

The role of small natural history collections in contributing to understanding species' distributions

Travis D. Marsico¹, Jeremy J. Caron², Richard Carter³, Emily Gillespie⁴, Erica Krimmel⁵, Ross McCauley⁶, Ashley B. Morris⁷, Gil Nelson⁸, and Anna K. Monfils²

¹Arkansas State University; ²Central Michigan University; ³Valdosta State University; ⁴Marshall University; ⁵Chicago Academy of Sciences; ⁶Fort Lewis College; ⁷Middle Tennessee State University; ⁸Florida State University

Quantifying the contribution

- Why?


- Collections are important, but what (specifically) do small institutions contribute?
 - How variable is the contribution by state?
 - What common themes emerge?
- Prioritizing digitization efforts
- Defending the purpose
- Defending the space



Previous related research

- 2010-2011—Discovering botanical diversity through accessioned herbarium specimens: a justification for digitization efforts in small collections
 - Greene County vouchers at STAR
 - 1569 vouchers at STAR
 - 540 taxa
 - 225 taxa not previously recorded for Greene County
 - Increased county total from 543 to 768 (a 30% increase) simply by sharing data

Getting the team together



North American Network of Small Herbaria

Homepage

- [Search Collections](#)
- [Dynamic Checklist](#)
- [Dynamic Key](#)
- [Image Library](#)
- [About Network](#)
- [Resource Links](#)
- [Symbiota Help Page](#)

Other Networks

- [Great Plains](#)
- [Intermountain](#)
- [MABA Flora](#)
- [SEINet](#)
- [SERNEC](#)

[Log In](#)

[New Account](#)

[Sitemap](#)


North American Network of Small Herbaria

The North American Network of Small Herbaria is an open access data portal provided by Symbiota and intended to foster digitization of small collections and facilitate collaboration among institutions. The establishment of this portal is the result of collaboration between Symbiota and iDigBio's Small Herbarium Working Group (https://www.idigbio.org/wiki/index.php/Small_Herbarium_Interest_Group). To learn how to join the working group or network, contact Anna Monfils (monfi1ak@cmich.edu) or Gil Nelson (gnelson@bio.fsu.edu).

Small herbaria constitute a major source of information for understanding North America's plant diversity. These collections are typically regional in scope with strong ecological, taxonomic, and geographic biases. They frequently hold specimens that are unduplicated in larger herbaria and usually represent intense samplings of community composition that significantly expand our knowledge of landscape-level biogeography. As a result, they are singularly important to the study of regionally and nationally significant natural communities.

Until recently, access to the wealth of biodiversity data stored in small herbaria has been hampered by travel requirements, insufficient staff, and long-term loans that render specimens unavailable for extended periods. With the advent of biodiversity collections digitization, small herbaria are now poised to overcome these obstacles by making label data and specimen images readily available online through searchable electronic databases. As more institutions take advantage of open-source, community-supported digitization software, the online presence of small collections will rapidly increase and with it the volume of available biodiversity data.

