

Revised Bighorn Sheep Herd Objectives

September 14, 2015

In the Washington Department of Fish and Wildlife (WDFW) Game Management Plan, July 2015-June 2021 (available online at <http://wdfw.wa.gov/publications/01676/>), Objective 58 calls for the Department to reassess the bighorn sheep herd-specific objectives that appears as Table 1 in the chapter devoted to bighorn sheep (*Ovis canadensis*).

Issue Statement:

To better manage bighorn sheep populations, managers strive to maintain sustainable and healthy populations of bighorns, while at the same time maintain sheep at levels that minimize the risk of disease and reduce agricultural damage on private lands.

Objective 58:

Develop habitat-based population objectives for each bighorn herd, taking into account public conflicts, disease history, and risk of contact with domestic sheep and goats.

Strategies:

- a. Use existing GIS habitat data and local knowledge to quantify area (in km²) of summer and winter habitat in each bighorn range by 2016.
- b. Conduct a thorough literature review, and establish reasonable population density targets.
- c. Calculate new population objectives (to update Table 1) by 2017.

The following table provides the results of that task, and should be viewed as superseding Table 1, p. 76 (Bighorn sheep chapter), of the 2015-2021 Game Management.

Biologists managing bighorn herds considered that the previous designation of a single “population objective” was not sufficiently precise and informative. Instead, biologists have now developed short-term objectives and long-term potential population sizes. The former represent targets that could realistically be achieved within the planning time-frame (i.e., by 2021), given current population sizes and existing constraints. The latter represent the best guess at the long-term capacity of the site to support bighorn sheep, assuming that current constraints (e.g., chronic pneumonia, land-owner concerns) can be resolved or ameliorated. In both cases, lower and upper values are provided, reflecting our level of uncertainty.

Herd Name	Region	District	(1)	(2)	(3)	(4)	(5)	(6)	Notes
			Recent low documented total population size	Recent high documented total population size	Short-term early winter herd size objective (lower bound)	Short-term early winter herd size objective (upper bound)	Long-term potential (lower bound)	Long-term potential (upper bound)	
Hall Mountain	1	1	21	30	25	35	nd	nd	1
Vulcan Mountain	1	1	31	107	70	90	80	110	2
Lincoln Cliffs	1	2	110	120	100	120	180	220	3
Asotin	1	3	30	120	130	170	240	240	4
Black Butte	1	3	30	50	60	100	585	585	5
Mountain View-Wenaha	1	3	30	50	130	170	375	375	6
Tucannon	1	3	21	21	40	80	160	160	7
Mount Hull	2	6	90	110	80	100	80	100	8
Sinlahekin	2	6	30	86	50	80	100	150	9
Chelan Butte	2	7	160	191	150	170	150	170	10
Manson	2	7	120	140	100	120	200	200	11
Swakane	2	7	135	156	130	170	150	180	12
Cleman	3	8	200	250	170	220	170	220	13
Quilomene	3	8	62	140	150	170	150	170	14
Tieton	3	8	0	250					15
Umtanum	3	8	180	300	250	300	300	350	16

Short term objectives (columns 3,4) account for estimated population size in 2014 and existing constraints on population growth (e.g., disease, private lands)

Long term, potential ideal winter herd sizes (columns 5,6) reflect the potential of habitat to support bighorns assuming disease and land-owner tolerance issues can be resolved

Notes

Hall Mountain	1	These numbers are only slightly larger than current estimates; they reflect 1) evident lack of growth of this population over past few years, for reasons as yet undetermined, and 2) possibility of capturing and moving some Hall Mtn animals to Tucannon Herd for genetic augmentation of next few years. The ideal size of this population has yet to be estimated.
Vulcan Mountain	2	The current number is considered far less than habitat can support, but reasons for low population size remain unknown at this time. Highest number since 2001 was 81, but unlikely to reach that by 2021 even if all issues are resolved. Historic high was 107 animals, which may have been greater than limited habitat can support, as evidenced by failure to get close to that in recent years.
Lincoln Cliffs	3	These numbers are only slightly larger than current estimates. They reflect the currently-largest historic population size, but with land-owner concerns increasing (land above cliffs is largely private), this is likely the largest feasible population size here.

Asotin	4	These figures came from approximately doubling what appeared to be historic high densities of population abundance in the Blue Mountains. At that point, there was no indication the population was negatively affected by density, and all indications it could grow to at least twice that size. The lower figure for the 2021 objective reflects the fact that this population is currently much lower than it could be (because of pneumonia), and further that pneumonia is
Black Butte	5	These figures came from approximately doubling what appeared to be historic high densities of population abundance in the Blue Mountains. At that point, there was no indication the population was negatively affected by density, and all indications it could grow to at least twice that size. The lower figure for the 2021 objective reflects the fact that this population is currently much lower than it could be (because of pneumonia), and further that pneumonia is
Mountain View-Wenaha	6	These figures came from approximately doubling what appeared to be historic high densities of population abundance in the Blue Mountains. At that point, there was no indication the population was negatively affected by density, and all indications it could grow to at least twice that size. The lower figure for the 2021 objective reflects the fact that this population is currently much lower than it could be (because of pneumonia), and further that pneumonia is
Tucannon	7	These figures came from approximately doubling what appeared to be historic high densities of population abundance in the Blue Mountains. At that point, there was no indication the population was negatively affected by density, and all indications it could grow to at least twice that size. The lower figure for the 2021 objective reflects the fact that this population is currently much lower than it could be, for reasons yet to be elucidated. WDFW will be
Mount Hull	8	The figures of 80-100 reflect currently high abundance; it is unlikely the habitat can support more than this (estimated density/habitat now is 6-7 sheep/km ² , among the highest); sheep have propensity to travel north and south along the Okanogan, putting the herd at risk of disease transmission. Herd is currently at objective (no evidence of disease - yet), but should not be allowed to grow larger.
Sinlahekin	9	The ideal range of 100-150 reflects some uncertainty about the biological capacity of this area (fair amount of forested habitat; cliff habitat dispersed), as well as historic high numbers just below 100 (it is also similar, if slightly lower, than the density suggested for the Blue Mtns herds). We remain uncertain as to the population-level consequences of infection by <i>Psoroptes ovis</i> which is unlikely to abate during the planning period. Thus, the lower objective
Chelan Butte	10	
Manson	11	
Swakane	12	
Cleman	13	
Quilomene	14	

We view this population as forage limited (among the driest habitat, if not the very driest, of any population in the state), so these objectives and ideal herd sizes may be overly optimistic.

Tieton

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This herd was eliminated during the disease event of 2013 to protect the adjacent Cleman Mtn herd; WDFW game management plan calls for restoration of bighorns in this area when the risk of disease transmission can be lowered to acceptable levels.

Umtanum

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The ideal population size of 300-350 reflects the recent historic high population size. Given the high density per habitat implied by this (5-6 sheep/km²) it seems unlikely a long-term equilibrium could be much higher. The objective to 2021 is somewhat lower because 1) we expect to see a population decline over the next few years due to very poor recruitment during summers 2013 and 2014 (and likely in future), and land-owner tolerance on the Selah