

Genetic Updates for *Eutrema*  
*penlandii* and *Lygodesmia*  
*doloresensis*

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# Genetic structure and diversity in *Eutrema penlandii* (Mosquito Range Mustard)

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# *Eutrema penlandii* (Mosquito Range Mustard)

- ESA Threatened
- Endemic to the Mosquito Range
- Total north-south distribution is < 20 miles
- Occurs above 11,500 ft
- Delisting Recovery Criteria
  1. 11 high (A) or medium (B) quality populations are stable or increasing
  2. Threats to the species are minimized to achieve criteria 1
- Considerable annual monitoring

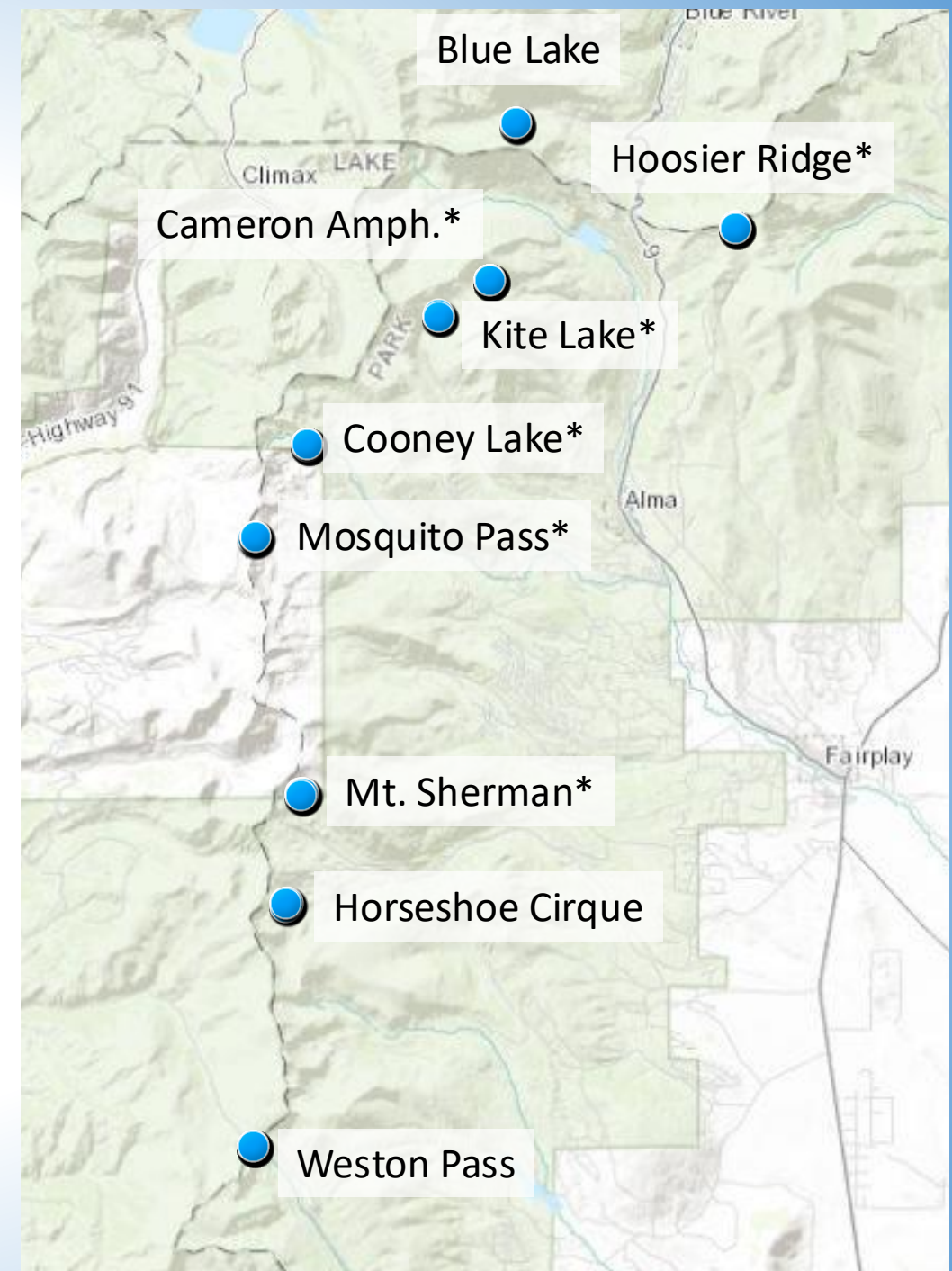


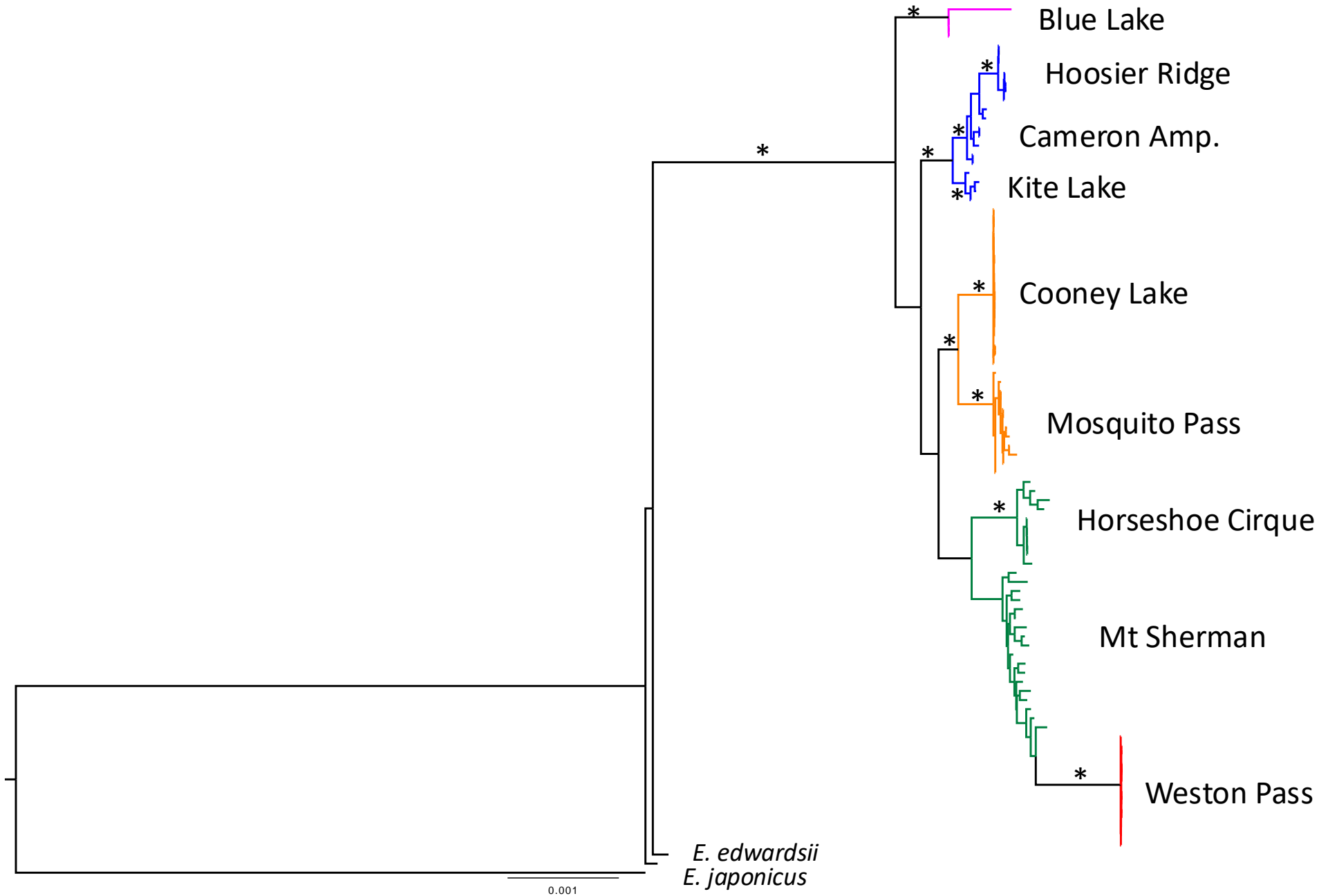




# Study Aims

- Examine genetic structure across the species range
- Examine genetic diversity within and among populations
  - RADseq Next Generation DNA Sequencing
  - Population genetic analyses







Blue Lake

Hoosier Ridge

Cameron Amp

Kite Lake

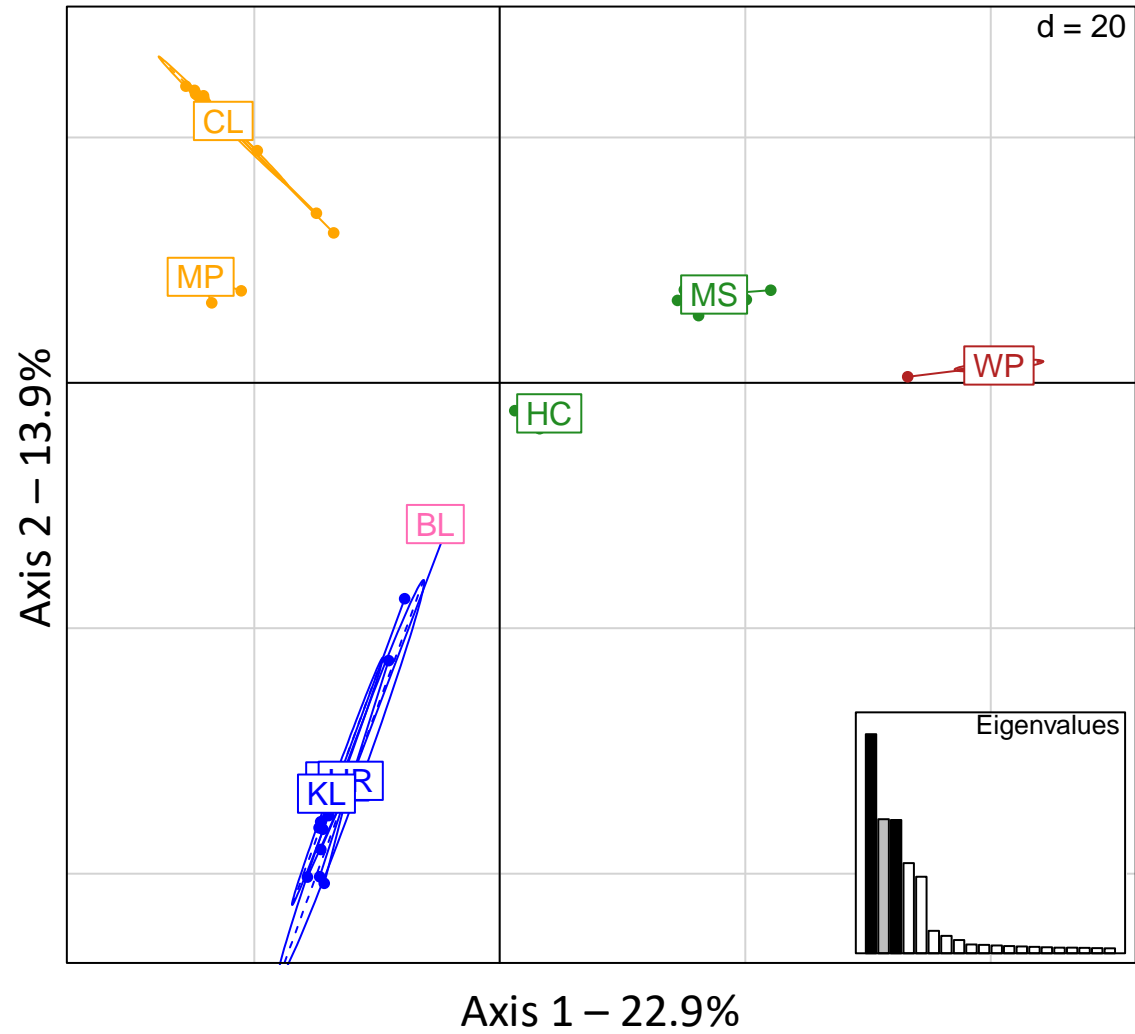
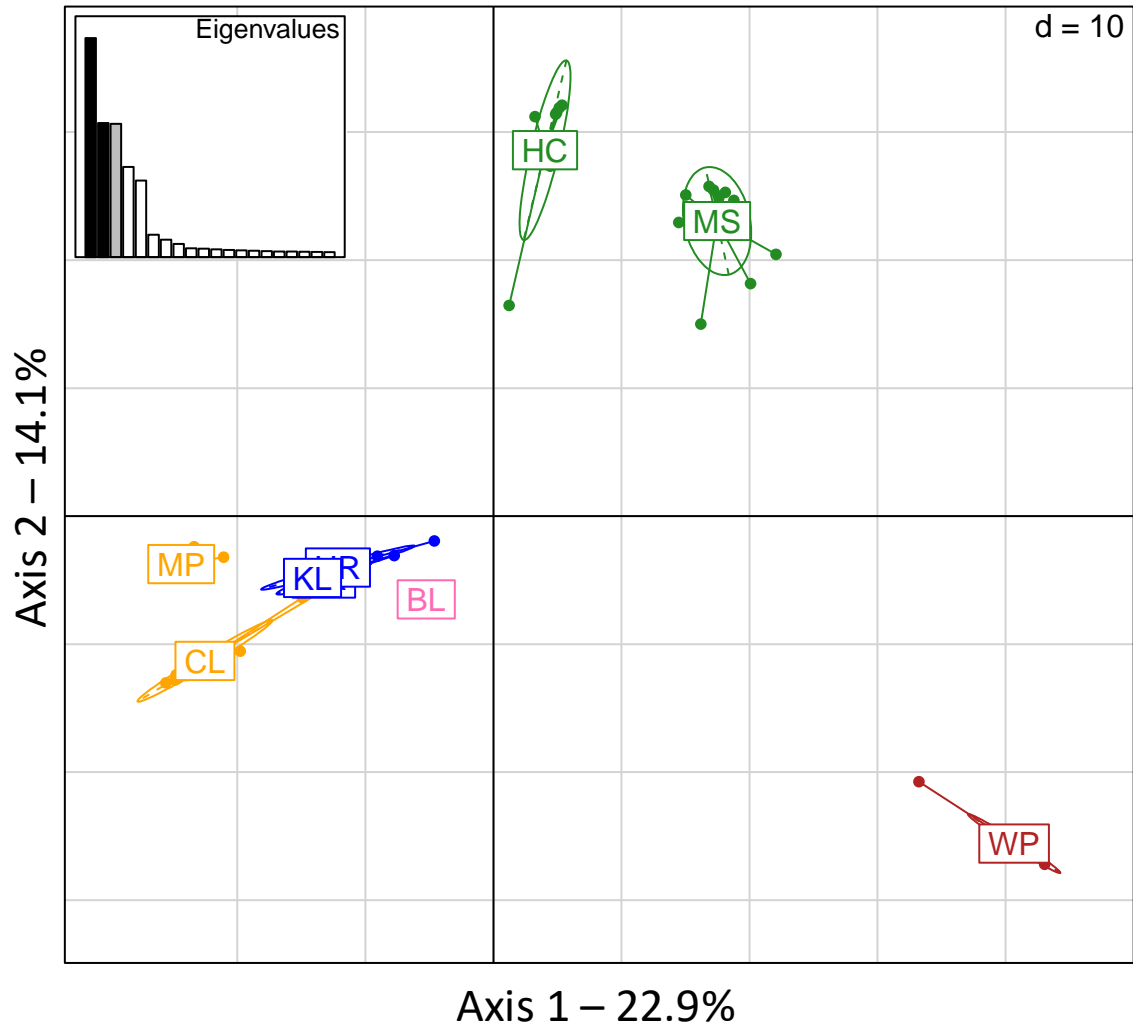
Cooney Lake

