Grinnell Resurvey Project

To Red

Grinnell-1918

Meadows, and specimens of this form is not bolding. insides Boreal, and seem that Boldings does in the other species of chipmunk. Saw several Chickarees in the Big Meadows region. Pines come in.


On the Cliffs above (one in meadow, Donohoe Pines Trail 10,100 ft. one in rocks near this meadow). An alpine chipmunk was shot near one setting of steel traps on top mips (11,000 ft.) between McCloud and Lyall Falls. (few Pinn. albicaulis)

Three Cions were shot, one in rocks slide 200 ft. above same area, and two in open rocky ground a short distance above meadow on Donohoe Pine Trail at 10,000 ft. Dignan below shows some typical copy attitudes on rocks.
Belding’s Ground Squirrel Distribution

66 sites
2km = site
Site Extinctions (N=30)
Site Persistence (N=36)
Continued Absences (N=47)
<table>
<thead>
<tr>
<th>Factor</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>NS</td>
</tr>
<tr>
<td>Latitude</td>
<td>NS</td>
</tr>
<tr>
<td>Longitude</td>
<td>NS</td>
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<tr>
<td>Grazing</td>
<td>NS</td>
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<tr>
<td>Anthropogenic Site</td>
<td>NS</td>
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<tr>
<td>Proximity to Water</td>
<td>NS</td>
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<tr>
<td>Temperature Change</td>
<td>NS</td>
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<tr>
<td>Winter Temperature Change</td>
<td>NS</td>
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<tr>
<td>Precipitation Change</td>
<td>NS</td>
</tr>
<tr>
<td>Winter Precipitation Change</td>
<td>NS</td>
</tr>
<tr>
<td>Elevation (m)</td>
<td>p &lt; 0.005</td>
</tr>
<tr>
<td>Average Temperature</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Average Winter Temperature</td>
<td>p &lt; 0.0005</td>
</tr>
<tr>
<td>Modern Beecheyi Presence</td>
<td>p &lt; 0.001</td>
</tr>
</tbody>
</table>
Site Extinction at Lower Sites

$p = 0.002$

Extinct Sites

Persistent Sites

Elevation (m)

450 m difference
Site Extinction at Hotter Sites

- Persistent Sites Extinct Sites
- Historic
- Modern

Average Annual Temperature

- $p = 0.022$
- $p = 0.035$

$N=66$
Survey methods

- Visual resurveys at 66 sites
- Late June to early September (July 26 average)
- 1-4 observers/site (44 by myself)
- Average of 90 minutes/site
- Average of 2.6 visits
- Trapped at 30 sites
Highly detectable

- Diurnal
- Group living
- Alarm calling

Detectability ($p$) = 0.95 (95% CI: 0.86 - 0.98) for 1 visit (N=18)
Detectability ($p$) = 0.9975 for 2 visits (N=13)