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

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Quantifying the contribution

- **<u>Why?</u>**
  - 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

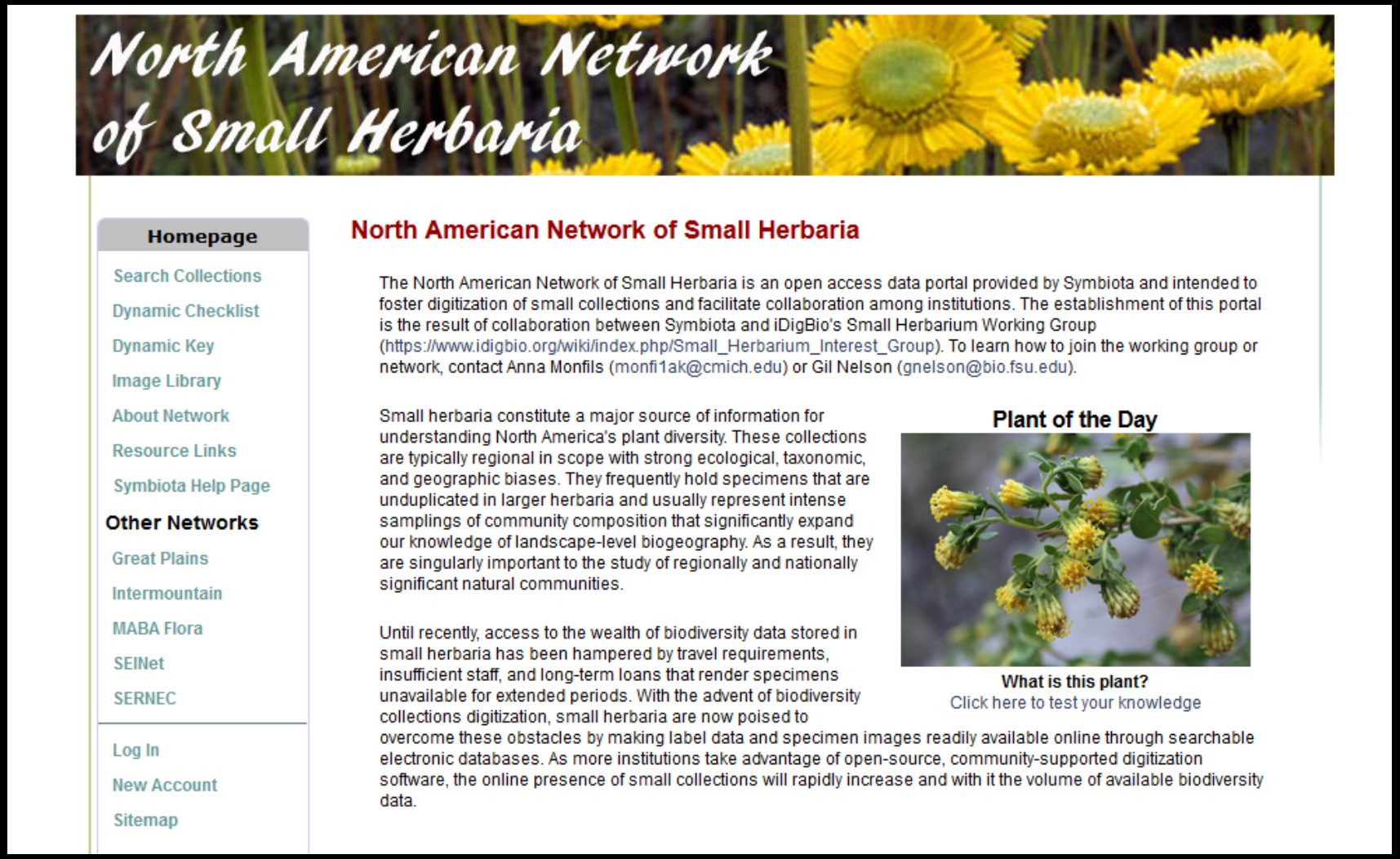
www.sunfarm.com

