's sheep were locally intense through the first quarter of the 20th century. Other than that, Dall's sheep populations existed in pristine habitats, and human-caused mortality was low to non-existent (Toweill and Geist 1999**).**

The most extensive review of Dall's sheep harvest regulatory history from early territorial days to the present may be found on page 6 of an ADF&G review, *The Dall's Sheep News*, from 2017
http://www.akleg.gov/basis/get_documents.asp?session=30&docid=42666

> Author's note: I consider this early review unimpeachable. Some later opinions in "*The Dall's Sheep News*" are less well documented. I'll not be going into those opinions here. WEH

Early (circa 1960-1971) Alaskan wildlife managers had been trained in colleges and universities where the wildlife curriculum was dominated by the cervid/ursid/small game tradition (Toweill and Geist 1999). Consequently, Dall's sheep were considered "typical ungulates," and their specific adaptations to habitat were under-appreciated. Modern reporting and monitoring of Dall's ram harvests began during the 1960s with introduction of a "harvest ticket" program (ADF&G 2017). It continues today.

Any view of Dall's sheep management in Alaska is a matter of perspective. When viewed over the shorter time, management may appear chaotic. However, when viewed over the longer-haul, its development appears more systematic.

Modern Dall's Sheep Management in Alaska

Management beyond the "naturalist" level began with statehood in 1960s (Nichols 1971). In 1968 there was a notable die off of Dall's sheep on the Kenai Peninsula (Nichols 1968, 1971). This die off resulted in a research project to determine the cause. The most likely cause was severe winter weather, and the research position created for that project disappeared at the end of the study. By 1970 a more management-focused position was established in Interior Alaska. This left Alaska with one Dall's sheep position and minimal operating budgets located in the Interior.

The Interior Alaska project focused on management-relevant Dall's sheep biology, driven by the availability of Dall's sheep for inexpensive capture and marking (via drop and rocket-net trapping and primitive neck-banding) at mineral licks. During this period, Dall's sheep management consisted primarily of monitoring ram harvests set at the ¾ curl ram minimum. That eventually changed, but that's another story (Heimer 1990, 1992, 1986, 1998a).

Societal Factors

Dall's sheep management became more complex with Congressional passage of the Alaska Native Claims Settlement Act (ANCSA) of 1972. ANCSA contained a section that reflected the compromise between environmental protection and oil development. This compromise eventually produced the Alaska National Interest Lands Conservation Act (ANILCA) of 1980 (Heimer 1982).

Land Classification and Economics

As detailed by Heimer (2000) Alaska's idyllic neglect of Dall's sheep ended with the development-driven necessity of settling ANCSA land claims and the resulting ANILCA land classifications. In the course of negotiating ANILCA-driven land ownership, half of Alaska's Dall's sheep were declared "off limits" to hunting via executive order of then-President Carter. The resulting loss of revenue to the state focused

attention on the value of Dall's sheep in Alaska's economy (Heimer 1982). Eventually, half of the loss was mitigated by amendments to ANILCA legislation, and the net loss to Alaska's economy from federal land reclassifications was reduced to about 25% of the pre-ANILCA resource base (Heimer 1985). The time-adjusted economic benefit to Alaska from Dall's ram harvests is presently estimated at 20-25 million dollars annually (K. Gordon, pers. comm.).

Current Alaskan Dall's sheep management

Today, ADF&G supports two full-time Dall's sheep research positions, their technical support staffs, and associated graduate student programs. Survey, reporting, and regulatory duties are covered by regionally diversified participation by Area Management Biologists. The present fiscal commitment to Dall's sheep management by ADF&G is estimated at about a quarter of a million dollars annually. The revenue to the state is estimated about at roughly 80 times that figure. The National Park Service, the U.S. Fish and Wildlife Service, and the Bureau of Land Management make additional expenditures pursuant to their agency objectives. Unlike the lower USA, Alaska has an insignificant number of wild (Dall's) sheep on U.S. Forest Service lands.