Mosquito Pass

Mt Sherman

Horseshoe Cirque

Weston Pass

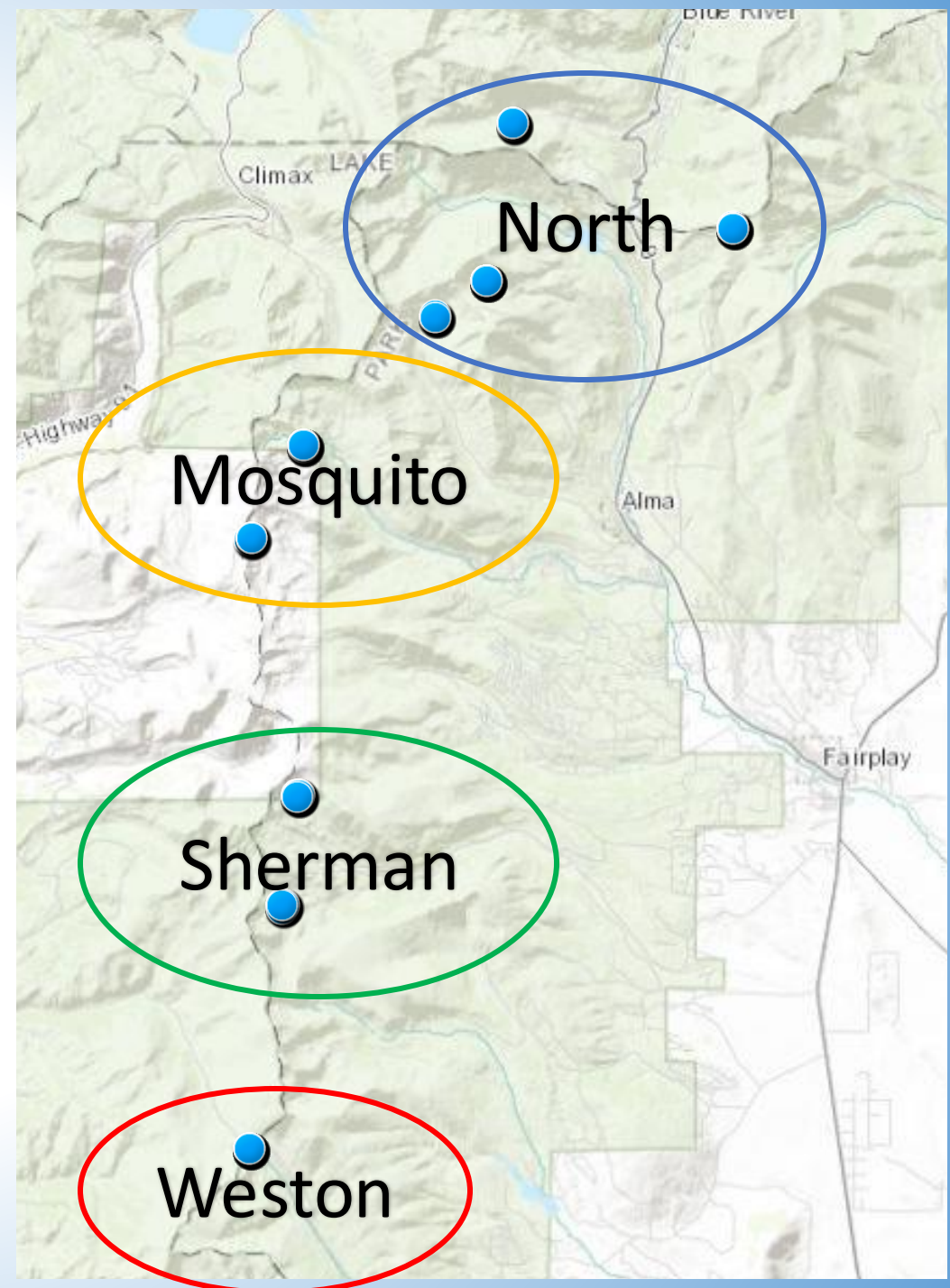


# Genetic Diversity

Population	N	$\pi$	%P	Rank
Blue Lake	1	0.048	636	LOW
Hoosier Ridge*	6	0.022	1618	LOW
Cameron Amp*	6	0.036	2343	MODERATE
Kite Lake*	4	0.036	1706	MODERATE
Cooney Lake*	15	0.019	2619	MODERATE
Mosquito Pass*	12	0.042	4067	HIGH
Mt. Sherman*	16	0.053	5825	HIGH
Horseshoe Cirque	9	0.020	2838	MODERATE
Weston Pass*	13	0.024	2471	MODERATE

# Conclusions

- Populations are functioning as independent units
  - No gene flow
- Four genetic/geographic groups
- Genetic Diversity is Moderate to High in most conservation populations
  - Hoosier Ridge - LOW
  - Mosquito Pass and Mt Sherman – HIGH
- Given the genetic patterns, populations should be managed as individual units



# Species status of *Lygodesmia doloresensis* (Dolores River Skeltonplant)

Mit McGlaughlin, Natalie Hieber, Laura Meadows, and  
Sami Naibauer



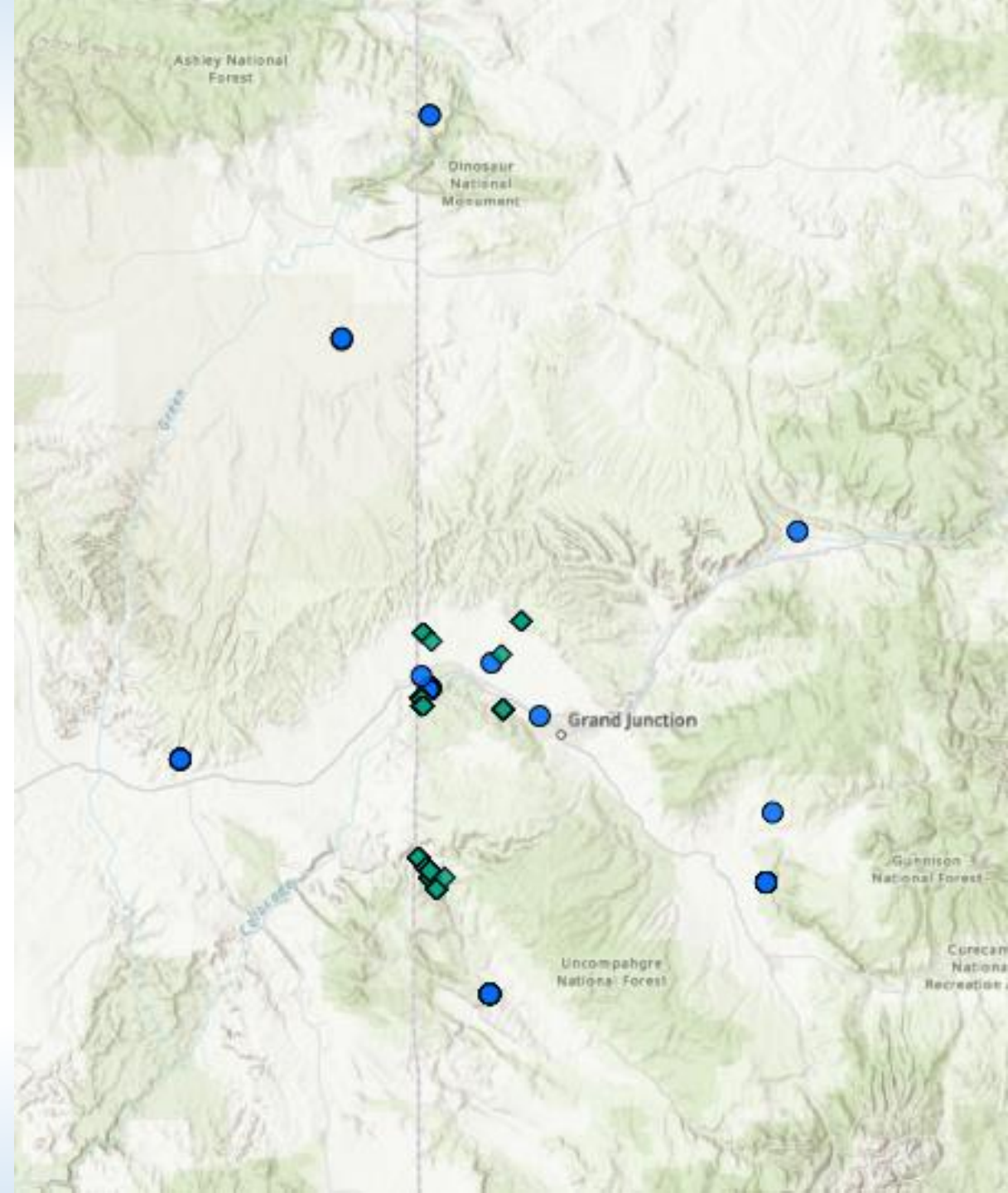
# *Lygodesmia doloresensis*



- BLM Sensitive Species
- NatureServe T1
- Variable Rank
  - *L. doloresensis*
  - *L. grandiflora* var. *doloresensis*
- Ackerfield - distinguishes based on keeled involucre bract tip
- FNA – distinguishes based on multi-branched stem, fewer phyllaries (5) and florets (5)

