

WIRAC Dall Sheep Management Plan Guidelines

April 2023

The Western Interior Alaska Regional Advisory Council continues to have grave concerns regarding the current Dall sheep populations within the Central Brooks and Alaska Ranges. The Council's authority to ensure healthy populations of fish and wildlife using recognized scientific principles is found in ANILCA Title VIII, sec. 805 (3) (A) through D. Sec 805 (3) (A) is explicit regarding evaluation and recommendation concerning policies and management plans. (3) (D) (i) through (iv) requires councils to identify and make recommendations regarding management of fish and wildlife to ensure subsistence uses.

The Dall sheep populations have been reduced to numbers far below the long-term carrying capacity of the habitat. These declines are due to multiple climate events in the past decade and in some excessive harvest mortalities in popular sport hunting areas. Local Rural residents have utilized and relied on these sheep for non-wasteful consumptive use. The Customary and Traditional use determinations reflect these uses. Many local rural residents have recognized the critical declines in the sheep populations and voluntarily reduced harvest.

The State of Alaska Board of Game endeavored to develop a sheep management plan in 2014/15. The broad based user group's participants could not come to a consensus on several issues. The planning process was a failure. Without a plan to set basic parameters for Dall sheep management, the populations can be harvested beyond sustainability.

WIRAC has successfully advocated for FSB regulatory closure for all hunting of suppressed sheep populations in GMU,s 24A and 26B west of the Sagavnirktok River through 7/1/2024.

The Council is compelled to recommend management strategies regarding the biological parameters needed rebuild and maintain the Dall sheep populations and the subsistence and non-subsistence uses on Federal public lands.

Sheep Ecology

It is a recognized fact that Dall Sheep are a very social animal with minimal movements within their learned habitat. Dall sheep are to be managed within the Game Management Unit (GMU) and sub-units they reside in. These sub populations should not be expected to provide the large majority of sport harvests for the entire mountain Range encompassing multiple GMUs. GMU and sub-units with snow shadow that hold higher sheep populations should not be combined with areas with typically higher snowfalls.

Dall sheep rams and ewes are raised and learn the use areas for the various times of year, feeding, rutting, and mineral uses. Sheep rarely move over 6 to 12 linear miles throughout their lives. As sheep move with older animals than themselves, they learn predator evasion strategies. Younger sheep will run to the mature sheep to lead them out of harms way. Sheep routinely live to 10-12 years of age under normal conditions. Many lightly hunted areas routinely sustain 10-12 year old ram harvests.

Wind scouring of winter habitat is very important to all sheep. Early wet snow with rain on snow seals the ridges, not allowing wind scouring. Dall sheep are not very tall (12-20" to the belly), and have a climbing hoof not conducive to excavating a lot of snow.

Rain on snow, deep snow, and late springs that exhaust the weaker individuals of the population cause population declines. Weaker individuals that are lost first are young of the year, smaller yearlings that were late-born, and older animals over 10 to 12 years old. Most rams 2 to 10 years old survive in real hard winters. Ewes are approximately 50% smaller and have higher mortalities in deep snow than rams.

When winter-stressed ewes survive deep wet snow and/or late springs, their physiological recovery can take all summer, and fecundity is affected for the next reproductive cycle. Lambs produced by stressed ewes will typically be late born, smaller than average, with reduced winter survival rates, especially if another bad winter is encountered. Young ewe sheep that survived to adulthood after a hard winter start in life may not produce lambs until their fourth birthday.

Sheep rely on snow melt-off on steep south-facing slopes to access new growth in late April. They will move to very low elevations to get green florescence as soon as it is available. With each additional week that the melt off is delayed, overall sheep mortality increases, especially gestating ewes and yearlings. A one-month delayed melt-off in 2013 proved to be extremely detrimental to vulnerable segments of the sheep population. Most yearlings, older sheep, and lambs died; causing a greater than 50% decline in the overall sheep populations. The severely stressed ewe component again produced extremely low lamb numbers in 2014. The end-result caused three recruitment cohorts, (2012, 2013, and 2014) to be predominately missing.

