

INFORMATION/BRIEFING MEMORANDUM

DATE: September 25, 2015
FROM: Jeffrey Kershner, Director, Northern Rocky Mountain Science Center
SUBJECT: Scientific findings of genetic study on Yellowstone grizzly bears.

This briefing paper describes key findings in an upcoming publication by USGS and partners titled, "Multiple estimates of effective population size for monitoring a long-lived vertebrate: an application to Yellowstone grizzly bears" to be published in *Molecular Ecology*. That article is relevant to a USFWS decision whether to move forward with a proposed delisting rule to remove the Yellowstone grizzly bear population from the Endangered Species List.

BACKGROUND

Grizzly bears in the lower 48 States were listed as threatened [under the Endangered Species Act \(ESA\) in 1975](#). In 2007, the Yellowstone population was delisted, but subsequent litigation and a ruling by the 9th Circuit Court ordered vacating of the delisting rule, placing it back under ESA protection in 2009 under the justification that there was inadequate information on how changes in food sources would impact the grizzly population. The Interagency Grizzly Bear Study Team (IGBST) developed a comprehensive synthesis of existing data to help answer this and related questions. In 2013 the [Interagency Grizzly Bear Committee \(IGBC\)](#) voted to recommend the development of a new proposed Delisting Rule by the U.S. Fish and Wildlife Service.

IGBST data also indicated the Yellowstone grizzly bear population showed robust growth during the 1980s and 1990s, with a concomitant doubling of occupied range. IGBST documented a slowing of population growth during the early 2000s and evidence of bear density as a potential driving factor. Combined, these observations may represent a biological indicator of population recovery. The Yellowstone population is the most southern and isolated grizzly bear population in the contiguous U.S. and several NGOs have expressed opposition to delisting because of concerns regarding long-term genetic viability. IGBST's long-term research on Yellowstone grizzly bears provided a rare opportunity to examine the usefulness of newly available genetic techniques for a comprehensive analysis of trends in Yellowstone grizzly bear genetics.

Members of the IGBST include representatives from the U.S. Geological Survey (coordinating agency), National Park Service, U.S. Fish and Wildlife Service (FWS), U.S. Forest Service, the Eastern Shoshone and Northern Arapaho Tribal Fish and Game Department, and the States of Idaho, Montana, and Wyoming. Although the Bureau of Land Management (BLM) does not have a sitting member on the study team, a BLM representative is a voting member of the Yellowstone Ecosystem Subcommittee of the IGBC. Data are collected by all member agencies and are held in trust by the USGS as long-term, ecosystem-wide databases. This coordinated, collaborative approach to data collection is crucial for research and monitoring because most bears use multiple jurisdictions.

DISCUSSION

An upcoming paper by a USGS-led research team in the journal *Molecular Ecology* presents genetic evidence that support the growth of the grizzly bear population in the Greater Yellowstone Ecosystem since the 1980s, with no loss in genetic diversity:

- Multiple techniques indicate that the effective population size of Yellowstone grizzly bears (the number of individuals that contribute offspring to the next generation) has increased 4-fold over a 25-year period
- Yellowstone grizzly bears are approaching effective population size criteria for long-term genetic viability established by geneticists in previous studies
- Although an isolated population, genetic diversity of Yellowstone grizzly bears remained stable and inbreeding was relatively low (0.2 percent) over the 25-year period
- The study demonstrates how genetic monitoring can complement traditional demographic-based monitoring, providing valuable tools for wildlife managers for current and future studies, and underscores the effectiveness of long-term research on trust species

NEXT STEPS

A press release is planned when this article is published. Throughout this process, the IGBST has made it clear that its role is to provide sound, credible science to decision makers. A number of aspects of our science have been, and will continue to be, critically examined because parties have expressed different opinions regarding population estimates and trends, genetic health, and aspects of mortality management.

We will continue to work with the USGS Office of Communications to respond appropriately to inquiries specific to our science. Any questions pertaining to how IGBST data will be used to inform the process of grizzly bear delisting or subsequent management of Greater Yellowstone grizzly bears will be directed to the FWS.