

Grizzly Comment Response Options

TOPIC 1: Confusion about the management objective

Issues in the comments:

- We received comments from peer reviewers and the public that expressed confusion about the population management objectives and their scientific basis. Commenters thought that the proposed rule and Conservation Strategy were unclear about whether the population goal is 500, 600, or 674; commenters further opined that, if the population goal is 500 bears, then the states would decrease the current population of grizzly bears by more than 100 bears. Moreover, a peer reviewer emphasized that there is no biological basis for a population goal of 500 bears. Commenters point out that the Service references a management objective of 674 bears within the DMA whereas the states have agreed to a “management objective for the DMA of at least a range between 600 and 747 (based on the 95% confidence interval of the estimated average population size between 2002 and 2014) and upon mortality rates to keep the population within this range.” Some commenters believed that the population should be managed for stable to increasing to allow the population to continue to expand into currently unoccupied lands within the DMA. Some commenters and peer reviewers suggested that it is unrealistic to manage the population to a single number when the confidence intervals are large and do not account for all sources of variation. Finally, one peer reviewer recommended that the population goals be periodically re-evaluated to allow for consideration of natural and anthropogenic changes in the ecosystem.

Current text:

- Text involving a population of 500 bears
 - Demographic Recovery Criterion 1: “Update Demographic Recovery Criterion 1 to reflect the demographic goal of maintaining a population size of at least 500 grizzly bears and at least 48 females with cubs in the Demographic Monitoring Area...” (in the Revised Recovery Criteria)
 - Footnote for Demographic Recovery Criterion 1: “This number is required to maintain short-term genetic fitness in the next few decades. It is not a population target, but a minimum.” (in the Revised Recovery Criteria)
 - “Demographic Recovery Criterion 1— Maintain a population size of at least 500 bears and at least 48 females with cubs in the demographic monitoring area (DMA)” (in the Proposed Rule and the Conservation Strategy)
 - “In 2013, we proposed to change two of the recovery criteria for the Yellowstone Ecosystem in the Grizzly Bear Recovery Plan (78 FR 17708; March 22, 2013). Changes were proposed for the demographic goal of maintaining a minimum population of 500 animals and at least 48 females with cubs, and to eliminate this criterion’s dependence on a specific counting method” (in the Proposed Rule)

- Service can initiate a formal status review or emergency relist “if the population falls below 500 in any year using the model-averaged Chao2 method, or counts of females with cubs fall below 48 for 3 consecutive years” (in the Proposed Rule)
- Service may initiate formal status review if “a total population estimate of less than 500 inside the DMA” (in the Conservation Strategy)
- “The Recovery Plan target for a minimum population size of 500 animals inside the DMA to assure genetic health has been met since at least 2007, using the conservative model-averaged Chao2 estimate.” (in the Proposed Rule)
- “The most current N_e estimate of 469 (Kamath et al. 2015) approaches the minimum threshold criterion of 500 required for a threatened population to retain long-term evolutionary potential and maintain adequate genetic variation necessary for adaptation to environmental change as defined by Franklin (1980).” (in the Conservation Strategy)
- “The number 500 is not a population goal nor is there any intention to manage down to 500 bears. The number 500 represents a minimum population size necessary to assure no short-term negative effects of loss of genetic diversity” (in the Revised Recovery Criteria)
- “...A minimum population size of at least 500 animals within the DMA will assure genetic health.” (in the Proposed Rule)
- “Five hundred is a minimum population threshold. The goal is to maintain the population well above this threshold to ensure that genetic issues are not a detriment to the short-term genetic fitness of the GYE grizzly bear population. If the population declined to 500, more than one third of the suitable habitat in the DMA would be unoccupied (van Manen 2015, in litt.), and, therefore, the grizzly bear population could not be considered demographically recovered.” (in the Proposed Rule)
- “To further ensure this minimum number of animals in the population necessary for genetic health is always maintained, the draft 2016 Conservation Strategy established a standard to maintain the total population size above 500 animals” (in the Proposed Rule)
- “Population standards and monitoring items include...Maintaining at least 500 bears in the GYE to assure the genetic health of the population.” (in the Conservation Strategy)
- Text involving a population of 600 bears
 - Demographic Recovery Criterion 3: “...If any annual **model-averaged Chao2** population estimate falls below 600 (the lower bound of the 95% confidence interval), this criterion will not be met and there will be no discretionary mortality, except as necessary for human safety.” (in the Revised Recovery Criteria); “Demographic Recovery Criterion 3--...If any annual population estimate falls below 600 (the lower bound of the 95% confidence interval), this

criterion will not be met and there will be no discretionary mortality, except as necessary for human safety.” (in the Proposed Rule and in the Conservation Strategy)

