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October 5, 2022

MEMORANDUM

TO: Council Members

FROM: Cathy P. Kellon, Oregon Fish and Wildlife Policy Analyst

SUBJECT: Bradshaw's Lomatium: a conservation success story

BACKGROUND:

Presenter: Tom Brumbelow, Ecologist, U.S. Fish and Wildlife Service

Summary: For three decades Bradshaw's lomatium - a small plant in the carrot family that is endemic to wetland prairies of the Willamette Valley, Oregon, and southwestern Washington - was listed as endangered under the federal Endangered Species Act. Thanks to the collaborative efforts of public and private partners, the U.S. Fish and Wildlife Service (USFWS) declared the plant recovered in April 2021 and delisted it. Today, more than 99% of Bradshaw's lomatium plants in the Willamette Valley are on properties with some assurance of protection, including sites acquired under the *Willamette Wildlife Mitigation Program*.

Relevance: Land acquisition and conservation played a critical role in the recovery of Bradshaw's lomatium. In 2010, the State of Oregon and Bonneville Power Administration (BPA) entered into a fifteen-year agreement to permanently settle wildlife mitigation responsibilities under the Northwest Power Act for the federal Willamette River Basin Flood Control and Hydroelectric Project. Under the agreement, Oregon and the BPA agreed to acquire at least an additional 16,880 acres of wildlife mitigation property to protect 26,537 acres or more by the end of 2025. The Oregon Department of

Fish and Wildlife manages the agreement's *Willamette Wildlife Mitigation Program (WWMP)* in coordination with Tribes and in collaboration with stakeholders. Projects are solicited on an annual basis and reviewed by technical and advisory teams. Following their review, the ODFW Director recommends a final project list to BPA for funding.

Properties are prioritized for acquisition under *WWMP* using an ecosystem-based approach whereby sites are expected to provide benefits for targeted wildlife species and may also address other species and resources of interest, such as insects or plants. For example, lands with threatened and unique habitats like wet prairie are high priority because they can benefit multiple species of concern. As a result, individual properties acquired under the *WWMP* are host, or potential hosts, to several at-risk species. *WWMP* properties that currently include Bradshaw's lomatium are Willow Creek, Courtney Creek, and Coyote Creek South. The fact that these sites not only have growing populations of Bradshaw's lomatium but are also permanently protected habitat, contributed to the USFWS decision to delist.

Background: Bradshaw's lomatium (*Lomatium bradshawii*) is a perennial flowering plant and member of the carrot family. Also known as Bradshaw's desert parsley, it is endemic to wetlands and wet prairies in Oregon's Willamette Valley and adjacent southwestern Washington, where the soils are seasonally saturated or poorly drained and there is ample light. These habitat types were widespread in the area prior to Euro American settlement but starting in the mid-1800s, settlers drained wetlands and wet prairie and converted them to pasture or other agricultural uses. As a result, Bradshaw's lomatium was thought to be extinct for much of the 20th century.

In 1979, a graduate student found a few Bradshaw's lomatium growing outside of Eugene, Oregon and thereafter more small populations were rediscovered in the Willamette Valley. However, urban development and agricultural conversion continued to threaten the plant's preferred habitat, and the U.S. Fish and Wildlife Service (USFWS) listed it as endangered under the Endangered Species Act in 1988.

In the decades following its listing, many public and private organizations, landowners, and volunteers have collaborated to bring the plant back to the Willamette Valley through research, propagation, land and easement acquisition, and habitat restoration. As a result, their abundance increased from around 25,000 flowers in the late 1980s to more than eleven million today and Bradshaw's lomatium are again throughout their historic range. In April 2021, the USFWS declared the species recovered and it was delisted.

Land acquisition and conservation played a critical role in the plant's recovery and the decision to delist. More than 99% of Bradshaw's lomatium plants in the Willamette

Valley are on properties with some assurance of protection such as conservation easements or being in public or nonprofit conservancy ownership. This includes WWMP properties at Willow Creek, Courtney Creek, and Coyote Creek South, among others, where wet prairie habitat is important to multiple at-risk species. It is worth noting that while Oregon hosts the most unique populations (23 of 24), there is one population in Washington state on private land with the majority of individual Bradshaw's lomatium plants.

