

Garlic Mustard EDRR in Southern California

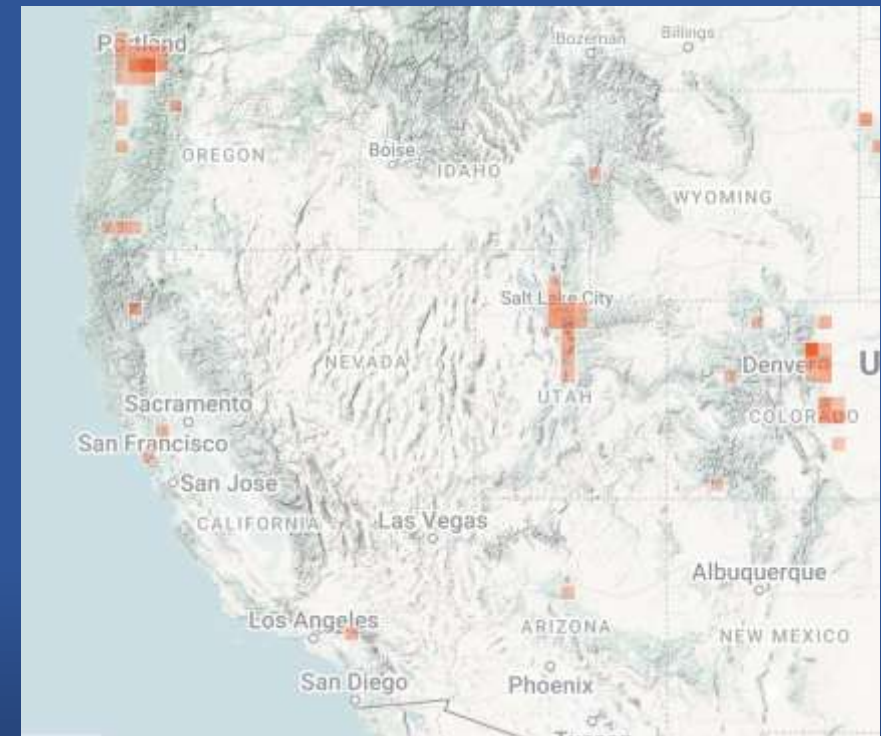
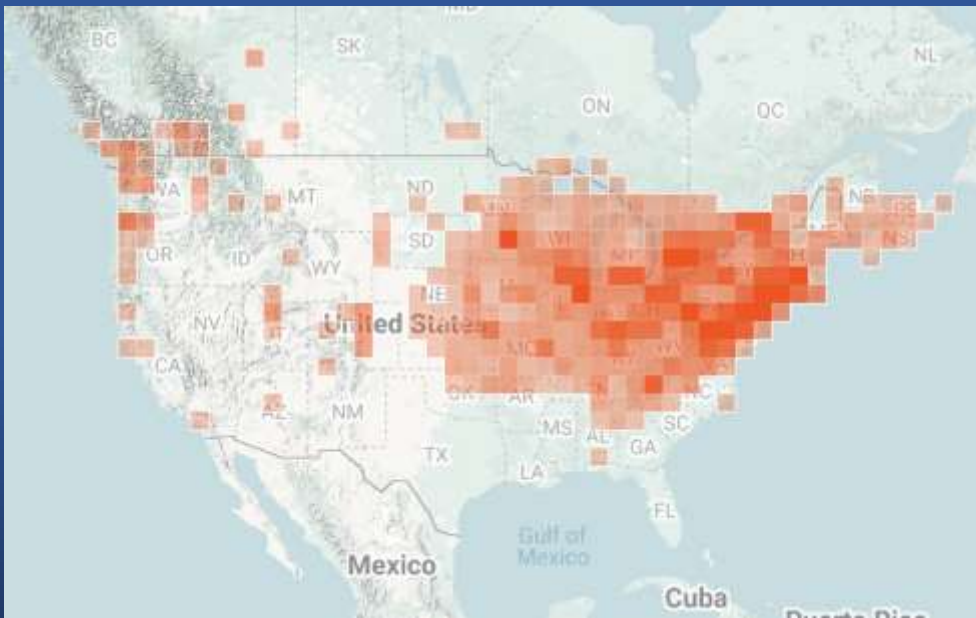
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Garlic Mustard

- *Alliaria petiolata*
- Well established in eastern US, becoming a common riparian forest weed, unusual in SW U.S.
- Close infestations Pac. NW, Utah, Colorado



