# Survey Says...

**Text and photos by Jeff Kurrus**

*...a lot, as far as a fishery is concerned. Anchored in science, fish surveys are an invaluable part of fisheries management and provide both short- and long-term estimates regarding the health of a water body.*

"How's the fishing?" and "Catching any?" are two of the most asked questions heard on any of Nebraska's approximately 500 public fishing waters. A better question, however, would be "How healthy is this fishery?" Each spring, summer and fall, Nebraska Game and Parks Commission fisheries biologists attempt to answer this important question as well as they can, but it's not always easy.

Numerous factors can affect the dynamics of a fishery – summer and winterkill; overharvest; drought and floods; and too much or not enough aquatic vegetation. Needless to say, maintaining a quality fishery is a difficult process and without constant attention many fisheries would be negatively affected.

At Prairie View Lake near Bennington, Commission fisheries biologist Larry Pape and conservation technician Lindsey Richters prepare to electrofish just before nightfall. Electrofishing is a survey technique primarily used to analyze black bass populations.

In Nebraska, much of this attention begins in the form of fish surveys. Commission fisheries biologists essentially conduct two types of surveys. The first, and simpler, method is an angler survey that is used periodically to try and determine how many anglers are accessing a given body of water, how many hours they are fishing, and how many fish are they catching. This information is then compared to data from past years to help biologists determine whether any changes need to be made to management practices in place for that particular body of water.

Complementing that type of data are the annual netting surveys conducted on many of Nebraska's lakes and reservoirs. These surveys, based in scientific theory and empirical data, provide consistent methods for analyzing a fishery's health.

Because not all fish use the same type of habitat, however, no single netting technique can be used to capture and analyze all fish species. Therefore, this article will define the three different fish surveying techniques commonly used in Nebraska – electrofishing, trap netting and gill netting – and how they are used by fishery biologists to help provide better angling across the state.

## Electrofishing

Electrofishing is a fish surveying method that uses electricity, specifically DC current, to induce temporary paralysis in fish within the current's field. "Physiologically, shocking is hyper-stimulating muscles," said Daryl Bauer, Commission Fisheries Outreach Program Manager. "The electric current will attract fish to a certain extent, and once the fish are within the current's field, they get tetanus, meaning muscle contraction, forcing them to float to the surface." The fish are then netted into a livewell on the "shocking" boat, where data is taken by the boat's crew, usually a two-person assignment.

Despite being in an aluminum boat, the crew is protected from the electrical current by their rubber boots and gloves, as well as the size of the electrical field. The size of this field depends on water chemistry and the gear's settings, but generally would extend as much as 10 to 30 feet around the front of the boat and as deep as 6 to 10 feet.

This particular survey strategy is primarily used for black bass species, including large- and smallmouth bass, because of this species' propensity for shallow water. "This gear is effective in shallow water, usually 6 foot or less," said Commission fisheries biologist

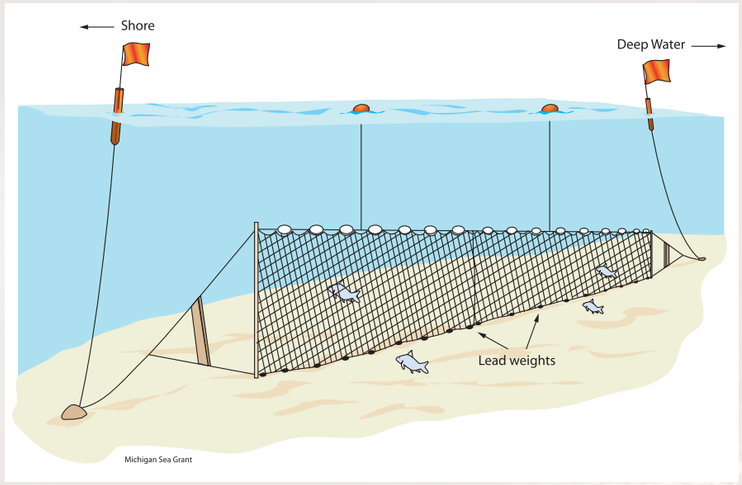
When surveying, scales are taken below the lateral line and at the tip of the pectoral fin from a subsample of fish.

