

Attachment A

Framework to manage inside the DMA to stabilize the population at the 2007 Chao2 population estimate of 683.

Management Framework	Background and Application Protocol			
1. Area within which mortality limits apply.	19,279 square miles Demographic Monitoring Area (DMA) ¹ (Figure 1)			
2. Management objective.	To stabilize the population at approximately the 2007 Chao2 population estimate of 683, and to annually measure population size using the Chao2 method to assess the success of this management objective. ²			
3. Population goal.	A population close to the 2007 Chao2 estimate of 683 bears using the Chao2 estimator as the population measurement tool.			
4. Allocation process for managed mortalities and response if limits are exceeded.	Management within the mortality limits within the DMA. Coordination to manage within the mortality limits within the DMA among the states. The Wind River reservation will receive a portion of the available mortality limit based on the % of the WRR geographic area within the DMA.			
5. Management review every 5 years to assure that management actions are achieving the objective of a stable population at the estimated number at time of delisting.	The management review will assess if the management system is achieving the desired objective to maintain a stable population at the 2007 Chao2 estimated level. The management review is a science-based process that will be led by the Study Team (which includes all state and federal agencies and the WRR Tribes) using all recent available scientific data to assess population numbers and trend against the management objective. Vital rates such as age/sex-specific survival and reproductive rates will also be reevaluated using the most recent data to adjust sustainable mortality levels as necessary.			
6. Mortality limit % for independent <u>FEMALES</u>.	<683	683 ³	684-757	>757
	<7.6%	7.6% ⁴	9%	10%
7. Mortality limit % for independent <u>MALES</u>.	<683	683	684-757	>757
	<15%	15%	20%	22%

¹ See maps on p. 4.

² The 2014 Chao2 population estimate is 757.

³ Population ranges based on Chao2 method. The mortality limits for independent females and males change as the annual Chao2 population estimate changes.

⁴ A 7.6% independent female mortality rate will result in population stability using the updated vital rates (IGBST 2012).

8. Mortality limit for % of dependent young.	<683	683	684-757	>757	
	<7.6%	7.6%	9%	10%	
9. Expected background level of annual mortalities from management and other causes – Using average yearly total mortality of independent bears (≥2 years) from all causes including unknown/unreported estimates, 2011 to 2014.	38 expected independent bear deaths/year due to management, illegals, and other deaths (17 F, 21 M) (This includes dead bears from inside the DMA only.)				
10. Total mortality limit independent FEMALES (≥2 years).	609 (as an example) at <7.6% mortality	609-683 <7.6% mortality	683 at 7.6% mortality	684-757 at 9% mortality	>757 at 10% ⁵ mortality
	<16	16 to 18	18	21 to 24	≥26
11. Total mortality limit independent MALES (≥2 years).	609 at <15% mortality	<683 <15% mortality	683 at 15% mortality	684-757 at 20% mortality	>757 at 22% mortality
	<32	<36	36	48 to 53	≥58
12. Examples of the number of independent female and male bears “available” for hunting and additional management removals inside the DMA. This is the number available in excess of the expected annual mortality from other causes.	Examples: For 683 bears: (manage for population stability) F limit = 18 – 17 background morts = 1 F available (1 state, 0 WRR) M limit = 36 – 21 background morts = 15 M available (15 state, 0 WRR) For 757 bears: (manage for population decline) F limit = 24 – 17 F background morts = 7 F available (7 state, 0 WRR) M limit = 53 – 21 M background morts = 32 M available (31 state, 1 WRR) (+ Independent bears outside DMA)				

⁵ A 10% mortality level of females will result in rapid return to lower population numbers with resulting rapid reductions in available discretionary mortality. Such a high female mortality rate will result in inconsistent year to year discretionary mortality levels and challenges in season setting and management. A lower level such as 8% or 9% would result in a less rapid decline in population down to the 2007 level of 683.

13. State allocation (all 3 states) (based on % of area within the DMA).	609 (as an example)	683 ⁶	684-757	>757
	F: 0 M: 10⁷	F: 1 M: 15⁵	F: 4 to 7 M: 25 to 31	F: ≥9 M: ≥36
14. Wind River Reservation allocation (based on % of reservation within the DMA).	609 (as an example)	683	684-757	>757
	F: 0 M: 0	F: 0 M: 0	F: 0 M: 1	F: 0 M: 1

Table 2. Conditions and responses to departures from these conditions. *Blue items in italics* would be desirable in state regulations.

Condition	Response
<i>1. Exceeding independent female mortality limit at any time during the year.</i>	<i>Cease grizzly hunting in the DMA upon exceeding the limit.</i>
<i>2. Exceeding independent female mortality limit for 3 consecutive years</i>	<i>No grizzly hunting in the DMA the following year. FWS status review.</i>
<i>3. Exceeding independent male mortality limit for 3 consecutive years.</i>	<i>No grizzly hunting the following year. IGBST biology and monitoring review.</i>
<i>4. Exceeding dependent young mortality limit for 3 consecutive years.</i>	<i>No grizzly hunting the following year. IGBST biology and monitoring review.</i>
5. Failure to meet distribution of reproductive females criterion.	IGBST biology and monitoring review.
6. Failure to meet habitat standards in forest plans.	IGBST biology and monitoring review.
7. Failure to receive adequate funding to implement monitoring and management requirements in the Conservation Strategy.	IGBST biology and monitoring review. Could lead to a FWS status review.
8. Total population less than 500 bears necessary for genetic health as measured with Chao2 method.	No grizzly hunting inside the DMA the following year. FWS status review and possible relisting.
9. Changes in Federal, State, or Tribal laws, rules, regulations, or management plans that depart significantly from the specifics in the Conservation Strategy.	FWS status review and possible relisting.

⁶ Between 609 and 683 there would be a fraction of an adult female available.

⁷ For practical application, with 0 or 1 female available and the difficulty of the average hunter to distinguish between males and females in the field, the states may consider what hunting management for males is actually available.

Literature Cited

Interagency Grizzly Bear Study Team. 2012. Updating and evaluating approaches to estimate population size and sustainable mortality limits for grizzly bears in the Greater Yellowstone Ecosystem. Interagency Grizzly Bear Study Team, U.S. Geological Survey, Northern Rocky Mountain Science Center, Bozeman, Montana.

[http://nrmsc.usgs.gov/files/norock/IGBST/GYEGBMortWksRpt2012\(2\).pdf](http://nrmsc.usgs.gov/files/norock/IGBST/GYEGBMortWksRpt2012(2).pdf)



Figure 1. Map showing PCA vs. DMA. Red line is the PCA (23,828 sq. km). Green area is the DMA (49,931 sq. km).

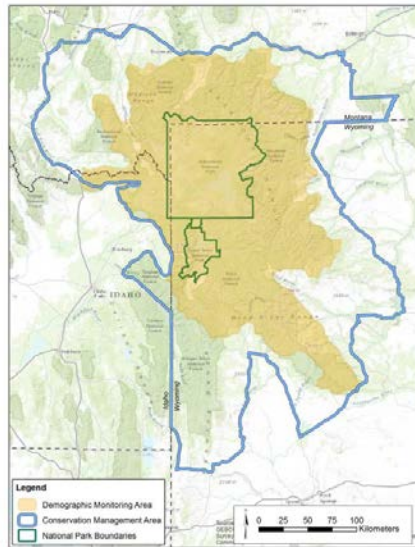


Figure 2. Blue line = old area where mortalities counted (95,225 sq. km); tan area = new mortality count area or the DMA (49,931 sq. km).