



Status of Fish Communities at Pea Ridge National Military Park (PERI), 2009 & 2012

Fish community composition offers a good indication of long-term environmental conditions within a stream. Many native fish species are intolerant of habitat alteration and poor water quality. Land use change has resulted in stream habitat degradation and contributed to the decline in fish populations throughout their ranges. Watersheds with karst geological features, such as those at Pea Ridge NMP, are particularly susceptible due to sink holes, caves, springs, and losing reaches of streams permitting close interaction between groundwater and surface water. The purpose of fish community monitoring at PERI is to determine status and trends in fish diversity, abundance, and community composition and correlate this data to water quality and habitat conditions. Data collected through monitoring equips park managers with science-based understanding needed to make informed decisions on water quality issues that protect the entire aquatic community.

Methods:

For details on methods of site selection, fish sampling, habitat and water quality data collection, and data analysis see Dodd et al. (2008) and Dodd et al. (2011).

- The fish community at Pratt Creek was sampled in May 2009 and 2012 using a backpack electrofishing unit. Fish were identified to species, measured and inspected for diseases or abnormalities (Figure 1).
- Physical habitat was collected to assess channel morphology, fish cover, and bank conditions
- Temperature, dissolved oxygen, pH, specific conductance, and turbidity were collected hourly using a logger deployed upstream of the reach for 24 hours.
- Biological metrics that reflect fish community diversity abundance, and composition were calculated.



Figure 1. Measurement of collected fish.

Summary of Findings:

- Six species were collected at Pratt Creek with the community dominated by Southern redbelly dace (Figure 2).
- Four of the six species (including Southern redbelly dace) are sensitive to poor water quality conditions.

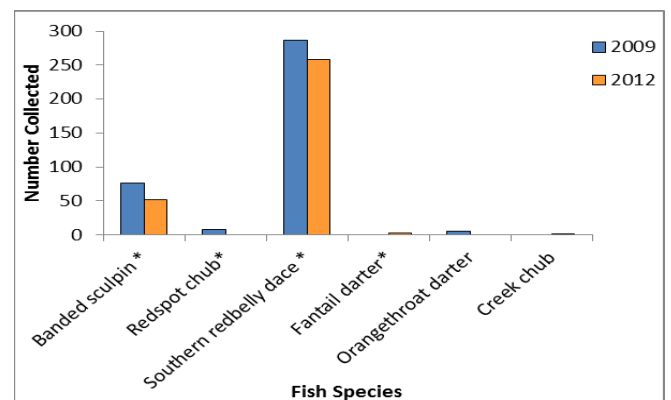


Figure 2: Species collected in Pratt Creek in 2009 and 2012. An asterisk indicates species sensitive to poor water quality and human disturbance.

- Pratt Creek had low fish diversity in both years. This is likely due to cool groundwater inputs from springs and the small size of the creek, allowing only smaller species adapted for cooler water to inhabit the creek.
- The high abundance of sensitive fishes along with no incidence of diseases indicates the fish community in Pratt Creek is in relatively good health.
- Physical habitat was typical of a headwater stream and water quality conditions were within standards for surface waters of the Ozark region (ADEQ 2008).
- Findings by HTLN were similar to those found by the US Geological Survey at Pratt Creek in 2003 (Justus and Petersen 2005).

For More Information Contact:

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Citations:

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Justus, B.G., and J.C. Petersen. 2005. The fishes of Pea Ridge National Military Park, Arkansas, 2003. U.S. Geological Survey, Reston, Virginia. Scientific Investigations Report 2005-5129.