Establishing Long-Term Monitoring of Herpetofauna and Vegetation on Mined Land in Southeast Kansas

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Introduction

History of Reclaimed Mined Land

- From the early 1900's through the 1970's, Crawford and Cherokee county were strip mined for resources such as coal, zinc and lead. Much of the land was ravaged from the large scale mining.
- Once the mining ended, Kansas Department of Wildlife Parks & Tourism (KDWPT) and Pittsburg State University acquired mined land through purchase or donations. These lands are now partially restored to native grasslands and forest fragments.
- There have been few studies to indicate if the restoration of these mined land areas are actually suitable habitat for local herpetofauna.

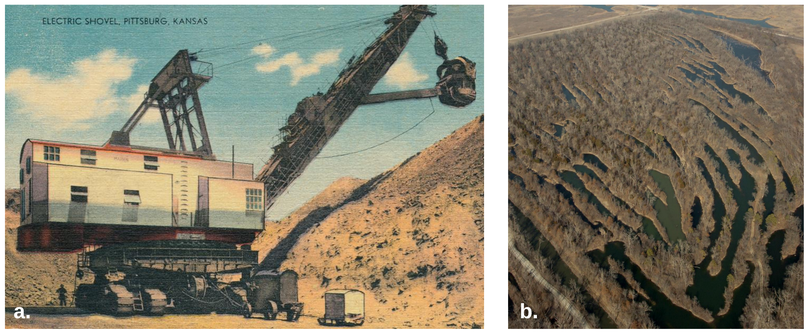

Figure 1 (a) Pittsburg Shovel Company machine, mining for coal in the early 1900s (b) resulted in a post-mining landscape characterized by surface mining pits that have since filled with water.

Objectives:

- Continue ecological monitoring on reclaimed mined land.
- Determine the distribution, abundance, and diversity of local species.
- Document any species in need of conservation.
- Quantify habitat relationships between sampled fauna and establish a baseline dataset for planning and assessing habitat modifications.

Figure 2. Example species found in mined lands: a) Southern Leopard Frogs and an American Toad, b) Three-toed Box Turtle, c) Broad-headed Skink, and d) Rough Green Snake.

Methods

Herpetofauna Monitoring

- In 2018, long-term herpetofauna monitoring sites were established at each of the following properties in Crawford and Cherokee counties:
  - Natural History Reserve
  - O'Malley Prairie
  - Monahan Prairie
  - Mined Land Wildlife Area Unit 4 & 14
  - Buche Wildlife Area (Not historically mined)
- We currently have 5 trap arrays (Fig. 3), 25 cover boards, and 15 funnel traps deployed across the six sites. Each trap array consists of a drift fence, pitfall and funnel traps. All individuals found within the array were released.
  - Pitfall traps were constructed by drilling 1/8th inch holes in the bottom of five-gallon buckets and burying them until the rim of the bucket was flush with the ground level.
  - Funnel traps were made from carpenter fabric formed into a cylinder with two inward facing cones at each end.
- Traps were checked almost daily from mid April to late October.
- Aural surveys for the Spring Peeper (*Pseudacris crucifer*) were conducted at the mined land areas from late February to mid May.

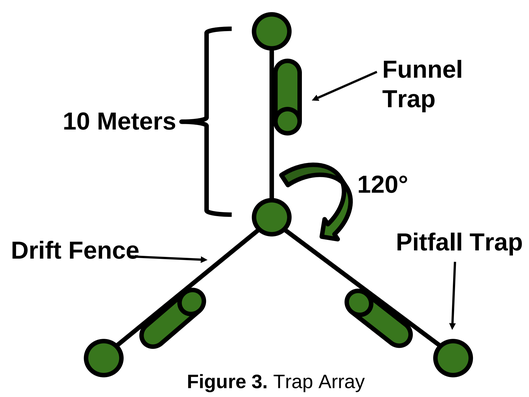

Figure 3. Trap Array

Vegetation Monitoring

- Vegetation composition and structure were assessed at each trap array.
  - Ground vegetation composition, height, and cover (Daubenmire frame)
    - Artificial surface, bare soil, forbs, grass, leaf litter, rock, shrubs, tree, woody litter, water
  - Tree community composition and diameter-at-breast-height (DBH)
  - Shrub community composition
  - Canopy cover
  - Vertical density (Nudd's board)

Results

- We observed 449 individuals belonging to 24 species (Table 1).
  - Amphibians: 5 species, 376 individuals
  - Reptiles: 19 species, 58 individuals

Common Name	Latin Name	Count	% Sites
Southern Leopard Frog	*Lithobates sphenocephalus*	220	100%
American Toad	*Anaxyrus americanus*	102	100%
Blanchard's Cricket Frog	*Acris blanchardi*	41	100%
Dekay's Brown Snake	*Storeria dekayi*	15	80%
Red-Eared Slider	*Trachemys scripta*	10	80%
Spring Peeper	*Pseudacris Crucifer*	N/A	80%
Three-Toed Box Turtle	*Terrapene triunguis*	10	80%
Western Ribbon Snake	*Thamnophis proximus*	6	80%
Bullfrog	*Lithobates catesbeianus*	3	60%
Yellow-Belly Racer	*Coluber constrictor*	6	60%
Western Rat Snake	*Pantherophis obsoletus*	3	60%
Common Snapping Turtle	*Chelydra serpentina*	2	40%
Cope's Grey-Tree Frog	*Hyla chrysoscelis*	12	40%
Western Painted Turtle	*Chrysemys picta*	2	40%
Ornate Box Turtle	*Terrapene ornata*	3	40%
Prairie Kingsnake	*Lampropeltis calligaster*	1	20%
Broad-Headed Skink	*Plestiodon laticeps*	1	20%
Six-lined Racerunner	*Aspidoscelis sexlineata*	1	20%
Rough Green Snake	*Opheodrys aestivus*	2	20%
Five-Lined Skink	*Plestiodon fasciatus*	1	20%
Common Garter Snake	*Thamnophis sirtalus*	6	20%
River Cooter	*Pseudemys concinna*	1	20%
Smallmouth Salamander	*Ambystoma texanum*	1	20%
Plain Belly Water Snake	*Nerodia erythrogaster*	1	20%

Conclusions

We recorded five new species during the 2019 field season and added aural surveys of spring peepers.

Overall, 5 additional species and 240 more individuals were observed this year compared to the 2018 field season.

The broad-headed skink and spring peeper were the only species found that are state-listed (SINC).

We will continue to survey these mined land areas, adding new survey locations at each area in spring 2020.

Acknowledgements & References

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