Sheep move up the south-facing, melted slopes with the green up. In mid to late May through the 14th of June most sheep are on south-facing alpine slopes that have Dryas and other wildflower forbs in pre-blossom and in flower. This is the critical period when there is high protein pollen available to put into muscle recovery and lactation. Periodic rain events delay pollenating insect activity, providing longer access for sheep to this high-quality feed. The sheep move onto ridges and north-facing slopes as the wildflower forbs come into later phenology blossom. Damp, cloudy summers are a big advantage to sheep because this extends their access to high protein. Recruiting lambs will have much heavier fall weights. Conversely, rapid melt off with hot weather maximizes the insects to pollenate the forbs. When they pollinate quickly, the high-protein food source is available for a shorter period of time. Lactating ewes will have less exposure to high quality feed, affecting fall lamb weights, yearling growth rates, and the ewe's own fat reserves. Very young rams leave their natal ewe group in the summer of their second or third year, having 1/4-1/2 curl horns. Established 1/2 and 3/5 curl rams typically ostracize these young rams, as they endeavor to join ram groups. Most rams separate from ewes in summer/and fall working out their pecking orders for dominance. These young rams are inexperienced in predator detection so are at a vulnerable position before they are accepted into a ram group. Young rams all run to the oldest rams when predators are detected. Mature sheep lead the way to escape terrains they know intricately in their home range.

Management should assure that sufficient adult rams (>7 years old) are available post hunting season. Mature rams aged 7 to 12 years old have fat reserves to endure the rutting activity and combat with other rams. Heavy fat reserves translate to kinetic energy when

butting horns. Adult rams' orbital gland weeps a strong pheromone that is attractive to ewes. Adult rams will provide more synchronous first estrus with best advantage to the lamb's survival. These adult rams have a much higher winter survival rate than if only young rams are available. Young rams 3 to 6 years old have less pheromone with a disruptive effect on breeding ewes. Younger rams left as primary breeders reduce successful recruitments to the population. In the absence of older rams, younger rams will expend a tremendous amount of energy chasing ewes that are essentially rejecting them. Often, ewes will pass their first estrus without breeding when only younger rams are available. If they do breed with these younger rams, it may be during their second estrus, resulting in late-born lambs not hearty enough for the coming winter. Young rams with much lower fat reserves and body mass expend too much energy as primary breeders and die prematurely in normal winter stress.

The social presence of 7 to 12 year-old rams is very important to the overall sheep populations' survival. Mature rams defend ewes from young rams while in rut, saving young rams' fat reserves. Mature rams are larger and have more experience evading predators, helping younger rams' survival throughout the annual cycle. Mature rams' larger body mass allows them to access varied feeding areas in winter by break trails for smaller sheep on the mountain. Mature rams and ewes lead younger cohorts throughout their home ranges, to mineral sources, spring feeding sites, rutting areas, and in predator avoidance.

Dall Sheep Management Plan

Remote weather monitoring by staff

Winter weather events should be monitored by federal management agencies that have sheep and habitats. Many times there are remote sensing instruments and weather reporting stations to draw data from. There are also webcams that can be remotely accessed. Regional Advisory Councils' and State Advisory Committees' comments on local conditions such as deep snow, rain on snow, late spring, far fewer animals observed, etc. need to be taken seriously for sheep conservation and management. There should be open dialogue and sharing of findings between managers and local users.

Adverse conditions to sheep's over-winter success:

- Early winter deep snow with rain events
- Extended warm up with liquid rain that freezes crusts on snow throughout the winter.
- Late spring melt off timing

Positive conditions for sheep's successful wintering:

- Freeze up before significant snowfall
- Cold snowfall at typical levels throughout the winter
- High winds to scour the ridges
- Melt-off commencing in late April on south facing slopes

Survey timing and methodology

- Dall sheep are to be managed within the Game Management Unit (GMU) and sub-units they reside in. These subpopulations should not be expected to provide large sport harvests for the entire mountain Range encompassing

multiple GMUs. GMU and subunits with snow shadow that hold higher sheep populations should not be combined with areas with typically higher snowfalls.