Population Contractions and hunter number declines

Apparent weather-related population contractions occurred ten years later than the losses in harvest opportunity caused by land reclassifications. These population contractions began in the early 1990s, and seemed linked to lamb production failures that, in turn, coincided with changes in weather patterns. Population contractions were more notable in some areas than others, with geography and prevailing weather being the greatest variables between areas (Heimer *et al.* 1994).

The decreases in harvestable Dall's sheep populations (whether due to weather or land reclassification or both) were accompanied by a steady drop in numbers of hunters participating. Over the 15-year period from 1980 to 1995, Dall's ram hunter numbers declined from about 4,500 to half that number reporting. However, the documented decline in hunter participation drew less public or managerial interest than the primarily anecdotal accounts of declines in sheep population sizes (Heimer 2012). Declines in hunter participation have continued through 2021 (J.Want, ADF&G pers. comm.).

Hunter paranoia postulated that deteriorating hunting conditions were occurring because of Dall's sheep population declines (neglecting the decline in hunter numbers, which probably outstripped the losses to sheep population sizes). This paranoia began to drive demands for managers to do something to fix the situation.

Complaints by the Alaska Chapter of the Wild Sheep Foundation lead to a re-awakened interest in management planning without regard to existing plans made operational almost four decades earlier (ADF&G 1974).

Management Planning

Logically, management plans should implement established policy. Alaska's Constitution defines the policy of the state with respect to natural resources. It prescribes making Alaska's natural resources available for maximum sustainable use consistent with public interest and the maximum benefit to 'Alaska's people.' In the early 1970s, this mandate was generally overlooked, because, visionary ADF&G leadership directed inexperienced biologists into Alaska's first management planning effort (ADF&G 1974). In drafting these plans, present management practices were prioritized over the Alaska Constitution. In 1974, there were few enough hunters in Alaska that little attention was paid to what might happen in 50 years. During this management planning effort Dall sheep mangers understood the "maximum benefit" to 'Alaska's people' to mean giving users what they wanted, within the conservation limits imposed by the Alaska Constitution.

Consequently, a comprehensive survey of 'what hunters wanted' was undertaken. The results of this survey (of all hunters in 1973-the average

during this period was about 3,000 reporting) showed the highest priority of Alaska's Dall's ram hunters was assurance of continued harvest opportunities. The second highest priority was the opportunity to hunt in un-crowded conditions, and the third priority was to have the opportunity to hunt for trophy rams at some time during a sheep hunter's life.

These hunter-desired priorities were reflected in the 1976 plans for hunter-experience-based objectives. Defined opportunity objectives for specific regions were consistent with existing Dall's sheep populations, and the then-existing uses were the result. Areas with high sheep population densities and ready access were designated as "maximum opportunity" zones. Those areas with less dense populations, more difficult access, and lower hunter use were classified as "aesthetic hunting" opportunity zones, where participation would be controlled by limited-entry permit. The "trophy hunting' desire was limited to two areas (one designated, and the other *de facto*). In the designated area, higher age limits and horn sizes were prescribed. Opportunity to hunt was necessarily limited by lottery permits in areas planned for "aesthetics" and "trophy hunting" to provide these experiences.

These plans were either so successful or forgettable that they were accepted as "the way it had always been" within a decade or two. Then, with changes in personnel, the existence of these formally approved plans was forgotten. Purposeful Dall's sheep management consisted of monitoring ram harvests and administering the designated permit systems for "aesthetic" and "trophy hunting" regions. A few additional "aesthetic" areas were developed along the way and report-requiring subsistence hunting was recognized (Heimer 1986).

As the anecdotally-driven perception of deteriorating sheep hunting conditions spread, a movement advocating establishment of modern management plans as a solution to the perceived problem arose. In contrast with Alaska's hunter-experienced but forgotten management plans, modern management plans typically specify prescribed population size objectives, population composition objectives, hunter participation levels, and harvest objectives (see any published management plan.)

The Alaska Chapter of the Wild Sheep Foundation (a NGO) actively advocated for plans of this type, even offering to pay for the planning effort. However, there was some resistance to this effort on the part of the Department of Fish and Game. The Department seemed to sense that this sort of plan might not be readily applicable to Dall's sheep in Alaska (K. Gordon, WSF pers comm.)