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

Harris et al., 2012, Journal of the Arkansas Academy of Science, 66: 94-105

Getting the team together



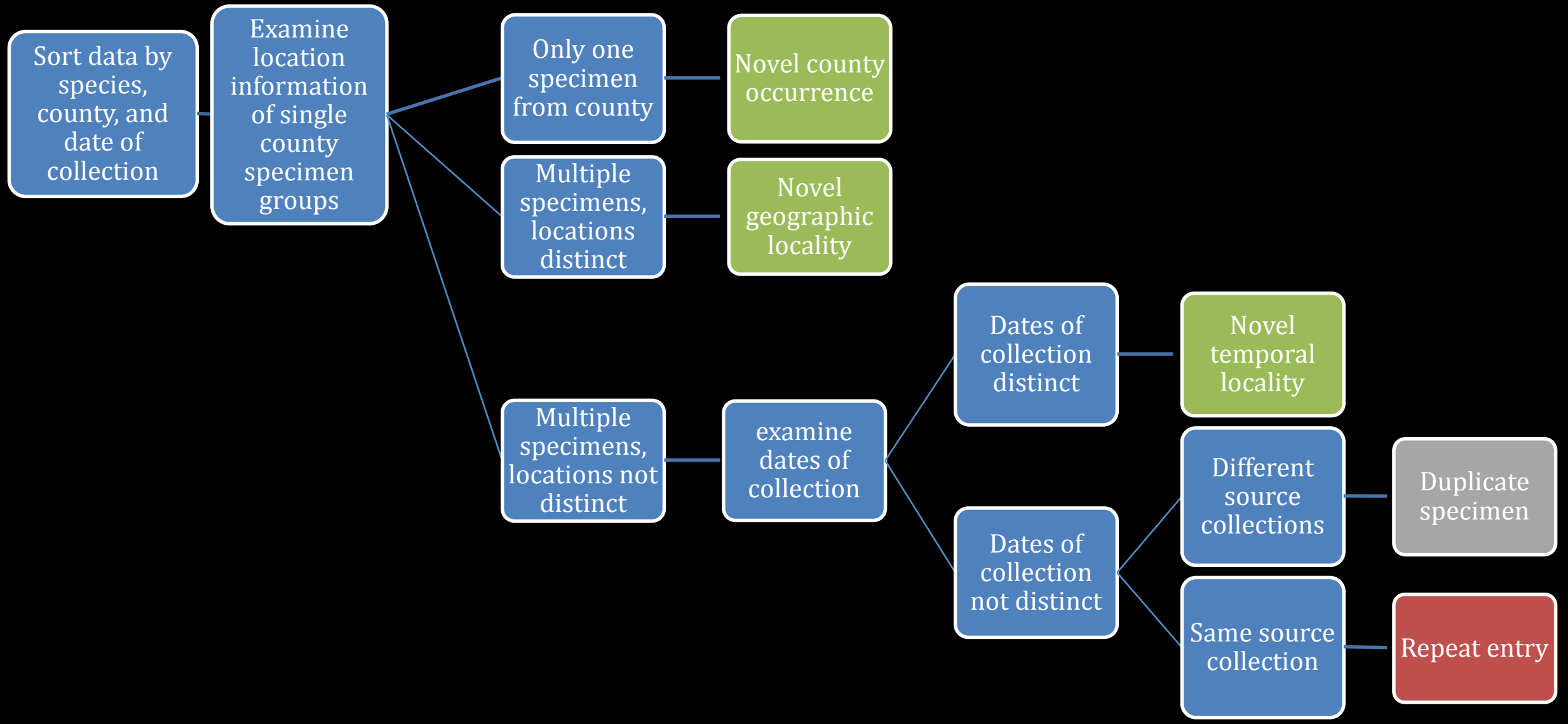
www.nansh.org; participating states: AR, CA, CO, FL, GA, MI, TN, WV

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.

