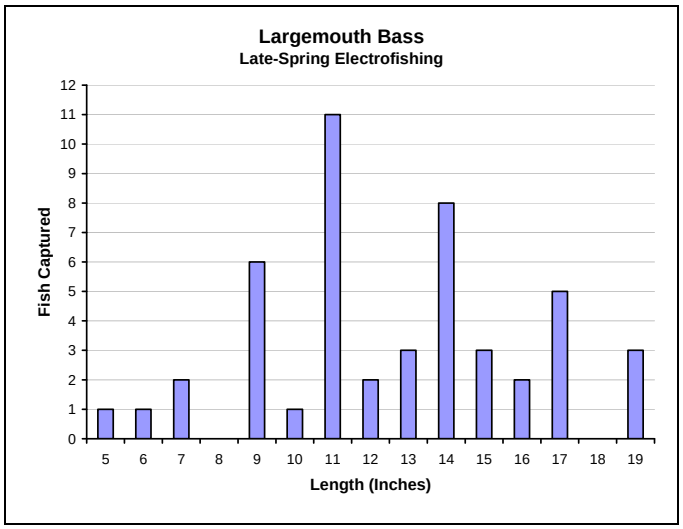
Late-Spring Electrofishing Survey Summary
Murphy Flowage, Rusk County, 2011

On June 2, 2011 WDNR's Fisheries Management Team from Park Falls completed an electrofishing survey to assess the status of largemouth bass and bluegill populations in Murphy Flowage. We sampled 2 miles of shoreline in 0.98 hour, including a half mile sub-sampled for panfish in 0.28 hour. Quality and preferred sizes referenced in this summary are based on standard proportions of world record lengths developed for each species by the American Fisheries Society. "Keeper size" is based on known angler behavior.

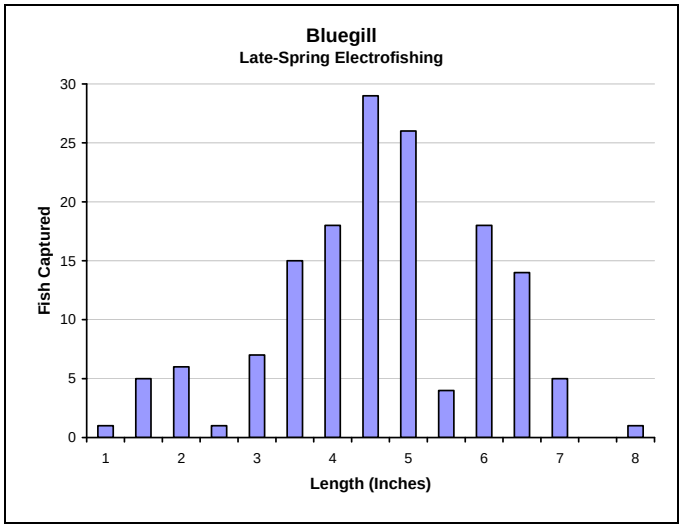
Largemouth Bass

Captured 22 per mile or 45 per hour ≥ 8"	
Quality Size ≥ 12"	59%
Preferred Size ≥ 15"	30%
Legal Size ≥ 18"	6%



Bluegill

Captured 274 per mile or 484 per hour ≥ 3"	
Quality Size ≥ 6"	28%
Keeper Size ≥ 7"	4%
Preferred Size ≥8"	0.7%



Background and Habitat Characteristics

Murphy Flowage is a 171-acre, soft water impoundment on Hemlock Creek surrounded almost entirely by Rusk County forest land. Three of its four tributaries are classified as trout waters. Maximum depth is 14 feet, and 45% of the reservoir is shallower than its average depth (5 feet). Bottom materials in the shallow area near shore are mostly silt (65%) and detritus (20%) with smaller amounts of boulder (10%) and gravel (5%).

The Department manned a research station at Murphy Flowage (1955 – 1970) to study the effect of liberalized harvest regulations on fish populations. Today's regulations aim to offer quality fishing opportunities. The minimum length limit is 18 inches on largemouth and smallmouth bass and 26 inches on northern pike. The daily bag limit on panfish is 10 in total.