- Sheep aerial and ground surveys should be conducted immediately after lambing and when sheep are aggregated on south facing slopes and ridges from June 5 to June 20. Weather is typically still in a dry air mass with good visibility. The sheep are very easily found when on green slopes gorging on flower blossoms in the sun. Federal agencies should seriously look at changing when aerial sheep surveys are conducted. Arbitrarily doing surveys in mid July has large disadvantages. Sheep have dispersed into north-facing shadowed areas, especially during hot weather, making them much harder to spot. By July, wildfire smoke can be excessive in hot summers, affecting sight-ability, or preclude if the surveys can be conducted that season. Mid-July also enters into the typical weather shift to higher precipitation with cloudy weather. Mountain obscuration is normal from Mid-July to late August during the highest precipitation of the entire year. These disadvantages add additional expensive flight time.
- The currently depressed sheep population should be surveyed using what is known as the minimum count method. Distance sampling with extrapolation has very high error rates that have not been documented when sheep populations are historic lows. At a minimum, there needs to be some minimum count units throughout the area where distance sampling is conducted. Depressed sheep population groups since 2018 are few and far between. Encountering an aggregate can overestimate sheep presence and underestimate if the group is missed in the extrapolation calculation.
- Ram groups need to have composition documentation to calculate age classes present in the overall sheep population, and success or loss of certain cohorts. This is best achieved with high definition digital video with optical zoom cameras. All ram groups should be video recorded during the survey, to make classification assessments after the survey. Classification of rams by curl should be 1/2, 5/8, 3/4, 7/8, and 4/4 full curls. It is a management imperative to know if there are adult rams entering a hunted population. Only enumerating only full curl rams that may be killed before the next breeding season is futile. The delineation of the various ram cohorts is a strong indicator of the ewe age classes. Missing cohorts from multiple years can be used to anticipate longer recovery times.
- Data interpretation should not consider recruitment values for neonatal lamb:ewe ratios. Lambs are not recruited until June of the following summer. Lambs can have high mortalities with adverse conditions. The recruitment performance is determined by overall “ewe-likes” relative to the previous surveys. The ewe-like trend shows if gains or losses of the core population are occurring. Rams survive at higher rates than the ewe-likes. Ram trends can be disparate to ewe-like. Ram:ewe ratios can markedly increase as the core ewe-like population is declining. Some managers are encouraged with higher ram:ewe ratios or lamb:ewe ratios, but this is a false understanding and interpretation of the data sets.

Carrying capacity

- There are data sets from surveys done for the last >20 years. Many of the sheep populations have shown the carrying capacity of the habitats. If areas have historically shown 1500-1800 sheep and are currently 500-600, then harvest needs to be curtailed on mature rams to maintain the breeding composition. Sheep populations with healthy breeding cohorts will return to carrying capacity if weather events permit. When suppressed populations have missing cohorts, as determined by composition data, there is a need to reduce hunter encounter rates and harvest to ensure enough mature rams are present through the impending young ram trough. Once more abundant younger ram cohorts move up to mature status, hunting opportunity can increase utilizing “full-curl/both-horns-broken” only management. Many hunters miscount annual ring annuli, mistakenly taking immature rams. Moving away from sport hunters counting annuli is an essential part of this management plan.
- There is only minor documentation of incidental hunting mortalities. The state seizures of sublegal rams at sealing of harvested rams are only the tip of the iceberg. In many areas where moose have antler restrictions, several illegal bulls are found abandoned in the field by Fish and Wildlife enforcement every year. The USFWS Atigun Gorge sheep composition data from 1986 to 2012 reflects young ram cohorts missing after $\frac{3}{4}$ curl when mature 360-degree full curl rams are unavailable. *(below)
- The State Regulation allowing hunters to estimate age of sheep annuli for 8 rings causes hunters to take $\frac{3}{4}$ curl to below full-curl rams. Most rams with horns $\frac{3}{4}$ to just under full curl that are taken are not 8 years old, illegal, and are lost for recruitment as mature rams.

Allocation of Dall sheep on Federal lands

- Priority one is to maintain healthy populations of the Dall sheep resource, using best science. If the resource needs harvest reduction, this needs to happen once the population data is available. When survey data is unavailable or incomplete for a struggling sheep population, management should default to restrictive management. A lack of data should never lead to overharvest.
- Healthy populations of Dall sheep at carrying capacity will support subsistence harvests annually. This is a priority use, typically nominal when rams only are taken. Some subsistence ewe harvest when sheep populations are at or above carrying capacity is sustainable, especially in remote or limited eligibility areas like Park units.
- Road accessible areas like the Dalton Highway area in GMU 24A, and 26B have high impact use by non-federally qualified resident and commercial hunters, typically 10-20 miles from the road. Sheep move perpendicular to the road in mountainous habitats. Sheep ram populations within the 20-mile zone move in and out of the Dalton Highway Corridor management area. The ram populations are subjected to multiple encounter rates by walk in, aircraft, and boat hunters. The complete lack of any mature rams >7 years old within the Dalton Highway corridor management area’s 5-mile-zone attests to the full extirpation by these user groups, primarily with firearms outside of the Archery area.
- Commercial allocations within the high road impact zone 20 miles should be calculated for a small percent of available legal rams. This would maintain subsistence allocation and for the high resident non-federally qualified hunter

participation. Management on Federal public lands should never allocate all available legal rams to commercial permitted guides, as has been happening until recently. Guided hunter success rates are very high.