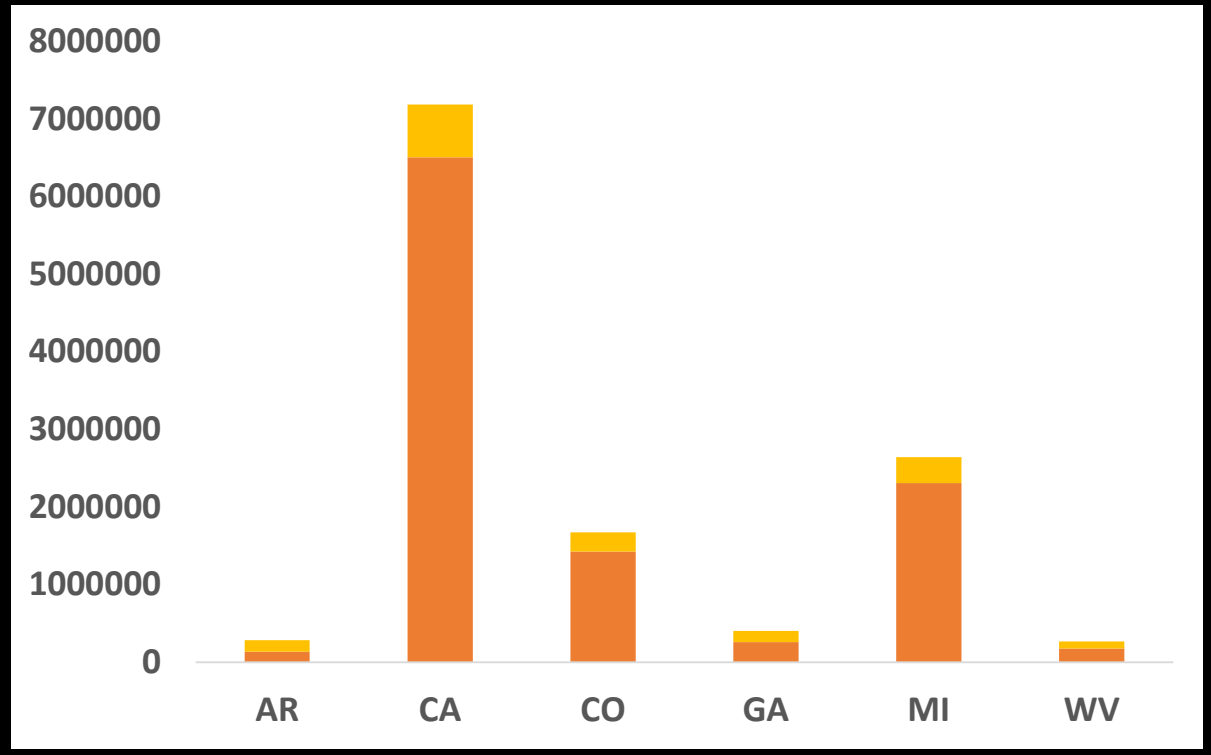
- Obtained lists of S1 and S2 taxa; randomly selected 10 from each list
- Used state non-native or invasive lists; randomly selected 10 taxa from list
- randomly selected plants from an overall state list and chose the first 10 that were not state-listed that were also native…this was an iterative process