Although there are more Bradshaw's lomatium today than in more than a century, the wet prairie habitat it depends upon is still very rare and vulnerable. To maintain Bradshaw's lomatium's viability and keep it from the endangered species list, managers will need to prevent further loss and degradation of the plant's preferred grass-dominated habitat. Management at protected properties focuses on controlling invasive species like reed canary grass, and reestablishing disturbance regimes through mowing, seasonal flooding, grazing, or prescribed burning.

More Info:

- [Willamette Wildlife Mitigation Program](#)
- [U.S. Fish and Wildlife Service resources on Bradshaw's lomatium](#)
- NPCC Fish and Wildlife Program [2014 Program \(see esp., pp.72-75\)](#)

Bradshaw's lomatium

A Conservation Success Story





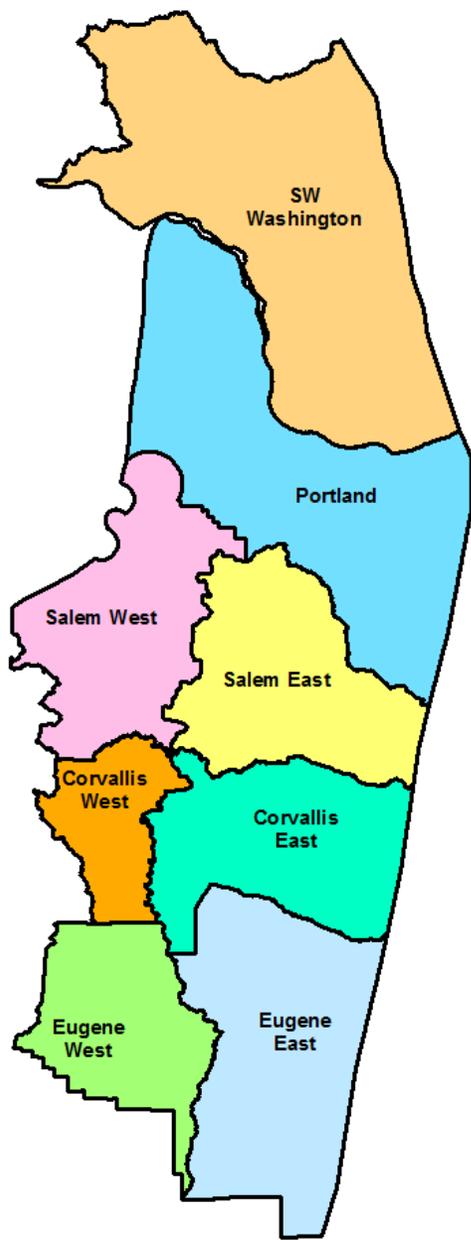
- First collected in 1916 and described to science in 1934.
- Obligate wetland plant, often in the wettest places on sites with thin rocky soils or clay layers causing poor drainage.
- Blooms as early as March.
- No collections for decades starting in 1942, and the species was presumed extinct.



- Historically, wet prairies covered approx. 10% of the Willamette Valley (estimated 137k ha. / 339k ac.)
- As of 2011, wet prairie made up only 1.5% of its historic extent, at an estimated 2024 ha / 5001 ac.
 - Conversion to agriculture and other development
 - Ecological succession in absence of disturbance

- Listed as Endangered in 1988
 - Habitat loss
 - Invasive species
- First Recovery Plan published in 1993
- Updated Recovery Plan finalized in 2010 focused more broadly on Willamette Valley species and ecosystems
 - Bradshaw's lomatium
 - Nelson's checkermallow
 - Kincaid's lupine
 - Willamette daisy
 - Fender's blue butterfly
 - Numerous other species of concern





- Set criteria for number, size, and distribution of populations across the species' range
 - Delisting target of 100,000 Bradshaw's lomatium rangewide
- Sites must be managed and protected long-term
- Set habitat quality guidelines for native species diversity, woody species cover, and invasive species



- Partnerships are crucial in a fragmented landscape
- Mixed ownership is Federal, State, Tribal, private
- Shared resources for management

How to recover a species?

