Wild Sheep Ram Hunting Permit Setting Process and Metrics for Western States and Provinces

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ABSTRACT: A questionnaire was completed in early 2018 by 19 of the 20 wild sheep program managers in the western U.S. states and Canadian provinces on their ram hunting permit/tag process, demographic survey efforts, season structure and limited hunt results. A similar review of west-wide ram harvest strategies was conducted 10 years ago. The goal of the questionnaire was to: review the demographic information collected and guidelines and criteria used in setting ram hunting permit/tag numbers; compare season structure and harvest metrics; and challenge jurisdictions to use the best available science and consider more ram hunting opportunities without sacrificing ram horn quality.

Table 1 summarizes agency's survey methods, objectives, and frequency; ram classification; and population estimating methods. Figure 1 is a timeline that displays the variability in timing of surveys conducted by each jurisdiction by species and subspecies.

To determine ram hunting permit numbers, most agencies use a guideline of 1) percent of the current estimated population size, 2) total rams, 3) mature rams in population or survey, or 4) previous year's ram harvest metric (Table 2). Two agencies have no standard guideline.

The ranges of long-term average ram harvest age by jurisdiction and species/subspecies were: 7.8 – 9.3 for Dall/Stone; 6.5 – 7.0 for California; 6.4 – 10 for Rocky Mountain; and 6.4 – 9.0 for Deserts (Figure 2). Figure 3 timeline shows the similarities and differences of ram hunting seasons across the westwide by species/subspeciies. Figure 4 map compares the magnitude of ram harvest by jurisdiction west wide. Most jurisdictions have a similar hierarchical decision/approval ram permit process of: field/regional review of wild sheep data and information and suggest/submit recommendations; program lead and Bureau/Division heads provide oversight and support; wide array of stakeholder involvement; and final Board/Commission review and approval. Many agencies follow guidance provided by their wild sheep management plan. One state has a single committee that sets permit numbers with no public process. One jurisdiction is moving to a formal "Structured Decision Making" (SDM) process to better engage stakeholders, provide transparency, account for uncertainty and values/opinions, while incorporating science and following management objectives. Finally, Table 3 applies each of the jurisdictions ram permit # guideline to Nevada's desert bighorn herds to compare the resulting ram permit numbers compared to Nevada's 2017 approved desert bighorn ram permit #s.

TABLE 1. Data Collection and Population Assessment Methods and Approaches

	Survey Method	Survey Objectives	Survey Frequency	Ram Categories	Population Estimate
Most Common Approaches	10 agencies rely primarily on helicopter surveys	All agencies collect lamb ratios and ram age structure	8 agencies -each herd annually	8 agencies use Class I-IV with IV as 8+ yrs old	10 agencies do not use a model to generate population estimates
Exceptions or less common	5 agencies (WA, ID, OR, CO, CA) conduct both helicopter and ground surveys	9 agencies identified minimum count from survey as important	8 agencies - varies with a few to half the herds annually	5 agencies (AK, CO, CA, WA, YK) use Degree of Curl	AB, CO, NV, & WY use a reconstructive spreadsheet model; AB exploring others like PopR integrated modelling software
	3 agencies (ND, SD, NE) primarily only conduct ground surveys	CO, ID, NM, and SD conduct mark-resight sampling for some herds	2 agencies (AZ, BC - bighorn) - every 3rd year or so	2 agencies (BC-bighorn, NV) use Class I-IV with IV as 6+ yrs old	SD & NM for some herds use mark resight model
	AK conducts fixed-wing, helo, and ground surveys	Gates of the Artic NWR conduct distance sampling in AK	BC - thinhorn - some herds never surveyed due to remoteness and logistics	2 agencies (ND, WY) use a 2 or 3 ram category system; and MT uses 3 different classifications	ID & BC -bighorn - sightability model for some herds; AZ applies a sighting rate to adjust for survey group size
					OR is developing a mixed data model

Survey Timing (see graph)
19 Jurisdicitons responded to survey

FIGURE 1. Wild Sheep Demography Survey Timing by Jurisdiction across Biological Year (June - May)