Plant of the Day



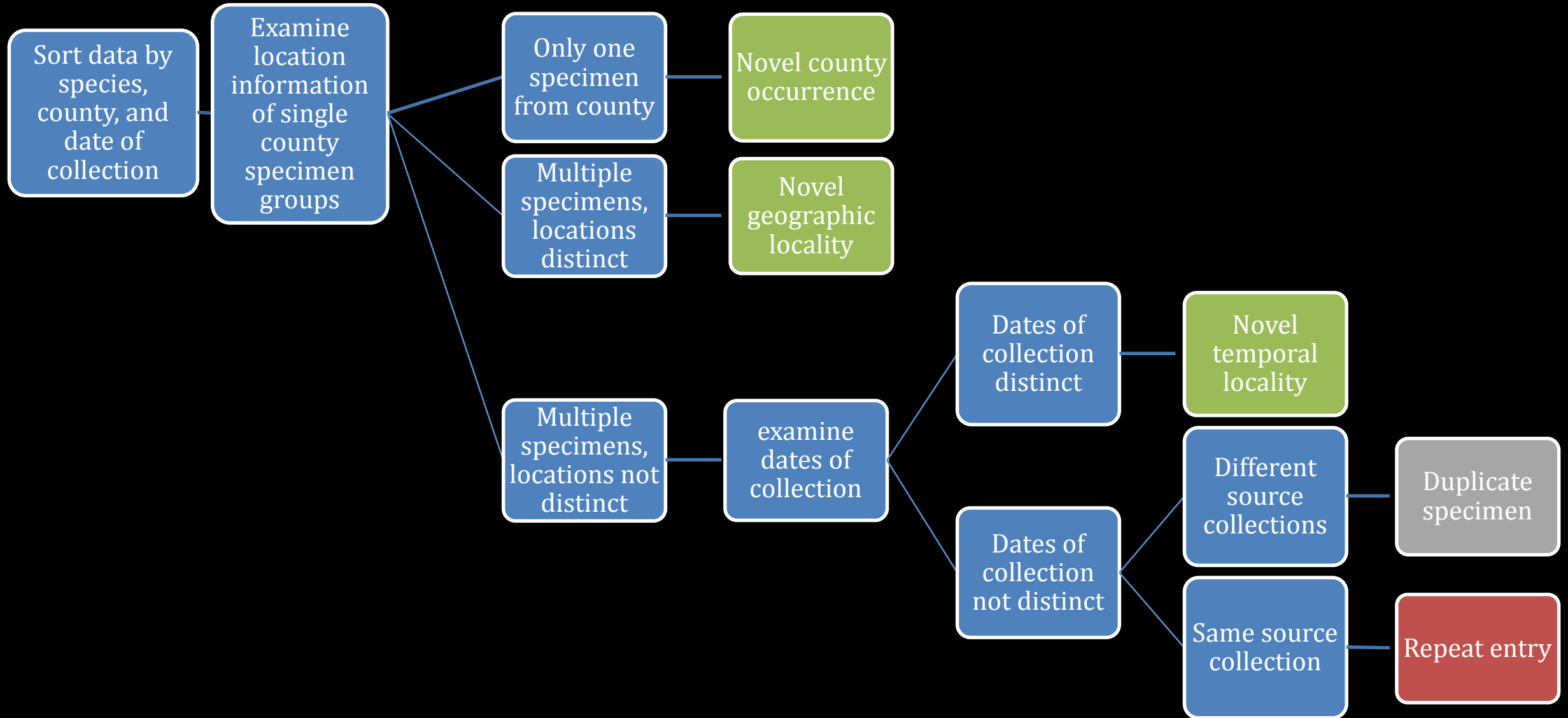
What is this plant?
[Click here to test your knowledge](#)