# Study Aims

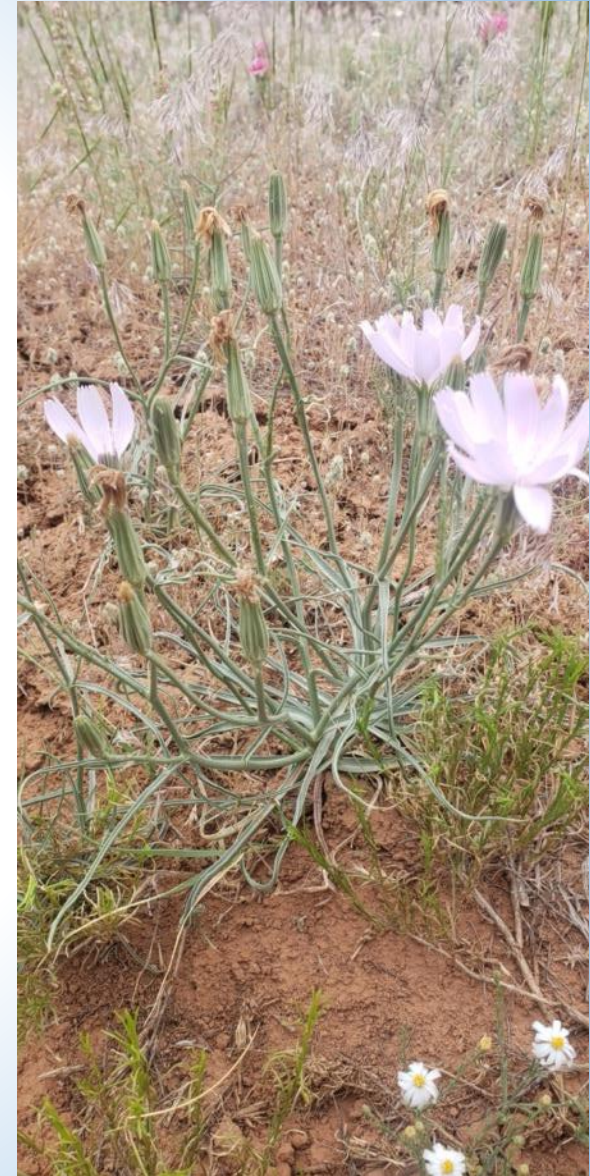
- Examine the genetic placement of *L. doloresensis* relative to other members of the genus