These scales are then placed in a labeled envelope for later analysis.

PHOTO BY DOUG CARROLL

The scales are placed on a clear plastic slide and examined using a microfiche reader, microscope or similar device.

Biologists analyze each scale to determine the age and growth rate of the scale's donor.

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**Anchored perpendicular to the shore by surface buoys and lead lines, a gill net hangs like a curtain beneath the water. Made of monofilament line very similar to fishing line, the netting has holes of various sizes that ensnare fish when they attempt to swim through it. Fish usually become trapped when their gillcovers go through the hole in the net and the fish are unable to move forward or backward.**

Larry Pape. "We run our stations right down the shoreline in bass habitat." Stations are determined by either the length of an area surveyed or the time spent surveying. By standardizing the lengths and times, biologists are able to compare data from year to year in an effort to make appropriate management decisions regarding a body of water.

Those decisions start, as with all of the techniques mentioned here, with the number and sizes of the fish surveyed. "We'll set management objectives that may state, for example, that we want an electrofishing catch rate of 200 bass per hour on this particular body of water," said Bauer. "If we're not getting that number, then maybe we need more protection of that fishery because anglers are harvesting too many fish."

In addition to measuring abundance and size, biologists also take some scale samples to measure growth rates of the fish. Once this data is taken, fish are released back into the water unharmed.


**Commission fisheries biologists Jeff Schuckman (left) and Phil Chvala pull a trap net from the water last spring at Overton Lake southwest of O'Neill.**

## Trap Nets

Like electrofishing, trap nets are used in shallow water and similar information is gathered from fish that are caught. Outside of these similarities, trap netting constitutes an entirely different method of fish surveying.

Trap nets are used primarily for bluegill, crappie and perch. Bluegills are targeted from late spring through early summer, crappie during the fall, and northern pike and yellow perch in the early spring. Trap nets are also occasionally used to capture walleye, such as when biologists use them during the spring walleye spawn at Merritt Reservoir in order to collect eggs for stocking efforts in other lakes across the state.

A trap net works by allowing fish to catch themselves: "Any fish that swims down the shoreline will hit a barrier net, eventually funneling them into the frame net where they can't escape," said fisheries biologist Jeff Schuckman. To keep variables as consistent as possible, trap nets are set during the evening and pulled the following morning. "At times, I've seen an entire net completely filled up," said Bauer. "I've seen so many fish that two men couldn't pull the net into the boat."

Once in the boat, length measurements are taken and, just like electrofishing, scale samples are taken and weights are measured on a subsample of fish. "When taking scales and weights, we want to take a few fish from each length sampled, from the smallest to the largest," said Bauer. "We will take, say, five fish per centimeter group." By taking scales from fish of various sizes, Commission biologists are able to analyze the various year-classes of the fish surveyed to determine their growth rates.

"If growth rates are declining at a water body," said Bauer, "then water quality could be deteriorating, habitat isn't strong or there is a potential competitor, such as gizzard shad, causing problems. These measurements don't tell us exactly what is going on in a water body, but they do provide a few puzzle pieces and give us ideas of how to adapt."

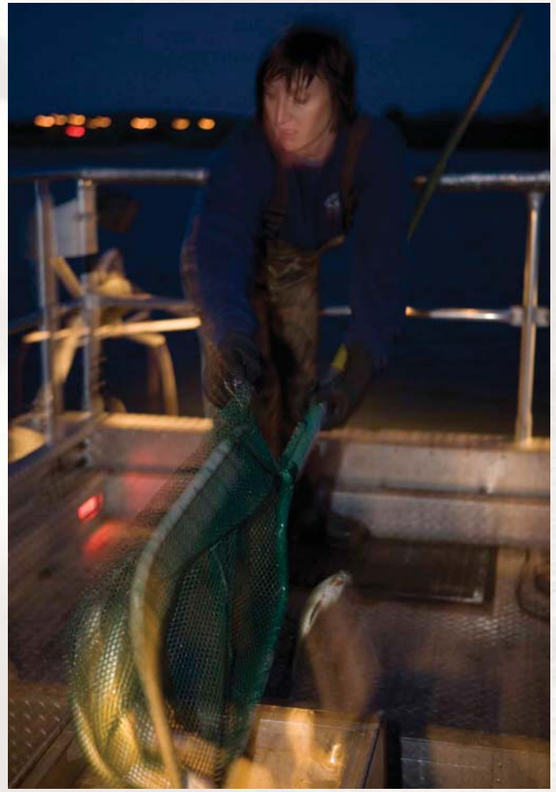
Just like electrofishing, fish are released back into the water unharmed, providing fisheries biologists with another technique for gathering reliable fish data while also keeping fish alive.

