• Allows inclusion of all confirmed grizzly bear location data
• Tracks, DNA, verified observations, etc…
• Defines outer perimeter of occupied range without overestimating
Methods to Estimate Distribution

Legend
- Confirmed grizzly bear locations
- Grizzly Bear Recovery Zone
- National Park Boundaries

IGBST
Methods to Estimate Distribution

Legend
- Confirmed grizzly bear locations
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IGBST
Methods to Estimate Distribution

Legend
- Confirmed grizzly bear locations
- Grizzly Bear Recovery Zone
- National Park Boundaries

IGBST
Historic Distribution 1980

- Ground & aerial reconnaissance
- Time lapse cameras at bait stations
- Opportunistic sightings and sign
- 16,160 km² by 1980

Legend
- Grizzly Bear Distribution 1980
- Confirmed grizzly bear locations outside occupied range
- Grizzly Bear Recovery Zone
- National Park Boundaries
Historic Distribution
1990

- Verified sightings, mortalities, and captures
- Increase in telemetry data
- Expansion in all directions
- Increase in "outliers"
- 23,971 km² by 1990

IGBST
Historic Distribution 2000

- Traditional VHF telemetry
- Very beginning of GPS data
- More expansion to north and south
- 33,298 km² by 2000
Historic Distribution 2010

- Major increases in GPS location data
- Continued expansion to northwest and southeast
- 50,280 km² by 2010
Current Distribution 2014

• Continued increases in GPS location data

• Outlier areas becoming occupied range

• 58,314 km² by 2014
Current Distribution 2014

- Continued increases in GPS location data
- Continued expansion to northwest and southeast
- Increase in "outliers"
- 58,314 km² by 2014
Current Distribution 2014

- Filling in suitable habitat
Areas of expansion

• Heart Mountain

• Increase in grizzly activity in recent years

• Now included in main distribution
Areas of expansion

• Heart Mountain

• Increase in grizzly activity in recent years

• Now included in main distribution
No "doughnut hole" effect

- Population still centered on core based on female with cubs locations
No "doughnut hole" effect

- Population still centered on core based on female with cubs locations
No "doughnut hole" effect

- Population still centered on core based on female with cubs locations
### Distribution Area by Jurisdiction

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>2010 Area (km²)</th>
<th>Percent of Total</th>
<th>2014 Area (km²)</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idaho</td>
<td>4,508</td>
<td>9.0</td>
<td>4,893</td>
<td>8.4</td>
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<tr>
<td>Montana</td>
<td>11,970</td>
<td>23.8</td>
<td>14,508</td>
<td>24.9</td>
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<td>Wyoming</td>
<td>21,843</td>
<td>43.4</td>
<td>26,231</td>
<td>45.0</td>
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<tr>
<td>National Parks</td>
<td>10,237</td>
<td>20.4</td>
<td>10,237</td>
<td>17.6</td>
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<tr>
<td>Wind River Reservation</td>
<td>1,721</td>
<td>3.4</td>
<td>2,445</td>
<td>4.2</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>50,280</strong></td>
<td></td>
<td><strong>58,314</strong></td>
<td></td>
</tr>
</tbody>
</table>
Implications of Increased Distribution

Private Land within Grizzly Distribution

Private Land Area (km²)

- 1980
- 1990
- 2000
- 2010
- 2014

IGBST
Implications of Increased Distribution
Grizzly Bear Mortalities on Private Lands

<table>
<thead>
<tr>
<th>Decade</th>
<th>Private land mortalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970s</td>
<td>12%</td>
</tr>
<tr>
<td>1980s</td>
<td>12%</td>
</tr>
<tr>
<td>1990s</td>
<td>20%</td>
</tr>
<tr>
<td>2000s</td>
<td>26%</td>
</tr>
</tbody>
</table>
Summary

- Grizzly bear distribution increased from 50,280 km$^2$ in 2010 to 58,314 km$^2$ in 2014
  - Increase of 16%

- No "doughnut hole" effect

- Largest population growth occurred in 1990s, largest distribution increase occurred in 2000s
  - Reflective of increasing densities in core

- Increase in private land area and mortalities within grizzly distribution as bears establish in new areas
  - Follows trend in overall increase in distribution