Two consecutive winter drawdowns (1968-1970) attempted to control dense aquatic vegetation that hampered fishing access in portions of the flowage, a condition that persists today. The dam was breached by a flood in 1970 and reconstructed in 1994. Submerged woody structure is plentiful—the likely result of shrubs that re-colonized the exposed lakebed and natural recruitment of fallen trees along publicly-owned shorelands with little of this important habitat component intentionally removed by people.

Summary of Results

With water temperature in the mid 60s the timing of our early June survey corresponded well with largemouth bass and bluegill spawning activity, allowing us to accurately assess the relative abundance and size distribution of these populations. Reservoir elevation slightly above normal gave us advantage to access largemouth bass nesting among stumps and flooded alder in the shallow zones. By contrast some bass stunned or observed in deep water along steeply-sloping shorelines eluded capture.

Our survey revealed a fish community comprised primarily of largemouth bass and small bluegill, though favorable habitat conditions and survey results from September 1997 and 2002 suggest that the flowage supports fishable populations of northern pike and black crappie—both known to be poorly represented in late spring electrofishing samples.

An electrofishing capture rate of 45 largemouth bass ≥ 8 inches per hour indicates moderate population abundance. The catch included largemouth bass from all size classes—evidence that natural reproduction provides a consistent source of new adults since WDNR planted 10,000 fingerlings once in 1994 following dam reconstruction. A strong catch-and-release ethic among bass anglers coupled with the 18-inch minimum length limit appears to be effective for maintaining satisfactory proportions of preferred-size bass ≥ 15 inches long. Six percent of all bass in our sample attained legal length and 30% of those ≥ 8 inches were 15 – 19 inches long. Age analysis using scales revealed that largemouth bass grew to 10.5 inches long in 5 years (range = 9.4 – 11.4; n = 7) and 13.9 inches in 10 years (range = 13.7 – 14.2; n = 4)—an extremely slow growth rate 2.5 and 5.1 inches less than the regional average length at those ages. Apparently, voluntary and regulatory protections have allowed slow-growing adults to survive long enough to attain desirable size. However, largemouth bass starting the year 10 – 13 inches long grew on average only 0.9 inch (range = 0.6 – 1.3; n = 17) by the end of the growing season, a small annual gain unlikely to produce many bass of memorable-size ≥ 20 inches before the oldest individuals succumb to angler harvest or natural causes of death, despite their higher level of protection. Strategies to increase production of yellow perch, absent from our sample and a

preferred food of largemouth bass, could indirectly lead to improved size structure in the largemouth bass and northern pike populations.

Bluegills ≥ 3 inches were very abundant along the half mile of sub-sampled shoreline, but only 4% attained keeper-size ≥ 7 inches and only one (0.7%) grew to preferred size ≥ 8 inches. Age analysis using scales revealed that bluegill grew to 5.5 inches long in 6 years (range 5 – 6.1; n = 10) and 7 inches in 9 years (range 6.6 – 7.3; n = 6)—1.3 and 1.2 inches shorter than the regional average length at those ages. Due to high numbers and competition for limited food, the slow-growing population fails to produce bluegill in the sizes anglers prefer despite angling regulations intended to reduce the proportion harvested each year. Largemouth bass and northern pike are ineffective in controlling bluegill recruitment by predation in shallow lakes and impoundments with abundant aquatic plants. With insufficient predation to reduce their numbers when young, most bluegill in this system will continue to grow too slowly to reach preferred size before they die of natural causes. Stocking young walleye, a predator usually more effective in controlling bluegill abundance than largemouth bass and northern pike, is not recommended due to insufficient walleye spawning habitat and the potential for adverse impact on wild brook trout populations in three Class 1 trout waters upstream. But increasing the population of large adult yellow perch (≥ 8 inches) could help by increasing predation on juvenile bluegills during fall and winter.

Jeff Scheirer, Kendal Liebzeit, and Greg Rublee, WDNR Fishery Team—Park Falls
January 25, 2012

Approved by Dave Neuswanger
Fisheries Supervisor, Hayward Field Unit
February 2, 2012