Manual of Fisheries Survey Methods II: with periodic updates

Chapter 4: Forms – Uses and Points of Clarification

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Suggested citation:

Schneider, James C. and J. W. Merna. 2000. Forms – uses and points of clarification. Chapter 4 *in* Schneider, James C. (ed.) 2000. Manual of fisheries survey methods II: with periodic updates. Michigan Department of Natural Resources, Fisheries Special Report 25, Ann Arbor.

Chapter 4: Forms – Uses and Points of Clarification

James C. Schneider and James W. Merna

Survey forms are listed and briefly described in this chapter. Only items that may be confusing to users are discussed in detail. Photocopies of forms may be found at the back of this chapter. For additional clarification, refer to related text in the Manual of Fisheries Survey Methods II and to the examples provided with the 1981 version of the Manual of Fisheries Survey Methods. Some equivalents are in the electronic Fish Collection System.

SURVEY PLANNING (R-8060)

Use to plan all surveys. The purpose of this form is to assist in reviewing past surveys, setting objective(s) for the proposed survey, and communicating this information to others. An electronic equivalent is available.

LIMNOLOGY (R-8056)

Use to summarize water analyses and vegetation observations for a lake. Some data may be recorded in the electronic version. Most requirements are self-explanatory. Note that space is provided for certain chemical analyses for which most survey crews are not equipped. Two columns are available for temperature-oxygen depth profiles. These can be used for two stations, if desired, or for one station if the lake is exceptionally deep. One station located in the deepest part of the lake is adequate unless the lake consists of two or more distinctly separate basins.

Wave condition–Recorded as calm, choppy, rough, or white caps. These designations give a better indication of wind effects on a lake than simply recording wind velocity.

Maximum depth of vegetation–In most lakes it is possible to see the maximum depth of vegetation growth. The actual depth at the line of demarcation should be measured with a sounding line or an echo sounder. If plants are not easily seen, the limit of growth can be determined with a plant hook or boat anchor.

Percent shoal–Defined as percentage of total lake area shallower than 5 m or 15 feet. Measure on a hydrographic lake map with the aid of a planimeter or grid. If map contours are given in 5-foot intervals, use the 15-foot contour; if the map is scaled in meters, use the 5-m contour.

Pollution–Record any pollution observed. The "comments" section should mention if remedial steps are being taken and if a report has been filed through administrative channels.

Vegetation–Aquatic vegetation will be classified as to type (submergent, emergent, floating, and *Chara*), and ranked in abundance as: none, sparse, common, abundant, or excessive. A designation of excessive indicates nuisance conditions that interfere with recreational uses of the lake. (Excessiveness may be confirmed by frequent public complaints and requests for plant control programs.) The observations required for the form evaluate abundance of various types of vegetation throughout the entire littoral area. For each type of vegetation, list a combination of percentage and abundance designations to equal 100% of the littoral area. For example, submergent weeds might be excessive throughout 50% of the littoral (50E), common in 20% (20C), and sparse in 30% (30S). The entire designation for "submergent" would thus be: 50E, 20C, 30S. Give similar designations for all other vegetation types, even for types absent from that lake (Example: Floating 100N).

Additional comments–Observations worthy of comment might include (but not be limited to):

- Sensitive areas to be protected such as marshes, spawning shoals, etc.
- Evidence of dredging or filling or other perturbation.
- Residential development: percent developed, whether on septic tanks or sewers, etc.
- Immediate watershed: percent in agriculture, forest, old field, residential, urban, etc.
- Existing or potential erosion problems.
- Potential for water quality management or rehabilitation.
- On-going vegetation control programs.

LAKE PHYSICAL DESCRIPTION (R-8057)

Use to summarize information from various sources on the physical characteristics of a lake. Line items 1-5 are to be completed from available maps and reference materials listed on the form (data for public lakes larger than 100 acres are available now); other lines are to be completed by on-site surveys. Update form every 20 years or when new information becomes available.