www.nansh.org; participating states: AR, CA, CO, FL, GA, MI, TN, WV

Methods for species selection

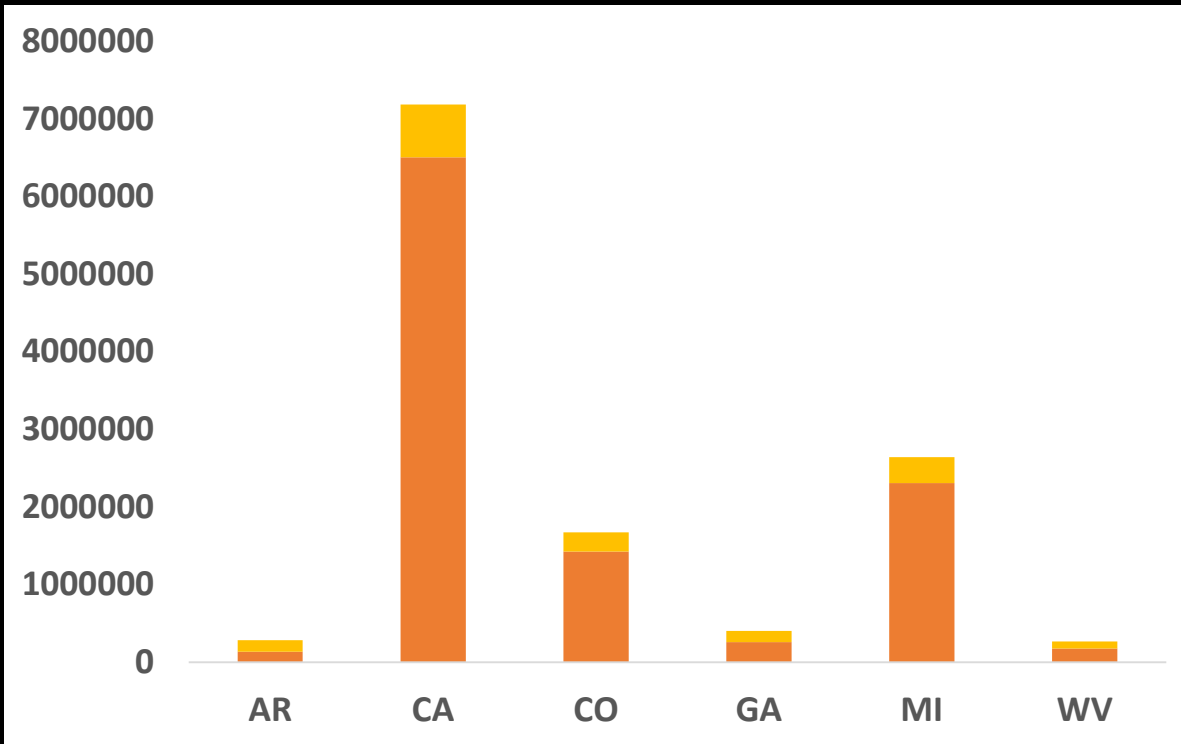
- 4 categories of species: S1 Rare, S2 Rare, non-native (invasive), common native
- Why 4 categories?
 - Herbaria of different sizes may have different emphases.
- Obtained lists of S1 and S2 taxa; randomly selected 10 from each list
- Used state non-native or invasive lists; randomly selected 10 taxa from list
- randomly selected plants from an overall state list and chose the first 10 that were not state-listed that were also native...this was an iterative process

