PLANNING FOR FUTURE NORTH DAKOTA FRESHWATER MUSSEL SURVEYS

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UND GEOG 474

CVANCARA (1983)

- "Aquatic Mollusks of North Dakota"
- Purpose: to characterize the molluscan fauna of North Dakota
  - Habitat
  - Population
  - Ecology
  - Spatial arrangement

IMPORTANCE

- Pollution effects
  - High sensitivity to water quality
- Biodiversity
  - A popular topic, especially relating to climate change
- Paleodrainages
  - Post-glacial landscape evolution

WHY GIS?

- Easy to make new maps
- Easy to add data from new surveys
- Easy to add new data layers
- Querying

- PLAYING WITH THE DATA!

THIS PROJECT

- Planning future freshwater mussel surveys
- Filling in gaps in existing record
- Revisiting previous sites to evaluate changes in population and biodiversity
- Based on particular species (threatened or endangered)

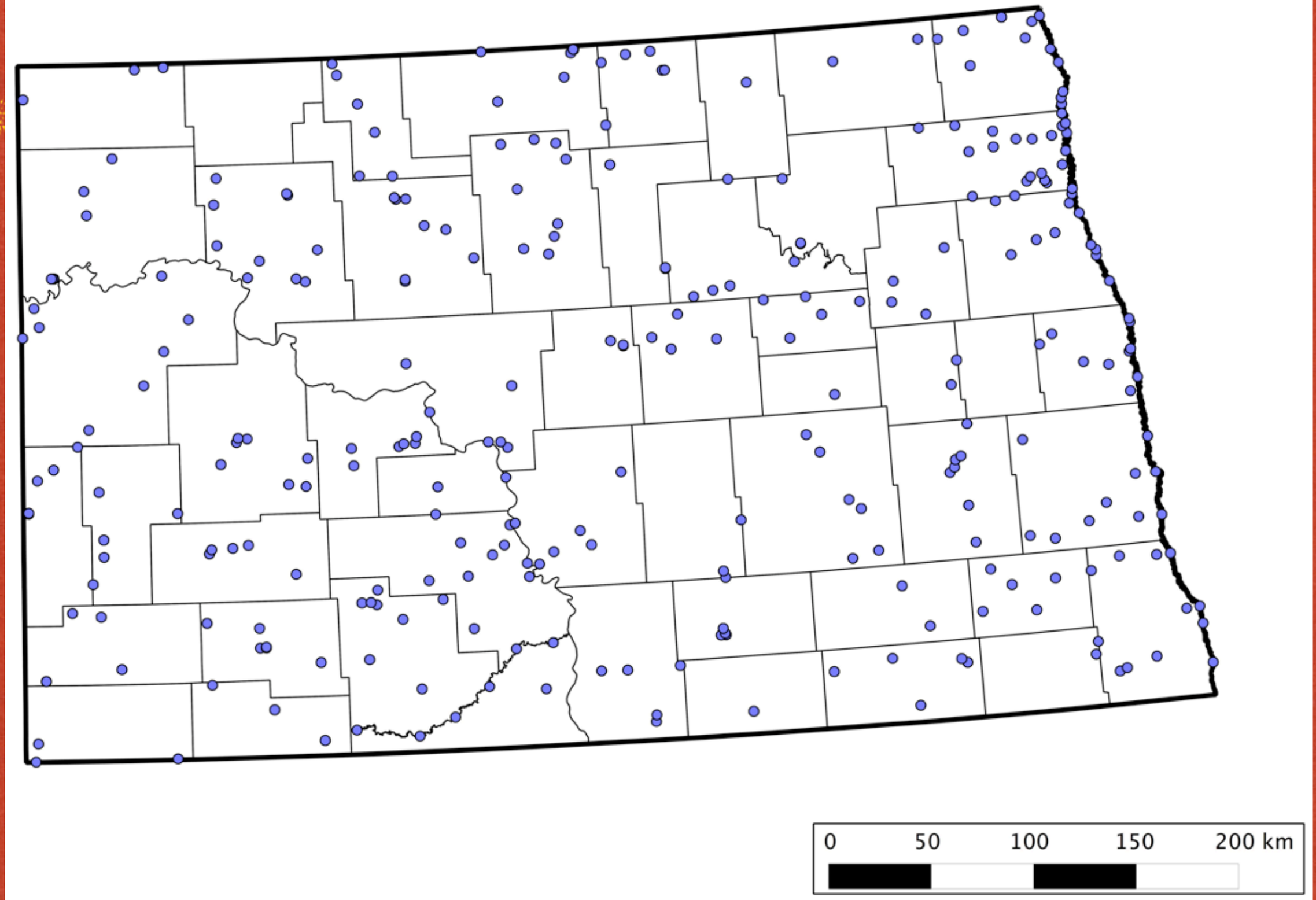
DATA

- 297 unique sites, 36 revisited by Cvancara after 2-10 years
  - Location to QQQ
  - Unionoid freshwater mussel abundance data (13 species in 9 genera)
- ND GIS Hub
  - State outline, counties

TOOLS

- AllTopo
  - Converted TRS positions to latitude/longitude and UTM
- Quantum GIS (QGIS) 1.0.1 ‘Kore’
  - Open-source alternative to ArcGIS
  - Table Editor and fTools plugins