Distinguishing locality types

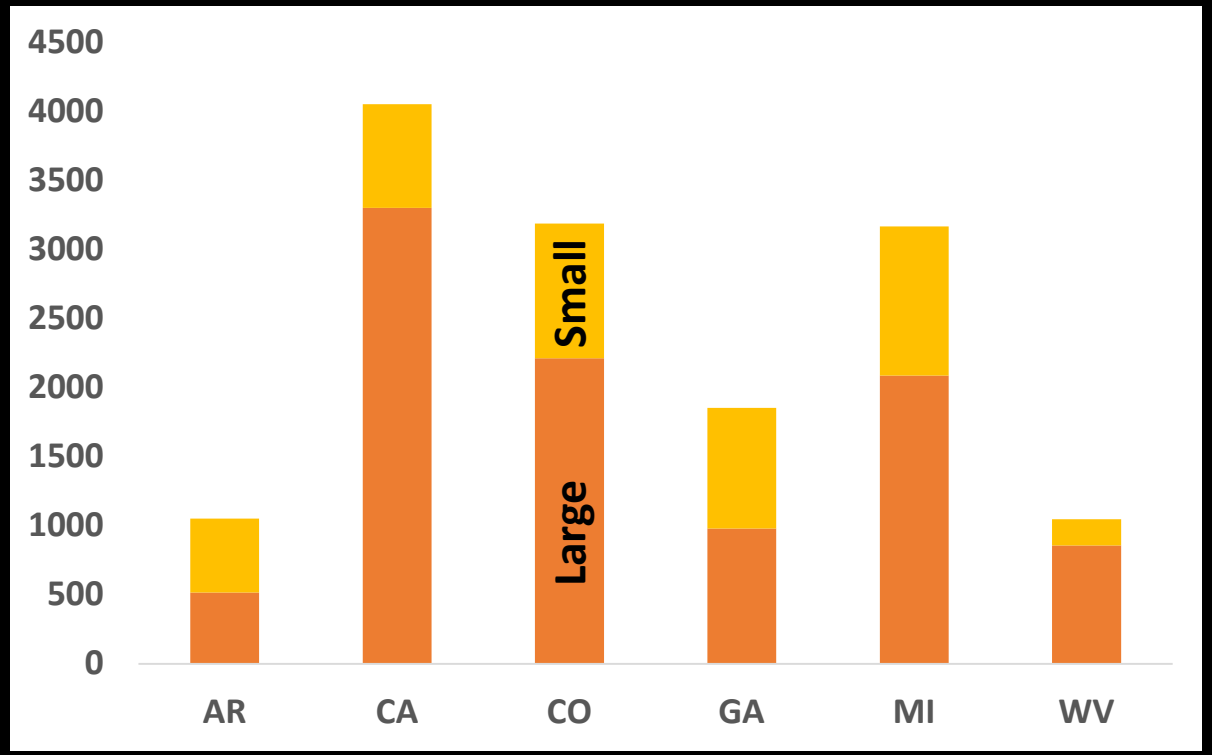


State holdings and project contributions

Herbarium holdings



Number of specimens contributed to project



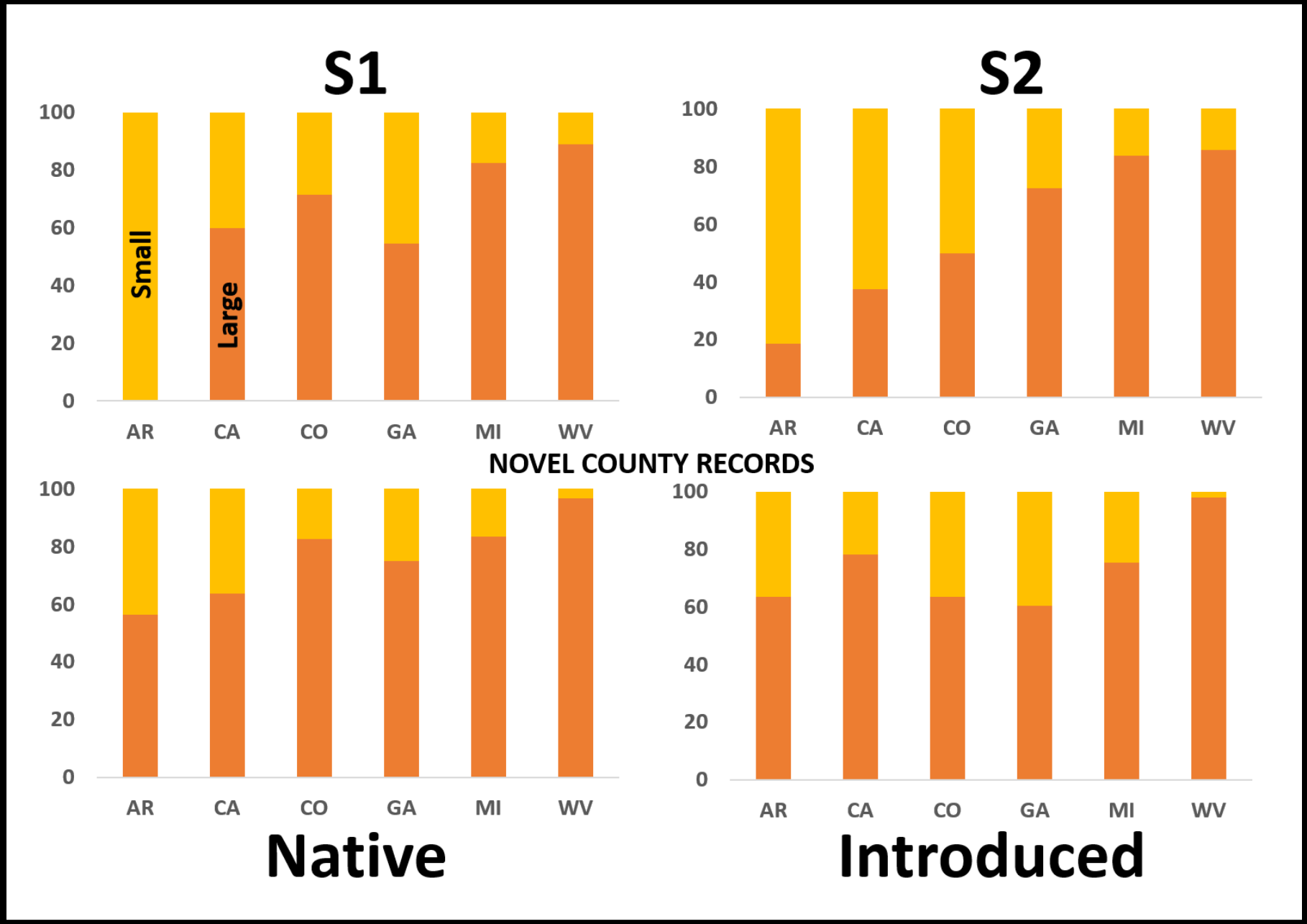
Important terminology