Distinguishing locality types

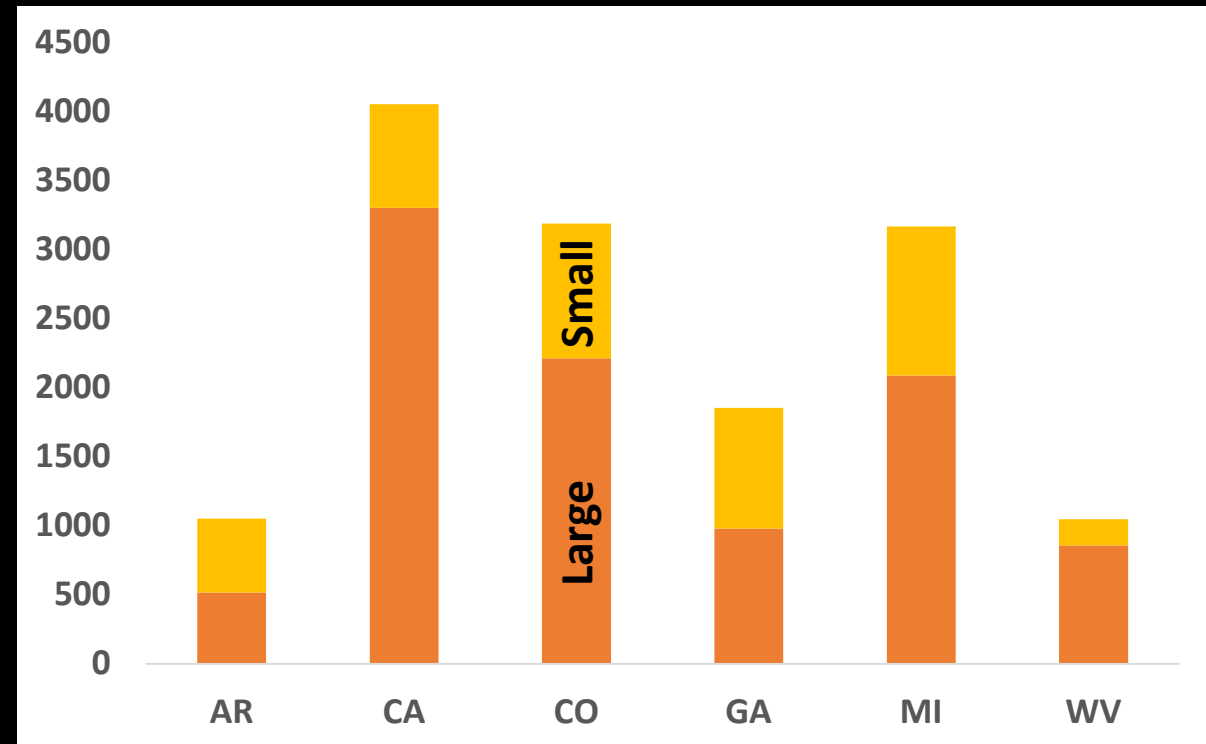


State holdings and project contributions

Herbarium holdings



Number of specimens contributed to project



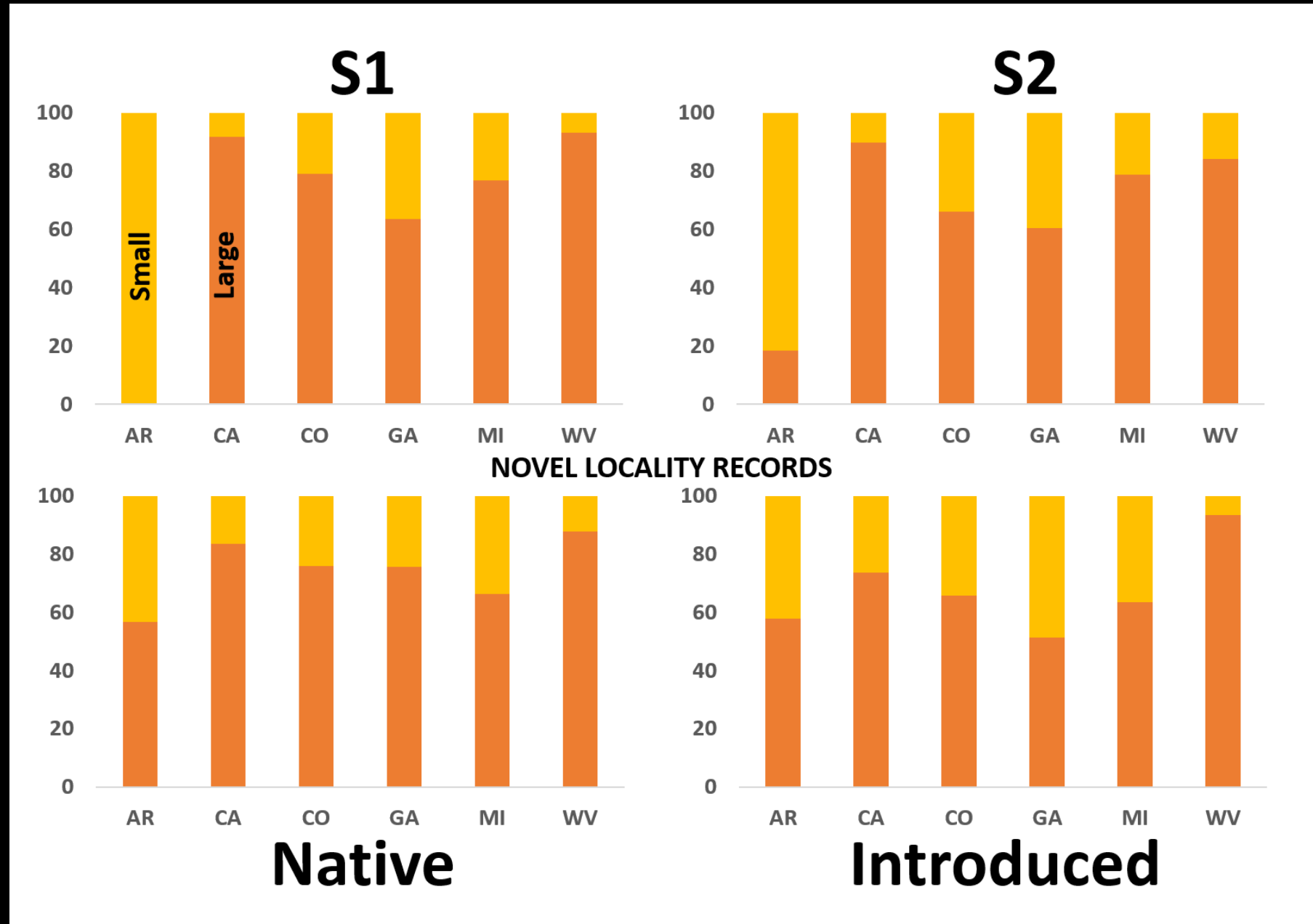
Important terminology

- **Novel County Occurrence:** Specimen data informing the geographic distribution of a species at the county scale
- **Novel Geographic Locality:** Specimen data informing the geographic distribution of a species on a scale more specific than county
- **Novel Temporal Locality:** Specimen data informing the temporal distribution of a species at a redundant geographic location