- Protect and preserve habitat
- Reduce woody cover through burning and mowing
- Reduce invasive plants through manual, mechanical, and chemical means
- Augment populations through planting
- Increase native plant community diversity

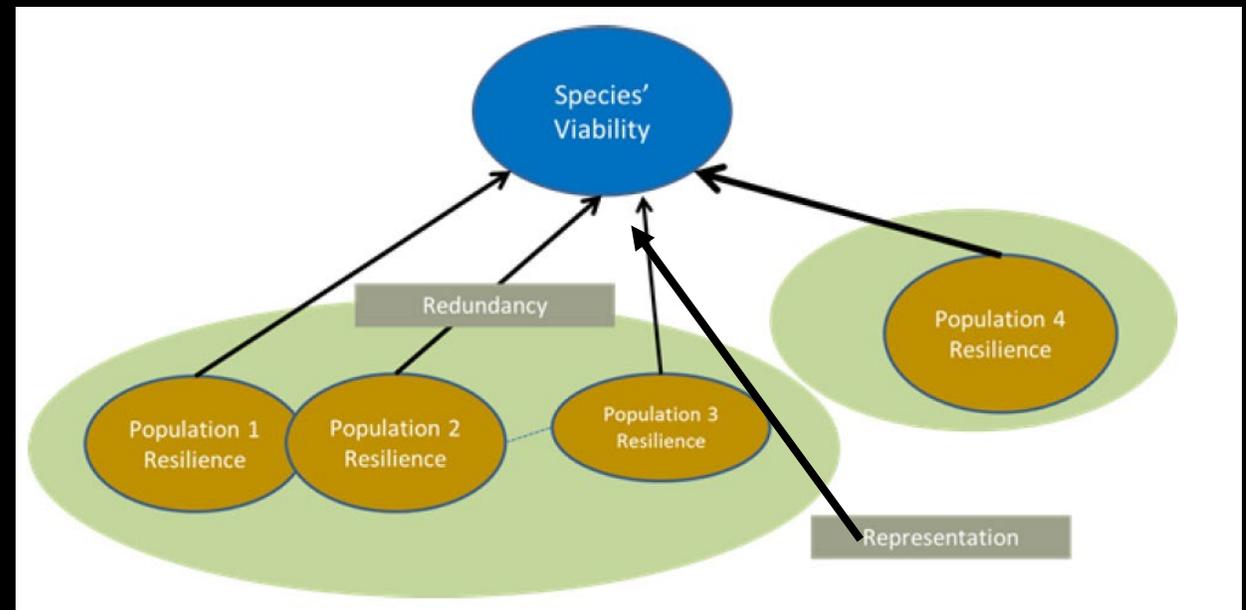




- Kingston Prairie (Stayton, OR) transferred to Greenbelt Land Trust from The Nature Conservancy in 2018. Bradshaw's lomatium population crucial to recovery due to habitat quality, population size, and location.

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- An aerial photograph showing a large, open field with scattered trees and a road on the right side. The field is mostly brown and dry, with some green trees and shrubs. A road runs along the right edge of the field. The background shows a dense forest of green trees.
- Courtney Creek property in Lane County purchased by Greenbelt Land Trust in 2017 thanks to the Willametter Wildlife Mitigation Fund protects over 25,000 Bradshaw's lomatium.
 - US Fish and Wildlife Service supports ongoing management through Partners for Fish and Wildlife program.