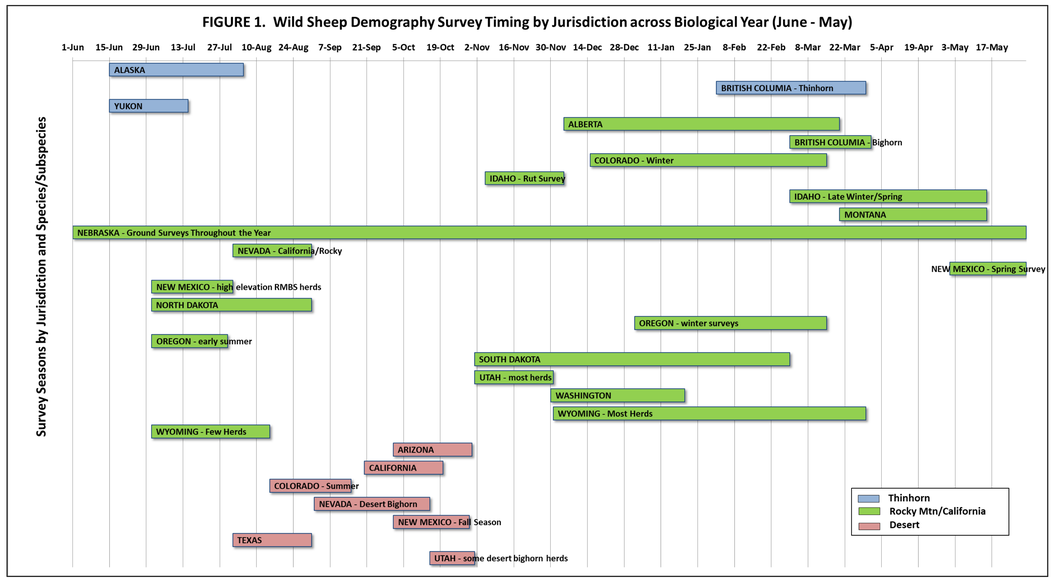

FIGURE 2. Long-term (10+ yrs) Average Age of Harvested Rams by Species/Subspecies and Jurisdiction