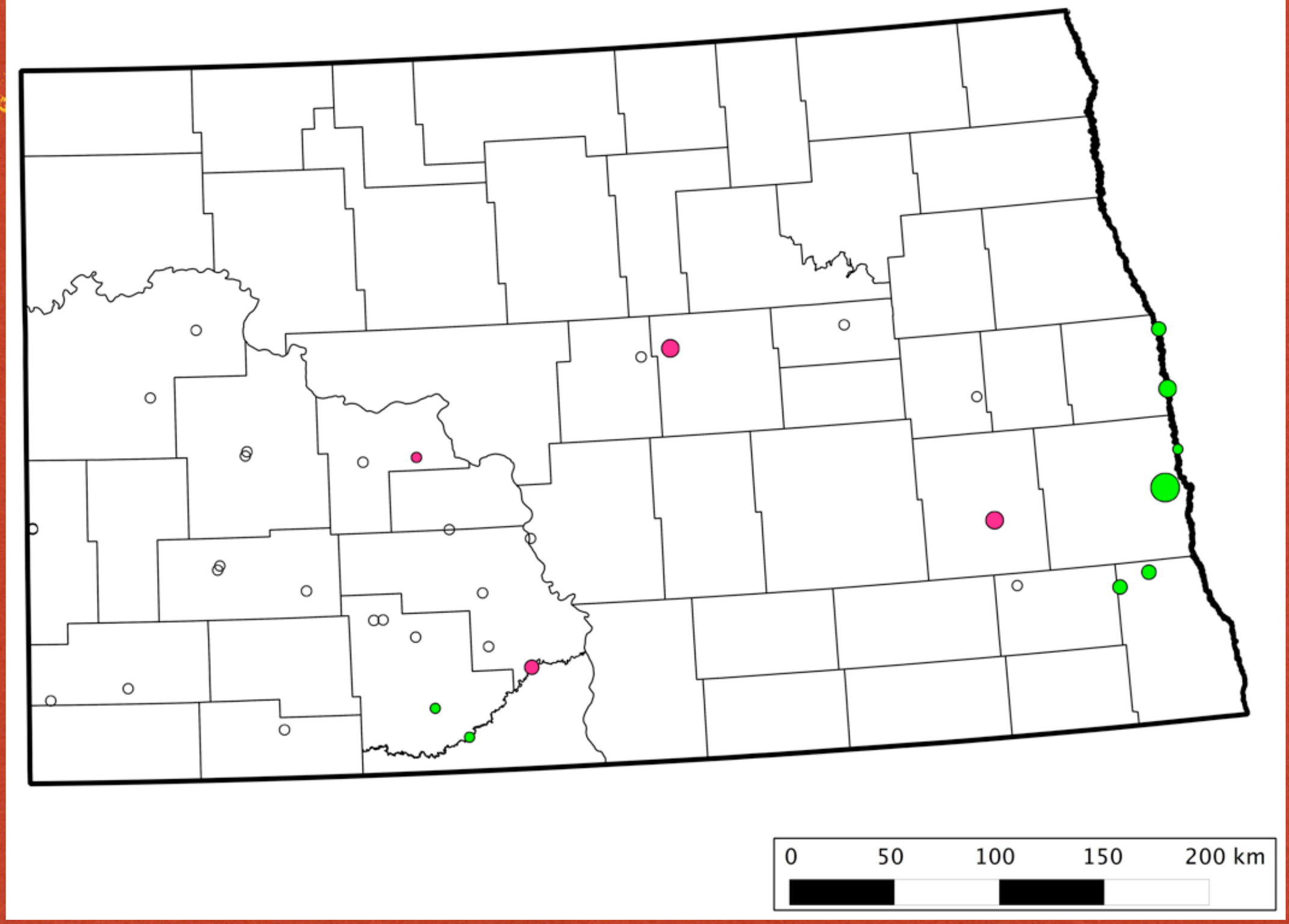
SURVEY SITES



HYPOTHESES

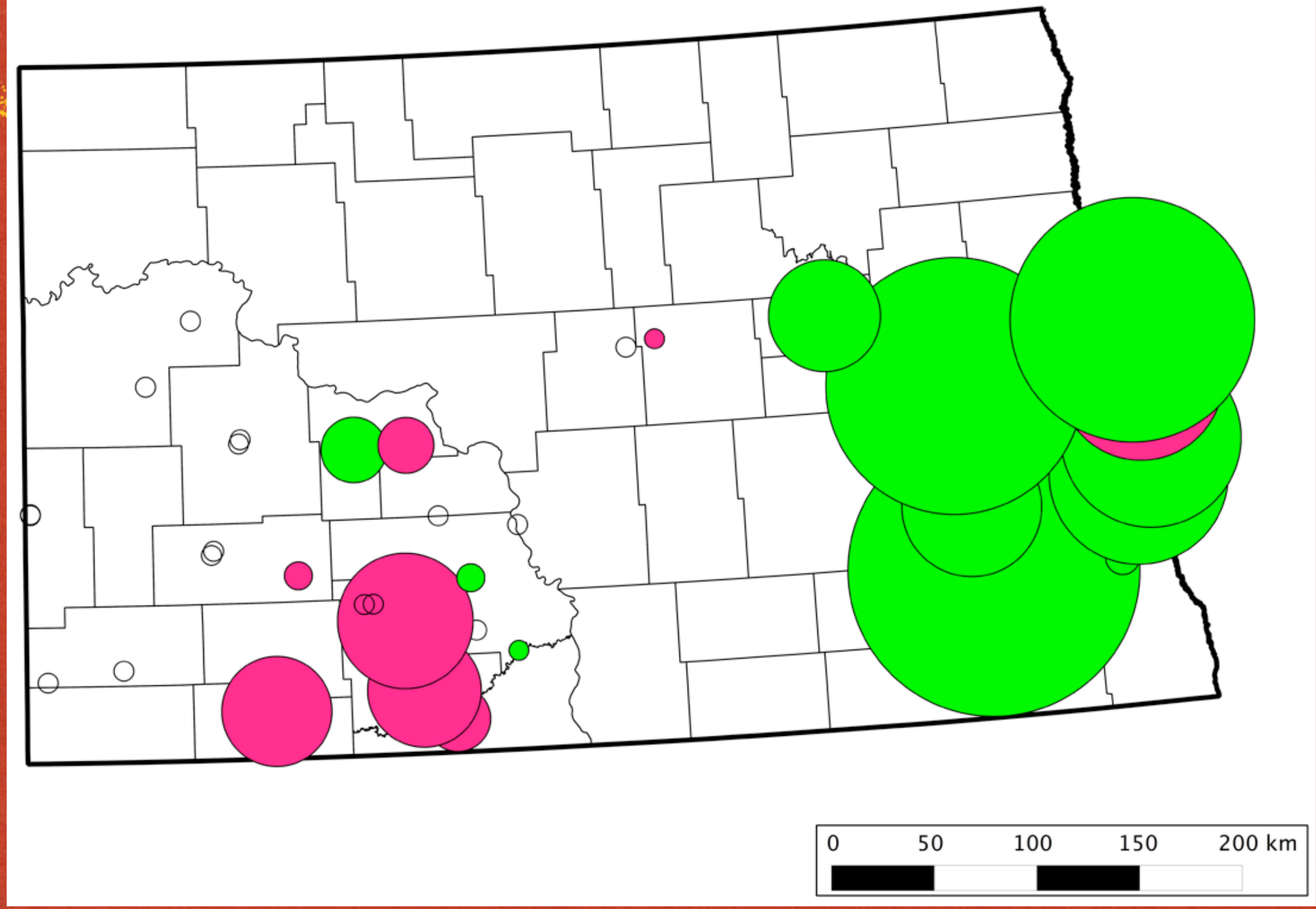
- Change in biodiversity between visits
  - Introduction or extirpation
- Change in population (overall/species) between visits
  - Introduction of extirpation
- Presence/absence in each watershed of a subbasin
- Presence/absence over area of a political unit
  - Local control over conservation