LAKE AREA AND VOLUME ANALYSIS (R-8069)

Use for calculating the area and volume of a lake from its hydrographic map. See Chapter 12.

FISH COLLECTION (R-8058) and **FISH COLLECTION (CONT)** (R-8058-1)

This form has been replaced with an electronic version in the Fish Collection System but the important elements remain the same. Intended primarily for distribution and permanent file storage, but may be adopted for use in the field as well. Use for fish collections from lakes, rivers, or streams. Summarizes information on sample site(s), year, catch, CPE, LENGTH-FREQUENCY, and LENGTH-BIOMASS. Extensive space is provided for maps, analysis, and comments. *Not every item of information requested is relevant to each survey*. These forms may be used in four ways to summarize catch:

a. By gear type and mesh size, for all collection sites. A compulsory use. More than one kind of gear may be listed sequentially on one sheet, as illustrated.
b. For all gear types, for all collection sites. An optional use in addition to (a). May be put on the same sheet as (a).
c. For an index station.
d. By individual collection site or net set.

Side 1

Summary of.–Indicate source of information on this form, i. e., site and gear.

Sample site(s).–Indicate number of locations and ranges in depth and temperature where gear was fished. If water temperature was uniform from surface to bottom, record only surface temperature.

Sample location(s).–Describe, or use space below for sketching a map.

Cover.–Rank abundance of cover (none, sparse, moderate, abundant) and describe type (vegetation, undercut banks, logs, etc.).

Fish foods.–Comment on foods observed in the habitat or in fish stomachs.

Water clarity and level.–Refers to conditions which might affect gear efficiency (especially electrofishing).

Conductivity.–Measure in microSiemens (µS) per cm^2. Record temperature elsewhere.

Electrofishing efficiency.–Either rank as poor, satisfactory, or good; or for mark-and-recapture studies, give recapture percentage on second "run" (i. e., number recaptures divided by total catch during second run).

Stream physical data.–It is recommended that length, average width, average depth, average velocity, and annual discharge be determined by the methods in Section 2.1.2. If those methods are not followed, prefix the estimates with "approx.". When a current meter is not available for the proper determination of average velocity, use "the wood chip method" and record the result as "surface velocity."

Bottom type.–Primarily intended for stream surveys, but also may be used to describe lake sample sites. Estimate percentage of bottom comprised of bedrock, boulder (diameter greater than 10 inches), cobble (3 to 10 inches), gravel (1/8 to 3 inches), sand, silt, clay, muck, and detritus.

Gear.–List number of units used, types, unusual features (see description of standard gear in Chapter 3) and, for trap and fyke nets, height and pot mesh size (stretched). For example: 5 exp. gill; 1 G. L. gill; 3 gill 100 ft. x 8 ft. x 1 inch suspended at surface; 2 traps 3 ft. x 1 1/2 inch; 7 traps 6/3 x 1 1/2 inch; 3 fykes 4 ft. x 1 inch; etc. For electrofishing gear, give AC or DC, voltage, amperage, number of electrodes, and day or night operation. For seines, indicate length, height, and stretch mesh as follows: seine 50 ft. x 6 ft. x 1-inch bag. For recording fishing effort, code gear as: T = trap, F = fyke, EG = experimental gill, GLG = Great Lakes gill, E = electrofishing, S = seine, and TR = trawl. Develop and define other codes as needed.

Effort.–Standard units of effort are given in Table 2.4. For net lifts, record the total number of lifts which were fished one or more nights (e. g., four nets lifted once a day for 3 days = 12 net lifts; four nets lifted every third day = 4 net lifts). For net nights, record total number of lifts which were fished one night (net nights = net lifts if the nets were lifted once a day; net nights =0 if four nets were lifted every third day). For area covered, record acres seined, trawled, or electrofished (for streams). For hours shocked, record actual fishing time spent in lake or stream (optional) electrofishing. Non-standard types of effort, such as nets lifted more than once a day, should not be recorded here but may be noted under "Analysis, map, remarks, fishing reports". Standard effort which is not representative (for example a torn net) should be footnoted and explained, and CPE should not be calculated from it.