  - *L. grandiflora*
  - *L. juncea*

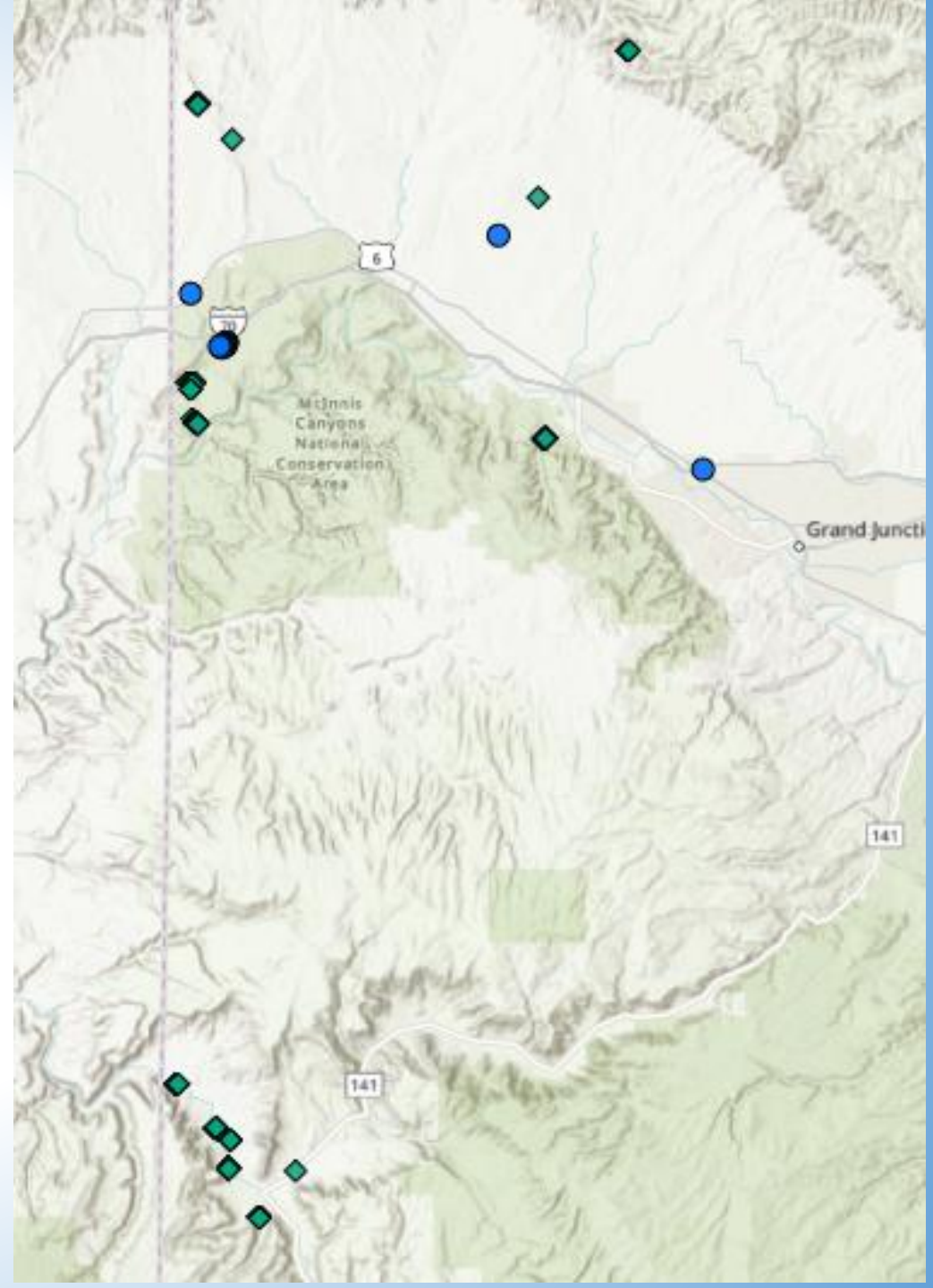
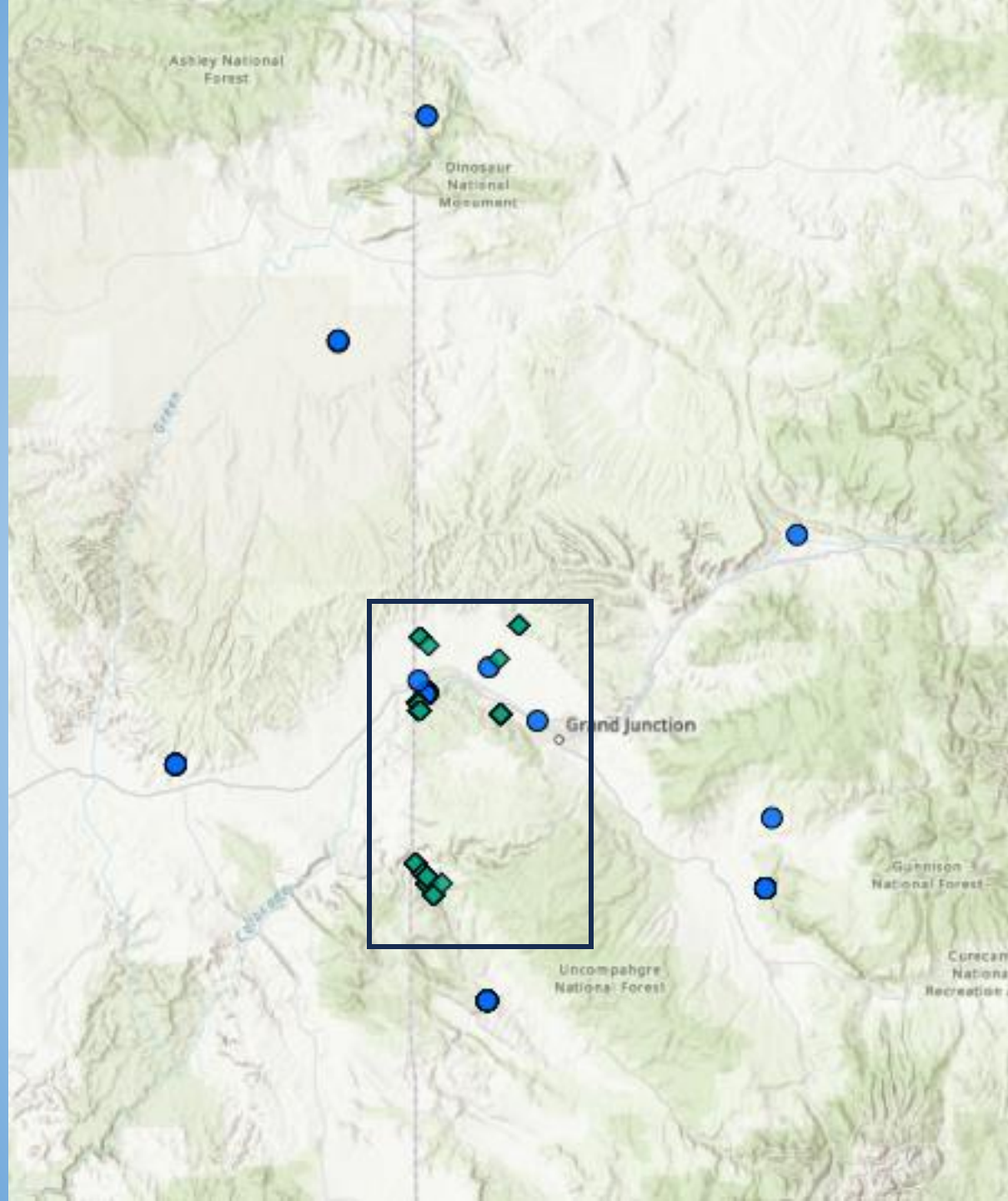