CHANGE IN BIODIVERSITY



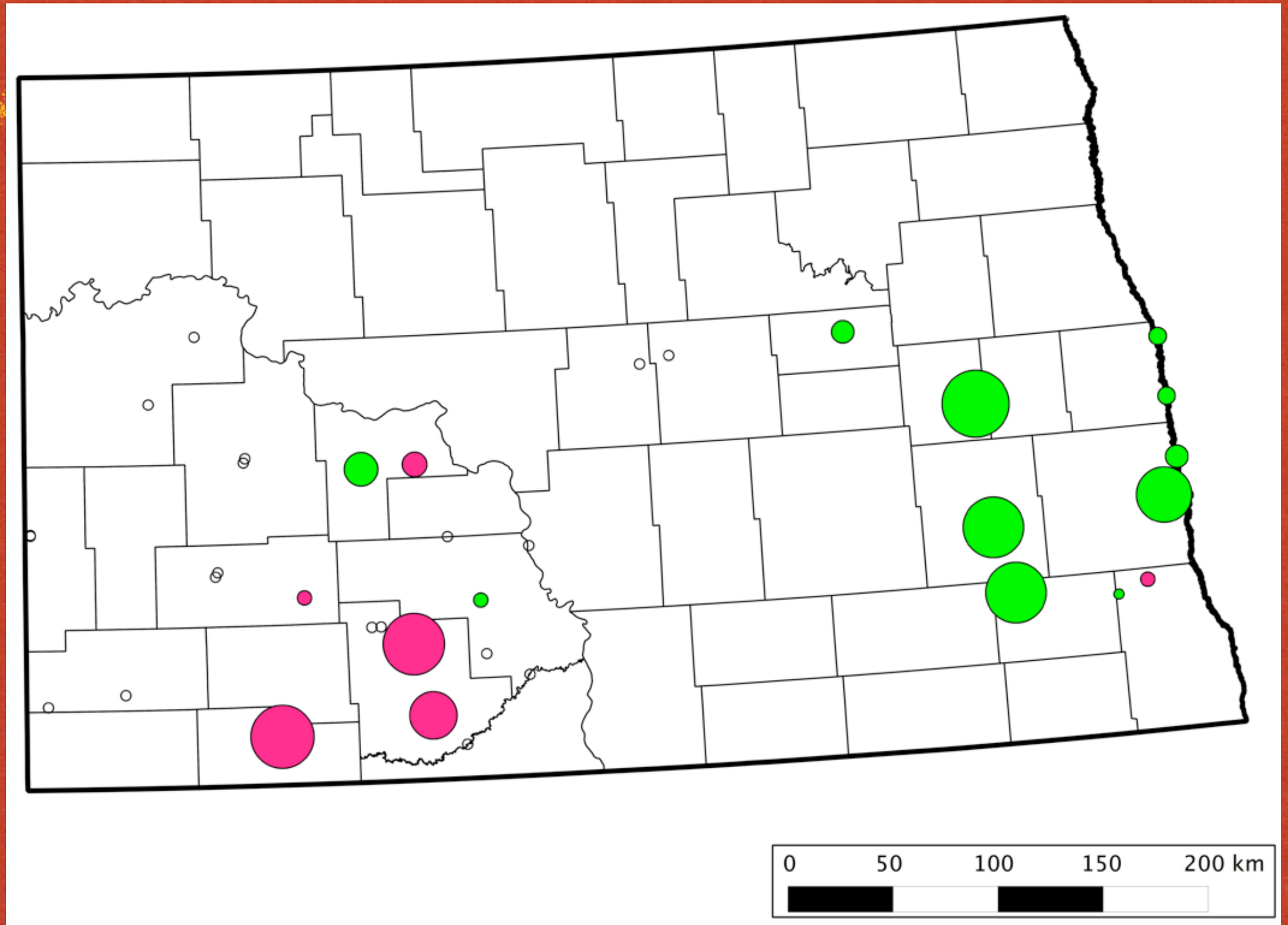
CHANGE IN POPULATION

Overall population



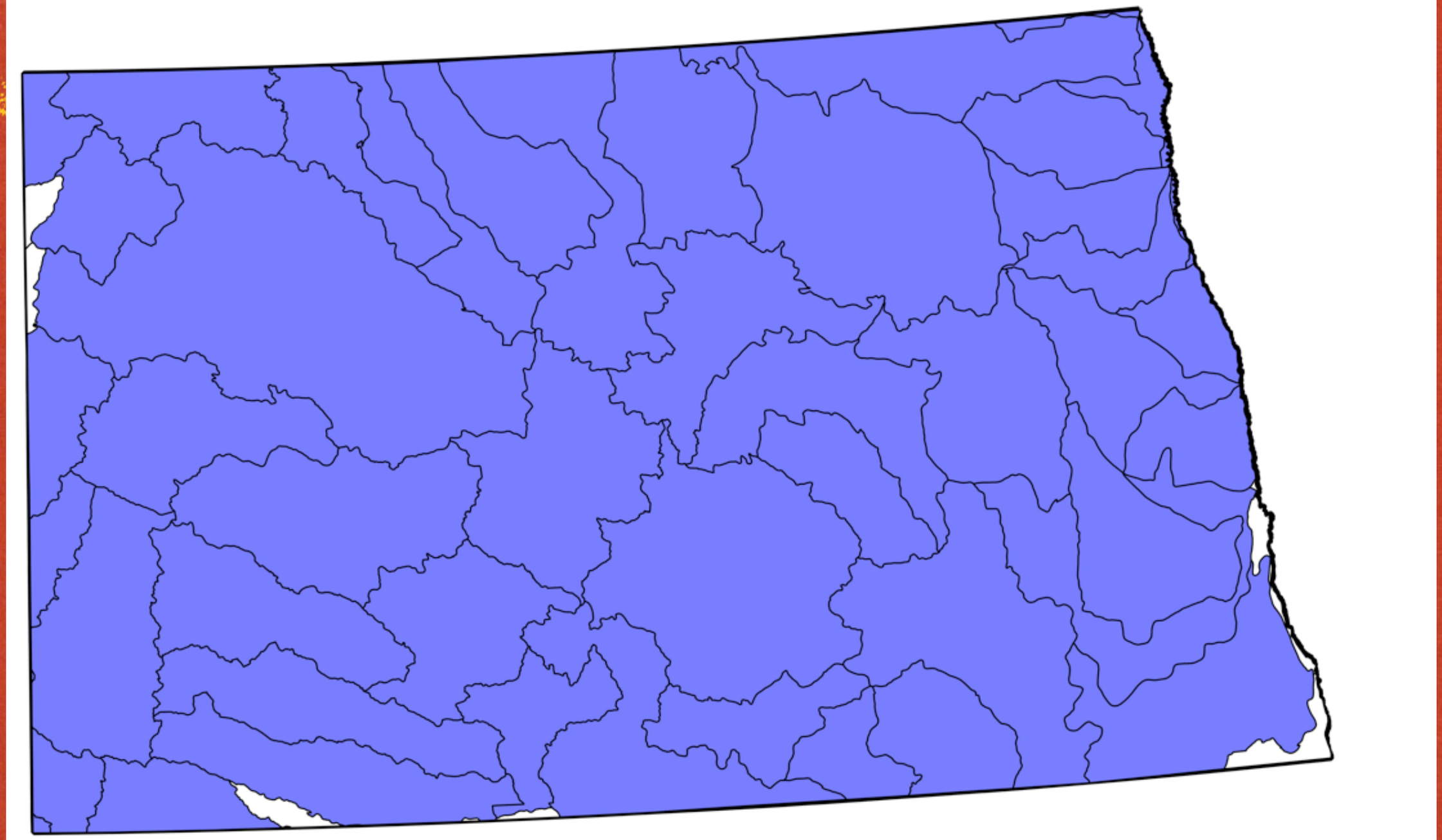
CHANGE IN POPULATION

