Movement and Habitat Use of the Great Basin Spadefoot at its Northern Limit

Jocelyn Garner, Karl Larsen
Thompson Rivers University
& Roger Packham
Ministry of Environment (retired)
Great Basin spadefoot
(*Spea intermontana*)
Great Basin Spadefoot

• Species at risk
  – Threatened (COSEWIC)
  – Blue Listed (special concern) in BC
  – Priority 1 species under Goal 2 of BC’s Conservation Framework
Great Basin Spadefoot
Breeding Ponds
Telemetry
Results

• **19** individuals tracked for avg of 49.5 days
  • Max = 90 days, Min = 4

• **Locations:**
  • Total = **707**
  • Per individual: Avg = 37.2, Max = 59, Min = 4

• **Number of retreats:**
  • Total = **170**
  • Per individual: Avg = 8.95, Min = 22, Min = 4

• **4 potential hibernation sites**
SF201: May 16-Jul 14

Max to pond = 153 m
SM201: May 17 - Jul 14

Max to pond = 377 m
SF204: May 31-Aug 21

Max to pond = ??

Straight-line distance = 1.1 km
SM204: May 29-Aug 24

Max to pond = 243 m
SM204: Hibernation Site
SM204: Hibernation Site
SM204: Hibernation Site
SM204: Hibernation Site
SM204: Hibernation Site
Results—Movement

1. Distance from breeding pond:
   - For individuals on air > 35 days (n = 12)
   - Max = 371 m, Avg = 136 m (SE = 28.3, SD = 98.2)
Results—Movement

2. Movement pattern
   • Few long directed movements
   • ‘Activity centers’
Habitat-type

- used > random: open grassland, forest path
- used = random: forest
- random > used:
  transition zone, wetland, shrub, grassland path
Results—Habitat

• Retreat site microhabitat
## Results—Habitat

<table>
<thead>
<tr>
<th>Model</th>
<th>Bare</th>
<th>Rock</th>
<th>MLF</th>
<th>AIC&lt;sub&gt;c&lt;/sub&gt;</th>
<th>Δ&lt;sub&gt;i&lt;/sub&gt;</th>
<th>w&lt;sub&gt;i&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare + Rock + MLF</td>
<td>0.030</td>
<td>0.041</td>
<td>-0.530</td>
<td>474.35</td>
<td>0</td>
<td>0.68</td>
</tr>
<tr>
<td>Bare + Rock</td>
<td>0.031</td>
<td>0.039</td>
<td></td>
<td>477.42</td>
<td>3.07</td>
<td>0.15</td>
</tr>
<tr>
<td>Bare + MLF</td>
<td>0.032</td>
<td></td>
<td>-0.046</td>
<td>477.59</td>
<td>3.24</td>
<td>0.14</td>
</tr>
<tr>
<td>Bare</td>
<td>0.032</td>
<td></td>
<td></td>
<td>480.36</td>
<td>6.01</td>
<td>0.03</td>
</tr>
</tbody>
</table>

- **Mixed-effects models**
- **Bare ground important**
- **Best model**
Summary

• Spadefoots did not venture far from breeding sites (compared to other terrestrial amphibians), with 136 m being the average displacement.

• Short movements between retreats within activity centers were common and long directed movements were rare.

• Study animals showed a preference for open areas, both at the fine-scale of retreat sites and the larger scale of habitat-type.
Management Implications

• Distance from breeding site + habitat knowledge → management planning

• Wildlife Habitat Areas
Management Options

1. Aquatic Habitat
2. Aquatic habitat + typical buffer zone (30 m)
3. Aquatic habitat + average distance from site
4. Aquatic habitat + average distance from site + terrestrial habitat considerations
5. Terrestrial habitat focus
Funding
QUESTIONS?