Eventually, it was discovered that the NGO's generous offer to fund management planning was unworkable. In the course of things, the already-existing management plans were discovered. Realizing that sheep populations were virtually certain to be regulated by factors beyond the human harvest of rams as then regulated (at full curl or eight years of age throughout the previous three decades), the Department managed to blunt the "modern trend" in wildlife management plans for Alaska's Dall's sheep. The result was maintenance of the *status quo* of the pre-existing Alaska-relevant "hunter experience-based" objectives from 1976. ADF&G promised more frequent review of the existing management plans linked to reporting on federal funding for wildlife restoration and management (called Pittman-Robertson contracting in the USA

The Resident Hunter Preference Movement

The wide-spread failure to recognize the subtly significant decline in hunter numbers coupled with the obvious decreases in sheep numbers gave rise to the popular impression that hunting conditions were deteriorating statewide.

This popular, anecdotally based perception was soon coupled with allegations that the guiding industry was responsible. Resident hunter efforts to lower nonresident hunter participation via proposed changes in harvest regulations (at the risk of economic losses to Alaska's economy) lead to analysis of hunter behaviors, guided hunter harvests, and ultimately to calculation of harvest rates (Heimer 2012). Results indicated no support for the allegations that guides were the problem (*ibid*).

The unexpectedly low harvest rates (Heimer 2012) were publicly criticized by prominent sheep managers who argued that calculating harvest rates based on ram ages was unreliable, because hunters select rams based on horn curl, not age. These criticisms were investigated in detail (J. Want, ADF&G pers. comm.) and found to be without support from harvest statistics (Heimer 2012).

Correct or not, the popular perception, coupled with an influential local resident's vendetta against guide/outfitters lead to the most recent resident hunter preference movement. This was not the first resident-preference movement in Alaska's history. Sheep hunters have always bristled at not having the mountains all to themselves. Here's how this particular movement developed.

Resident Hunters of Alaska (RHAK): Origin of an NGO

An influential resident hunter had flown his personal aircraft into the sheep hills and cached 82 gallons of avgas to use in an upcoming sheep hunt. When he got back to his stash, his aviation fuel was gone. He alleged it had been found, stolen, and combusted by the locally resident, territorial, airplane-using guide in the area. This led to a campaign to punish the guiding industry by amplifying the ancestral animosity of residents toward non-resident hunters, who must have a guide to hunt sheep in Alaska. The aggrieved airplane owner enlisted a cadre of friends in a campaign to limit nonresident hunter participation (i.e., guiding) in Alaska. These residents essentially "buried" the Alaska Board of Game with proposals (which anyone may submit to Alaska's harvest-regulating board) to, among other things, restrict nonresident hunters to 10% of the harvest (Alaska Board of Game Public Proposals 2007-2013).

While the Board of Game was sensitive to the fact that such a restriction would greatly reduce revenue for wildlife management and restoration, the resident hunter preference/anti-guide interests persisted. The public clamor over this issue eventually resulted in an orchestrated effort to address the issue via a broadly based public special interests working group initially organized to solve the problem by delegating management planning (see earlier text). This effort ultimately failed for legal, fiscal, and human logistic reasons.

However, before that happened, the Board directed the Department to contract an assessment of present-day hunter preferences via a survey of hunter attitudes (ADF&G 2014). Complaints about use of aircraft in hunting Dall's rams were predictably prominent in the results of that assessment. Consequently, the Board passed a regulatory proposal prohibiting the use of aircraft in looking for Dall's rams to hunt. In retrospect, the regulation proved basically un-enforceable (and was identified as such by enforcement personnel at the time). My inference that the Board was hoping to tamp down the orchestrated resident preference fervor by "throwing the most vocal residents a bone" was later confirmed by a conversation (T. Spraker, Board Chair pers. comm.) If this were the strategy, it failed.

