Study Team Members

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Overview

• Females with cubs and population size
• Occupancy by females with young
• Mortalities and mortality rates
• Additional data

This information is preliminary and is subject to revision. It is being provided to meet the need for timely best science. The information is provided on the condition that neither the U.S. Geological Survey nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the information.
Greater Yellowstone Ecosystem

- National Parks = 10,344 km²
- Primary Conservation Area/Recovery Zone = 23,828 km²
- Demographic Monitoring Area (DMA) = 49,931 km²
Greater Yellowstone Ecosystem

- National Parks = 10,344 km$^2$
- Primary Conservation Area/Recovery Zone = 23,828 km$^2$
- Demographic Monitoring Area (DMA) = 49,931 km$^2$
- Occupied range (2004-2018) = 68,736 km$^2$
Grizzly bear distributions and outlier observations
Demographic Recovery Criterion #1: Females with Cubs and Population Size
Observation flights 2020

- Excluded units (orange) in which no grizzly bears had been observed during 2015-2019 observation flights
- Reduced to one flight per unit
Females with cubs 2020

- 234 Observations
  - 40 Observation flights (17%)
  - 86 Other aerial (37%)
  - 108 Ground (46%)
Females with cubs 2020

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  40 Observation flights (17%)
  86 Other aerial (37%)
  108 Ground (46%)

- 58 unique females with cubs
  Mean litter size = 1.95
  14 single (24%)
  34 twins (59%)
  9 triplets (16%)
  1 quadruplets (2%)
Females with cubs 2020

- **234 Observations**
  - 40 Observation flights (17%)
  - 86 Other aerial (37%)
  - 108 Ground (46%)

- **58 unique females with cubs**
  - Mean litter size = 1.95
    - 14 single (24%)
    - 34 twins (59%)
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    - 1 quadruplets (2%)

- **58 in DMA**
Female with cub observations, den-emergence to 31 August, 2018-2020
Number of females with cubs 2020 (DMA)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unique females with cubs</td>
<td>58</td>
</tr>
<tr>
<td>Chao2</td>
<td>53</td>
</tr>
<tr>
<td>Model-averaged Chao2</td>
<td>57</td>
</tr>
</tbody>
</table>
Trend in annual estimates of females with cubs 1983-2020 (DMA)
Trend in annual estimates of females with cubs 1983-2020 (DMA)
### Total population estimate 2020 (Chao2 estimator; DMA)

<table>
<thead>
<tr>
<th>Population segment</th>
<th>Estimate</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent females (≥2 yrs old)</td>
<td>252</td>
<td>201</td>
<td>303</td>
</tr>
<tr>
<td>Independent males (≥2 yrs old)</td>
<td>252</td>
<td>196</td>
<td>307</td>
</tr>
<tr>
<td>Dependent young (cubs and yearlings)</td>
<td>223</td>
<td>201</td>
<td>245</td>
</tr>
<tr>
<td>Total</td>
<td>727</td>
<td>648</td>
<td>806</td>
</tr>
</tbody>
</table>
Demographic Recovery Criterion #2: Occupancy by Females with Young
Occupancy by females with young (cubs, yearlings, or 2-year-olds) 2020

• 18 of 18 Bear Management Units (BMUs) occupied during 2020

• 18 of 18 BMUs occupied at least 4 of last 6 years (2015-2020)
Demographic Recovery Criterion #3: Mortalities and Mortality Rates
Known and probable mortalities 2020

• 25 in DMA

25 human-caused
0 natural
0 undetermined cause

Mortalities as of 10/25/2020
## Known and probable mortalities by area, sex, and age class 2020 (DMA)

<table>
<thead>
<tr>
<th>Area</th>
<th>Sex</th>
<th>Dependent (&lt;2 years old)</th>
<th>Independent (≥2 years old)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside DMA</td>
<td>Female</td>
<td>0</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>0</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>3</td>
<td>22</td>
<td>25</td>
</tr>
</tbody>
</table>

Mortalities as of 10/25/2020
Mortality rate thresholds

<table>
<thead>
<tr>
<th>Total mortality rate</th>
<th>Total Grizzly Bear Population Estimate*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;674</td>
</tr>
<tr>
<td>for independent FEMALES.</td>
<td>&lt;7.6%</td>
</tr>
<tr>
<td>for independent MALES.</td>
<td>15%</td>
</tr>
<tr>
<td>for dependent young.</td>
<td>&lt;7.6%</td>
</tr>
</tbody>
</table>
# Estimated percent mortality for population segments (DMA)

<table>
<thead>
<tr>
<th>Population segment</th>
<th>Estimated N</th>
<th>Documented mortality</th>
<th>Estimated total mortality&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Estimate % mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent aged females (≥2yrs old)</td>
<td>252</td>
<td>8</td>
<td>14</td>
<td>5.6</td>
</tr>
<tr>
<td>Independent aged males (≥2yrs old)</td>
<td>252</td>
<td>14</td>
<td>17</td>
<td>6.8</td>
</tr>
<tr>
<td>Dependent young (&lt;2yrs old)</td>
<td>223</td>
<td>3</td>
<td></td>
<td>1.3&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> Unknown/Unreported estimate is not applied to loss of dependent young

<sup>b</sup> Estimated from documented human-caused mortalities only
Other Monitoring Data

Photo: Jake Davis
Known and probable mortalities 2020

- 25 in DMA
  - 25 human-caused
  - 0 natural
  - 0 undetermined cause

- 18 outside DMA
  - all human-caused

Mortalities as of 10/25/2020

Preliminary Information-Subject to Revision. Not for Citation or Distribution
Known and probable mortalities 2020

- **25 in DMA**
  - 25 human-caused
  - 0 natural
  - 0 undetermined cause

- **18 outside DMA**
  - all human-caused

- **2 additional mortalities from 2019**
  - Undetermined causes

Mortalities as of 10/25/2020
Mortalities inside and outside of the DMA by cause in 2020

Mortalities as of 10/25/2020
Captures and Known-Fate Monitoring
Grizzly bear captures 2020

- Total captures = 110
  Research = 70
  Management = 40
- Individuals bears = 93
  Females = 32
  Males = 55
  Unknown = 6
- New bears = 59

Captures as of 10/25/2020
Grizzly bears radio-monitored 2020

Total monitored = 103
  Adult females = 39

Current = 59
  Females = 37
  Males = 22
  Bears missing = 2

Monitored as of 10/25/2020

Photo: J. Hadley/NPS
Body Condition and Genetic Monitoring
Estimating body condition (% body fat)
Average % body fat by month, 2000–2019 vs. 2020

Compare 2020
- 2000-2019
- 2020
Genetic monitoring

- Results through 2018
- **1,186** individuals genotyped (20 microsatellite markers)
- No evidence of non-GYE ancestry in any of the individuals genotyped to date
Summary

Population
- High count for females with cubs in DMA \( (n = 58) \)
- Population estimate = 727
- No major change from previous years

Mortality
- Primary causes inside DMA: site conflict, self-defense, and livestock
- 2020 mortality rates in DMA
  - Within thresholds for independent females (5.6%)
  - Within thresholds for independent males (6.8%)
- 42% of mortalities occurred outside the DMA

Year of relatively good food supply
- Good berry production
- Average whitebark pine cone production, better in the north
- High moth site year, bear activity into early October
Study Team website: search “IGBST”
Acknowledgments


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