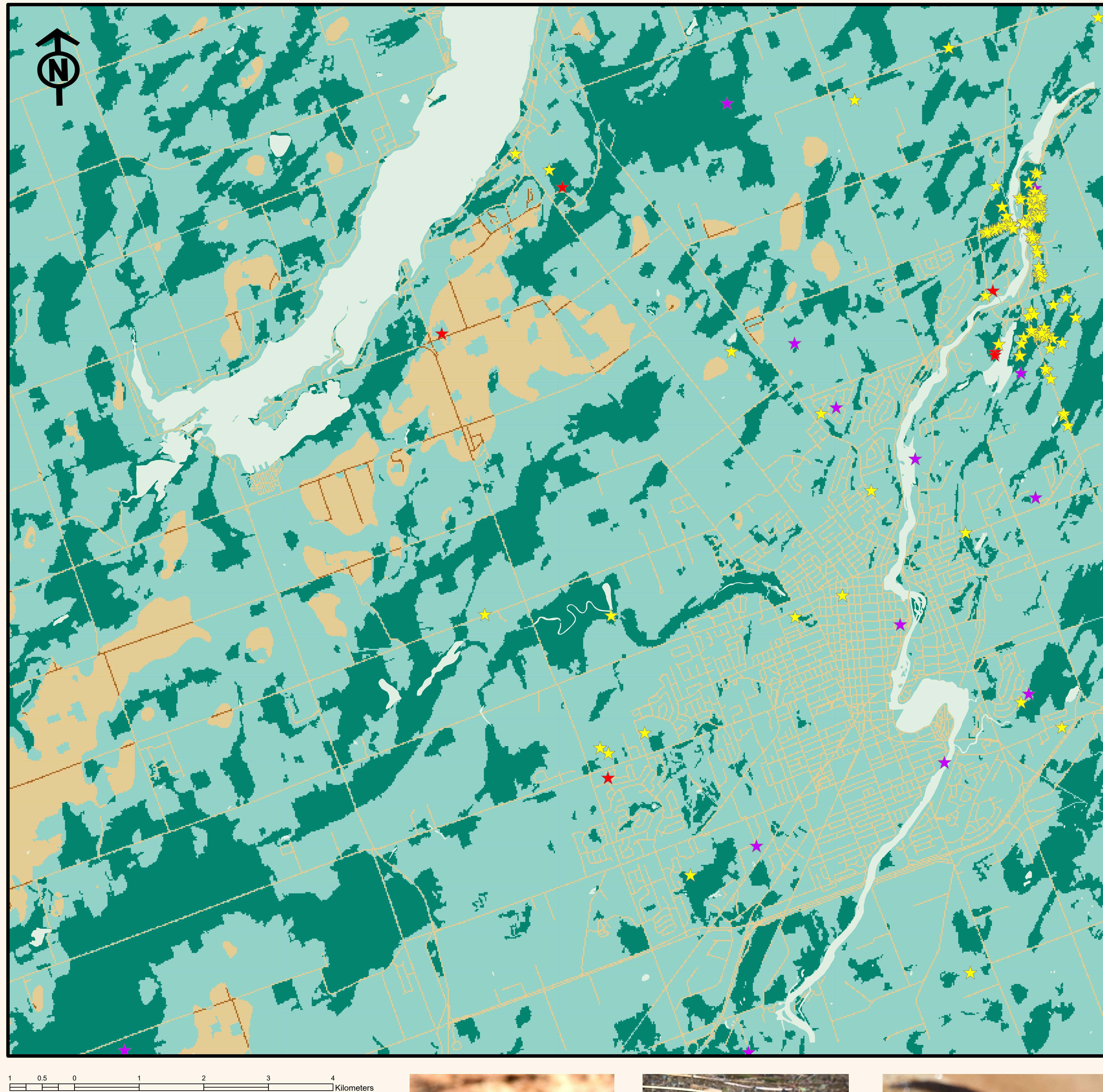


Salamander Habitat Site Suitability

Between Lindsay and Peterborough, Ontario



Salamander Sightings

- Species
- ★ Blue-spotted Salamander
 - ★ Unisexual Mole Salamander
 - ★ Eastern Red-backed Salamander



Blue-Spotted Salamander
Ambystoma laterale



Unisexual Mole Salamander
Ambystoma 'unisexual complex'

