

Briefing paper on Yellowstone Delisting
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C. Servheen

This briefing paper is organized as a series of important questions and answers to help address issues about the proposed management system that will be in place upon delisting.

- When is the new population estimate going to be used and what is the estimate in 2014 along with any confidence intervals or caveats?

The mark-resight estimator is a new approach to estimating the total population size of the Yellowstone grizzly population. It resulted from 3 scientific workshops organized by the Interagency Grizzly Bear Study Team (Study Team) 2011-2012. The mark-resight technique was published in a peer-reviewed scientific paper published in a statistical journal (Higgs et al. 2013)¹. Before adopting this new estimator, we are comparing the results from it to the results from a different technique based on genetics and this comparison is almost complete. The next step is to prepare a manuscript for publication that documents the genetic population analyses and compares it to the mark-resight results. If this manuscript is accepted for publication and results indicate similar estimates of population size and trend from both the genetic and the mark-resight technique, it will represent the best available science. We will then formally adopt the mark-resight technique as the primary population estimation approach for the Greater Yellowstone Ecosystem. We expect to decide on the adoption of this new estimator approximately mid-2015.

- How many bears were alive in 2007 versus 2014? Is the population continuing to grow?

It is important to realize that the number of bears in the ecosystem today (2014) is approximately the same number as were present when the population was delisted in 2007. Figure 1 (below) is a graphic from the Interagency Study Team showing the number of females with cubs of the year (FCOY) seen as a running 3-year averages using the old monitoring system (red line) versus the new monitoring system (blue line). These counts of FCOY are the basis for making the total population estimates each year. Note that since 2001 the numbers have changed very little as the population naturally stabilizes and population growth declines. The stable population management system in place under the new demographic management approach will further stabilize the population post-delisting.

¹ Higgs, Megan D., William A. Link, Gary C. White, Mark A. Haroldson, and Daniel D. Bjornlie. 2013. [Insights Into the Latent Multinomial Model Through Mark-Resight Data on Female Grizzly Bears With Cubs-of-the-Year](#). Journal of Agricultural, Biological, and Environmental Statistics. doi: 10.1007/s13253-013-0148-8

Three-year Running Average Chao2 vs. Mark-Resight 1998-2013

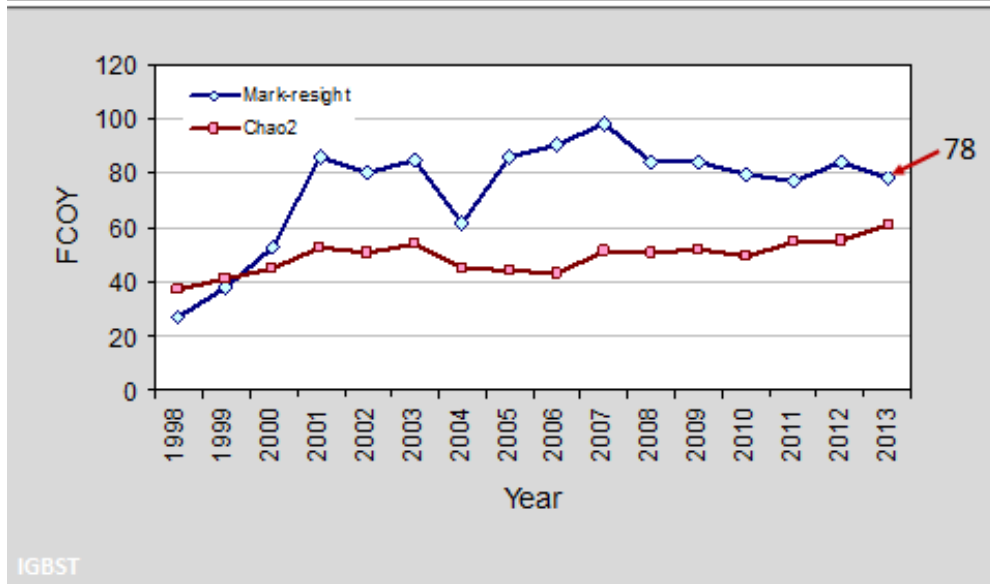


Figure 1. Number of females with cubs (FCOY) in the Yellowstone Ecosystem as a running 3-year average from 1998 to 2013. Note how both counting methods show that the population has grown very little since 2001 as the population occupies the suitable habitat in the ecosystem.

