Recognizing and integrating wildlife as Elwha restoration agents

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Outline

1 Restoration requires wildlife
2 Spatial & temporal contexts
3 Early wildlife distributions
4 Wildlife restoration roles
   -- ungulate browse patterns
   -- avian seed dispersal
   -- nutrient dispersal
5 Revegetation and LWD
6 Restoration implications
Attributes of Restored Ecosystems (SERI 2004)

1. Characteristic species, community structure
2. Indigenous species dominate
3. All functional groups for ecosystem development, stability
4. Capable of sustaining species required for (3)
5. Ecosystem functions "normally" for developmental stage
6. Integrated into larger landscape; biotic & abiotic interactions
7. Potential threats to integrity reduced or eliminated
8. Resilient to normal periodic stress events
9. Self-sustaining; potential to persist

Wildlife roles
Presence
Functions
Indirect functions
Early seral stage vegetation
Early successional and mobile wildlife

Wildlife using and shaping habitat and vegetation
Riparian vegetation matures

Nutrient transfer
Aquatic-terrestrial linkages
Restored complement of wildlife species

Recolonization

Habitat restoration
Restored ecosystem function

Time since dam removal
Natural revegetation
Active revegetation
Small mammals

*Peromyscus* (mice)

*Mustela* (weasels)

*Microtus* (voles)

*Sorex* (shrews)

*Neotoma* (wood rat)

*Zapus* (Jumping mouse)
Bird species composition

![Graph showing bird species composition by category and location.](image)

- **Elwha**
- **Aldwell**
- **Mills**

- Aquatic
- Raptors
- Aerial foragers
- Shrub nesters
- Edge spp
- Forest spp

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Ungulate browse selection

<table>
<thead>
<tr>
<th>Year</th>
<th>Plots w/ Elk pellets</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>10.3%</td>
</tr>
<tr>
<td>2016</td>
<td>20.0%</td>
</tr>
<tr>
<td>2017</td>
<td>48.3%</td>
</tr>
</tbody>
</table>
Revegetation and LWD
Dispersal

Substrate

Herbivory
- Early seral stage vegetation
- Early successional and mobile wildlife
- Wildlife using and shaping habitat and vegetation
- Riparian vegetation matures
- Nutrient transfer
- Aquatic-terrestrial linkages
- Restored complement of wildlife species

**Rcolonization**

**Habitat restoration**

**Restored ecosystem function**

**Time since dam removal**
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Wildlife roles
Presence
Functions
Indirect functions
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