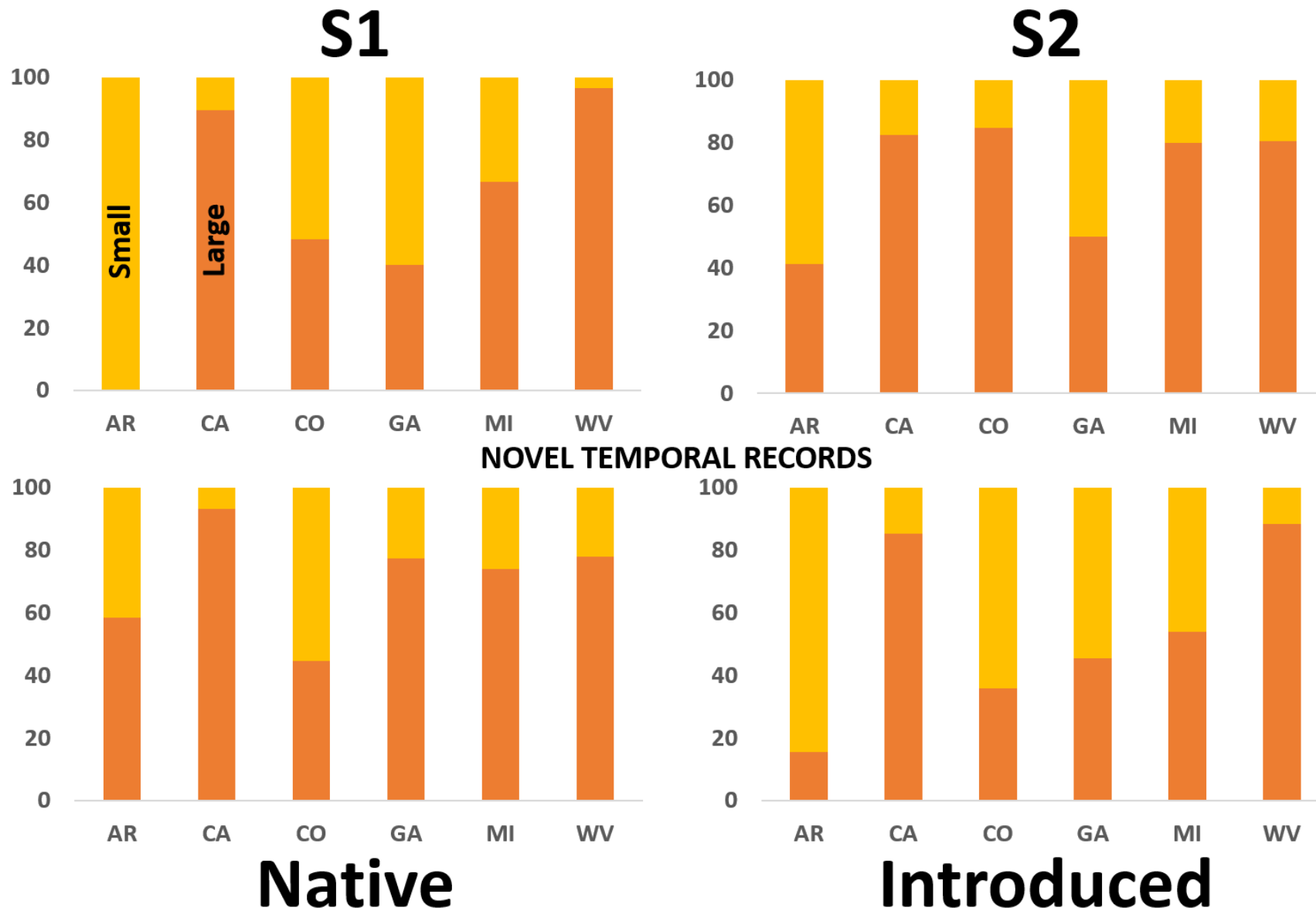
County-level results



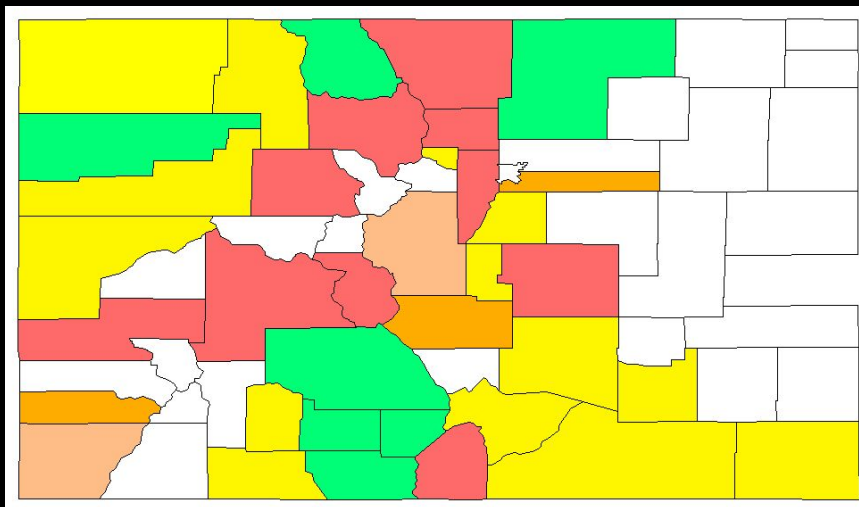
Locality-level results



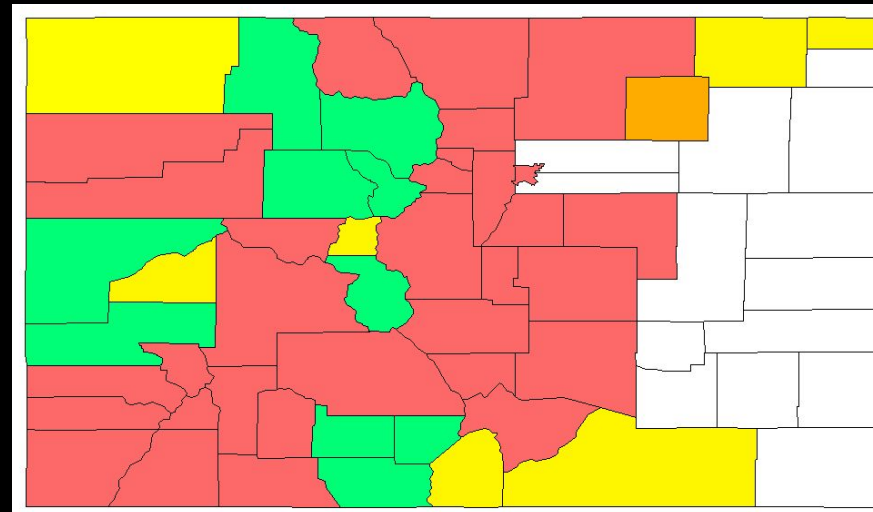
Temporal "locality" results



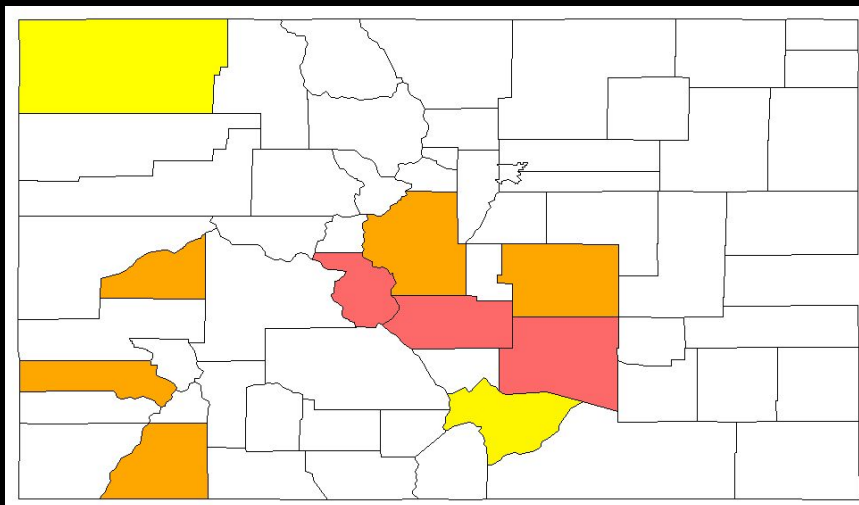
COLORADO



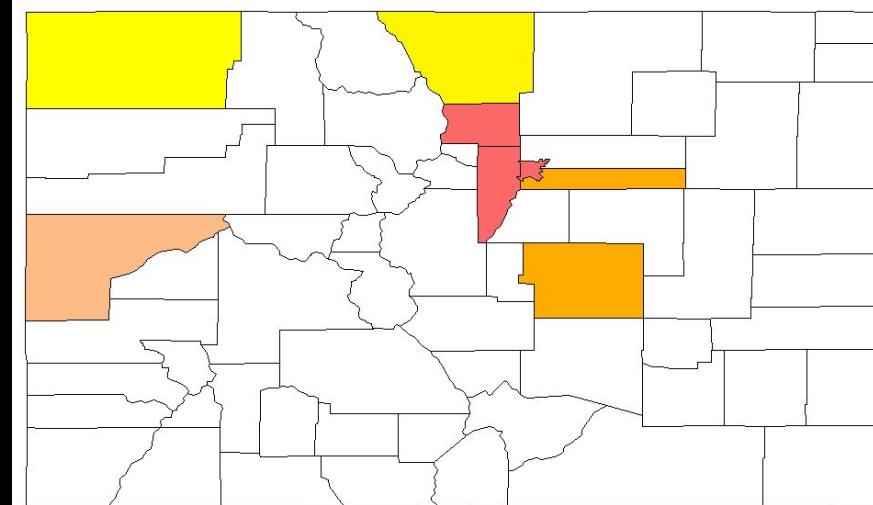
Elymus lanceolatus – Common Native