Purpose of collection.–State survey objectives or stimuli, to aid in the interpretation of sampling methods and results. Examples: Reports of poor fishing, basic inventory, survey of walleye recruitment.

Data collected.–Indicate types of data collected and types of summaries prepared. The Catch Summary, Length-Frequency and Length-Biomass summaries are on the FISH COLLECTION form; the other summaries appear on other forms.

Analysis, map, remarks, fishing reports.—Use this space for (1) commenting about gear, methods, condition and disease of fish, etc.; (2) a map of sample sites; (3) analysis and interpretation of the collection; and (4) reliable fishing reports.

Side 2

Length.–Record average length or range in length (to 0.1 inch).

Avg. Wt.–Total lb. ÷ No., or from Length-Biomass sample. Round to 0. 01 lb.

Total.–Total catch, by species and gear, in both numbers and pounds. Total pounds may be estimated from the Length-Biomass sample (Section 2.4.2.13). Round pounds to nearest 0.1 when <50; to whole pound when >50.

Total %.–For each type of gear: total number (and pounds) caught of each species ÷ All Species Total x 100. Round to whole number when >1%.

CPE.–In terms of both numbers and weight (see Section 2.4.2.9). Standard units of effort are net lifts (overnight sets); area (in acres) for seine, trawl, and stream electrofishing; time (in hours) for lake electrofishing. Round to 0.1 when <20; to whole number when >20.

%L-A.–Percentages of the Length-Frequency and Length-Biomass samples which were of legal or acceptable size. See footnote on form for definitions. Space is provided on the bottom of the form for alternative definitions. Round to whole number when >1%.

Length-Frequency.–Measure to inch group all fish caught, or sample the first 200 (see Section 2.4.2.12). Record numbers of fish in each group in "No." column and total number in sample at bottom of column.

Length-Biomass.–Determine weight of fish in each inch group of the Length-Frequency (see Section 2.4.2.13). Record as pounds under "Lb." column, rounding to 0.1 when <50 and to nearest pound when >50. Sum to obtain sample total pounds and divide by sample total numbers to get an average weight for fish collected.

All Species Total.–Grand total for that gear in numbers and pounds.

LENGTH-WEIGHT FIELD DATA (R-8059)

Intended primarily for field use for recording lengths and weights of individual fish, or of small lots of fish. Add appropriate headings and calibrate as needed. Space is provided for computing average weight by inch group, as an aid in calculating biomass estimates for the FISH COLLECTION form. Data recorded on scale envelopes in the field may be added to the form. Data may be transferred to a spreadsheet or other computer program for calculating a length-weight regression. The information recorded on this sheet is to be summarized on FISH COLLECTION and LENGTH-WEIGHT REGRESSION forms for distribution and permanent storage. The field sheet may be stored by the collector.

LENGTH-WEIGHT REGRESSION (R-8059-1)

A summary form for distribution and permanent storage of length-weight relationships of species taken in a fish collection. Conventional units of measurement are inches and pounds. Give the regression-equation on front of form, or plot the relationship on log-log graph on back of form.

FISH GROWTH (R-8070)

A computerized version is now in Fish Collection System that allows entries for individual fish samples, automatic tabulation, and comparison to state averages. Note *unusual* methods, such as: a random or complete sample of the catch instead of the usual stratified random size-selective sample; ages determined from otoliths, fins, etc., instead of scales; selection of key scales or scales from areas of the body other than the recommended areas; weighted mean lengths (see Chapter 15) instead of simple averages; etc. See Chapter 9 for the state average growth rates and the method for calculating growth indices. Note that space is provided for analysis of results.