- Demographic Recovery Criterion 1: “Update Demographic Recovery Criterion 1 to reflect the demographic goal of maintaining a population size of at least 500 grizzly bears and at least 48 females with cubs in the Demographic Monitoring Area...” (in the Revised Recovery Criteria). 48 females with cubs actually reflects a population of about 600 bears
- “These regulations must include: Suspending all discretionary mortality inside the DMA, except if required for human safety, if the model-averaged Chao2 population estimate falls below 600” (in the Proposed Rule)
- “For populations less than 600, there will be no discretionary mortality unless necessary for public safety or management of bear-human conflicts” (in the Conservation Strategy) (also in the Proposed Rule multiple times with slightly different phrasing)
- Service may initiate a status review or emergency relist “if independent female total mortality limits as per tables 1, 2, and 3, above, are exceeded for 3 consecutive years and the population is fewer than 600” (in the Proposed Rule)
- Text involving 612 bears
 - Demographic Recovery Criterion 3: “...If mortality limits are exceeded for any sex/age class for three consecutive years and any annual model-averaged Chao2 population estimate falls below 612 (the lower bound of the 90% confidence interval), the IGBST will produce a Biology and Monitoring Review to inform the appropriate management response...” (in the Revised Recovery Criteria) (in the Proposed Rule) (in the Conservation Strategy)
 - “In addition to the regulatory mechanism above, if total mortality limits for independent females, or independent males, or dependent young are exceeded for 3 consecutive years, and the model-averaged population estimate falls below 612 (the lower limit of the 90% CI), the IGBST will complete a biology and monitoring review to evaluate the impacts of these total mortality levels on the population and present it to the YGCC and the public.” (in the Proposed Rule)
- Text involving 674 bears (or a range around 674 bears)
 - Demographic Recovery Criterion 3: Update Demographic Recovery Criterion 3 to **maintain the population within the DMA around the model-averaged Chao2 average population size 2002-2014** (average = 674; 95% CI = 600-747; 90% CI = 612-735) by maintaining annual mortality limits for independent females, independent males, and dependent young as per Table 1. The adjustable mortality rates in Table 1 were calculated as those mortality rates necessary to **manage the population around the average number of 674 bears** (using the model-averaged Chao2 method) which occurred during the time period that the population's

growth has slowed and was stable or slightly increasing. (in the Revised Recovery Criteria)

- “Demographic Recovery Criterion 3— **Maintain the population around the 2002–2014 Chao2 modeled average** (average = 674; 95% CI = 600–757; 90% CI = 612–735) by maintaining annual mortality limits for independent females, independent males, and dependent young as shown in table 1 in this proposed rule. (These adjustable mortality rates were calculated as those necessary to **manage the population to the modeled average of 674 bears** which occurred during the time period that this population’s growth stabilized.)” (in the Proposed Rule and in the Conservation Strategy)
- “The new rates are based on the level of mortality that will result in **maintaining the population around the same population size at which the population began to demonstrate density-dependent population regulation**...Because there are several indications the population is at or approaching carrying capacity within the DMA and population growth has slowed (see Schwartz et al. 2006; IGBST 2012; Bjornlie et al. 2014), **managing human-caused mortality at levels that will maintain the population within the DMA at the average size since 2002** is reasonable and biologically sound.” (in the Revised Recovery Criteria)
- “Consistent with USFWS Director Dan Ashe’s letter of September 25, 2015, to the state directors, if the model-averaged Chao2 population estimate is less than 674, the total mortality rate for independent females and dependent young will be less than 7.6%.” (in the Proposed Rule)
- “Accordingly, the agencies implementing the draft 2016 Conservation Strategy have decided that the **population in the DMA will be managed around the long-term average population size for 2002–2014 of 674** (95% CI = 600–747)(using the model-averaged Chao2 estimate). The population inside the DMA has stabilized itself at this population size through density-dependent regulation.” (in the Proposed Rule)
- “To **achieve a population in the DMA around the long-term average of 674**, the total mortality limits for independent females will be set at 7.6 percent when the population is at 674, less than 7.6 percent when the population is lower, and more than 7.6 percent when the population is higher (as per table 1, above, and tables 2 and 3, below). A total mortality limit of 7.6 percent for independent females is the mortality level that the best available science shows results in population stability.” (in the Proposed Rule)

Options for responses:

1. Clarify throughout all documents that any reference to 500 is a minimum population for short-term genetic fitness and not a population goal or objective.
2. Clarify throughout all documents that 600 is not a population goal or objective but a trigger for a Service status review.