- **Novel County Occurrence:** Specimen data informing the geographic distribution of a species at the county scale

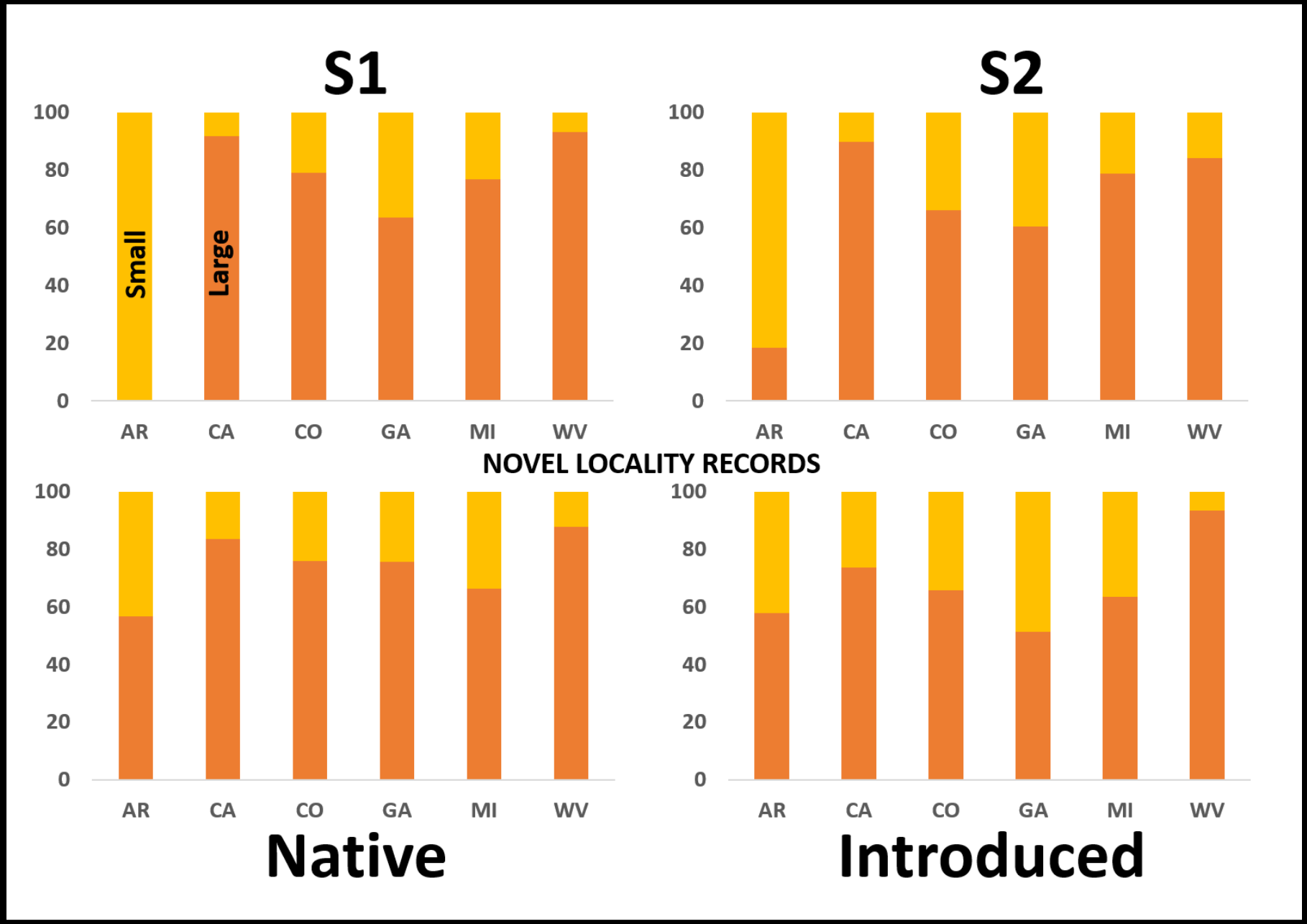
- **Novel Geographic Locality:** Specimen data informing the geographic distribution of a species on a scale more specific than county