- What would the sustainable mortality limits be inside the DMA in 2014 to maintain a stable population under the old and new population estimate methods?
The table below shows a comparison of the mortality limits from all causes of mortality between the 2 population estimates – the new method yielding a population size of 1200 versus the older method yielding a size of 757. Note the new approach for stable population management will allow more mortalities post-delisting because we expect to use the new population estimator yielding a more accurate population estimate.

Table 1. Mortality limits under delisted status and stable population management using the new versus the existing population estimators. Numbers in parentheses are the 2011–14 average known + unknown deaths, 2011-14.

Population estimate in 2014	Total population of 1200 using mark/resight method (the method expected to be used post-delisting)	Total population of 757 using Chao2 method (the method presently used)
Mortality limits	Inside the DMA to maintain a stable population in 2014	Inside the DMA to maintain a stable population in 2014
Independent females	25 (17)	16 (17)
Independent males	49 (21)	31 (21)
Dependent young (cubs and yearlings with their mothers not subject to hunting)	22	14
Average mortality/year from all sources over last 4 years (2011-2014)	38	38
Remaining potential independent grizzly bears “available” for hunting or other management purposes	36	9
25 + 49 = 74 – 38 = 36		

- Upper Green River cattle allotment conflicts – How many occurred over last 10 years and how would delisting affect management of these conflicts?

Over the last 10 years (2005-2014) an average of 34 cattle and 5 sheep were killed per year on the Upper Green River allotment. Over this time period, 19 grizzly bears were lethally removed and 38 grizzly bears relocated from the allotment, or an average of 1.9 removals/year and 3.8 relocations/year. The total number of nuisance grizzly captures in the allotment over the past 10 years has been 58, or 5.8/year. There has never been a year when a conflict on the Upper Green River allotment was not addressed with a necessary management action (either removal or relocation of a depredating bear) because of the existing mortality limits. Under the new delisting approach for stable population management, there will be additional management flexibility because of the use of the more accurate population estimator (see Table 1 above). Under the new approach and with stable population management in place, depredating bears can be removed as necessary and the density of bears in the area of the allotment could be reduced in order to reduce the probability of depredations. This post-delisting management approach will be scientifically sound, will assure the overall population does not decline, and will increase management flexibility in areas of bear conflicts and depredations like the Upper Green River allotment area.
- Compare management under the delisting that occurred between 2007-2009 with the present approach to delisting currently under consideration.

The answer is that the current delisting approach under consideration provides much more management flexibility than the management system that was in place under the 2007-2009

delisting (the 2007-2009 management system was supported by all the states at that time). Specifically, the present approach to delisting: 1) has less restrictive mortality limits because it relies on the new population estimate method (see Table 1); 2) counts mortalities against the mortality limits in an area approximately half the size of the area where mortalities were counted under the 2007 delisting; and 3) the population goal is stability and not continual increase as in the 2007 delisting. In summary, the current approach would stabilize the population as opposed to steady population increase under the 2007 delisting; allow increased management flexibility to address conflicts as necessary; allow a hunt as per state regulations; and count mortalities against the mortality limits in a much smaller area (18,900 sq. miles) compared to the area where mortalities were counted under the 2007 delisting (36,600 sq. miles).

Issue	2007 delisting	Current approach being considered
Area were mortalities are counted	36,675 square miles including Salt River and Wyoming Ranges in Wyoming, the Palisades in Idaho, and west to I-15 to Dillon and north to I-90 in Montana.	18,918 square miles; none of the specific areas listed (at left) in the 2007 delisting are within the count area.
Population goal	Increasing population	Stable population Less restrictive than 2007 to stabilize the population and
Mortality limits	Restrictive to allow the population to increase	mortality limits will be based on the new population estimator

- The partnership between state and federal agencies over the last 33 years has resulted in a recovered population. Everything that has been done to get to this point has been the result of this state/federal partnership. The development of every population monitoring method, demographic standard, and management objective has been a cooperative state/federal effort based on the best available science. The management policies that have gotten us to recovered status have always been based on the foundation of the best available science. Policy based on science will allow us to delist the Yellowstone population while allowing necessary management and assuring the future for the Yellowstone grizzly population.