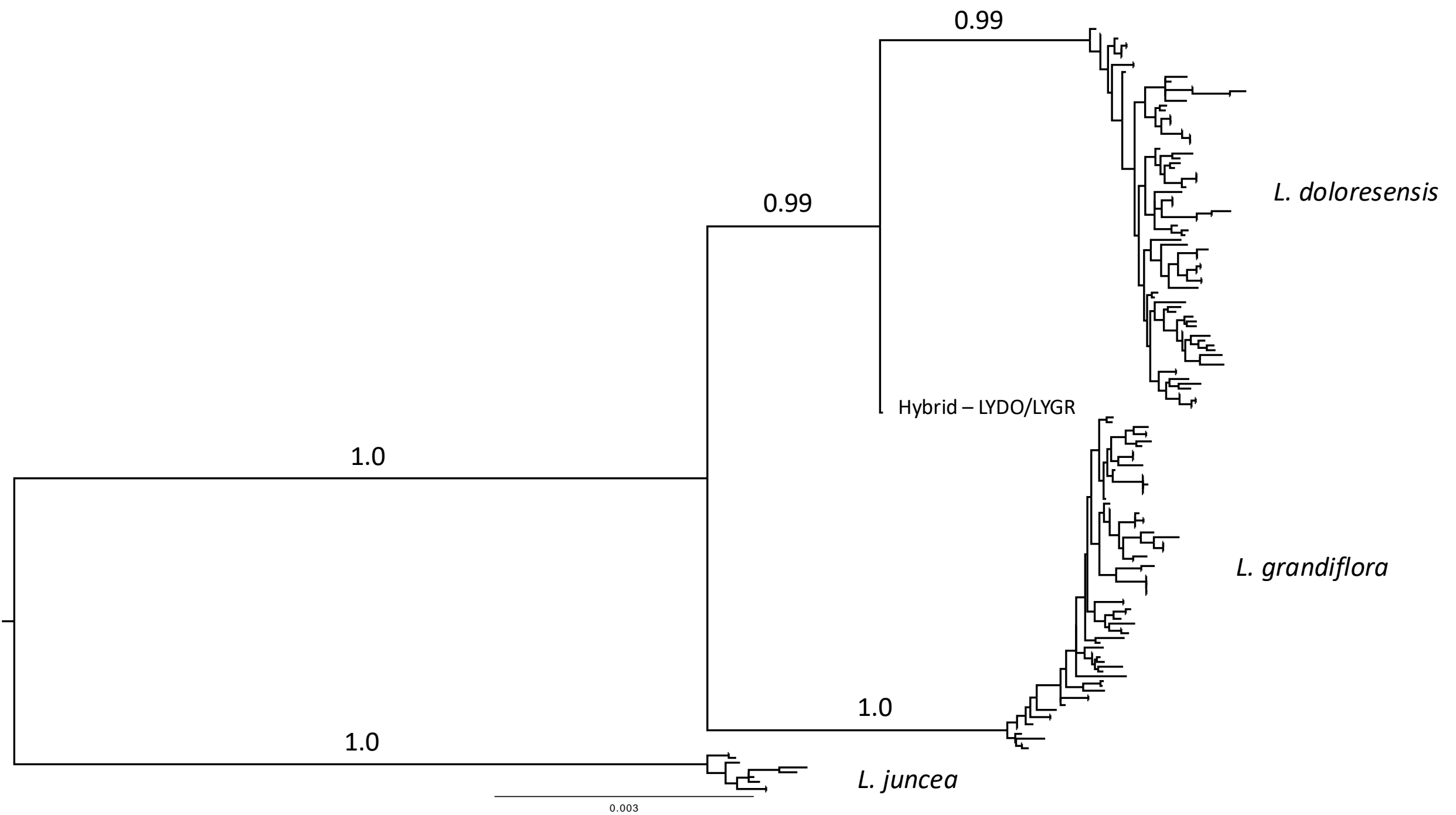
*L. doloresensis*



*L. grandiflora*







Dolores River/Gateway

North Desert

Devils Canyon

Knowles Camp.

