Prioritizing Vascular Plant Species for Conservation: Some Lessons from Wyoming

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Absaroka biscuitroot (Lomatium attenuatum)
Prioritizing Species

Center for Plant Conservation predicts that 20-33% of vascular plant species in US are threatened with local or range-wide extinction

Wyoming kittens (Besseya wyomingensis)
Prioritizing Species

Resources for plant conservation are limited: $\$, personnel, time

Which species should receive conservation attention first?

Weber’s scarlet gilia

\textit{(Ipomopsis aggregata ssp. weberi)}
Prioritizing Species

NatureServe system

Species ranked globally and sub-nationally (state/province), 1-5

Traditionally, ranks driven by # of occurrences; now include many criteria

Hyattville milkvetch (Astragalus jejunos var. articulatus)
Prioritizing Species

Rabinowitz (1981)
“Seven forms of rarity”

Focus on abundance, geographic range, & habitat specificity

Simple binary scoring

Transparent
Prioritizing Species

Need for quick ‘triage’ to make sure all of the most vulnerable spp are assessed

Issues with uncertainty (IUCN)

Need for transparency

Evert’s spring-parsley (Cymopterus evertii)
Prioritizing Species

“Wyoming” system borrows from others

Multiple factors of rarity (NatureServe)

Uncertainty (IUCN)

Ease of use & transparency (Rabinowitz)

Narrowleaf Arnica
(*Arnica angustifolia*)
WY System: 7 Ranking Criteria

1. Geographic Range
2. Abundance
3. Habitat Specificity
4. # of Populations
5. Intrinsic Rarity
6. Magnitude & Imminence of Threats
7. Population Trend

Arizona bluebells
(Mertensia arizonica)
Scoring

All criteria (except geographic range) rated as high, low, or unknown by expert team

Highs or lows scored 1 (high risk) or 0 (secure) as appropriate

Unknowns = 0 or 1
## Scoring

<table>
<thead>
<tr>
<th>Abundance (# of individuals)</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
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<tbody>
<tr>
<td>0 point</td>
<td>0</td>
<td>10,000</td>
<td>100,000</td>
</tr>
<tr>
<td>1 point</td>
<td>1 point</td>
<td>0</td>
<td>0</td>
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</tbody>
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Geographic Range

Local Endemic (2)

Regional Endemic (1)

Dwarf bearpaw poppy
(Arctomecon humilis)

Rock columbine
(Aquilegia scopulorum)
Geographic Range

Peripheral (1)

Disjunct (1)

Widespread (0)

Giant helleborine
(\textit{Epipactis gigantea})
WY System: Summary Scores

Two Scores:

Minimum score = sum of numeric values for all 7 criteria (0-8); unknowns = 0

Potential score = sum of all numeric values + all unknowns = 1

Heartleaf nippletwist (Streptanthus cordatus)
WY System: Translating Scores

Extremely High priority = 7-8 pts

High Priority = 6 pts

Watch list = 5 pts

Medium priority = 4 pts

Need data = 3+ unknowns

Sidesaddle bladderpod (Lesquerella arenosa var. argillosa)
Desert yellowhead

Geographic Range: local endemic (2)
# Populations: low (1)
Abundance: low (1)
Habitat Specificity: high (1)
Intrinsic rarity: high (1)
Threats: high (1)
Trend: stable (0)

Min Score: 7
Pot Score: 7
Rank: Ex High

Yermo xanthocephalus
Hoary willow

Geographic Range: peripheral (1)
# Populations: low (1)
Abundance: low (1)
Habitat Specificity: high (1)
Intrinsic rarity: low (0)
Threats: low (0)
Trend: unk

Salix candida by Joe Rocchio

Min Score: 4
Pot Score: 5
Rank: Medium
Western skunk cabbage

Geographic Range: peripheral (1)
# Populations: unk
Abundance: unk
Habitat Specificity: high (1)
Intrinsic rarity: low (0)
Threats: unk
Trend: unk

Lysichiton americanus by Joe Rocchio

Min Score: 2
Pot Score: 6
Rank: Need Data
Of 2483 native vascular plant taxa in WY:

Ex High priority: 13
High priority: 33
Watch list: 86
Medium priority: 431
Low priority: 1859
Need Data: 61

Northern hollyfern
(*Polystichum lonchitis*)
WY System: Results

22% of WY flora of some conservation significance (ExHigh to Med)

<2% identified as ExHigh & High priority – conservation attention can be focused more strategically

Twinleaf cinquefoil (Potentilla subjuga)
WY System: Results

38 of 46 ExHigh & High priority species were listed as Threatened, Endangered, or Sensitive

Good congruence with NatureServe ranks

Large yellow lady’s-slipper (Cypripedium parviflorum var. pubescens)
Habitat specificity contributed the most to rarity (44% of all spp.)

Optional in NatureServe ranking and not used by IUCN

Cushion Easter-daisy 
(Townsendia condensata)
WY System: Applications

Identify geographic areas of high conservation value

50% of ExHigh & High priority species are from the Wyoming Basins ecoregion and desert habitats
WY System: Applications

Identify species that are not protected

Rare species 2x less likely to be in protected areas than common species
WY System: Applications

Identify new taxa that should be tracked in Washington

Help prioritize among existing tracked spp

Help identify gaps in the Natural Areas network

Triangle-lobed moonwort
(*Botrychium ascendens*)
Have a nice daisy