## Gill Nets

These hanging, deepwater nets, are suspended in the water column through the use of weights on the bottom of the net and floating buoys on top (see graphic on page 42). Gill nets are used to gather data on fish prone to using deeper, more open water, such as walleyes, wipers, channel catfish and white bass.

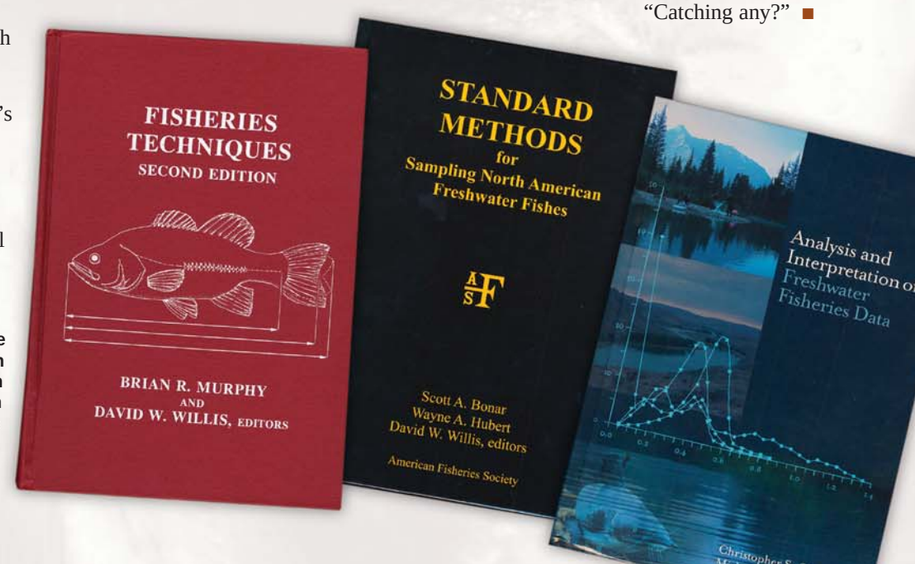
Measuring eight-feet-tall, these curtainlike mesh nets entrap fish that try to swim through them. "Our mortality rate is significant," said Bauer, "but for these species there are no other ways to collect population data. We may kill 100 walleyes during a survey from all the gill nets set, but there are a lot more walleyes going to the cleaning station on Memorial Day weekend at a number of lakes – these fish are a very small amount of the population and give us invaluable data."

Gill net stations, much like trap net locations, are marked by GPS coordinates to increase consistency from year to year, and nets are set for a consistent amount of time in an attempt to standardize effort.



**Richters drops a group of largemouth bass into an electrofishing boat's livewell. Biologists often survey fish at night because many species are more vulnerable to capture at that time.**

When these surveys are analyzed collectively, Commission biologists are able to better determine the health of a particular fishery by analyzing each species' recruitment, growth rate and individual year-classes. If you walk into Bauer's office any time of the year and ask, he's quick to hand you a copy of all the years of data that he and the rest of the fisheries biologists have processed. Even if you don't ask, he'll probably still tell you some places throughout the state where fish can be found and he may even point you to the Commission's latest "Fishing Forecast" where anglers can look at color bar graphs to see which lakes have the most crappie and which ones have the biggest bass. Bar graphs that are remembered during those late afternoons and early mornings where the most common question asked of survey crews is "What are you doing?" Quickly followed by, of course – "Catching any?" ■




**Fish surveying methods are guided by a science decades in the making, as seen in these fish surveying "manuals" known throughout the fisheries community.**