The interest of aircraft owners (those with the means to own personal aircraft) had been piqued by their invitation to participate in the failed management planning working group. These hunters were acutely aggrieved that their investments in and alleged approach to hunting plus their means of transport had been identified for discrimination. In response, they formed an organization called "Resident Hunters of Alaska" (RHAK). Enough money was raised to hire an Executive Director, and promote resident preference interests. Presently, the Board of Game deals with RHAK-driven proposals to disadvantage nonresidents hunting all species on a predictable basis (ADF&G 2007-2021).

Tension between local and non-local hunters (and their guides) has always existed, but the presence of RHAK in Alaska has exacerbated these tensions. RHAK seems to have diverted its interest away from the ban on aircraft use in Dall's ram hunting, and is presently focused more broadly on compromising nonresident hunting opportunity (and the guiding industry on which nonresidents depend).

Disease protection awareness overview

The effective focus of bighorn disease biologists on domestic sheep as causes of bighorn die-offs is broadly appreciated throughout North America. Bighorn die offs have always been interpreted in light of the existing knowledge base (Heimer 2002). Various "causes" for bighorn die off biology have enjoyed periods of predominant popularity over time. This progression began with blaming bighorn die offs on competition with domestic grazers, progressed through "the lungworm/pneumonia complex" era, the domestic sheep *Pasterellacae* period, the identification of *Mannheimia* and the discovery of leukotoxin effects (Heimer 2002). Today the focus is on *Mycoplasma ovipneumoniae (M. ovi)* (ADF&G 2017). Although no disease-related die offs resembling bighorn pneumonia have been recorded in Alaska, the present emphasis on *M. ovi.* among bighorns has affected Alaska. Both the Department of Fish and Game and the Alaska Chapter of the Wild Sheep Foundation plus domestic sheep advocates have been involved (Heimer. 2019).

Alaska's history with domestic sheep

Although various attempts to establish a domestic sheep industry in Alaska have occurred throughout the last 100 years, Alaska has no definable domestic sheep industry at this time. The attempts to establish a domestic sheep industry failed as consequences of location, weather, and marketing logistic constraints. Today, domestic sheep exist in Alaska as small "farm flocks" or student agriculture projects (Heimer, 2019).

Dating from the various gold rushes of the late 19th and early 20th centuries, thousands of domestic sheep have been introduced to Alaska. Hundreds were barged up the Yukon River, and thousands trailed through (but never ranged on) the heart of Dall's sheep habitat in the Central Alaska Range south of Fairbanks (ADF&G 2017). A University of Alaska (then called the College of Agriculture and Mining) project, in concert with the US Department of Agriculture, proposed (and experimented with) hybridizing captive Dall's sheep with domestics in 1930. Apparently hybrids were produced, survived, and became campus pet favorites. Nevertheless, the idea of producing weather-resistant hybridized wild/domestic sheep, where wild meat was plentiful, faded when confronted with economic realities. (Bunnell, 1930). Alaska currently has no industrial-scale domestic sheep industry. Nevertheless, protection of Alaska's Dall's sheep from small-flock domestic sheep-borne *M. ovi.* became controversial (Heimer 2019). Here's that story:

Contemporary efforts to protect Alaskan Dall's sheep from domestic diseases

Because of the focus on bighorn die-offs associated with *M. ovi.,* ADF&G initiated monitoring hunter-harvested Dall's sheep (and other species) for evidence of *M. ovi.* in Alaska. Ultimately, the ADF&G survey showed an apparently unique Alaskan strain of *M. ovi*. This strain is wide spread among caribou and Alaska's Dall's sheep, and its origin is uncertain (ADF&G 2019).

The Alaska Chapter of the Wild Sheep Foundation was initially unaware of that survey effort, and benightedly committed to creating *M. ovi.*-free domestic sheep, via administrative programs requiring mandatory testing and voluntary culling of domestic sheep and goats in Alaska, as the protective solution.

In an effort to effect its management goal, the Chapter acted to use the administrative mechanisms through the Alaska Board of Game (those it understood) to prohibit import of domestic sheep and goats that might carry *M. ovi.*

The Alaska Board of Game and the "clean list"

The Alaska Board of Game exists "... for purposes of the conservation and development of the game resources of the state." (Alaska Statute 16.05.221 (b)). Presumably as part of "conservation," and permitting efficiency, the Board has established a list of animals, for which it has statutory responsibility that may be imported to the state without a special permit. This list is called the "clean list." For unexplained reasons, the "clean list" expansively includes domestic animals like

sheep and goats, even though import of domestic animals is beyond the purview of the Board of Game. The Board may only deal with critters defined as "game animals," not domestics.

