

Sampling Procedures - Baseline Lakes

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Baseline Lakes Sub-team

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Fisheries Surveys

Large Lakes (100 acres or larger with public boat access)

Summer Panfish/Fish Community Assessments: During the summer (July and August), sampling of littoral zone fish communities will be conducted with mini-fyke nets. The number of randomly selected stations will be scaled to lake size. At least six sets should be used on lakes <500 acres, and at least 8 sets on lakes > 500 acres. The number of sets suggested here should be considered the minimum. Nets must be set by mid-afternoon and fished overnight. The catch of each species captured should be recorded, with separate counts kept for young-of-year (YOY). Please also note the number of rusty crayfish caught in each net. Each net-set should be recorded on a separate data sheet (do not combine catches from more than 1 net on a data sheet).

Recommended nets are the same as those recommended for comprehensive surveys, and have two 3'x2' frames (3'x3' frames are also acceptable), four 2'-diameter hoops spaced 2' apart, and a 30"x 2' lead. Nets used should be 3/16"-mesh, died green; 1"-mesh exclusion netting is optional.

Fall Gamefish Assessments: Fall sampling is intended to provide biologists with an indication of the health of the fishery through estimates of gamefish and forage/non-game fish relative abundance (catch per effort), gamefish population size-structure (length-frequencies), growth, and gamefish recruitment (young-of-year catch per effort). The electrofishing is conducted at water temperatures from 50 to 68 F. Centrarchid lakes should be completed first and muskellunge lakes should be completed last (muskellunge young-of-year catch rates tend to increase as temperatures decline). The electrofishing should be conducted according to the following protocols:

- Boom electroshocking will be conducted at night. Whenever possible, two experienced people should be used to dip fish.
- The entire shoreline should be divided into 2-mile segments. Within each 2-mile segment, all gamefish will be collected in a 1-½-mile **Gamefish station** and ALL fish will be collected in a ½-mile **Index station**. The minimum coverage needed is as follows:

Total Lake Shoreline (miles)	Minimum Sampling Required (2-mile segments)
4 miles or less	Entire shoreline/2 index stations
4 to 16 miles	2 gamefish stations/2 index stations
16 to 24 miles	3 gamefish stations/3 index stations
24 to 32 miles	4 gamefish stations/4 index stations
> 32 miles	5 gamefish stations/5 index stations

- The first 2-mile segment should be chosen randomly and the other 2-mile segments should be equally spaced around the lake to achieve uniform coverage. As a general rule, at least 25% of the total shoreline (or 25% of the 2-mile segments) of each lake should be sampled.
- Within each 2-mile segment, all gamefish species (including young-of-year) will be collected within the 1-½ mile **Gamefish station** and a minimum of 250 individuals of each species will be randomly selected and measured to the nearest 0.1 of an inch or centimeter. If panfish are abundant, they may be defined as non-gamefish species and collected only during the ½-mile **Index stations**, as described below. Scales should be collected from the most abundant gamefish (5 per 1/2" or 0.3" length group). Scales may also be taken from the most abundant panfish species. Weights may be measured and recorded for fish that are aged (not required). All data should be recorded on form 3600-186 for gamefish and nongame fish and 3600-190 for panfish (See Appendix A). *The investigator should record the data from each 1-½ mile gamefish station and each ½-mile index stations separately as described below.*
- Within each 2-mile segment, a ½-mile **Index station** will be delineated where ALL species (including gamefish species) will be collected, identified, and counted. Fine mesh dip nets should be used within the Index station. If panfish were defined as non-gamefish species, then a minimum of 250 individuals of each species will be randomly selected and measured. All data should be recorded on form 3600-186 for gamefish and nongame fish and 3600-190 for panfish (See Appendix A). *Data from each ½ - mile index station (including any gamefish species collected) should be recorded separately and should not be combined with data from the larger 1-1/2 mile gamefish station.*

Small Lakes (< 100 acres with public boat access)

Fall Gamefish Assessments: Only fall gamefish assessments will be conducted on small lakes using the same procedures described for large lakes (see above). No summer mini-fyke netting will be conducted on small lakes.

