

# Collecting Native Seed for Restoration

James Miskelly



*Satinflower*  
**NURSERIES**

*native plants, seeds & consulting*



Inspiring and  
empowering people to  
connect with nature  
through native plants.







## General rules for seed collection

- Positively identify all seed that you're collecting
- Do not collect seed where it is unlawful or not permitted
- Make sure your collection is not a threat to the population, its habitat, or other species
- Treat collected seeds as if they are valuable



## Where to collect:

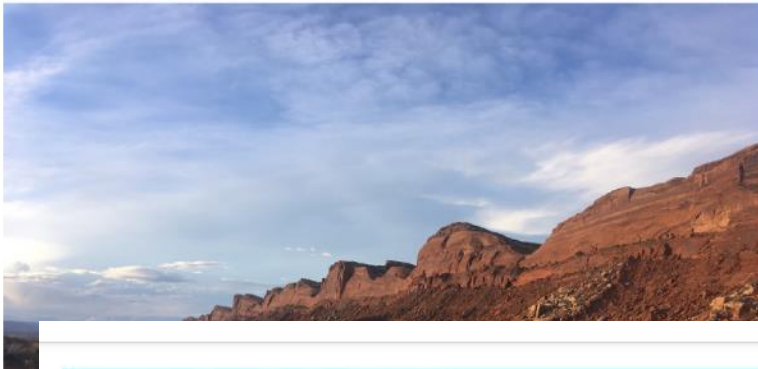
- English Nature: within 5 miles of restoration site (201 km<sup>2</sup>)
- Western Australia Forest Management Plan: within 15 km (707 km<sup>2</sup>)
- North Branch Restoration Project: within 15 miles (1810 km<sup>2</sup>), with exceptions
- US Forest Service: Ecologically/geographically based seed transfer zones, often more than 10,000 km<sup>2</sup>



**Genetically-informed seed transfer zones for *Pleuraphis jamesii*, *Sphaeralcea parvifolia*, and *Sporobolus cryptandrus* across the Colorado Plateau and adjacent regions**

Cooperator Report for the Bureau of Land Management's  
Colorado Plateau Native Plant Program

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**Using Common Garden Studies to Inform Seed Transfer Zones for Willamette Valley Species**

Final Report to the Bureau of Land Management, Eugene District

**December 30, 2008**

Stephanie A. Miller, Matthew L. Carlson, Rob Fiegenger, Melanie Gisler,  
Thomas N. Kaye, Kimiora Ward, Lisa Weiss and Amy Young  
Institute for Applied Ecology

Amy Bartow  
USDA-NRCS, Corvallis Plant Materials Center



**RESTORATION  
ECOLOGY**

The Journal of the Society for Ecological Restoration



 Full Access

**Can an Ecoregion Serve as a Seed Transfer Zone? Evidence from a Common Garden Study with Five Native Species**

Stephanie A. Miller, Amy Bartow, Melanie Gisler, Kimiora Ward, Amy S. Young, Thomas N. Kaye 

First published: 02 March 2011 | <https://doi.org/10.1111/j.1526-100X.2010.00702.x> | Citations: 56

 SECTIONS

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## Competing Concerns:

