



Fish Community Monitoring at Pipestone National Monument - 2015 Update

Fish often serve as biological indicators of ecosystem health and long-term monitoring can elucidate trends in fish community structure that reflect changes in land use, water availability, and ecosystem function. Pipestone National Monument provides some protection from land use changes and water quality degradation, allowing for native fish species to persist within the monument. Routine monitoring also allows for assessment of the status of the Topeka shiner, a federally endangered species found in Pipestone Creek.

The purpose of fish community monitoring at Pipestone National Monument (PIPE) is to evaluate the status and long-term trends in fish species richness, diversity, and abundance and relate these data to stream habitat and water quality condition. By using scientifically sound monitoring data, park managers have a better understanding of ecosystem trends, and are therefore better able to manage and protect aquatic communities within the monument.



Figure 1. Sampling Pipestone Creek in 2015.

Methods:

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

- Fish communities were sampled at two reaches (above the Winnewissa Falls and at the lower park boundary) in Pipestone Creek from 2001-2015 using seining techniques (Figure 1).
- All fish captured were identified to species, measured, and inspected for diseases or abnormalities prior to their release.
- Fish community diversity, abundance, composition, and overall stream integrity (Index of Biotic Integrity or IBI) were assessed.

Summary of Findings:

- Eleven species were captured in 2015 and all have been collected previously in the park. The three species collected at the above reach were also found at the lower reach. Species richness at the above reach was the second lowest value seen since sampling began in 2001. Richness at the lower site was similar to previous years (Figure 2).

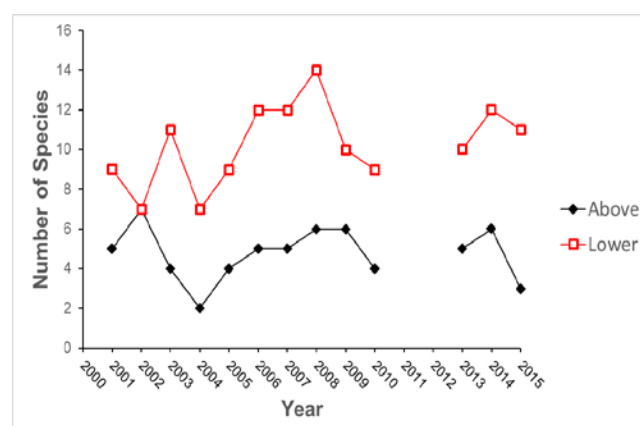


Figure 2. Number of fish species collected in the above and lower reaches of Pipestone Creek in Pipestone National Monument from 2001-2015.

- As in most years sampled, there was less diversity at the above reach compared to the lower reach in 2015, possibly due to differences in habitat conditions at the two reaches (Dodd et al. 2015). However, diversity of both reaches were within the range of previous years sampled.

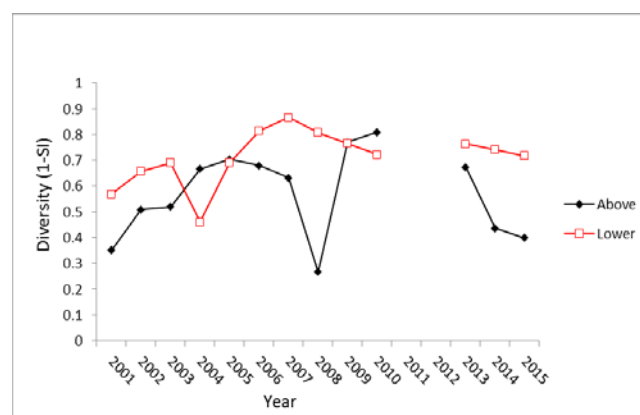


Figure 3. Diversity of fish captured in the above reach and lower reach of Pipestone Creek from 2001-2015.

- Number of fish captured in 2015 within the lower reach was low, but comparable to numbers captured in most years sampled. Abundance in the above reach was also low in 2015, but comparable to 2003-2005 and 2010 (Figure 4).

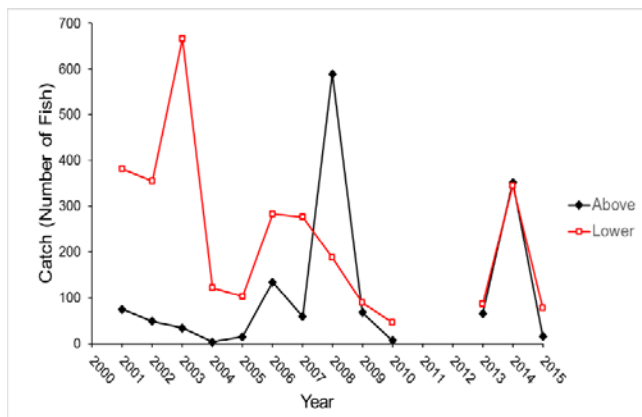


Figure 4. Total number of fish caught in Pipestone Creek in the above and lower reaches from 2001-2015.

- One Topeka shiner (*Notropis topeka*) was captured in 2015. Topeka shiners were collected in about half of the years (8 of 15 years) sampled (Figure 5).
- Based on fish community composition, the overall stream integrity was rated as fair to poor in the above reach and rated as good to fair in the lower reach from 2001-2015.
- The above reach consists of a homogeneous run habitat with bedrock substrate (Dodd et al. 2015), whereas the lower reach consists of pools, riffles, and runs. The heterogeneous habitat found in the lower reach contributes to the higher richness and diversity found at this site. The greater amount of niche availability in the lower reach allows for more species to persist.

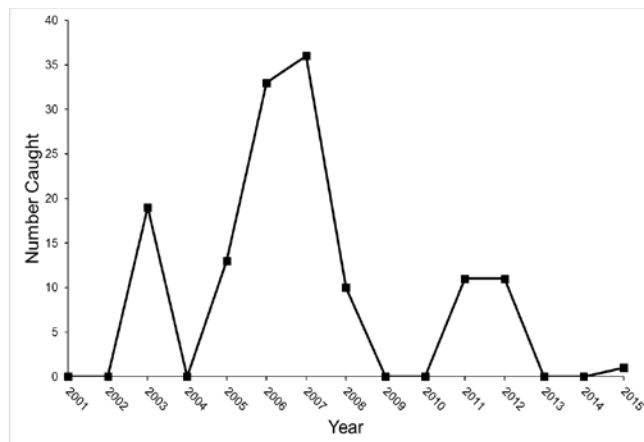


Figure 5. Number of Topeka shiner captured in the above and lower reach of Pipestone Creek from 2001-2015.

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Citations:

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