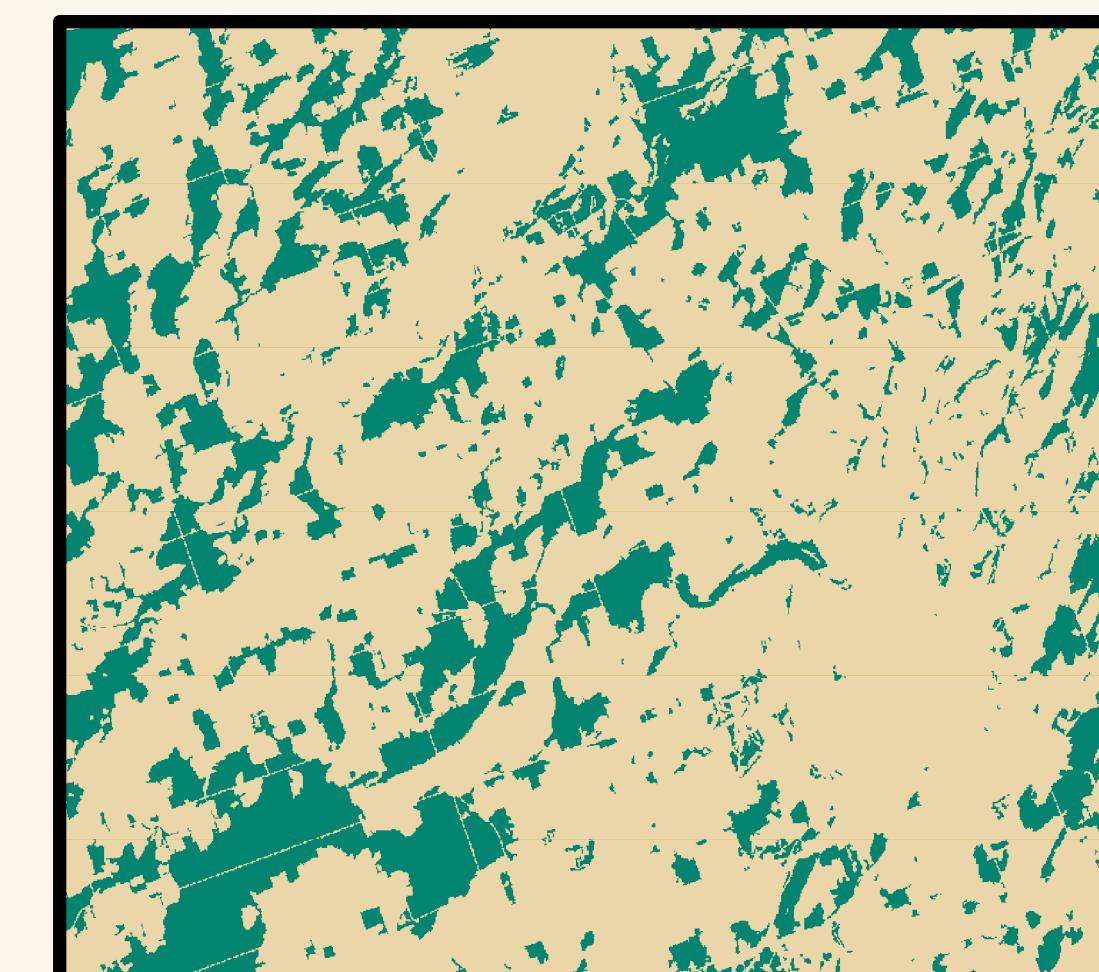


Red-Backed Salamander
Plethodon cinereus

Ambystomatid Salamander Reproduction

Ambystoma unisexual salamanders are nearly all female and reproduce by means of kleptogenesis. In Ontario, they rely on Blue-spotted Salamanders for acquiring DNA for triggering reproduction, but once initiated, the donated DNA material is discarded by the eggs and they develop asexually into cloned offspring. Due to kleptogenesis, Ambystoma unisexuals often occur in higher densities than the other Ambystoma species which they rely on for successful reproduction.