**Inbreeding depression:** The health of a population may decline due to a lack of genetic diversity

Vs

**Outbreeding depression:** The health of a population may decline due to the introduction of poorly-adapted genotypes

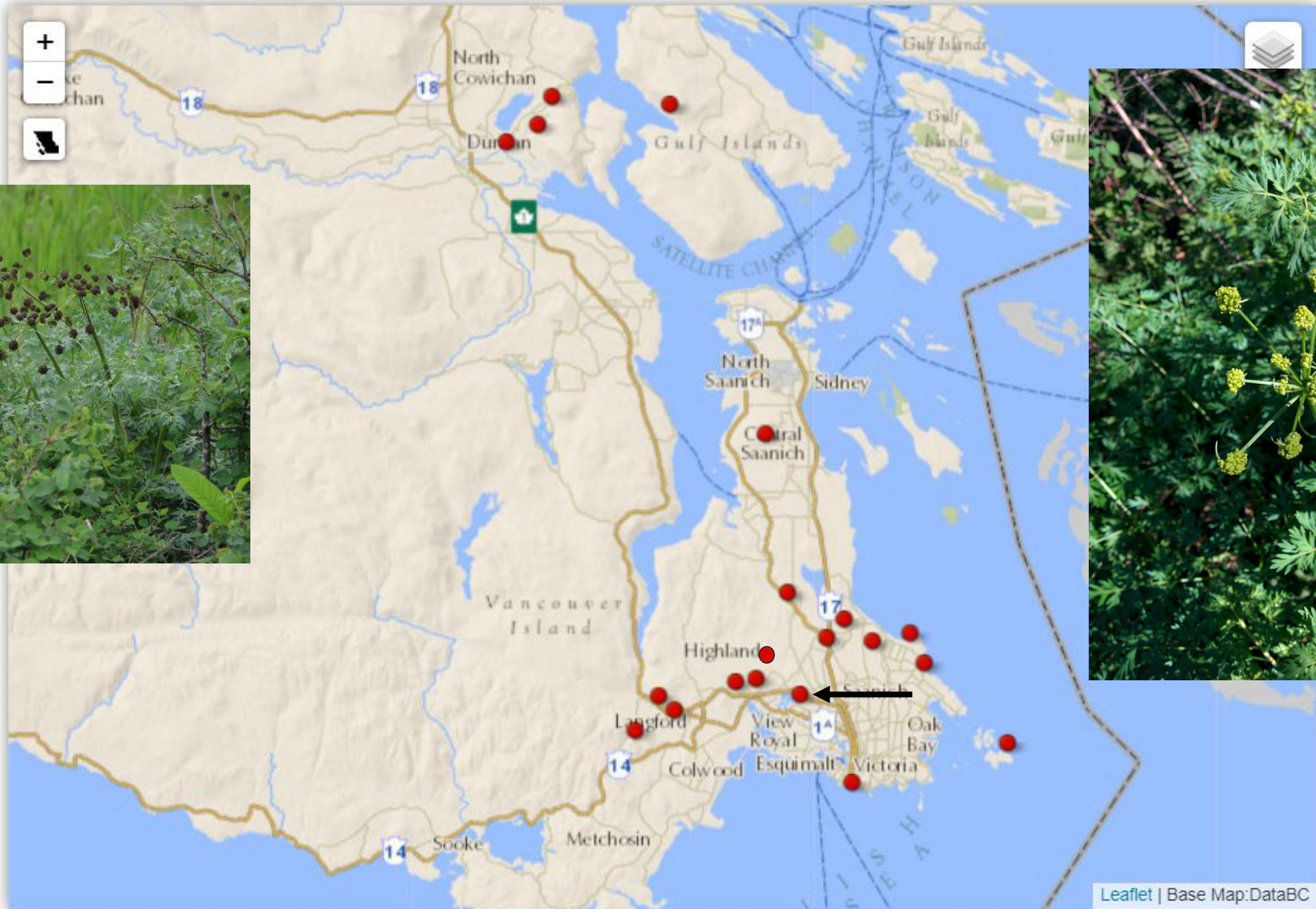
**Genetic distinctness:** Any population may be a unique combination of genes and this uniqueness contributes to diversity whether or not there's a known contribution to survival.

Vs

**Fragmentation:** Our region has experienced severe reductions in the area occupied by natural vegetation and barriers to reproduction now exist that were not originally present.



# Generalized Locations - *Lomatium dissectum* (fern-leaved desert-parsley)





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“The ultimate goal of these seed transfer zones is to protect natural patterns of genetic variation and maximize (or at least better understand) species' adaptations to local environmental conditions.”

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Two of five species investigated included populations that showed evidence of genetic uniqueness.