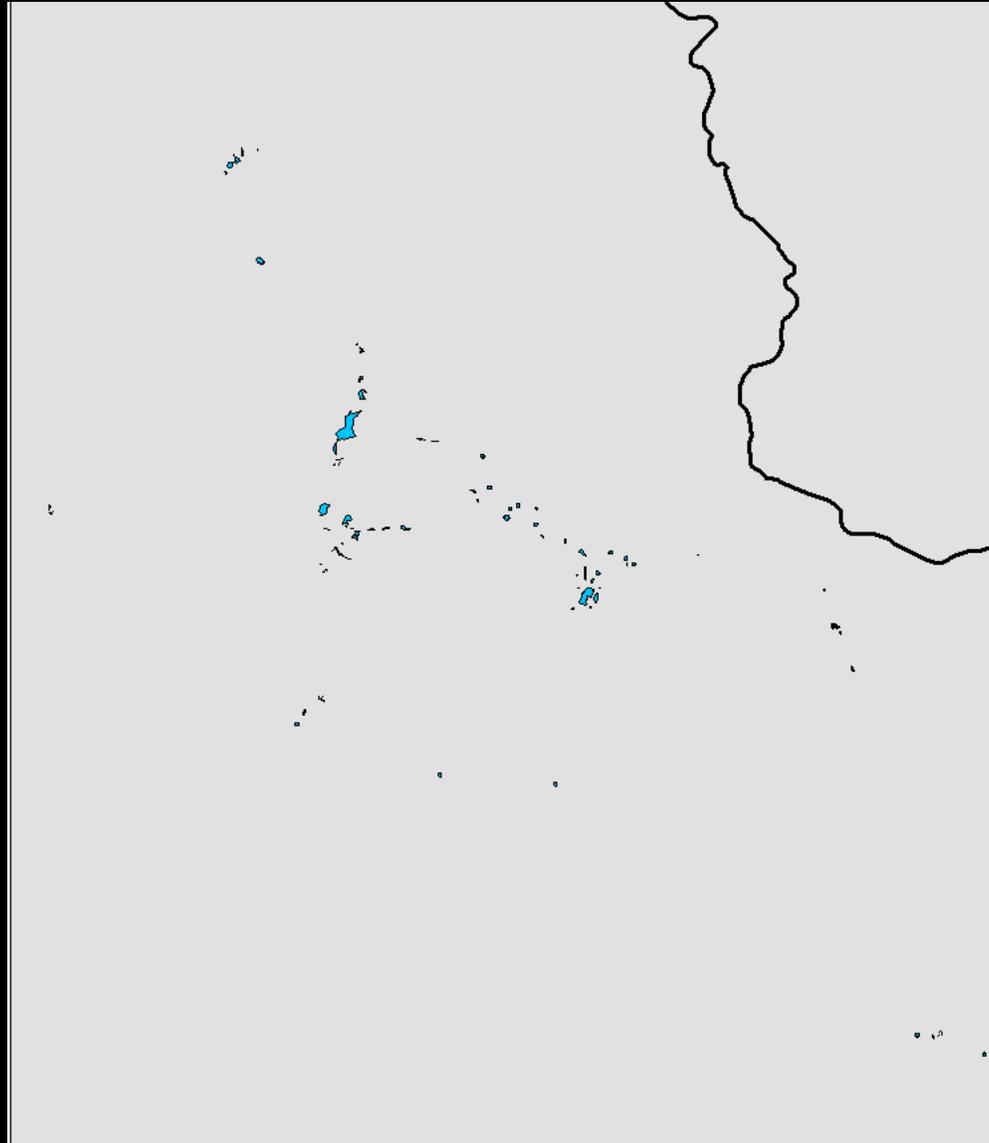
SSA Framework



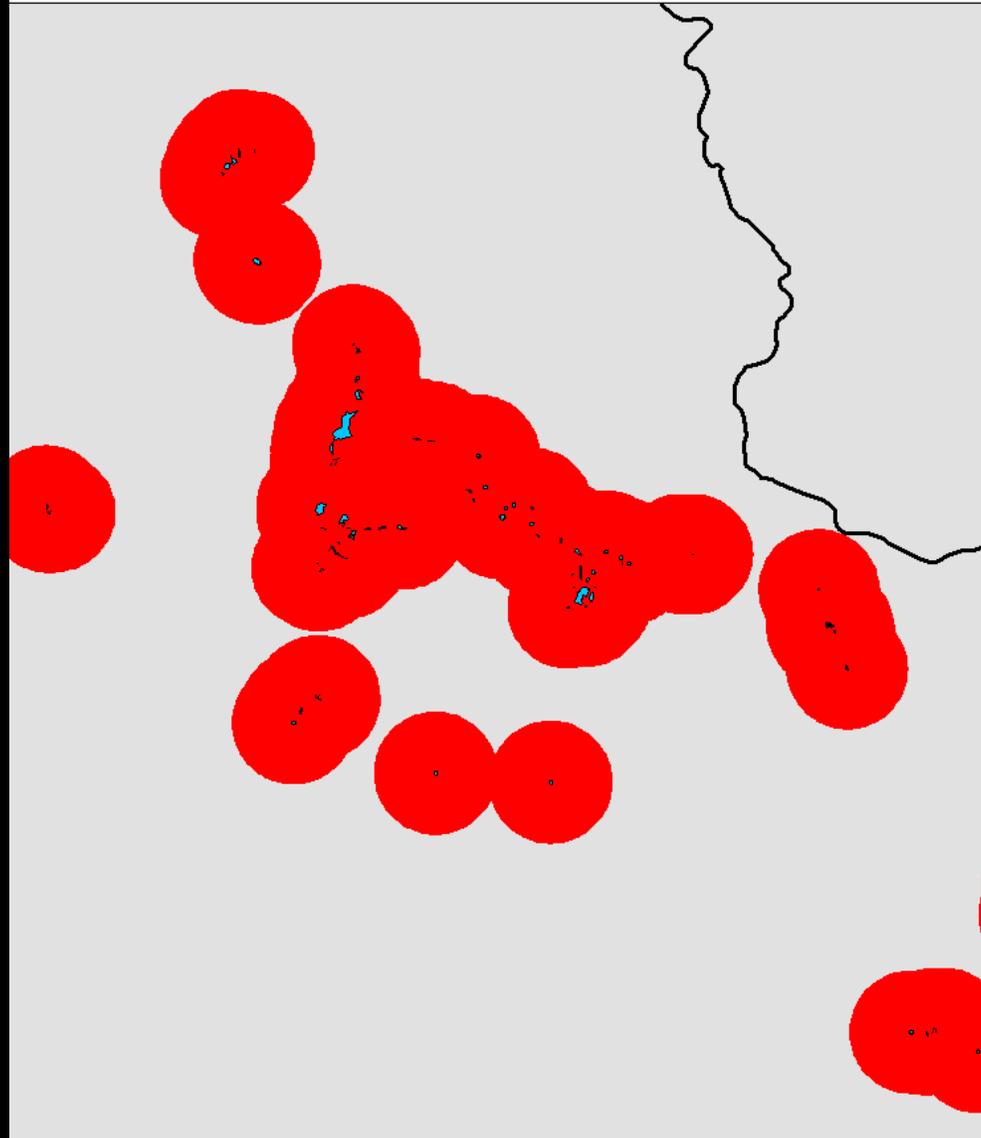
- **Resiliency** (population level) – ability to withstand stochastic events
 - Often an assessment of demographic and habitat quality / quantity factors
- **Redundancy** (species level) – ability to withstand catastrophic events
 - Number, distribution, resiliency, connectivity of populations
- **Representation** (species level) – ability to adapt to change
 - Genetic and ecological diversity

