

Fish Monitoring via Electrofishing



D Raver, US FWS

Division Electrofishing Boats

16ft boat used to survey Striped Bass in the Delaware River



14ft boat used to sample ponds and freshwater portions of tidal rivers



Electrofishing raft for areas with limited access and for American Shad Research in the Nanticoke River



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Electrofishing is one of the most efficient sampling methods used by fisheries biologists to collect fish to evaluate their populations. An electric current is used to temporarily 'stun' fish so that they can be more easily collected. Fish population data can be obtained safely if protocols are followed, thus only permitted researchers can utilize this method in Delaware.

On the Division's electrofishing boats, a generator is used to power a specialized electric unit which has variable voltage and amperage adjustments, pulse-width indicators, and a timer. Staff operate the unit using a foot pedal that is wired to the unit and to a set of anodes (positive current) that hang off of the bow of the boat. The current is delivered into the water through the anodes with the metal of the boat acting as the cathode (negative current) to complete the circuit. Usually pulsed, direct current is used to cause 'galvanotaxis' in fish. This is the involuntary muscle movement that causes the fish to swim toward the anode where staff on the bow of the boat can more easily collect them. Fish are netted quickly and placed into an aerated on-board livewell. Within a few minutes of being placed into the livewell, the fish typically return to their normal state. Biologists then net the fish out of the livewell and record length and weight measurements and note markings, wounds, or abnormalities. Some research projects also entail taking a few scales for aging or tagging the fish to examine fish movement and angler catches. The fish are then released back into the water.

Water visibility, fish size, level of stunning, and experience of the crew can have an impact on catches. Fish that occupy deep areas or that inhabit the pond bottom, like most catfish, may not float up towards the bow in time to be netted before they recover. Fish at the edge of the electrical field are often not fully stunned and may escape capture as well. Some species, such as chain pickerel, often move away from the area before the boat gets close enough to stun them. Not all fish in a water body can be collected, thus electrofishing results in a sub-sample of the population. Also, electrofishing is only effective in freshwater as more saline waters are too conductive to operate the unit. Despite these limitations, electrofishing is a reliable method for collecting target fish species to determine abundance, species composition, and population structure with minimal impact to the fish populations.



Staff netting a Largemouth Bass and transferring it to an on-board aerated livewell