Open Access

## Seed supply for broadscale restoration: maximizing evolutionary potential

Linda M. Broadhurst, Andrew Lowe, David J. Coates, Saul A. Cunningham, Maurice McDonald, Peter A. Vesk, Colin Yates

First published: 29 October 2008 | <https://doi.org/10.1111/j.1752-4571.2008.00045.x> | Citations: 426

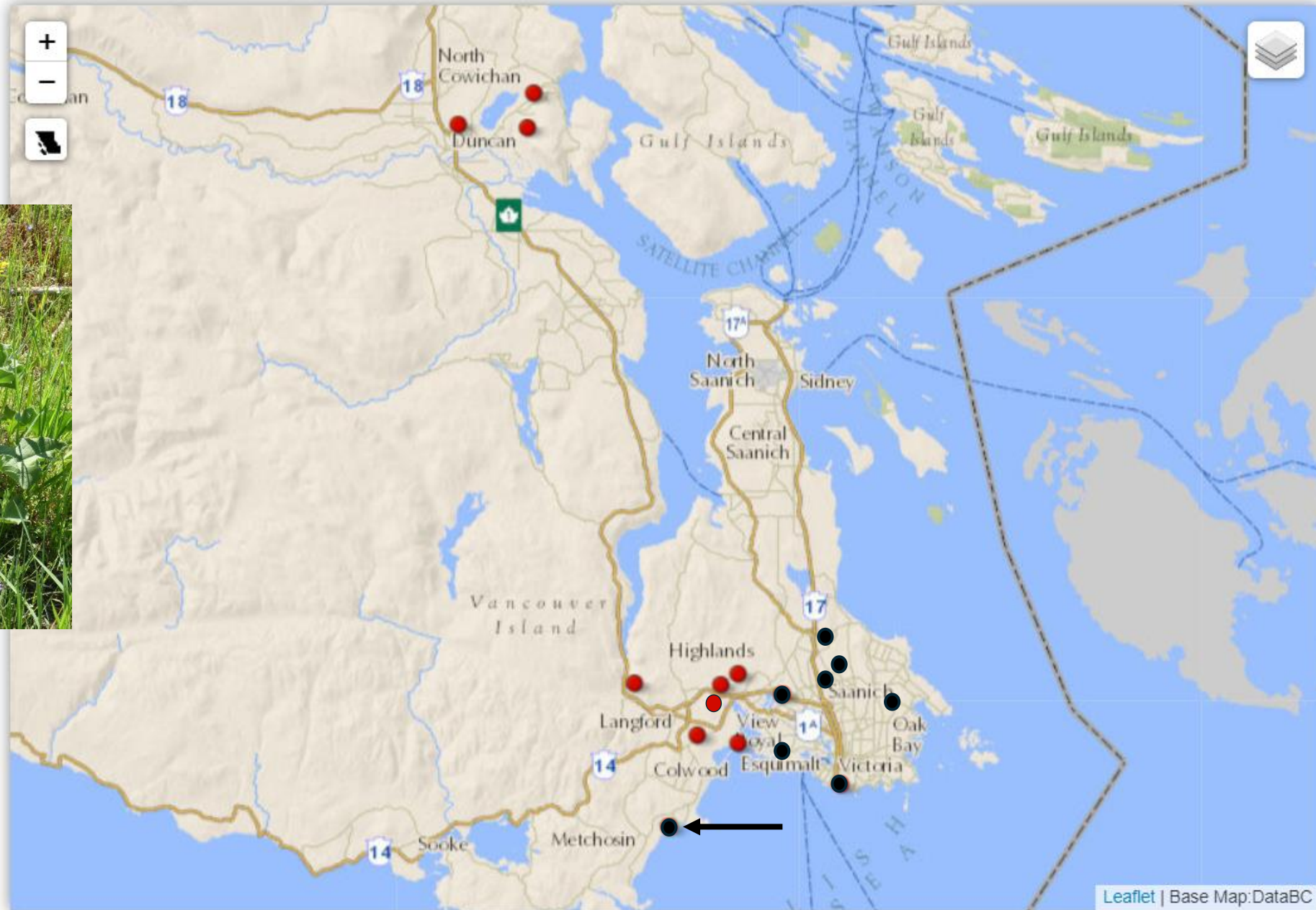
✉ Linda M. Broadhurst, CSIRO Plant Industry, PO Box 1600, Canberra ACT 2601, Australia.