- **Novel Temporal Locality:** Specimen data informing the temporal distribution of a species at a redundant geographic location

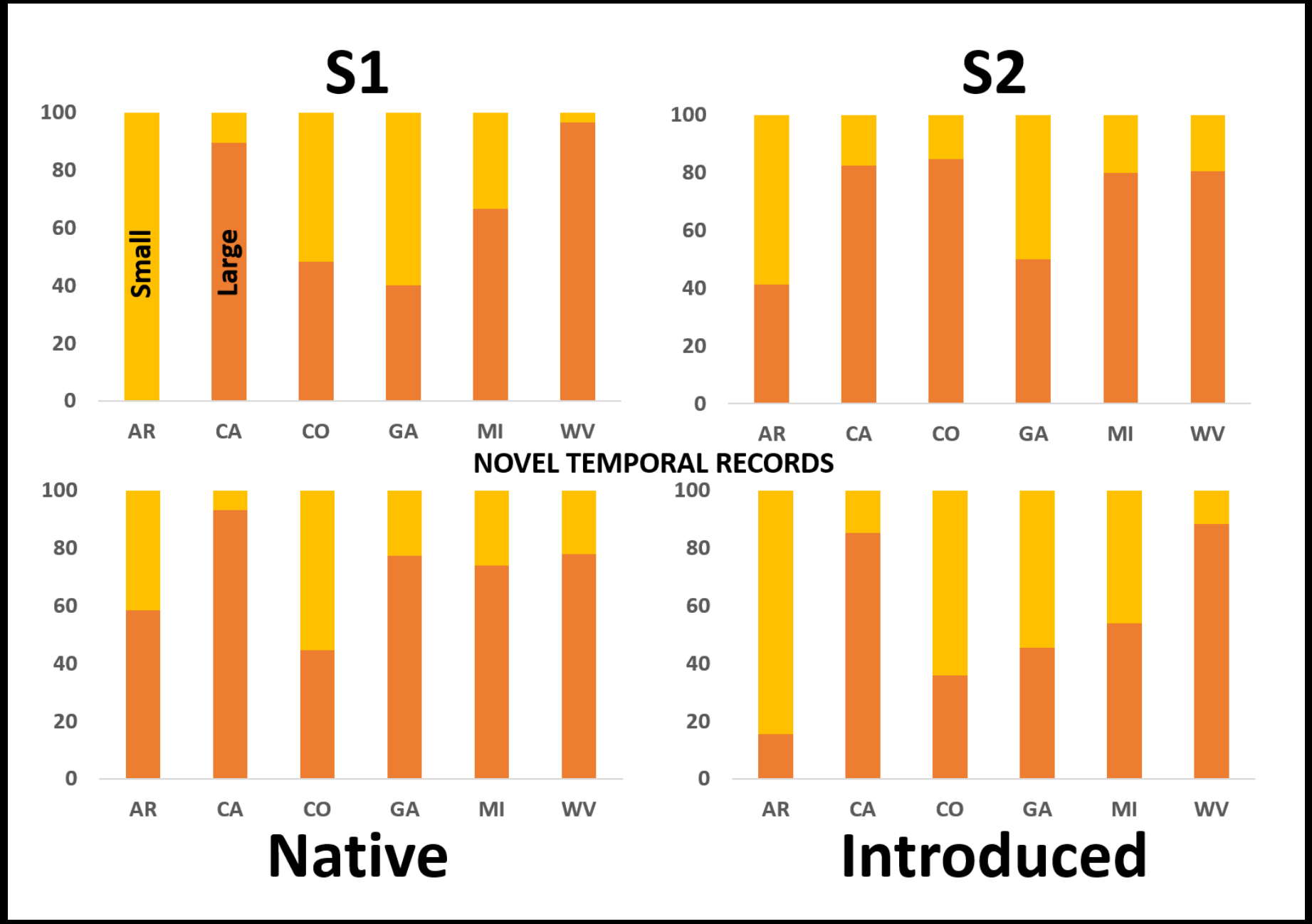
County-level results



Locality-level results