1 Rd/UT Border

Castle Rocks

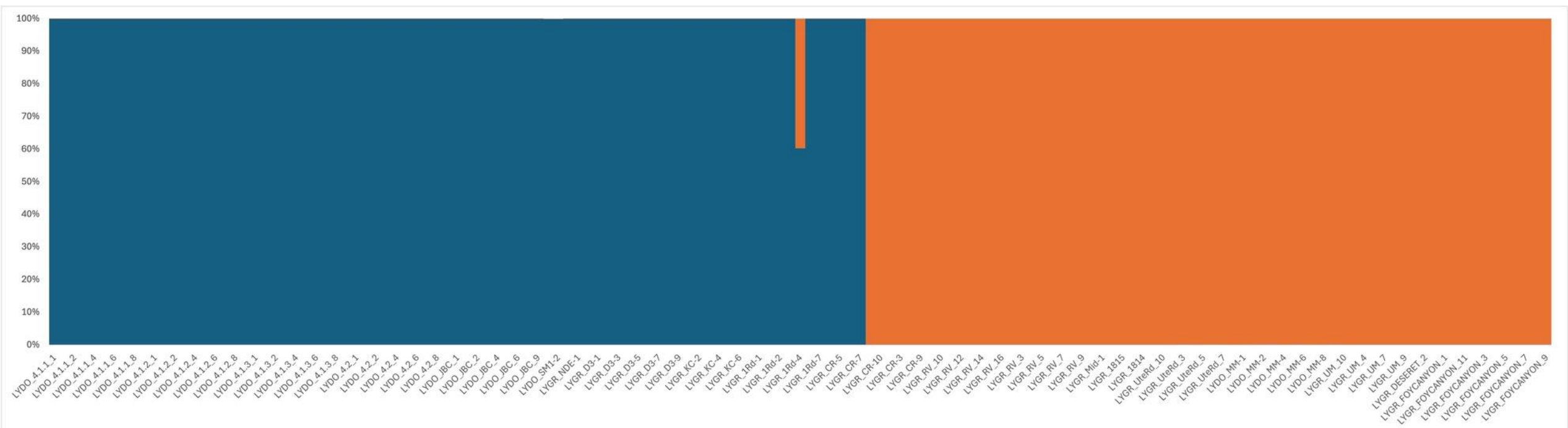
Rabbit Valley

Grand Valley CO

Montrose

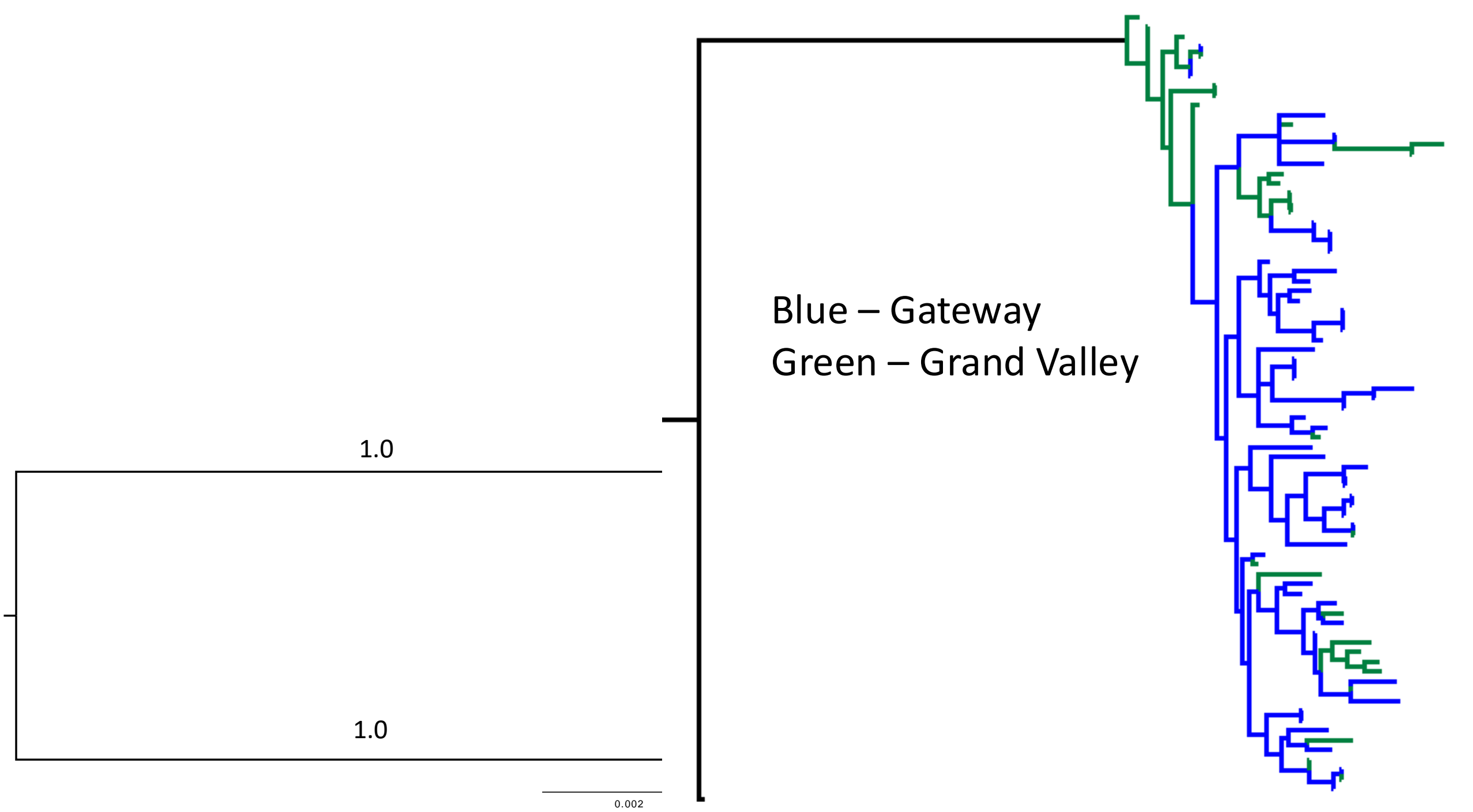
Dolores River -  
Uravan

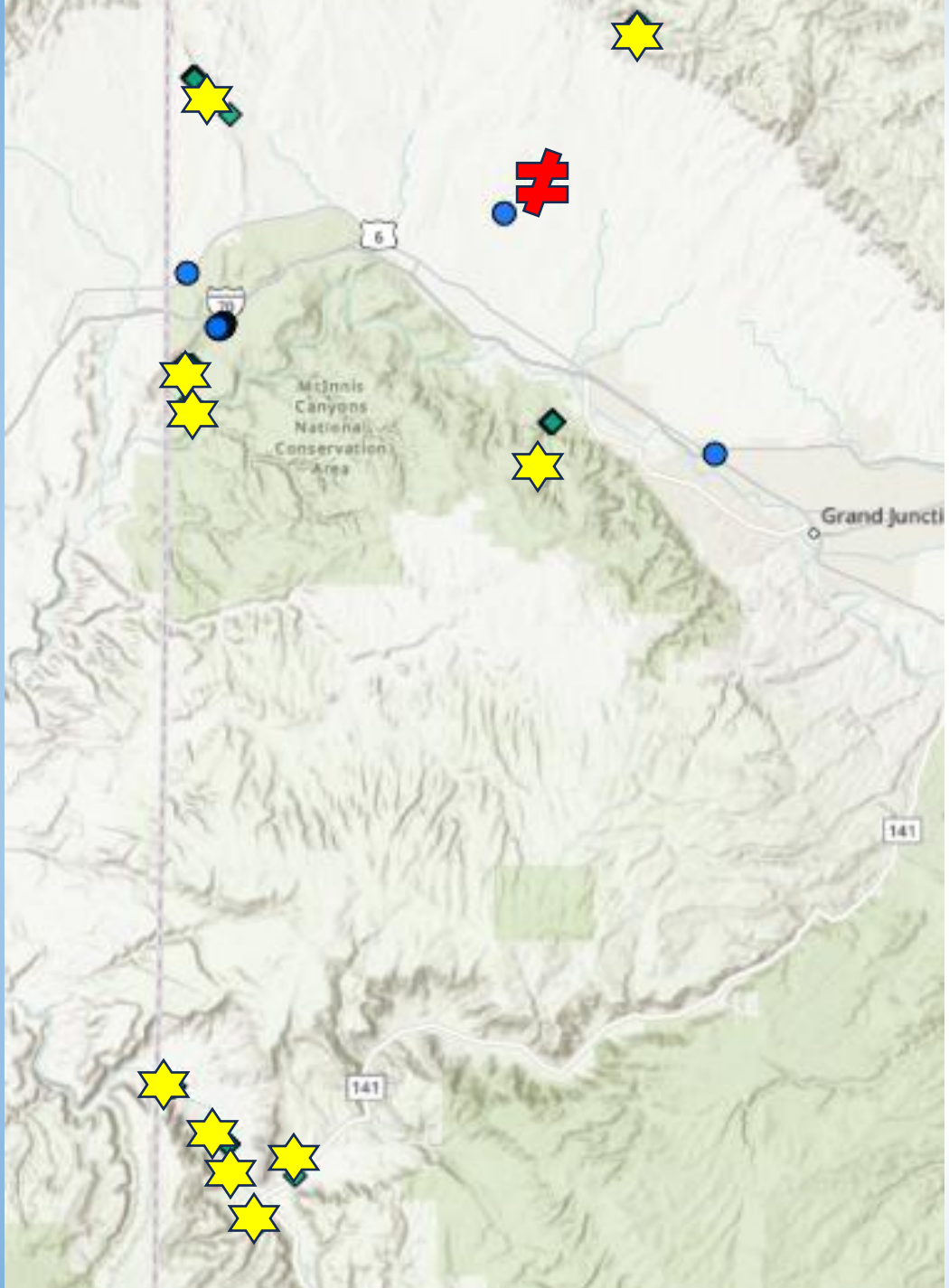
Utah



*L. doloresensis*

*L. grandiflora*



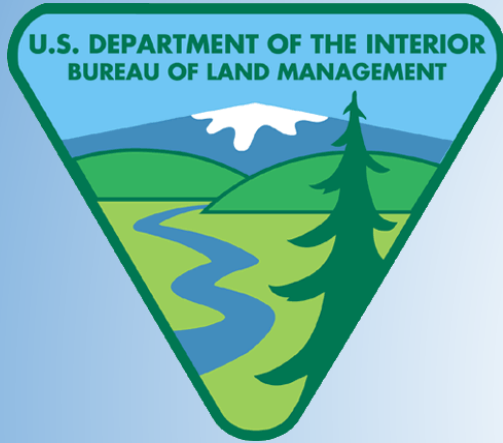


# Conclusions

- *L. doloresensis* is a unique entity that deserves recognition as a species!!!
- More research is needed on characteristics to differentiate *L. doloresensis*
  - Size and floret number were inconsistent with taxonomy
- There appears to be fine scale mixing near Castle Rocks and a genetic hybrid near Rd 1



# Funding and Collaborators



Colorado BLM

*Eutrema penlandii*



Sami Naibauer and Christine Mowad

*Lygodesmia doloresensis*



Laura Meadows, Natalie Hieber,  
and Sami Naibauer

**Graduate Students Wanted!!!**