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“The continued emphasis on *local is best* risks establishing populations with insufficient evolutionary potential to meet environmental challenges. Continued adherence to *local is best* protocols may also promote the use of inbred or genetically depauperate seed when genetically healthier but more distant sources may produce a better restoration result.”

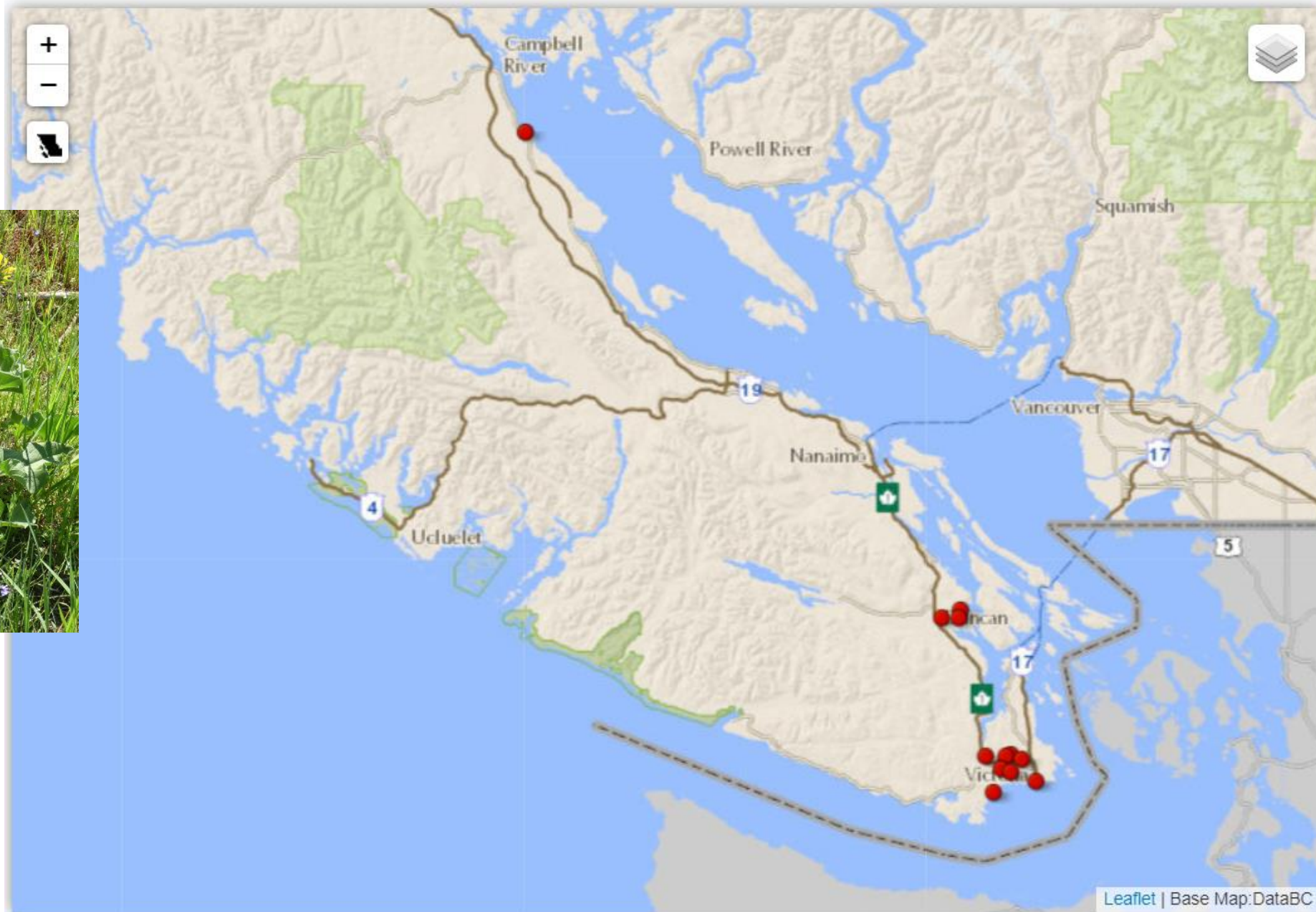


## Generalized Locations - *Balsamorhiza deltoidea* (deltoid balsamroot)

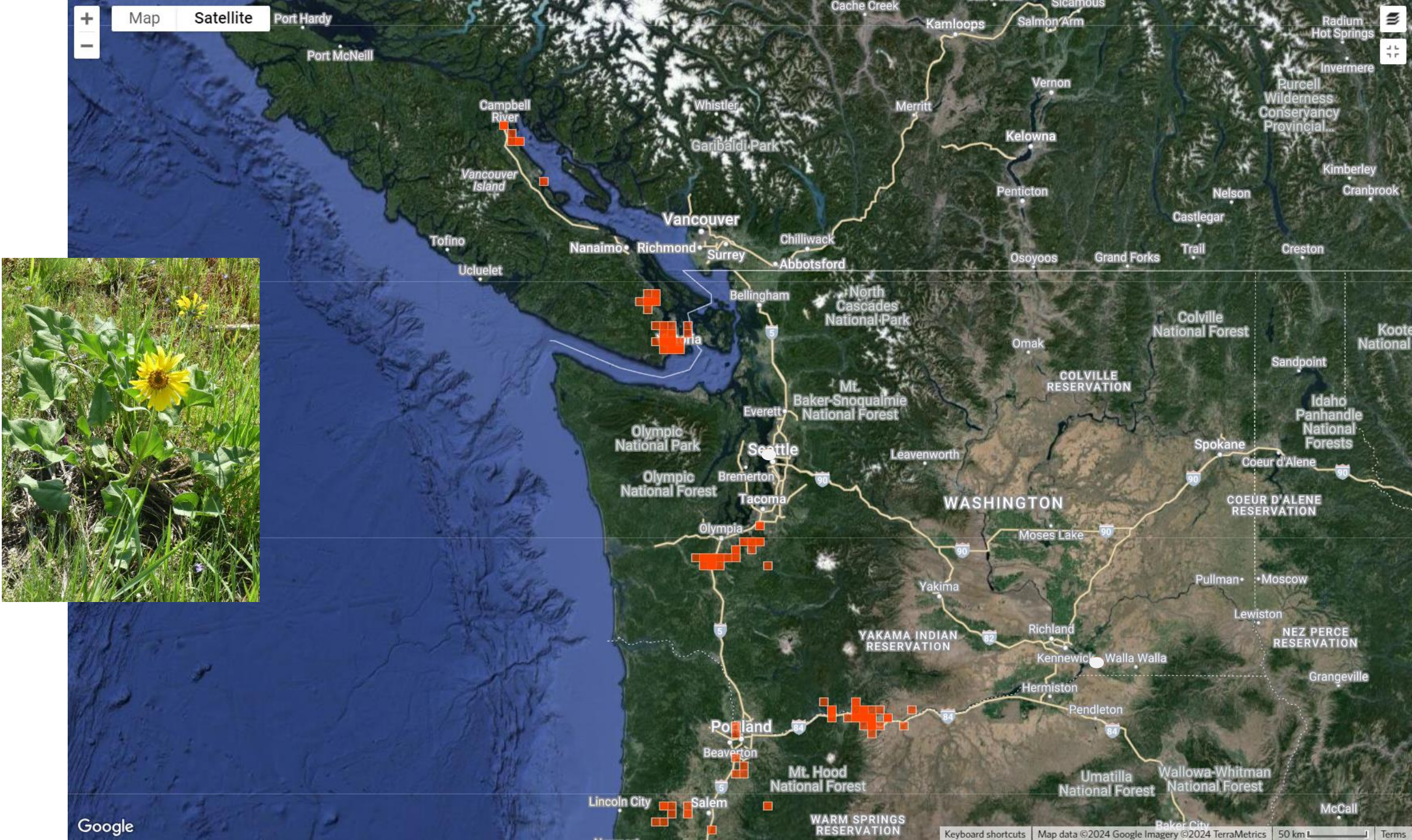




## Generalized Locations - *Balsamorhiza deltoidea* (deltoid balsamroot)

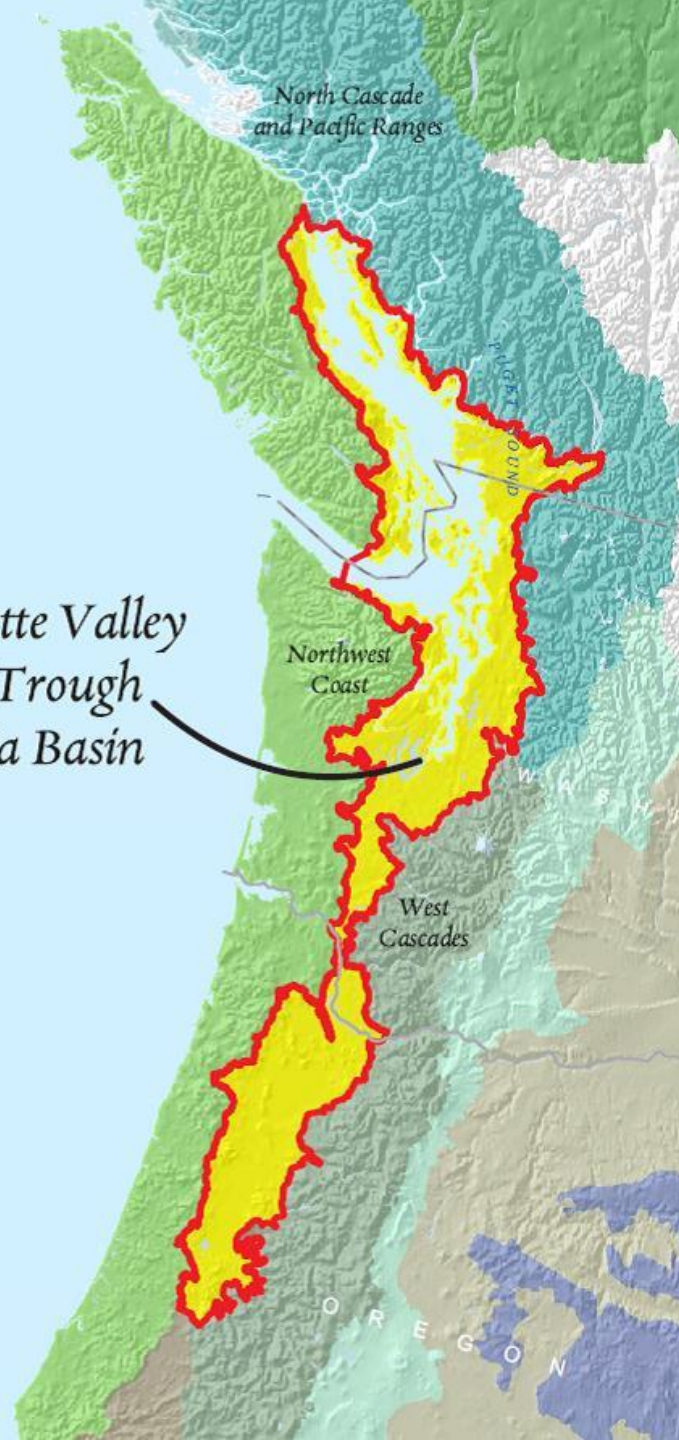








*Willamette Valley  
Puget Trough  
Georgia Basin*



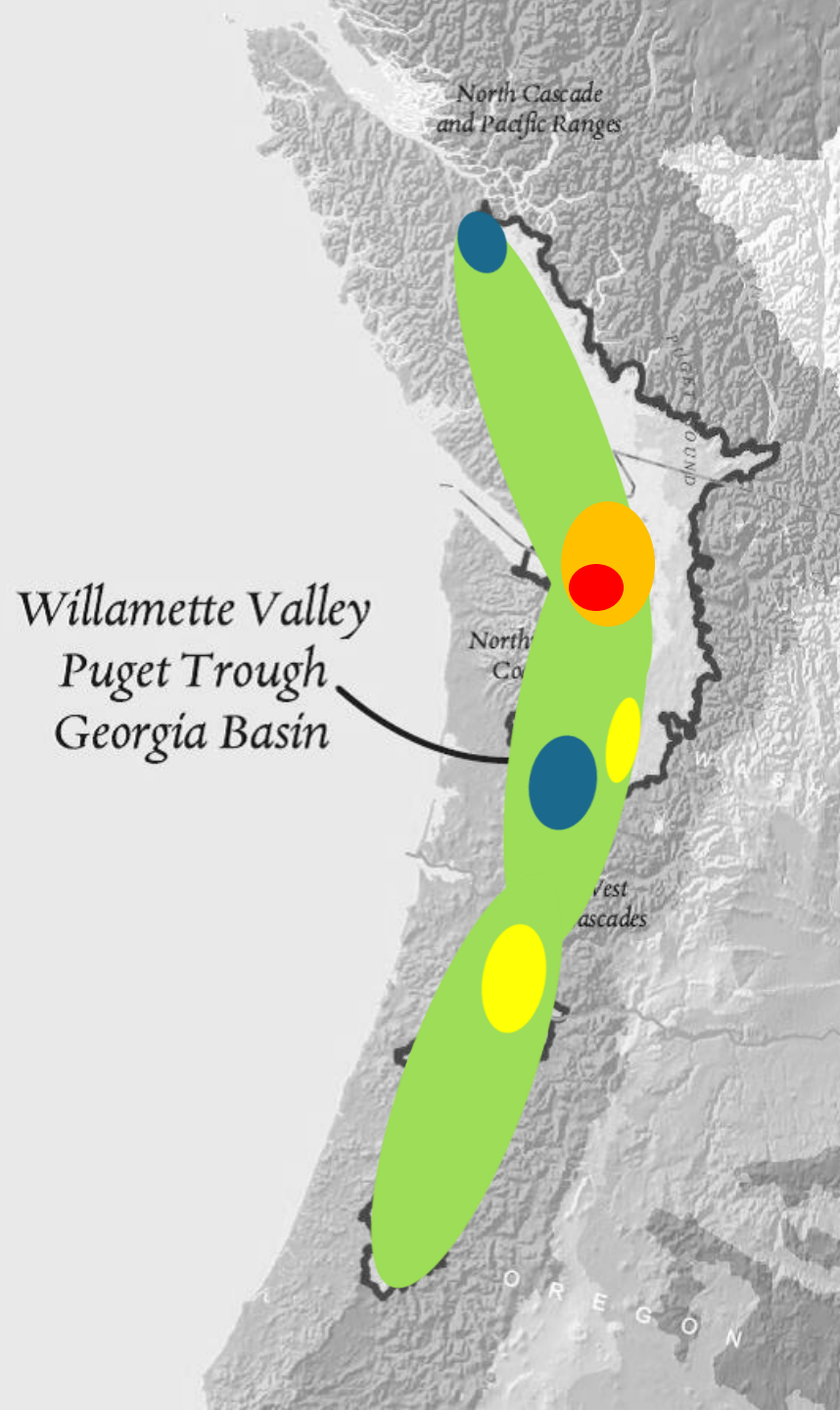
*North Cascade  
and Pacific Ranges*

*Northwest  
Coast*

*West  
Cascades*

*O  
R  
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# Annual Precipitation (mm)





## How much to collect:

- US forest Service (Wallowa Witman National Forest) no more than 50%
- North Branch Restoration Project: no more than 50% from perennials, 25% from annuals and biennials
- Kew: No more than 20%, but from at least 50 individuals from a single population
- North American Native Plant Society: No more than 10%
- Center for Plant Conservation: No more than 10%
- GOERT: No more than 5%



Broadhurst et al: “Most species, except those that are highly endangered with extremely small populations, will tolerate some level of harvesting, but this may range from 10% of seeds in 10% of years to 86% of seeds in most years.”