Garlic Mustard Biology

- Obligate cool-season biennial – germinates in fall or winter, produces a rosette the first year, flowers in second year, and then plants die



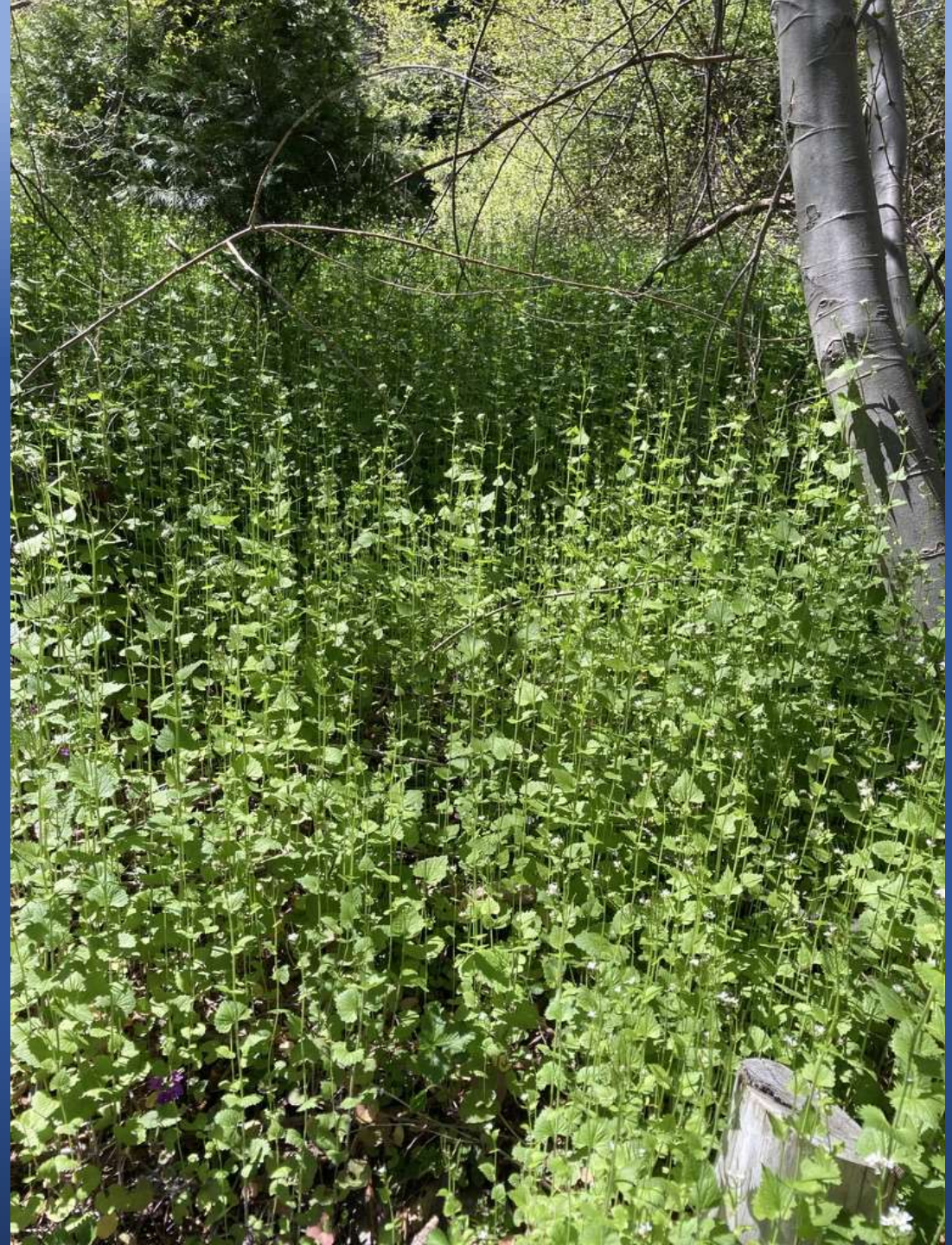
Life Cycle, Phenology

- Seeds need cold stratification, doesn't grow in areas with warm winters
- Seed bank is 10+ years!!!!
- Seedlings germinate after first rains from fall to winter, fewer germinate in spring, very shade tolerant, riparian in SoCal
- Second year plants begin to bolt in April to May
- Flowering in May to June
- Fruiting in May to July
- Pulling season ends in June to early July when fruits begin to dry