3. Clarify throughout all documents that 612 is not a population goal or objective but a trigger for a Biology and Monitoring Review.
4. Clearly state in all documents that the population objective is 674 bears, the model-averaged Chao2 population estimate between 2002 and 2014. Consistently state that we are managing “to” 674 bears or “at” the average population estimate between 2002 and 2014, as opposed to “around” 674 bears or between 600-747 (as suggested by the states).
5. To further emphasize that the population goal is 674 bears, allow no discretionary mortality when the population falls below 674 bears. The IGBST’s professional judgment supports such a restriction on mortality.
6. Clearly state in all documents that the population objective is “at least a range between 600 and 747 (based on the 95% confidence interval of the estimated average population size between 2002 and 2014).” Consistently state that we are managing “around” 674 bears, as opposed to “to” 674 bears or “at” the average population estimate between 2002 and 2014. Do not change current mortality limits.

TOPIC 2: Implementation of a new population estimator

Issues in the comments:

- Several commenters and a peer reviewer raised concerns over utilizing a new population estimation method in the future in lieu of the current methodology (Chao2). Some public commenters requested that any new population estimation methodology be open to public comment prior to implementation. Both commenters and peer-reviewers raised questions about how a new population estimation method would be implemented in the future and how new estimates would be reconciled with previous estimates that used the Chao2 methodology. A peer-reviewer noted that if managers were to use a new population estimation method, they would need to calibrate the method “to ensure long-term comparability of data.” Commenters noted that mortality limits would also need to be calibrated and the triggers for review be redefined in response to any new population estimation methodology. However, other public commenters noted that if a new population estimation methodology is implemented, it “should not be used to re-define what the recovered bear numbers are for future management decisions.”

Current text:

- Conservation Strategy: Appendix C:
 - Any change in the methods described below would be considered a change to the Conservation Strategy and would be revised through the Yellowstone Grizzly Bear Coordinating Committee process with the requirement that any proposed changes: 1) be based upon the best available science; and 2) go through public review before they are accepted, as per p. xx of this Conservation Strategy.

- The population goal is set for the average population size 2002–2014 inside the DMA. The current and approved method to estimate population size in the DMA uses the model-averaged Chao2 estimator. If another population estimator was adopted as per the Conservation Strategy procedures described above, this new population estimator will be applied to the 2002–2014 data to estimate the average population size 2002–2014. The new population estimate results would be inserted in Table 1 to reset the population size numbers with the same sliding scale, with the intent to maintain the population goal of the average population size 2002–2014. If a review of the vital rate data by the IGBST (similar to that in the 2012 report) resulted in new mortality rate for a sustainable population at the 2002–2014 average population size, then the new sustainable mortality rate for the average 2002–2014 population size would replace the 7.6% for independent females and dependent young in Table 1. Any such change would be considered a change to the Conservation Strategy and would be revised through the Yellowstone Grizzly Bear Coordinating Committee process, which requires that any proposed changes: 1) be based upon the best available science; and 2) go through public review before they are accepted, as per p. xx of this Conservation Strategy.*

*This is the paragraph that has been removed from Appendix C upon the request from the states. Possible new language is still being negotiated.

- Proposed Rule:
 - Recovery Criterion 1: ...As a conservative approach to population estimation, the model-averaged Chao2 method will continue to be the method used to assess Criterion 1 (see U.S. Fish and Wildlife Service 2016, Appendix C, for the application protocol for annual population estimation using the Chao2 method) until a new population estimator is approved. If new methods become available, these will be considered for application in the GYE as long as they represent the best available science. However, until possible new methods are developed, the model-averaged Chao2 method will continue to be used.

Options for responses:

1. Alternative B proposed to the steering committee: If a new method is accepted, it will be used in conjunction with the model-averaged Chao2 until a correlation or correction factor between the two methods can be determined. The new average population estimate and the lower and upper 95% confidence intervals that correspond to the model-averaged Chao2 population estimates would be inserted in Table 2 in the Conservation Strategy to reset the sliding scale of mortality limits to maintain the population at the average 2002–2014 population size. The new

lower 95% confidence interval would replace the model-averaged Chao2 lower 95% as the level below which no discretionary mortality is allowed.

2. Alternative C proposed to the steering committee: Any change in the methods described below, or adoption of an alternative population estimation method, would be considered a change to the Conservation Strategy and would be developed and/or evaluated by the IGBST, and revised through the Yellowstone Grizzly Bear Coordinating Committee process with the requirement that any proposed changes: 1) be based upon the best available science; 2) go through public review before they are accepted, as per p. 99 of this Conservation Strategy, and 3) be consistent with the recovery criteria (RP 2016).*

*This addition would include a change to Table 2 that denotes that the mortality rates are based on a population estimate using the Chao2 estimate.