Lasmigona complanata



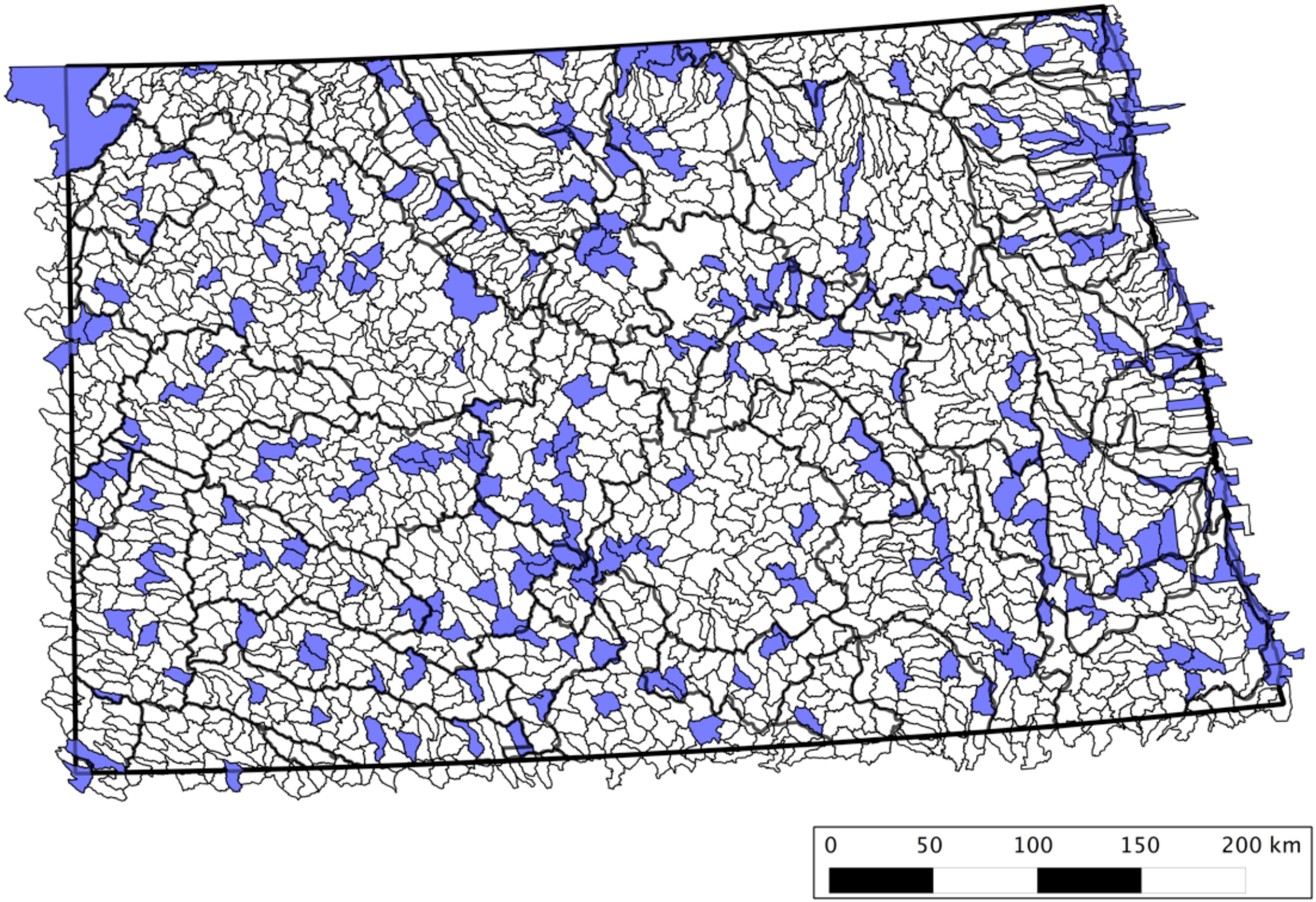
SITE PRESENCE/ABSENCE

Subbasins



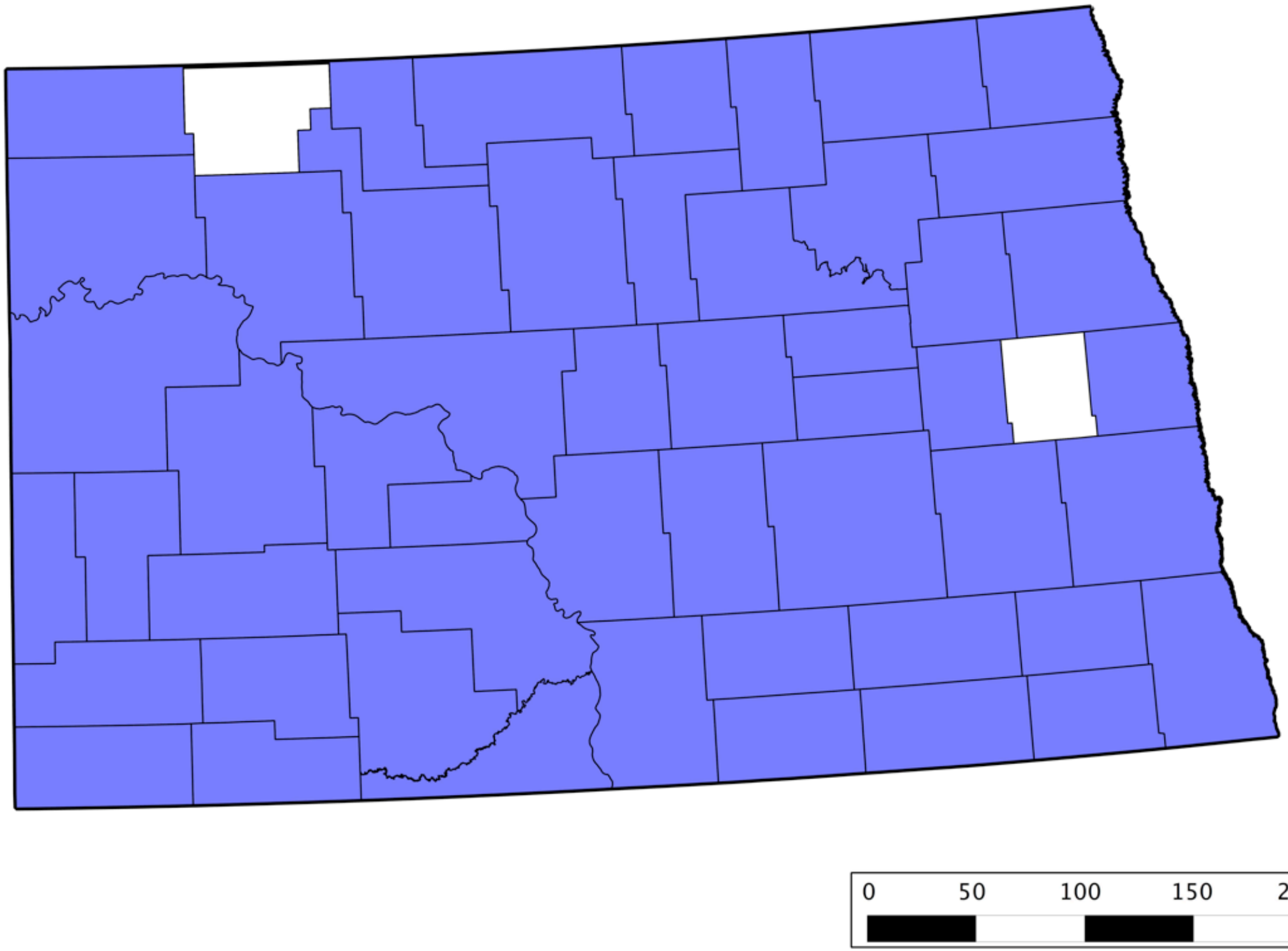
SITE PRESENCE/ABSENCE