Temporal “locality” results



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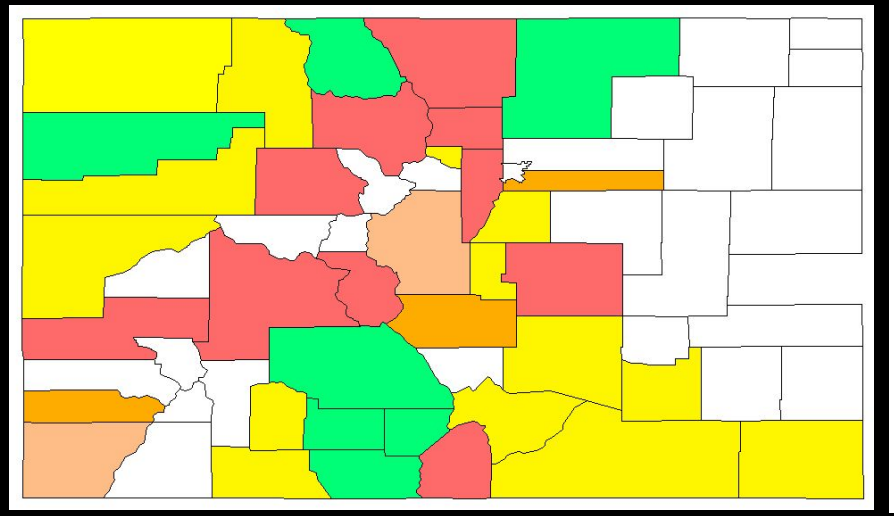
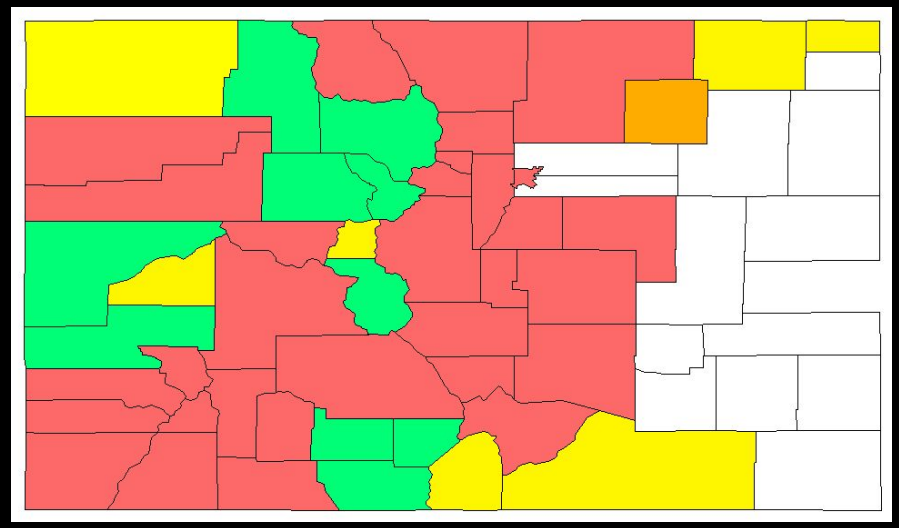
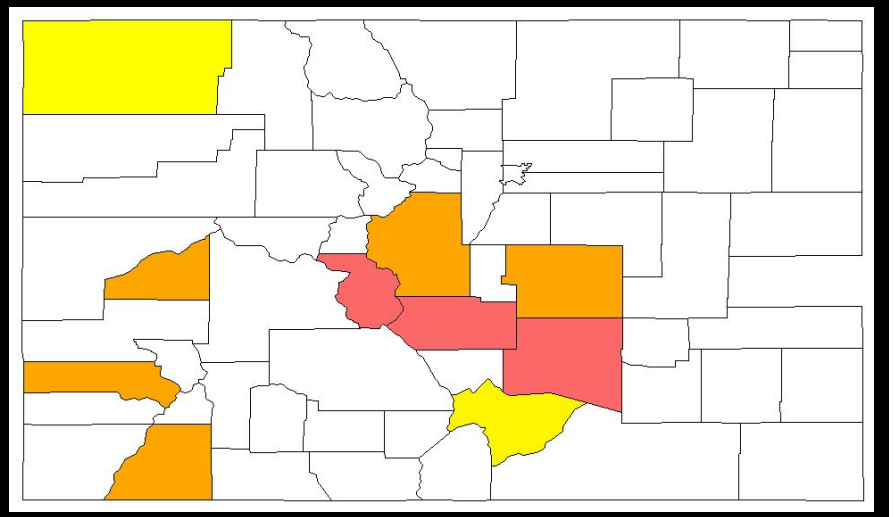