POPULATION ESTIMATES (R-8073)

Use to summarize data and computations for population estimates of fish. See Chapters 7 and 8. The form provides space for (1) raw data, (2) estimates by inch groups, (3) estimates by age groups, and (4) survival rates. Items 3 and 4 should not be attempted unless data are adequate (see Section 2.4.17). The form is set up for one species per side, but more could be inserted.

Sum.–The sum of all inch-group estimates. Note that 95% limits on the sum of the estimates are not simply the sum of the limits on inch-group estimates. See Chapters 7 and 8.

Survival.–Round off to 0.1% (e.g., 47.3%).

Estimates, lb.–Obtain for each inch group by multiplying estimated number by average weight, then summing.

NOTES AND REFERENCES (R-8077)

Use to record any valuable information not contained on other forms.

LAKE SURVEY SUMMARY (R-8063)

Use for summarizing physical, biological, and fishery information about a lake. Most items on form are self-explanatory; items 20 and 23 are explained below.

20. *Oxygen-thermal types.-B*ased on mid-late summer oxygen temperature profiles and history of winterkill:
    1. Stratified lakes with at least 2 ppm DO at all depths.
    2. Stratified lakes in which DO falls from a high level to 2 ppm in the hypolimnion.
    3. Stratified lakes in which DO falls from a high level to 2 ppm between the 5-foot level of the thermocline and the top of the hypolimnion.
    4. Stratified lakes in which DO falls from a high level to 2 ppm between the bottom of the epilimnion and the 5-foot level of the thermocline.
    5. Unstratified lakes in which surface temperatures exceed 72°F.
    6. Unstratified lakes in which surface temperatures do not exceed 72°F.
    7. Lakes subject to frequent, severe, fish kills (DO falls to near zero throughout the lake).
23. *Vegetation*.-Use ranking system for LIMNOLOGY form.

STREAM SURVEY SUMMARY (R-8064)

Use for summarizing physical, biological, and fishery information about a stream. Most items on form are self-explanatory or are explained in the text (see Section 2.1.2). Items 2 and 3 are explained below.

2. *Stream*.–name stream on which study station is located.

3. *Drainage system.*–name streams and rivers (in downstream order) traversed by water passing through the study site on its way to the Great Lakes.

Example: Stream – Butternut Creek
Drainage system – Butternut Creek, Fish Creek, Maple River, Grand River.

MANAGEMENT RECORD (R-8076)

Discontinued in lieu of Prescriptions. Summarize management recommendations and actions.

HERPS OBSERVATIONS (R-8001)

A new form has been developed for the Fish Collection System. Use to record incidental sightings of turtles, lizards, salamanders, frogs, toads, and snakes.

Written 1981 by J. W. Merna and J. C. Schneider
Updated 11/99 by J. C. Schneider

SURVEY PLANNING form, R-8060 (reduced to fit on this page).

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

Fisheries Division

SURVEY PLANNING

Water _____ Date _____

County _____ T. _____ R. _____ Sec. _____

Objective:

Previous surveys:

Gear types and dates

Comparison of results

Fish population changes

Limnological data and dates

Recommendations:

Gear type

Timing

Limnological measurements

Special studies

Units of measurement

Data to collect

CATCH SUMMARY

LENGTH-FREQUENCY

LENGTH-BIOMASS

LENGTH-WEIGHT

GROWTH

MARK & RECAPTURE ESTIMATES

AGE-FREQUENCY & SURVIVAL

R8060 4/81

LIMNOLOGY form, R-8056 (reduced to fit on this page).

MICHIGAN DEPARTMENT OF NATURAL RESOURCES R-8056 4/81

Fisheries Division LIMNOLOGY

Water _____ T. _____ R. _____ Sec. _____ Date _____

County _____ Id. _____ Station _____

Depth M	Temp. °C	O_2 ppm	Depth M	Temp. °C	O_2 ppm

Time AM PM	Temp. Air °C	Sky	Wave condition ↓	Preceding weather	Maximum depth of vegetation	Percent shoal (< 5M)	Water color ↕	Secchi disc (0.1m)	Chlorophyll a

Pollution (✓) None _____ Light _____ Moderate _____ Severe _____

Type (✓) Erosion _____ Organic _____ Chemical _____ Other _____

Comments: _____

Vegetation: Percent of littoral where: none (N), sparse (S), common (C), abundant (A), or excessive (E).