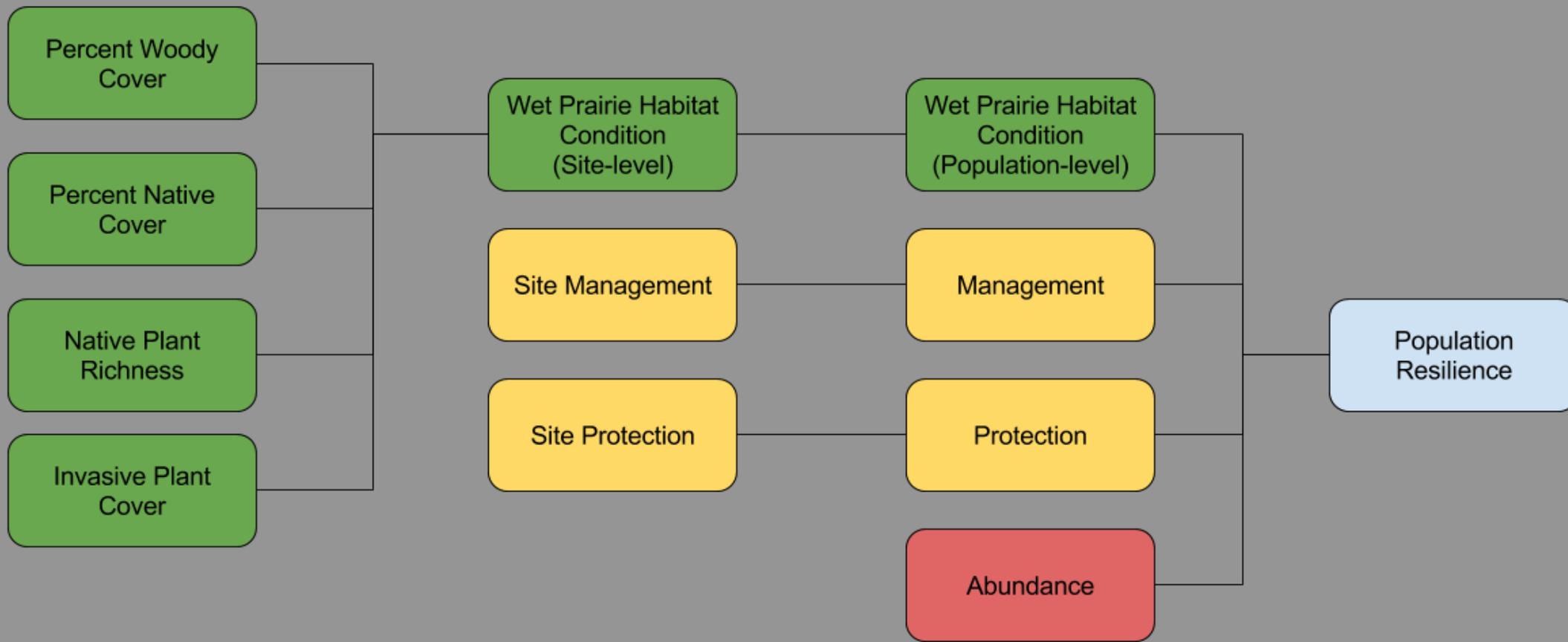


Defining Populations



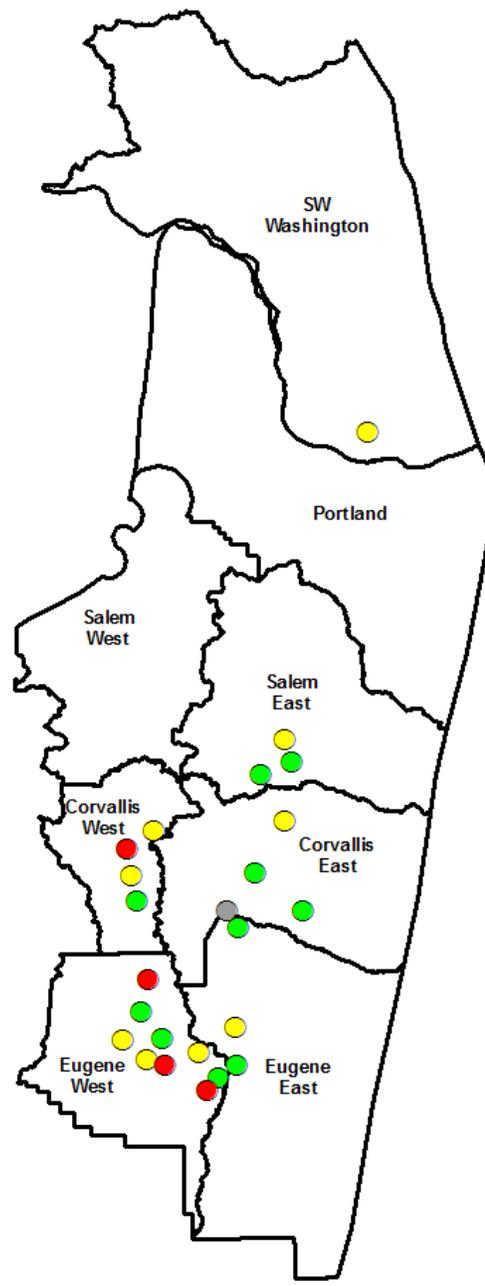
Defining Populations





Stage 1 (Site-level) Analysis

Stage 2 (Population-level) Analysis



- Greater than 11 million Bradshaw's lomatium across the range (~485k in Oregon)
- 24 populations (10 high, 9 moderate, 3 low, 1 not analyzed)
- 75% of sites receive some level of management for LOBR and / or prairie conditions (such as through PFW)
- 58% of sites have a management plan with goals for conservation of LOBR or prairie habitat.
- 51 of 71 known sites protected through public ownership, public ROW, conservation ownership, or easement. In Oregon, this accounts for 99% of known LOBR plants.
- Single SW WA population contains majority of plants known, but majority are on unprotected private land.

Distribution and Abundance of Bradshaw's lomatium

Recovery Zone	Downlisting Goals		Delisting Goals		Current Condition	
	Minimum # of Populations / Zone	Target # of Plants / Zone	Minimum # of Populations / Zone	Target # of Plants / Zone	# Populations Qualifying Toward Recovery Criteria	# of Plants in Populations Qualifying Toward Recovery Criteria
OREGON						
Portland	0	0	0	0	0	0
Salem East	1	5,000	2	10,000	3	62,604
Salem West	0	0	0	0	0	0
Corvallis East	2	10,000	3	15,000	3	179,462
Corvallis West	2	10,000	2	10,000	2	17,484
Eugene East	1	5,000	3	15,000	2	34,451
Eugene West	3	15,000	3	15,000	6	191,593
					<i>Subtotal</i>	485,594
WASHINGTON						
SW Washington	1	5,000	2	10,000	1	10,790,640
					<i>Subtotal</i>	10,790,640
+ Additional Populations (may occur in any Recovery Zone within range of Bradshaw's lomatium)	2	10,000	5	25,000		
Total	12	60,000	20	100,000	17	11,276,234

Future Conditions (25-50 years)

- Assuming continued conservation support