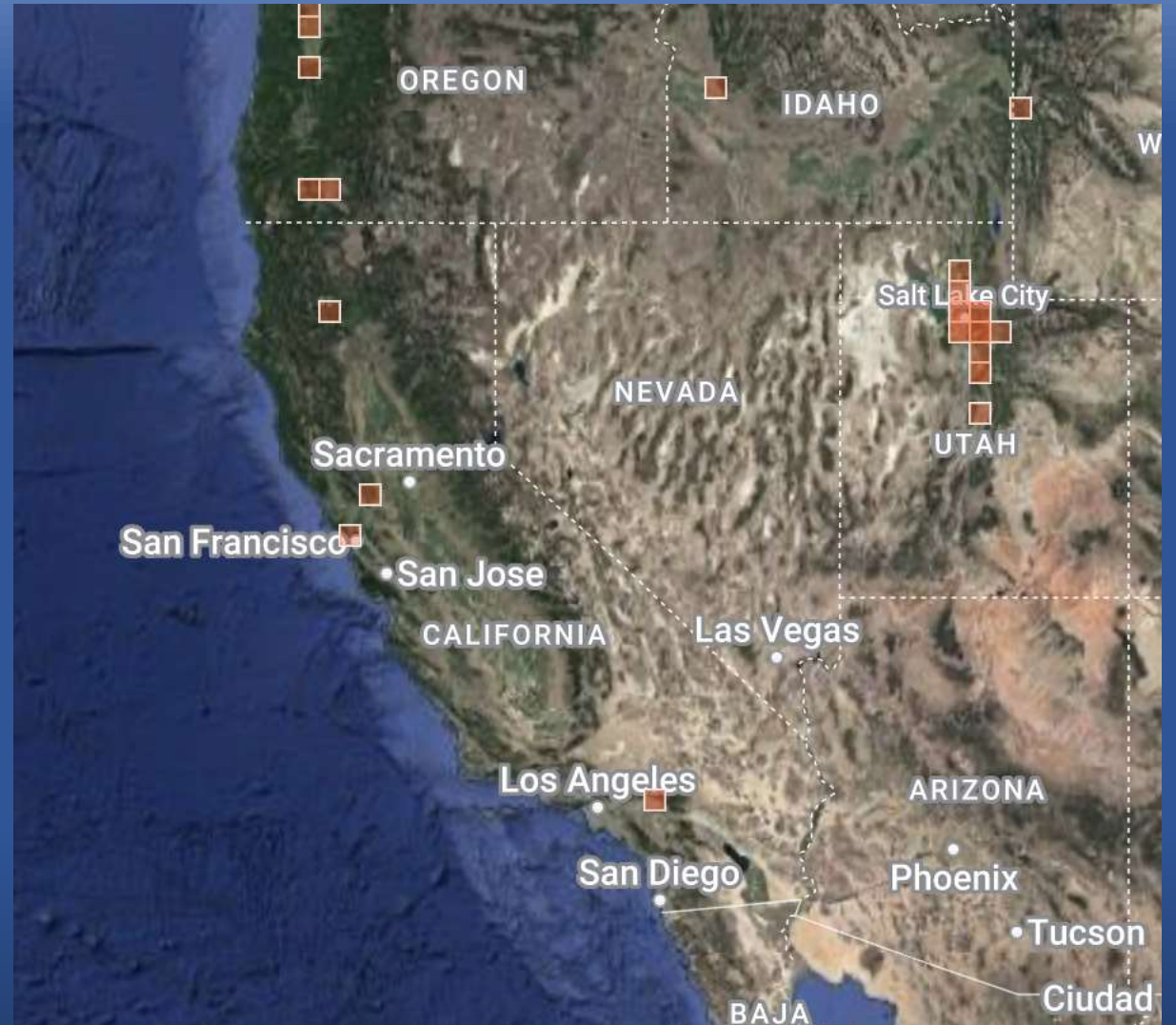
Variation in Size

- Plant size at flowering can be highly variable from 6 inches to 5 feet



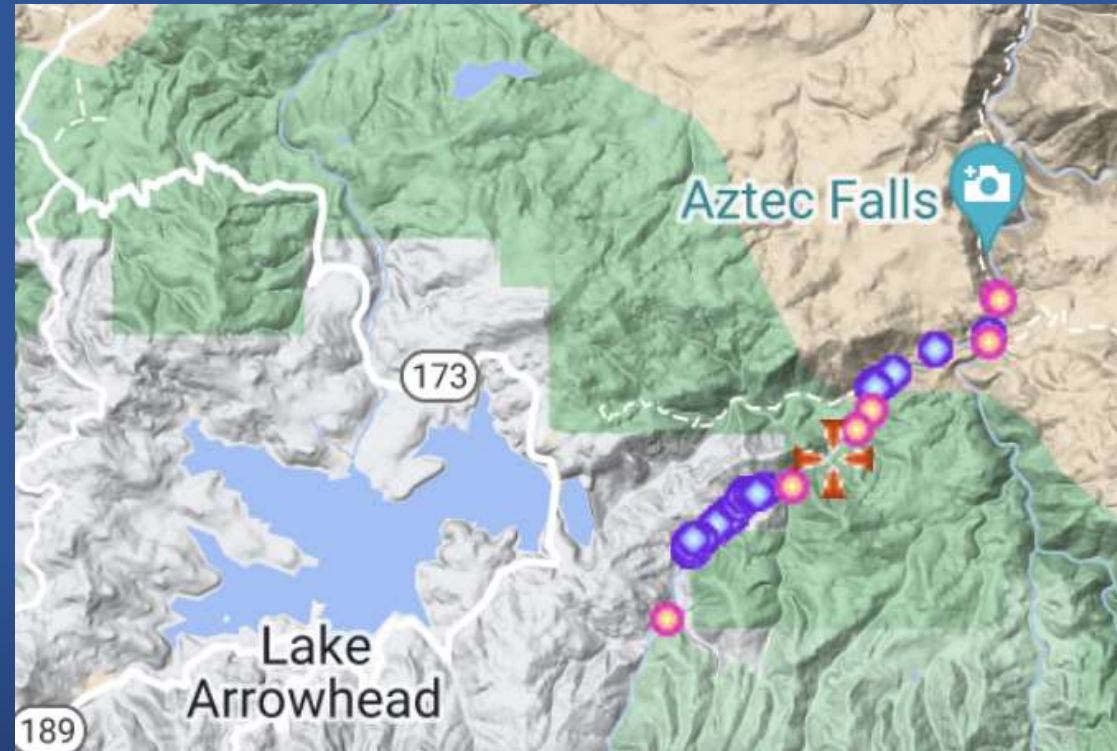
California Populations

- One population in NorCal in Trinity
- Two other reports in California, Marin (May 2024) and Napa (2017)



EDRR: Garlic Mustard in Southern California

- First known invasion in CA
- First reported in 2020 by Duncan Bell at Cal Botanic Garden
- Floristic survey sponsored by USFS
- Soon after found along 2.5 miles of creek in Hook Creek
- Well established when discovered



Challenges with Management

- 1/3 of length of infestation is on private property
- 2/3 of length of infestation is on USFS
 - No NEPA for herbicide use on USFS
- All locations riparian, most are also aquatic
- Hand pulling only
- Multiple passes each year per site
- Plants easily snap at soil surface, then re-sprout



Slow Progress

- Pulling effort mostly started in 2021 with limited efforts
- In 2022 pulling expanded to private property and easiest access areas of USFS about 50-100 populations
- In 2023 pulling effort increased to nearly all of private lands, but lots of extra work on USFS pulling new plants due to wet winters
- Still gaps in survey and pulling effort in difficult terrain or we just run out of time at end of season,



Funding Increases

- In late 2023 successfully obtained funding from CDFR and San Bernardino County Ag. Commissioner and National Forest Foundation
- In 2024 hired two additional crews to pull entire USFS stretch, Inland Empire Resource Conservation District and WRA Inc.
- Increase pulling to include all plants (flowering and rosettes) effectively buying time for 2025
- For first time pulling effort included nearly entire length of infestation
- Progress: A few regularly managed populations are declining and a few had no new plants in 2024
- 200+ populations left to extirpate

End of season 2023

CalFlora

Temporarily closed



End of season 2024



Team Work!

- USFS - Joseph Esparza and Scott Eliason
- USFS San Bernardino Forest Restoration Crew
- Urban Conservation Corps
- San Bernardino County Ag. Weights and Measures – Emilio Lopez, Brian Moreno, and crew
- Inland Empire Resources Conservation District – Aaron Echols, Kevin Harrington, Omar Pena, Jose Mora, and crew
- WRA Inc. – Jonathan Applebaum and crew
- And UCCE - Chris McDonald

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