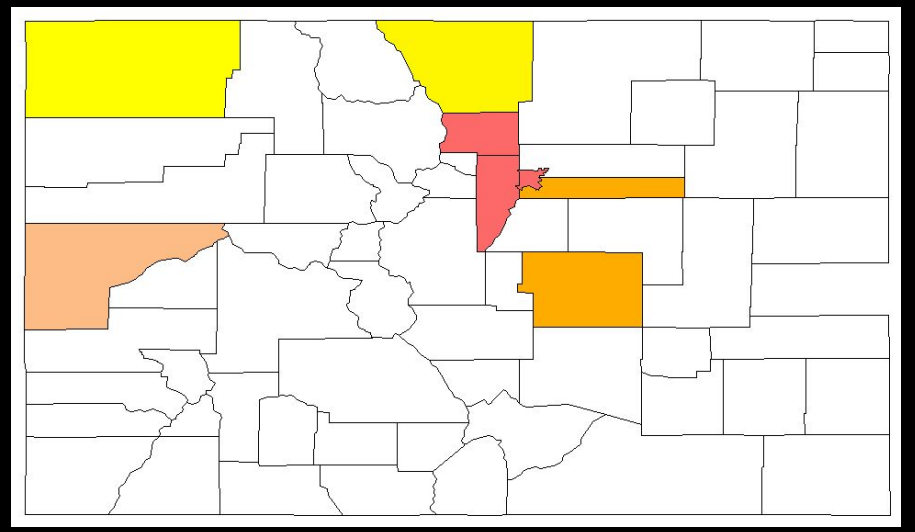
***Elymus lanceolatus* – Common Native**



***Maianthemum stellatum* – Common Native**



***Townsendia fendleri* – S2 Rare**



***Lythrum salicaria* – Invasive**

At least one large and one small collection

Two or more small collections

Two or more large collections

Single small collection

Single large collection

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