Spring Gamefish Population Estimates

In order to calibrate and “ground truth” recent changes in the protocol (a move from spring to fall electrofishing), each fisheries biologist with a Baseline Lakes workload is asked to conduct a gamefish population estimate on one of the baseline lakes sampled in each year of the biennium. The choice of the lake and species will be left up to the biologist, but generally, if baseline data indicate a fishery-related problem, a more detailed analysis can be completed within the same fiscal year (the following spring).

Population abundance and population size- and age-structure of the predominant gamefish species should be estimated based on the Comprehensive Survey guidelines. Generally, northern pike and walleye are marked, measured, and scales are taken from ice-out to peak spawning (40-50 F) using fyke nets; recaptures are made using electrofishing within the spawning period (45-50 F). For bass, fish are marked, measured, and scales are taken

during pre-spawn using electrofishing (55-60 F) – walleyes are also collected at this time, if they were marked earlier, to complete a total population estimate. Recaptures are also made with electrofishing during and after the spawning period, within 2 weeks of the marking run (60-69 F). Either a single-census estimate can be made, or multiple-recapture periods can be used to calculate a Schnabel-type estimate if the initial number of recaptures is low. Muskellunge population estimates should be conducted using fyke nets during the spawning period in two consecutive years, with first year for marking and the second year for recapture.

Fish Contaminants

Each spring a collection schedule for fish contaminants is developed. This schedule should be examined before conducting planned field work to see if fish are needed for contaminant analysis. See the following folder for the collection schedule and for collection procedures:

FHCOMMON:>MONITORING\Fish Contaminants

Training and Quality Assurance

Training of field staff for consistency in data collection and recording is critical to the success of the baseline-monitoring program. Training in taxonomy, deployment of field gear, and general program implementation will be made available to all staff periodically. A layer of quality assurance to maximize data integrity will be initiated through a data screening process built into the statewide database. All monitoring protocols employed will, at a minimum, meet the Department's data standards as developed by the Aquatic and Terrestrial Resources Inventory (ATRI) Team.

Water Quality Monitoring

Baseline water quality monitoring will be completed through the use of remote sensing data that are calibrated with data from the Lakes Volunteer monitoring program. The Bureau of Science Services will conduct this work.

Trend Lakes

Background - This program is currently under review by the Bureau of Science Services and recommendations for future sampling design and protocol will be made by early in 2006. Previously, about 56 lakes were identified statewide to monitor long-term trends in lake condition and provide regional reference conditions for each defined lake class. These lakes were to be used to characterize within-lake and among-year variability in Baseline Water Quality monitoring.

Sampling Protocol - Once the trend lakes have been identified, GIS or aerial photography will be used to assess watershed and riparian land-use. This should be repeated every seven to ten years. For 2005, the following protocol should be followed:

Trend lakes are sampled annually for water quality with an "expanded" baseline monitoring protocol (see 03_04_04 revision). Trend lakes should be sampled every 3 years for fisheries parameters, when possible.

Water quality monitoring on Trend lakes includes collection of total phosphorus in spring (as described above for Status Lakes) and components of the TSI (total phosphorus, Secchi disk, and chlorophyll a) along with field profiles for dissolved oxygen, temperature, and conductance, 3 times during the summer (15 July - 15 September). This should be done once every 2 to 3 weeks. In addition, other water quality parameters collected once each summer, include conductivity, pH, and alkalinity, color, and, on specified lakes, nitrate+nitrite and total Kjeldahl-N. Again, every attempt should be made to coordinate with ongoing "Self-Help" monitoring so that we are not repeating their efforts. For example, if "Self-Help" volunteers are collecting TSI data in the summer, don't do that portion of the protocol.

As with the Status Lakes, additional limnological parameters will be sampled on a one-time basis on Trend Lakes in order to refine the initial lake classification. These include calcium and magnesium. These measures should be collected once during the first summer sampling visit to each lake. Once these parameters have been estimated for a lake, they should not be determined on subsequent visits.

APPENDICES

Appendix A- DNR Field Forms: 3600-186 (generic), 3600-187 (gamefish), and 3600-190 (panfish) on the FHmonitoring common drive under \fhmonitoring\baseline lakes\Protocol&Strategy\Field Data Forms.

You may use any form you prefer, but make sure you collect all mandatory variables required in the FH database. On the FHmonitoring drive, the “.pdf” file is the form and the “.doc” file with the same number is the instructions on the reverse side.