- Management and efforts to formalize management plans continue
- Protected sites remain so
- Climate change may alter seasonal hydrology, with possible impacts including shift in phenology, increased mortality, decreased recruitment.
- Without reliable quantitative predictions, we conservatively considered future losses of 50% to populations.

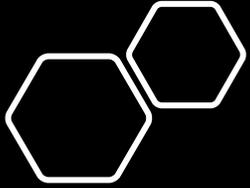
- Delisting proposed in November 2019 based on conclusions of the peer-reviewed Species Status Assessment
- Final delisting rule published March 2021, effective April 2021
- Post-delisting monitoring began in 2021





Conservation dependence

- FWS, BLM, NRCS, Army Corps finalized a Memorandum of Understanding in 2021 committing to continued habitat management to maintain prairie conditions



- Habitat focus has benefit beyond the individual species
- Nelson's checkermallow and Golden paintbrush also now proposed for delisting





Continuing
restoration work

- Ash trees removed to expand available prairie habitat



New partnerships

- At two wetland mitigation sites, new populations of Bradshaw's lomatium and Nelson's checkermallow are contributing to conservation
 - Site 1 - >18,000 lomatium, 1800 checkermallow, 12,000 Willamette daisy
 - Site 2 – 5000 lomatium and 21,000 checkermallow (smaller amounts of Willamette daisy and tall western penstemon)



Looking forward



Thank You!

- Partners: Willamette Valley NWR Complex, Army Corp of Engineers, Bureau of Land Management, Natural Resources Conservation Service, Oregon Department of Agriculture, Oregon Department of Transportation, Institute for Applied Ecology, Lane County, Greenbelt Land Trust, McKenzie River Trust, The Nature Conservancy, Sublime Organics, and so many private landowners and volunteers.