Occupancy of females with offspring

6-year tally (2011–2016)

6 yrs: 18 BMUs (60%)
5 yrs: 5 BMUs (17%)
4 yrs: 6 BMUs (20%)
2 yrs: 1 BMU (3%)
Survival monitoring

63 grizzly bears captured during 2016
50 fitted with radio-transmitters
Total of 73 bears monitored and 7 mortalities documented during 2016

Annual survival rate during 2004-2014 was 95% for females and 90% for males
We documented reproductive status for 43 adult females during 2016.

Proportion of females with cubs was 29% during 2004-2014.
We documented cub litter size for 6 females during 2016.
First observation ranged from Apr 11 (den emergence) to Oct 2 (new capture).

Estimated mean litter size was 2.1 during 2004-2014.
We documented dependent bear survival in 6 cub litters and 10 yearling litters during 2016.

Estimated survival was 55% for cubs and 64% for yearlings during 2004-2014.
## Mortality monitoring

### Documented mortality 2016

*All age-classes, all locations*

<table>
<thead>
<tr>
<th></th>
<th>Ageclass</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inside DMA</strong></td>
<td>Dependent</td>
<td>4</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Independent</td>
<td>9</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>13</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td><strong>Outside DMA</strong></td>
<td>Dependent</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Independent</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

We documented 22 mortalities during 2016

- 12 in the PCA
- 6 in Zone 1
- 18 in DMA
- 4 outside of the DMA
Mortality monitoring

Locations of documented mortality 2016
All age-classes, all locations
Causes of mortality 2004-2016
All age-classes, all locations

Mortality monitoring

<table>
<thead>
<tr>
<th>Cause</th>
<th>Total 2004-2014</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency removal</td>
<td>88</td>
<td>10</td>
</tr>
<tr>
<td>Defence of life</td>
<td>45</td>
<td>2</td>
</tr>
<tr>
<td>Poached/malicious</td>
<td>41</td>
<td>2</td>
</tr>
<tr>
<td>Automobile collision</td>
<td>27</td>
<td>3</td>
</tr>
<tr>
<td>Undetermined</td>
<td>22</td>
<td>1</td>
</tr>
<tr>
<td>Train collision</td>
<td>23</td>
<td>0</td>
</tr>
<tr>
<td>Illegal defense of property</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>Natural</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Hunting (mistaken identification)</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Poison</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
We documented 13 mortalities of independent (>= 2 years old) bears. We estimated 17 total independent mortality during 2016.
Sustainable mortality

Documented and estimated total mortality 2004-2016

*Independent bears inside the DMA*

Slight increase in estimated mortalities during 2004-2016
Sustainable mortality

Estimated total mortality versus sustainable mortality thresholds

Independent bears inside the DMA
Sustainable mortality

Estimated total mortality versus sustainable mortality thresholds

Independent bears inside the DMA
Acknowledgements

Scott Waller
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James Waddell
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Flathead-Spotted Bear Ranger District
(Deb Mucklow, staff, packers)
Flathead-Hungry Horse Ranger District
(Rob Davies, staff)
Glacier National Park
(packers)
Ken Justus
Rob Cherot
Jim Pierce
Red Eagle Aviation
Two Bear Air
Many others...
NCDE Technical Team
Objectives

(1) Facilitate and conduct research focused on producing information that the wildlife and land managers need to attain, maintain, and measure population recovery

- Prioritize research needs and report to the NCDE Subcommittee
- Respond to information requests made by member agencies, the NCDE Subcommittee, and the IGBC

(2) Based on best available science, evaluate the demographic criteria outlined in the Draft NCDE Conservation Strategy (2013) and provide recommendations for revisions to the NCDE Subcommittee
NCDE Technical Team
Guiding Principles

Prioritize research with direct application to population and habitat management

- Population dynamics and sustainable mortality
- Habitat interactions
- Tools for reducing bear-human conflict
- Human attitudes

Aim for the highest level of scientific rigor

- Be explicit about assumptions involved in analyses
- Detail limitations of the available data
- Acknowledge alternative interpretations of results
Potential movement paths for male-mediated gene flow between the NCDE and GYE grizzly bear populations

Estimation of unreported mortality: evaluation comparing reporting rates from the NCDE, GYE and CYE

Estimation of sustainable mortality in the NCDE

Spatial and temporal comparisons of body morphometrics in the NCDE, GYE, and CYE
NCDE Technical Team
New Projects

Kari Eneas, University of Montana, Confederated Salish and Kootenai Tribes
Quantifying the effectiveness of electric fencing in mitigating conflicts between grizzly bears and chicken coops (and potentially small livestock)

George Barce, Wildlife Biologist, Confederated Salish and Kootenai Tribes
Coordinating grizzly bear and forest management

Erik Peterson, Biological Technician, Glacier National Park
Grizzly bear use of army cutworm moth aggregation sites in the Northern Continental Divide Ecosystem, Montana
Recovery Plan
Demographic criteria difficult to document given conditions and current monitoring program. Should we try to address?

Conservation Strategy
New science available to help inform demographic criteria. Discussed possible approaches for revisions.
NCDE Technical Team
New Research Prioritization

- Habitat selection analyses, with focus on roads, fire history, and forest management
- Spatial analyses of human-bear conflicts
- Denning chronology / post-denning behavior (joint analysis with CYE)
- Montana-wide human dimensions public survey