Watersheds



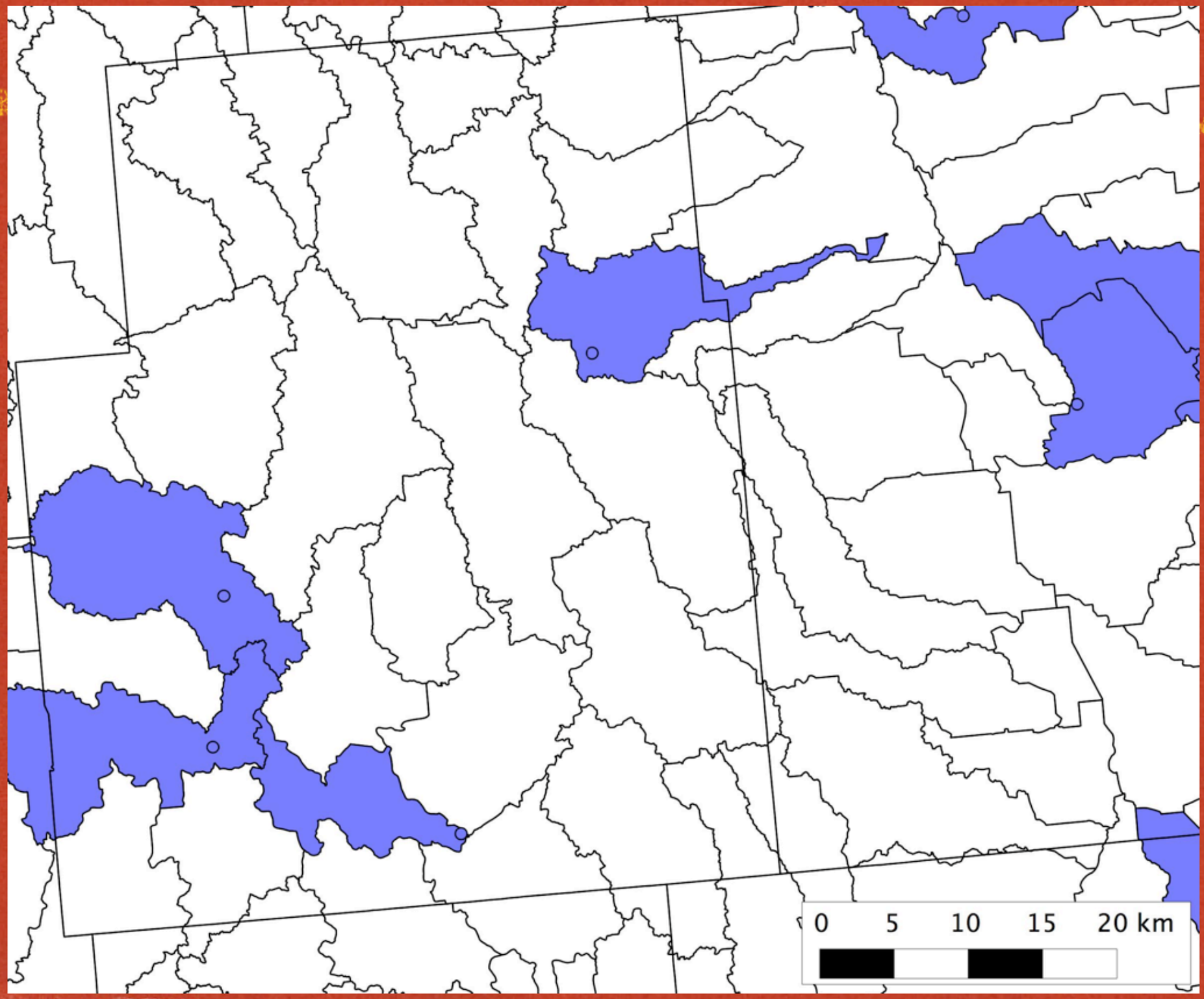
SITE PRESENCE/ABSENCE

Counties



SITE PRESENCE/ABSENCE

Example: Watersheds in Nelson County



TO DO

- More accurate positioning of survey sites
  - Current dataset places sites in center of QQQ
  - Actual location on water body is available from Accession catalog (UND Geology)
- Rethinking of data structure
  - Should be able to easily add faunal data from new sites and revisited sites
- More comprehensive literature search

QUESTIONS?