The Alaska Chapter of the Wild Sheep Foundation, hoped to get the Board of Game to remove domestic sheep and goats from the Board's "clean list." The implicit assumption was that once domestic sheep and goats were off the "clean list," import regulations would be more restrictive. The Alaska Chapter did not inform domestic growers of this plan prior to going to the Board of Game. It simply proposed removal of domestic sheep and goats from the Board's "clean list," as well as some separation language.

When news of this proposal reached the domestic growers, they felt threatened, and acted through their own non-governmental organization (the Alaska Farm Bureau), to oppose the proposal by the Alaska Chapter of the Wild Sheep Foundation. Controversy developed, and initiated a rough-and-tumble administrative struggle between the two special-interest groups. The Board of Game and ADF&G were caught in the middle, with the Department of Environmental Conservation (DEC) dragged into the mix. Regulation of domestic animal health is the responsibility of DEC because the office of the Alaska State Veterinarian is presently within that Department.

Ultimately, the issue of regulating domestic animal import was ruled to be beyond the authority of the Board of Game. Through a complex nexus of stormy negotiations, a facilitated working group meeting, and management agency efforts to address the problem, the Department of Environmental Conservation and the Department of Fish and Game negotiated a draft set of revised regulations requiring *M. ovi.* testing prior to import of domestic sheep and goats. These, now final, regulations (18AAC 36.015) call for testing of domestic sheep and goats for the presumably pathogenic strain of domestic sheep/goat *M. ovi.* prior to import. They also define *M. ovi.* infection in domestic animals as a "reportable disease," and require permanent identification of all imported sheep and goats.

These regulations look very much like what the activist Alaska Chapter of the Wild Sheep Foundation wanted. However, politics being what they are, the draft regulations from DEC propose an exception for importation of domestic sheep and goats under the age of two months. This exception seems based on early-reported research from Washington State University (subsequently shown to be unrepeatable) that sheep and goats under two months of age do not carry *M. ovi.* That preliminary finding has recently been recognized as a mistaken preliminary finding, and efforts to correct that mistake are underway (AWCA, 2020).

SUMMARY

The facts that our present knowledge of *M. ovi* is evolving, while the social complications and animosities generated during the course of these events persist, suggest the proposed regulations may not be the ultimate mechanism protecting Dall's sheep from domestic animal disease. Still, it seems a rational first step where *M. ovi.*is concerned.

Author's note: Surprisingly, to me as a participant in the facilitated M. ovi. working group, the domestic growers were agreeable to a zero-tolerance, lethally enforced separation policy. That policy would prescribe that any domestic grower who saw a Dall's sheep approaching his/her farmstead should shoot the interloping Dall's sheep on sight. The carcass would be forfeited to ADF&G for disease testing. That agreement on the part of domestic owners wasn't surprising. What was surprising was the reciprocal suggestion from the domestic growers. They insisted that to be effective, any domestic sheep or goat encroaching on Dall's sheep range be shot on sight as well, and the carcass forfeited to ADF&G for disease testing. This verbal agreement did not factor in pack goats closely attended by humans. The coordinated Alaska Chapter interests at the facilitated working group immediately dismissed this proposed solution as unworkable. Today, it exists only as a unique suggestion rejected by the Alaska Chapter of the Wild Sheep Foundation.

The progression of Dall's sheep management in Alaska over the last half-century appears both chaotic and directed. How it is seen as a matter of perspective. Management has evolved from benign neglect through arbitrary administration of use, and toward appreciation of Dall's sheep adaptations to environment. Trends in public involvement, and the influences of the broader wild sheep community, in disease protection have been recent influences. If management is to become more harmonious in the future, better communication between managers and users will be necessary. Special interest groups supporting management have been helpful. Special interest groups mistaking themselves for managers have not.

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