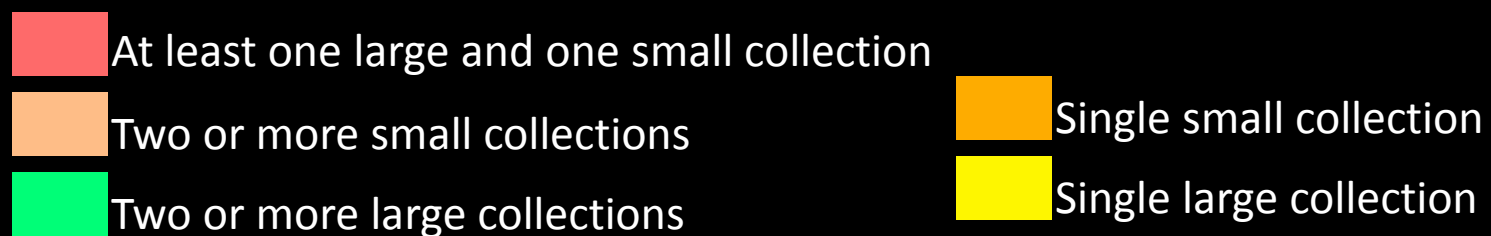
Maianthemum stellatum – Common Native



Townsendia fendleri – S2 Rare



Lythrum salicaria – Invasive



Anecdotes & Conclusions

- These 6 are different states with respect to collection distribution within herbaria
- AR has a well-curated small collection dedicated to rare plants at the state's natural heritage program (ANHC)
- STAR has an over-representation of mistletoe...an example of curatorial idiosyncrasy
- Within a state, species differ in their representation, making *a priori* predictions difficult
- State and species category seem to override predictions about spatial scale of contributions