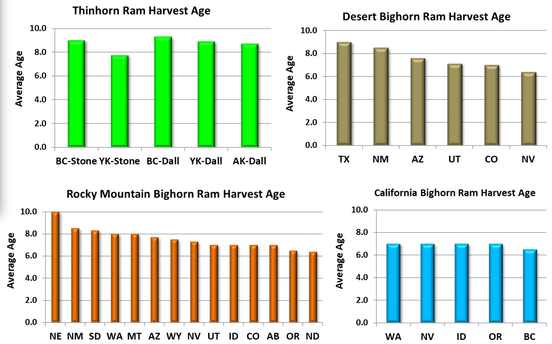

FIGURE 4. 2016 Ram Harvest Totals by State/Province

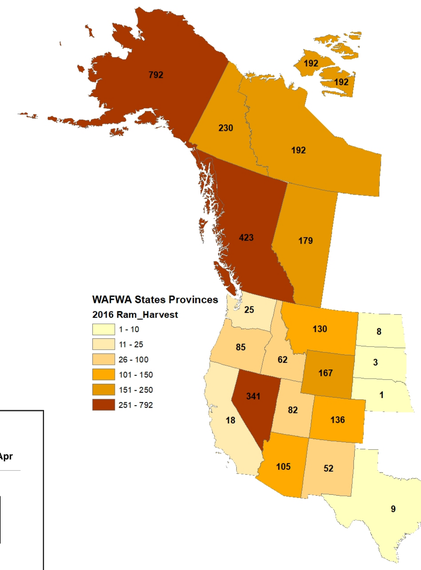

FIGURE 3. Wild Sheep Hunting Seasons by Jurisdiction and Species/Subspecies

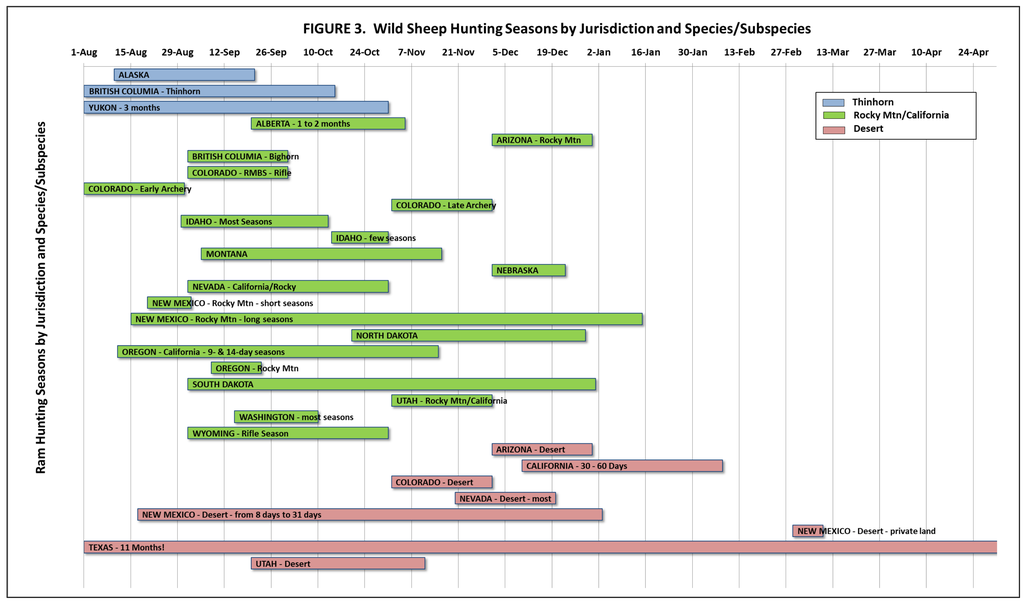

TABLE 2. Primary Guidelines by Category Used by Agencies to Set Ram Permit #s
Some agencies have more than one primary guideline

% of 3/4 Curl + rams in Population

Percent	State/Province		
10	Texas		
15	North Dakota	California	Alberta
10 - 20	Montana		
20	Washington	Arizona	
25	New Mexico		
35	Nevada		

% of All Rams in Population

Percent	State/Province		
7	British Columbia (bighorn)	Arizona	Colorado
8	North Dakota	Nevada	
10	South Dakota	New Mexico	
12	Utah		

% of Observed Class III&IV (3/4+ curl) Rams

Percent	State/Province
20	Idaho
30	Utah

% of Population

Percent	State/Province
2.4	Colorado
2.5	New Mexico
3	British Columbia (all subspp)
4	Yukon

Previous Years Ram Harvest

Metric	State/Province
6 - 8 yrs of age	Wyoming
7% 40+ inch horn length	Alaska

TABLE 3. Comparison of Applying All Other Agency's Ram Permit # Guidelines to Nevada's Desert Bighorn Hunt Units and Resulting 2017 Permit #s

	PREHUNT ESTIMATE				6+ Yr old	8% of	Permit #s	Permit #'s for all of Nevada's Desert Bighorn Herds if guideline from another agency was used													
	RAMS	EWES	TOTAL	RAM RATIO	Rams	Total RAMS	NV 8.5% Total Rams	WY 6-8 harv age prev year	WA 20% Class III&IV	UT 35% Obs III&IVs	TX 10% Mature Rams	ND <8% of Total Rams	ND <15% 3/4 Curl Ram	NM 25% Class III&IV	NM 2.5% of Total Pop	MT 15% 3/4 Curl Ram	ID 20% Class III&IV	CA 15% Mature Rams	BC (bighorn) 3% of Total Pop	AZ 20% Class III&IV	AZ 5% of Total Rams	AB 20.0% 4/5 curl Rams
Totals	3,840	5,761	9,602	67	910	308	328	228	182	204	91	269	127	228	240	137	116	137	288	182	192	100
Statewide Average Age							6.7	7.4	7.5	7	9	6.4	6.4	8+	8+	8	7	N/A	6.5	7.7	7.7	7
Average Ram Age by Unit ranges from							4.1 to 9.7														
% of Total Pop							3.4%														
% of 6+ yr old rams (mature or 3/4+ curl)							36%														
% of Total rams							8.5%														