



Fish Communities at Hot Springs National Park

Importance: *Fish indicate stream health*

Fish community composition offers a good indication of long-term environmental conditions within a stream. Many native fish populations have decreased in abundance throughout their ranges, largely because of land use changes that contribute to habitat degradation. Information on abundance and diversity of native species can indicate a stream's biotic integrity, or health. Long-term monitoring of stream integrity equips park managers with a scientific basis on which to make informed decisions about aquatic resource management that protects the entire aquatic community.

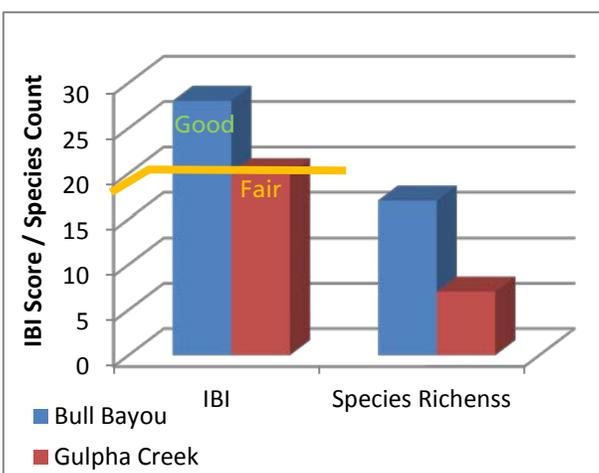


Long-Term Monitoring:¹ *Findings inform decision-making*

The Heartland Inventory and Monitoring Network sampled fish communities in Gulpha Creek and Bull Bayou for the first time in June 2009. Fish were captured using electrofishing and identified, measured and inspected for diseases or abnormalities. The Network collected physical habitat and water quality information in conjunction with fish sampling. These data establish the baseline for assessing changes in stream integrity by using changes in fish community composition and stream quality as indicators of overall aquatic conditions. The Index of Biotic Integrity (IBI) assesses overall stream health using eight fish metrics, relating to the various types of species found (disturbance intolerant versus tolerant, generalist versus specialist, herbivore versus carnivore), numbers of fish in the sample and the occurrence of diseases. These various measures and indices provide status and trends in aquatic conditions when changes are examined over multiple years.

Status and Trends: *Diverse and stable fish communities*

Scientists found 18 fish species in the two creeks, but total fish abundance was low. Several species sensitive to human disturbance were found in both creeks. Bull Bayou had more than twice as many species of fish as Gulpha Creek, but



overall diversity was the same for both streams. Stream integrity was rated as good for Bull Bayou and fair for Gulpha Creek. Bull Bayou had a higher number of species intolerant of human disturbance than Gulpha Creek and fewer incidences of fish disease or anomalies. Scientists also found:

1. Findings in 2009 were similar to those found by other scientists in 2003.
2. In-stream habitat conditions and bank stability were favorable for supporting a native fish community representative of small Ouachita Mountain streams. Water quality parameters measured were within the Arkansas state water quality standards.

Index of Biotic Integrity scores indicate assessments of good and fair stream integrity. The IBI and Species Richness from samples at HOSP in 2009 quantitatively assess the stream integrity and composition of the fish community.

Heartland Inventory and Monitoring Network of the National Park Service. Visit

<http://www.nps.gov/im/units/hltn/index.htm>
... protecting the habitat of our heritage



¹ Dodd, H. R. and S. K. Mueller. 2011. *Fish community monitoring at Hot Springs National Park: 2009 report. Natural Resource Data Series NPS/HTLN/NRDS—2012/235. National Park Service, Fort Collins, Colorado.*