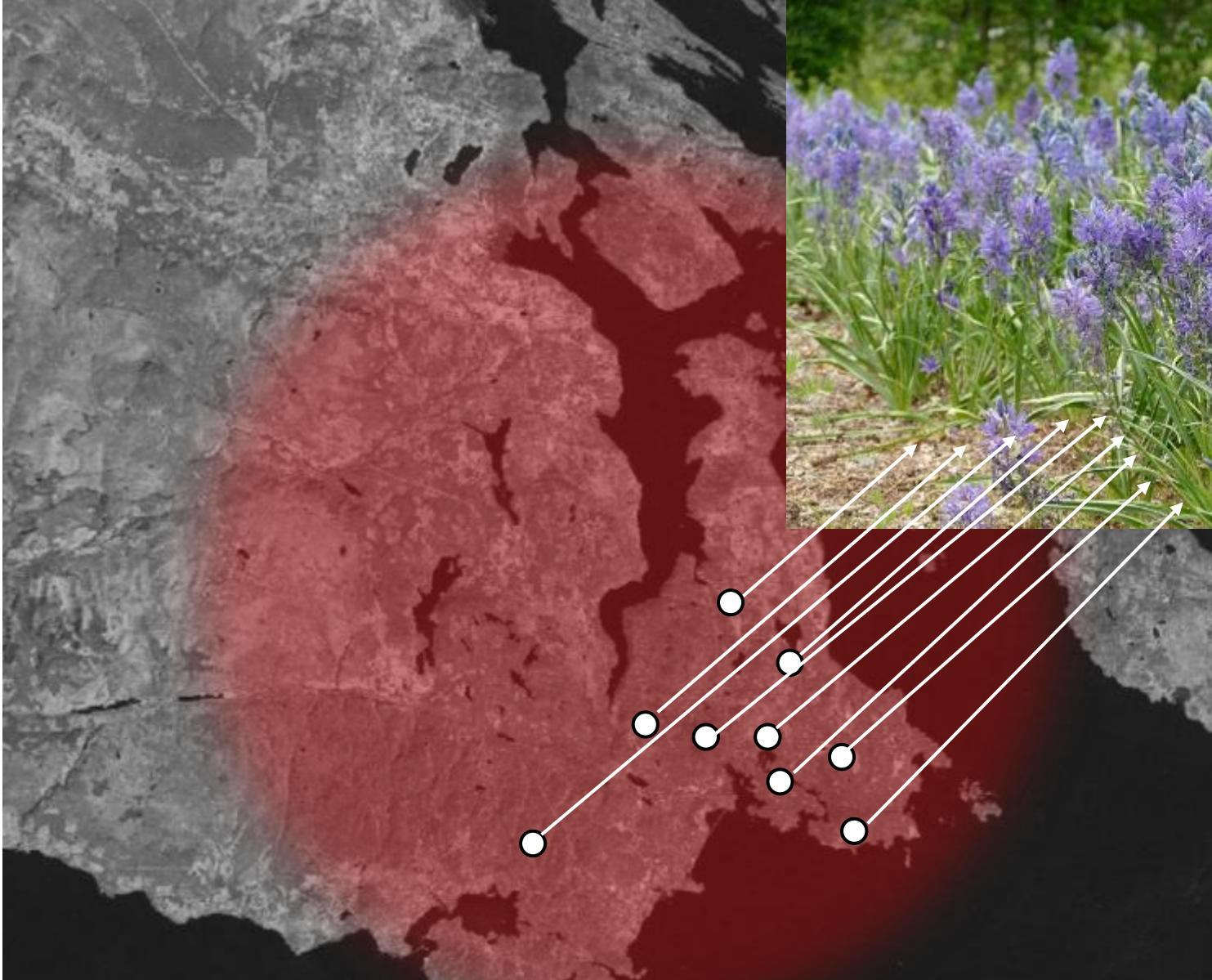


A photograph of a natural landscape featuring a stream or small river winding through a field. The foreground is dominated by tall, green grasses with white seed heads. In the middle ground, there is a dense patch of purple flowers. The background shows a continuation of the green field and the stream, with a white rectangular object visible in the top right corner.

## Other considerations:

- Is the species having a good or bad year?
- Is the species likely to have any inherent sensitivities?
- Will your collection be the only loss of seed from this population?
- Is your sample representative of the population?
- Where will the seed be going?
- What will be the fate of the donor plants?





Satinflower Nurseries approach: Maximize representation within a defined area.



