

Gamefish Locations in Relation to Depth, Bottom Hardness, and Macrophyte Biovolume in Sanford Lake, Wisconsin



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Sanford Lake

- A 35.6 ha mesotrophic drainage lake in Vilas County, Wisconsin.
- Undeveloped, virtually unexploited, and has a typical warm-water fish assemblage.
- Scheduled for an experimental introduction of coarse woody habitat in 2018.

Objective

- Identify habitat use of Walleye, Smallmouth Bass, and Muskellunge in Sanford Lake prior to the experimental introduction of coarse woody habitat.

Methods

Habitat Sampling

- Entire lake was surveyed with a Lowrance XDS™ sonar using BioBase™ mapping software.
- Depth (m), bottom hardness (from 0 (soft) to 0.5 (hard)), and aquatic plant biovolume (percent of water column occupied by plant matter) were collected at 15,349 locations.

Fish Sampling

- Seven Walleye, six Smallmouth Bass, and three Muskellunge sampled in July 2017 were surgically implanted with radio transmitters.
- Tagged fish were actively tracked by motorboat twice weekly until October 4, 2017. A total of 383 locations were recorded across all species.

Analysis

- Depth, bottom hardness, and biovolume data were compiled and mapped using a combination of BioBase™ mapping software and ArcGIS™.
- One-way ANOVA's and Tukey's HSD were used to compare mean depth, mean bottom hardness, and mean biovolume use among fish species. Data were transformed to meet model assumptions.

Discussion

- Walleye and Smallmouth Bass were found in areas with moderately hard bottoms, very little macrophyte biovolume, and an average depth of approximately 2.3 m (Figures 1 and 2).
- Muskellunge were found in shallower areas with higher macrophyte biovolume and harder bottoms than Walleye and Smallmouth Bass (Figures 1 and 2).
- Moderate bottom hardness and elevated levels of macrophyte biovolume are not common in Sanford Lake and are thought to be preferred by all species (Figures 1 and 2).
- A larger sample, especially for Muskellunge, would be beneficial. Fish 184 (green dots in Figure 1) was found most often in very shallow weedy areas, which may have driven much of the observed differences in mean depth, hardness, and biovolume usage among species.

Future Plans

- More fish will be fit with radio transmitters to gain more information on species habitat use in Sanford Lake.
- These results will be compared to similar results collected after Sanford Lake receives experimental additions of coarse woody habitat to assess the influence of additional coarse woody habitat on habitat use by these important gamefish species.

Results

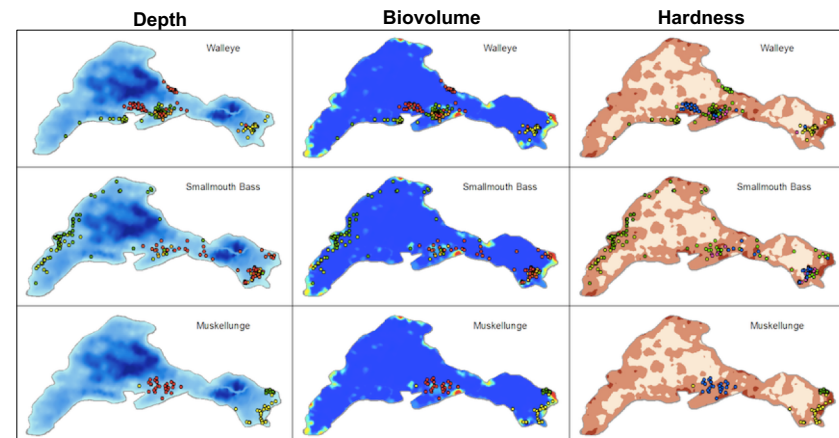


Figure 1. Maps of depth (darker is deeper), biovolume (blue is lowest, red is highest), and hardness (darker is harder). Superimposed points of different colors represent telemetry locations of individual fish.

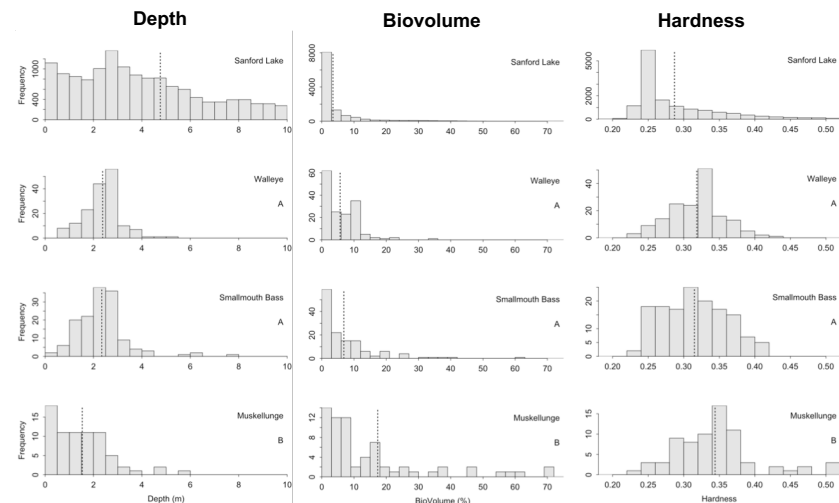


Figure 2. Histograms of depth, biovolume, and hardness for all locations on Sanford Lake and for telemetry locations of each fish. The vertical dashed line is the mean on each plot. Species with the same letter within a habitat variable did not have significantly different fourth-root transformed means for that variable.