Status of Lynx In Maine
Maine’s Forest – contiguous forestland

• ~18 million acres of forest
  – 6 million acres spruce/fir

• Privately owned-forest mgmt.

• Limited development pressures

• Easements on 2.5 million acres
  – Protected from development
  – Active forest management

Distribution of spruce/fir forest type group, Maine 2012 (Homer et al. 2012)
1970–85 Budworm Outbreak
1990s – Today
Extensive Areas of Regenerating Forest
3 million of acres of S/F forest

<table>
<thead>
<tr>
<th>Year</th>
<th>Sapling</th>
<th>Dense</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982</td>
<td>½ million</td>
<td>340,000</td>
</tr>
<tr>
<td>1995</td>
<td>1 million</td>
<td>½ million</td>
</tr>
<tr>
<td>2006</td>
<td>1.4 million</td>
<td>700,000</td>
</tr>
</tbody>
</table>

Source: Maine Forest Service – Ken Laustsen
Monitoring Lynx in Maine


2. Periodic Winter Snow Track Surveys

3. Credible Sightings – MDIFW Staff

4. Incidental Take
Radio Telemetry Study: 1999–2011

- Captured 191 lynx
  - 113 kittens in 43 litters
  - 85 radioed

- Occupy small home ranges

- Lynx select best habitats

- Good reproduction and survival
Radio Telemetry Study: 1999–2011

Budworm Impacted 46% s/f clear cuts
Radio Telemetry Study: 1999–2011

- Home range: 25 km² F, 50 km² M
- Male home range overlaps 3 females
Radio Telemetry Study: 1999–2011

Density:
- 4.5 adult/100km²
- 5-9 kittens/100km²
Radio Telemetry Study : 1999–2011

• Habitat Use – Selection for S/F sapling forest
  • 1,800–2,300 acres in Female HR
  • 3,000 –4,000 acres in Male HR
Radio Telemetry Study: 1999–2011

• Population demographics
  – 65% of adult females with kittens
  – Average litter size: 2.63 (range 1–5)
  – Kitten Survival: 78%
  – Annual Adult Survival: 76% (SE=3.37)
    • Predation
    • Starvation–lungworm
# Reproduction: Lynx Study Area (400km²)

<table>
<thead>
<tr>
<th>Year</th>
<th>AF</th>
<th># Litters</th>
<th>Productivity</th>
<th>Hares/Ha in CC</th>
<th>Hares/Ha in SHW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>3</td>
<td>3</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>4</td>
<td>4</td>
<td>100%</td>
<td>2.22</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>9</td>
<td>9</td>
<td>100%</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>7</td>
<td>6</td>
<td>86%</td>
<td>1.85</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>9</td>
<td>7</td>
<td>78%</td>
<td>1.79</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>5</td>
<td>4</td>
<td>80%</td>
<td>1.92</td>
<td>0.87</td>
</tr>
<tr>
<td>2006</td>
<td>7</td>
<td>1</td>
<td>14%</td>
<td>1.19</td>
<td>0.97</td>
</tr>
<tr>
<td>2007</td>
<td>7</td>
<td>2</td>
<td>29%</td>
<td>0.99</td>
<td>0.65</td>
</tr>
<tr>
<td>2008</td>
<td>4</td>
<td>0</td>
<td>0%</td>
<td>0.8</td>
<td>0.66</td>
</tr>
<tr>
<td>2009</td>
<td>4</td>
<td>0</td>
<td>0%</td>
<td>0.75</td>
<td>0.64</td>
</tr>
<tr>
<td>2010</td>
<td>5</td>
<td>5</td>
<td>100%</td>
<td>0.91</td>
<td>0.96</td>
</tr>
<tr>
<td>2011</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td>1</td>
<td>1.31</td>
</tr>
</tbody>
</table>
Population Estimate

- Available lynx habitat in northern Maine – FIA
- Proportion of habitat occupied – track surveys
- Amount of lynx in occupied areas – habitat in h.r.

See Appendix IV – Maine’s Lynx Assessment
2006 Population Estimate
750 – 1,000 Adult Lynx
2015 Population Estimate
> 1,000 Adult Lynx
Credible Sightings
Indices suggest Maine’s lynx pop still increasing

Road Mortalities

Incidental Captures in Traps
Periodic Winter Track Surveys

• Snowmobile 55–80 km Unplowed Roads / 100km²

• 24–72 hrs. after snow/wind event

• GPS survey route and track intercepts

• Collect additional data at track
  – Photograph
  – Measurements
  – Assign STQ
  – Number of Individuals
  – Direction of Travel
### Monitoring Lynx - Track Surveys

<table>
<thead>
<tr>
<th>Time period</th>
<th>Number of towns surveyed</th>
<th>Number of towns with lynx</th>
<th>% occupied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995–1998</td>
<td>116</td>
<td>10</td>
<td>9%</td>
</tr>
<tr>
<td>2003–2008</td>
<td>91</td>
<td>43</td>
<td>47%</td>
</tr>
<tr>
<td>2015</td>
<td>24</td>
<td>19</td>
<td>79%</td>
</tr>
</tbody>
</table>

19 towns surveyed in 2003–08 and 2015

<table>
<thead>
<tr>
<th>Time period</th>
<th>Number of towns surveyed</th>
<th>Number of towns with lynx</th>
<th>% occupied</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003–2008</td>
<td>19</td>
<td>11</td>
<td>58%</td>
</tr>
<tr>
<td>2015</td>
<td>19</td>
<td>18</td>
<td>95%</td>
</tr>
</tbody>
</table>
Preliminary Occupancy Models

2003
Naïve estimate: 17/19 towns
Ψ = 0.897 +/- 0.07 SE

Mean Detection rates:
p = 0.065 +/- 0.007 SE

2015
Naïve estimate: 18/19 towns
Ψ = 0.951 +/- 0.05 SE

Mean Detection rates:
p = 0.176 +/- 0.010 SE
Detection Higher 2015

▲ = 2003 tracks

= 2015 tracks
Future Surveys

• Surveys to continue 2016 and 2017
  – Resurvey areas previously surveyed
  – 25 towns each year for 3–4 years.
  – Same survey design

• Occupancy modeling –
  • Has Occupancy Increased (i.e., expanding)?
  • Has Prob. Of Detecting Lynx Increased?
  • Has density/pop increased?
Models

2003–08 Track surveys

Found lynx in
• 22 of 55 Low Probability
• 13 of 18 High Probability
Current Models:

Data

• From colonizing population of lynx that occupied best habitat first

• Limited data on value of Partial Harvest
  – Most of s/f forest cut in 1980s
  – PH in remaining smaller patches of s/f or mixed forest
• Another Budworm Outbreak on Horizon

• FPA – allowances for larger clearcuts
  – Wildlife Value
  – Response to disease

• Will PH in maturing s/f forest provide adequate habitat for hares and lynx?
Shelterwoods - emulate clear cuts
Summary

• Maine’s lynx population is robust

• Populations are still increasing

• Forest disturbance benefit lynx

• Land Use Regulations did not lead to current conditions

• Provide private land managers forest stand characteristics that support hares and lynx