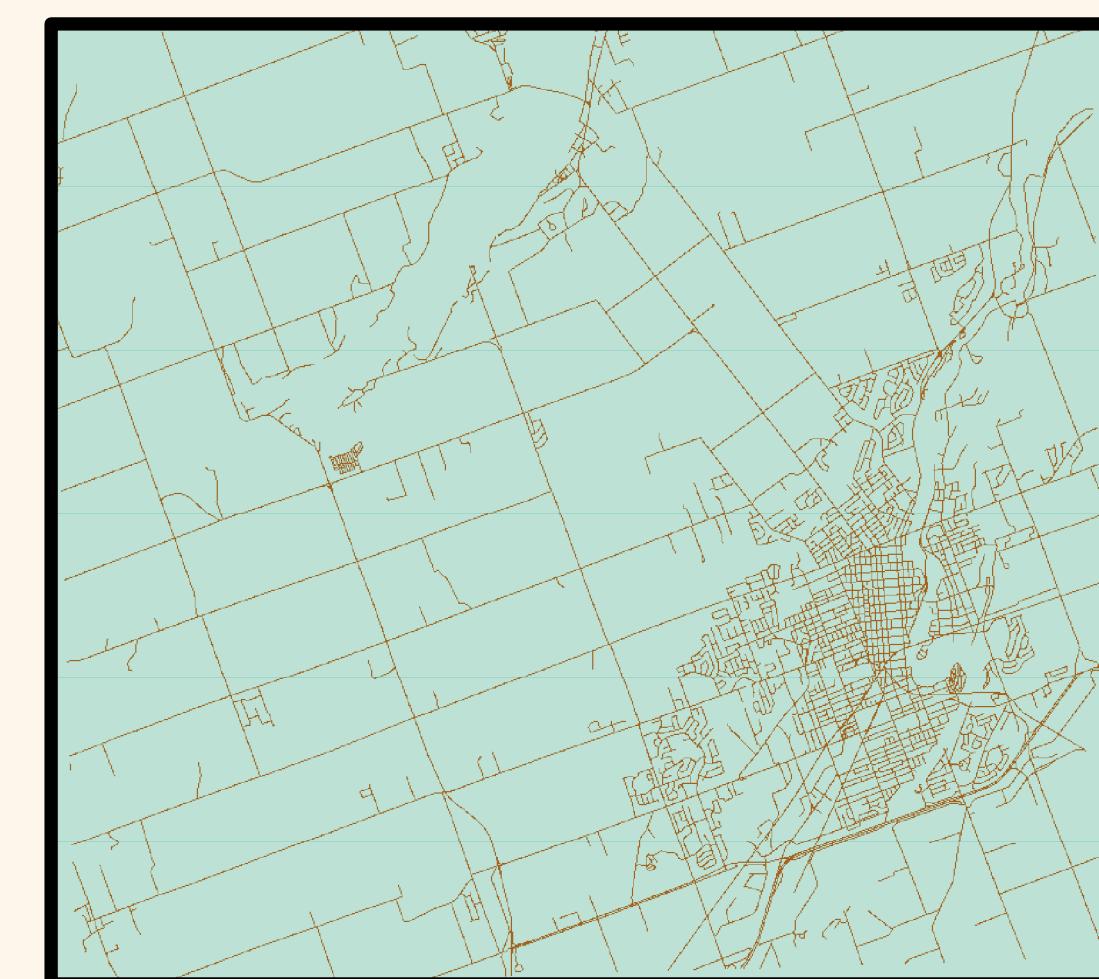
Fascinating and elusive ancient creatures, salamanders are amphibians of the order Urodela; scientifically, we have much to learn from them. Six of the twelve species in Ontario are endangered; two species are already extirpated. Conservation of salamander habitat is paramount.



Suitable Landcover



Ideal Elevations



Transportation Interference

Salamander Habitat Potential

- Highly Suitable
- Moderately Suitable
- Low Suitability
- Unsuitable

Salamander species in Lindsay-Peterborough area include the Blue-Spotted Salamander, Unisexual Mole Salamander, and the Red-Backed Salamander.

Due to their semi-aquatic requirements, salamanders have specific and unique identifiable habitats. They dwell under leaves, rocks, and decomposing logs that are close to the fish-free, temporary woodland ponds where they reproduce. Their permeable skin requires a moist environment and makes them susceptible to pesticides. They overwinter by burrowing beneath the frost line.

To create a suitability model for Salamanders in the Peterborough region, three key features were considered. First, data from the Southern Ontario Land Resource System (SOLRIS) were reclassified to identify the likely habitats such as forests (coniferous, deciduous, and mixed), treed and thicket swamps, bogs, and marshes. While salamanders require water for breeding purposes, they require waterbodies void of fish. Vernal pools found in the treed and thicket swamps are ideal habitat.