- Federal management is charged with maintaining healthy populations of fish and wildlife using recognized scientific principles on Federal public lands. When sheep populations show declines with missing cohorts and the need to protect mature rams, it is incumbent to inform the Regional Advisory Council to anticipate needed restrictions. The State should be informed of the same need for conservation. Ideally both Federal and State Boards will support conservation until the sheep populations are well on the way to achieving carrying capacity.

The Alaska Range GMU 19 B and C have had large declines in Dall sheep populations also. The Council is very concerned about the Dall sheep recovery in these units also. The recent Board of Game action to eliminate non-resident harvest will help reduce the most successful segment of the hunting public. There will still be a lot of resident hunters that will continue to affect the recovery of the sheep population. The western Interior Council represents rural residents who have used sheep in GMU 19.

* The data below was provided by USFWS Dall Sheep Composition work done by ground survey annually from 1986 to 2012 in the Atigun Gorge in the Arctic NWR. This area starts near the road extending east. Hunting was closed until 1982, the haul road was open to permitted commercial use only through 1992. Commercial guides were permitted, and many resident hunters gained access with false commercial mining claims. By 1986 hunting pressure was extensive in the Atigun valley where this survey work was done. Most sheep hunters walk out of the archery corridor 5 miles to use firearms. Unfortunately this data did not continue into the brutal declines of 2013 to 2020. The ram composition average, on the bottom line graphically shows that rams below 3/4 curl have low mortality rates. Approximately 60% of 7/8 curl sub-legal rams are miss aged by hunters in the long-term average. Few mature rams are left.

Sheet1		Age comp	Yr_L ratio	L_E ratio										Total	Ann Growth	% change
Dates	Year*	Ewes	Da	Yrlgs	2Yr	1/4 curl	3/8 curl	1/2 curl	5/8 curl	3/4 curl	7/8 curl	1/1 curl	Unk	Total	Ann Growth	% change
6 June	1986	79	42	62	24	0	18	9	9	10	0	1	0	254		
15 June	1987	93	47	20	17	7	13	10	10	12	7	0	0	236	0.93	-7
14 June	1988	138	80	54	29	0	11	13	16	10	6	3	16	376	1.59	59
19 June	1989	145	40	56	36	16	15	16	21	12	7	0	0	364	0.97	-3
11-13 June	1990	112	69	19	21	13	8	15	8	13	5	0	0	283	0.78	-22
11-17 June	1991	193	122	82	21	22	10	16	3	18	4	2	22	515	1.82	82
14-15 June	1992	171	39	81	35	22	7	15	0	10	2	0	0	382	0.74	-26
10 June	1993	127	24	21	35	23	5	10	12	14	5	1	0	277	0.73	-27
5 June	1994	169	89	25	13	18	10	12	9	13	3	5	0	366	1.32	32
11 June	1995	165	28	41	18	23	5	10	8	4	5	0	0	307	0.84	-16
6-7 June	1996	90	49	16	8	7	4	4	2	2	0	0	2	184	0.60	-40
14-16 June	1997	51	16	27	13	13	8	3	5	7	4	0	0	147	0.80	-20
11-12 June	1998	99	70	42	0	7	4	9	3	2	0	0	2	238	1.62	62
10-12 June	1999	89	40	29	22	9	8	6	2	4	3	0	8	220	0.92	-8
14-16 June	2001	95	44	16	22	12	5	6	1	5	2	0	0	208	0.97	-3
7-9 June	2003	161	68	52	43	20	10	10	3	8	3	1	10	389	1.37	37
6-8 June	2004	138	34	29	26	17	11	10	6	8	1	3	3	286	0.74	-26
6-8 June	2005	149	80	19	21	22	20	18	6	10	5	2	3	355	1.24	24
8-10 June	2006	123	55	29	20	2	6	13	7	10	4	4	17	290	0.82	-18
11-12 June	2007	44	19	12	14	4	5	4	4	3	1	1	9	120	0.41	-59
7-9 June	2008	96	46	16	20	10	4	9	6	4	3	1	13	228	1.90	90
7-8 June	2011	71	38	14	5	8	6	7	6	2	2	0	3	162	0.89	-11
7-8 June	2012	63	39	18	11	6	1	10	8	9	3	1	1	170	1.05	5
	2014															
Average =		116	51	34	21	12	8	10	7	8	3	1	5	276		

Ram Composition, Atigun Pass, 1986-2014