Another key analysis is the presence of transport infrastructure. Long stretches of dry road with high speed vehicles can directly impact salamander populations through vehicular collisions and cause habitat fragmentation and prevent adequate genetic mixing for non-ambystomatids.

Finally, higher elevation spots within the area were assessed as unlikely to provide suitable habitat, since water run-off flows to lower elevations, which contributes to the formation of vernal ponds.

The resulting Boolean raster analysis creates a ranked suitability map that identifies highly suitable to unsuitable salamander habitats. To evaluate, salamander sighting reports from iNaturalist have been overlaid on the resulting map. Though Figure 1 shows that the majority of sightings are in the moderately-suitable class, this result is still acceptable because the data is highly biased towards urban areas (and Trent University in particular).

Future site suitability analysis should consider the impact of agricultural pesticide runoff and consult with LIDAR results to identify vernal pools for salamander breeding.

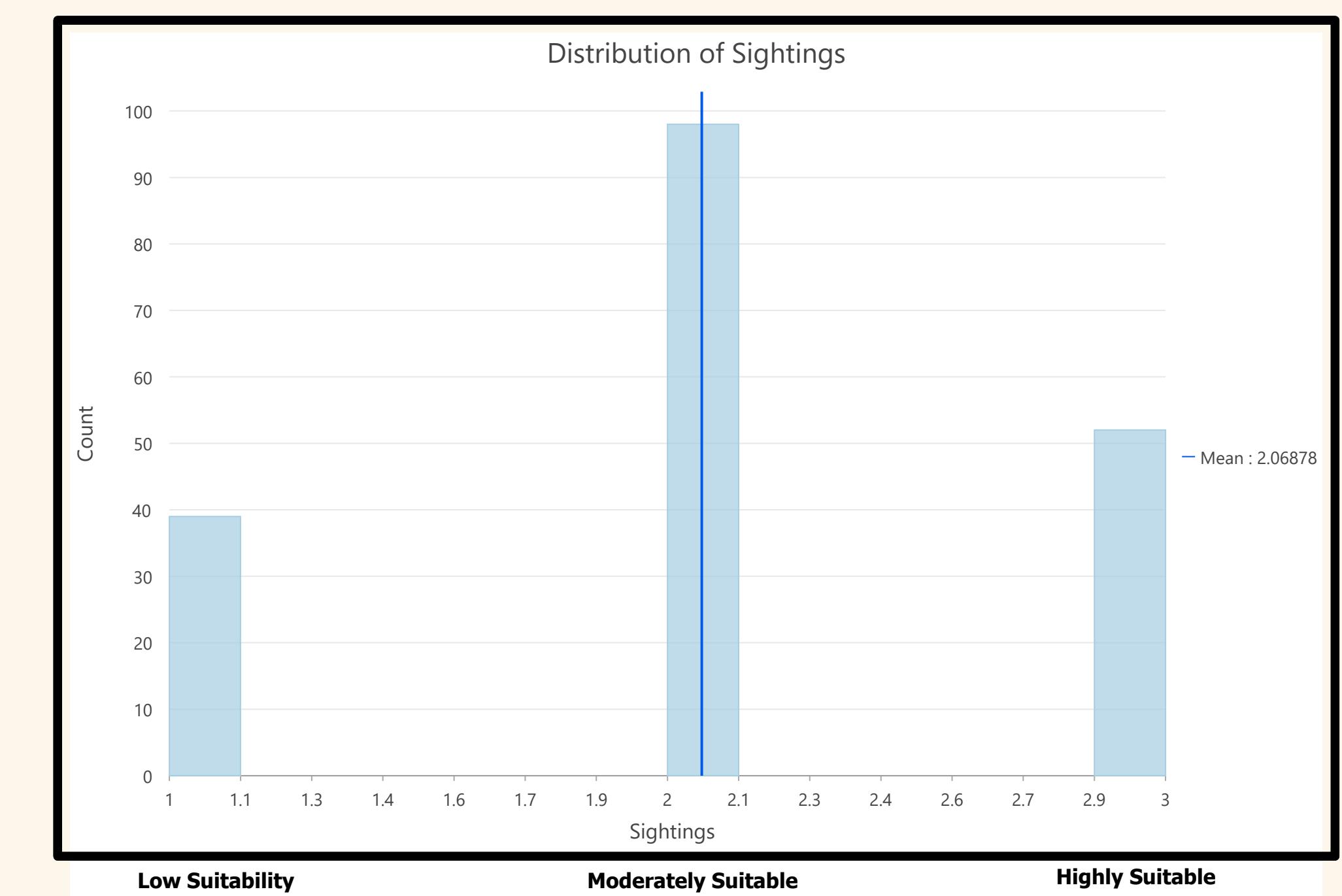
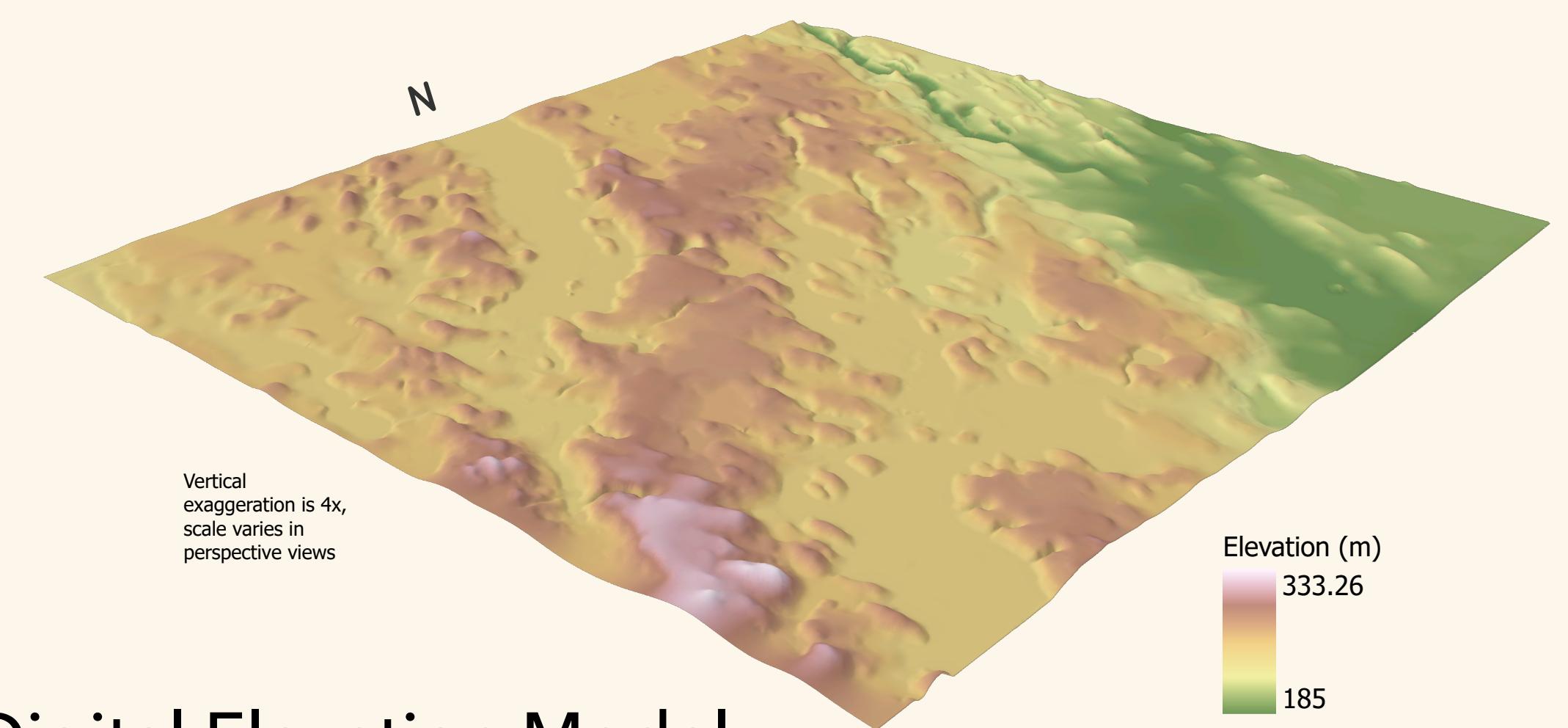


Figure 1: Counts of salamanders for three ranked habitats. Unsuitable habitat had no counts and is not shown.



Digital Elevation Model
TopoToRaster Interpolation