Submergent _____ Emergent _____

Floating _____ Chara _____

Parameter	Surface	Mid-depth (____ M)	Bottom (within 1M)
pH			
Alkalinity	pHth MO	pHth MO	pHth MO
Conductivity			
Chlorides			
Suspended solids			
Total solids			
Total phosphorus			
Ortho-phosphorus			
Nitrate			
Nitrite			
Ammonia			
Organic nitrogen			

Maximum depth at station: _____ Prepared by _____ Sec. _____

↓Calm, choppy, rough, white caps. ↕Clear, light brown, brown, dark brown, turbid.

(over)

Optional observations:

1. Additional parameters analyzed by Inland Lake Management Unit:

Parameter	Surface	Mid-depth (____ M)	Bottom (within 1M)

2. Additional comments on condition of lake: _____

3. Sketch map of lake with distribution of aquatic plants in littoral zone, and location of sampling station.

Copies to: Lansing ☐, Region ☐, District ☐, I.F.R. ☐, Lake Mgt. ☐.

LAKE PHYSICAL DESCRIPTION form, R-8057 (reduced to fit on this page).

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
Fisheries Division

R8057
Rev. 3/82

Lake _____ T. _____ R. _____ Sec. _____ **LAKE PHYSICAL DESCRIPTION**

County _____

Id. _____ Prepared by _____ Date _____

1. Lake: Area (ha) _____ Perimeter (km) _____ Shape factor ↓ _____ Ref. _____
2. Watershed: Area (km) _____ Perimeter (km) _____ Shape factor ↓ _____ Lake area ÷ watershed area _____ Ref. _____
3. Maximum depth (m) _____ Mean depth (m) _____ Volume (1000's of m³) _____ Ref. _____
4. Heating degree days (base 55°F) _____
5. Flushing rate (years) _____ Ref. _____
6. Drainage type (✓): Seepage _____ Intermittent outlet _____ Permanent outlet _____
7. Inlets: Names _____
   Mean annual discharge (m³/sec) _____ Ref. _____
8. Outlet: Name _____
   Mean annual discharge (m³/sec) _____
   Name of main drainage system _____
9. Lake type (✓): Natural _____ Natural with dam _____ Impoundment _____
10. Dam: Height (m) _____ Boat lock (✓): No _____ Yes _____ Functional fish ladder (✓): No _____ Yes _____
    Effect on upstream fish movement (✓): None _____ Hinders _____ Completely blocks _____
    Comments: _____
11. Annual fluctuation in water level (✓): 0-0.5m _____ 0.5-1m _____ 1-2m _____ more than 2m _____
12. Maximum long-term fluctuation in water level (m) _____
13. Soils in 0-2m (%): Organic _____ Muck _____ Clay _____ Marl _____ Sand _____ Gravel _____ Rubble _____ Bedrock _____
14. Soils in 2m+, (%): Organic _____ Muck _____ Clay _____ Marl _____ Sand _____ Gravel _____ Rubble _____ Bedrock _____
15. Shoreline (% by type): Bog _____ Swamp _____ Marsh _____ Upland _____
16. Lake use (✓): Private _____ Semiprivate _____ Public _____
17. Approximate number of: Cottages and houses _____ Resorts _____ Boat liveries _____
18. Surrounding land use (%): Undeveloped _____ Agricultural _____ Urban _____
19. Describe topography, soil, vegetation: _____

↓Shape factor formerly called shore development factor. Equals perimeter ÷ 3.5449 $\sqrt{\text{area}}$.

COPIES TO: Lansing ( ), Region ( ), District ( ), I.F.R. ( )

References for items 1, 2, 3, 5, 7, 8

Ref. code:

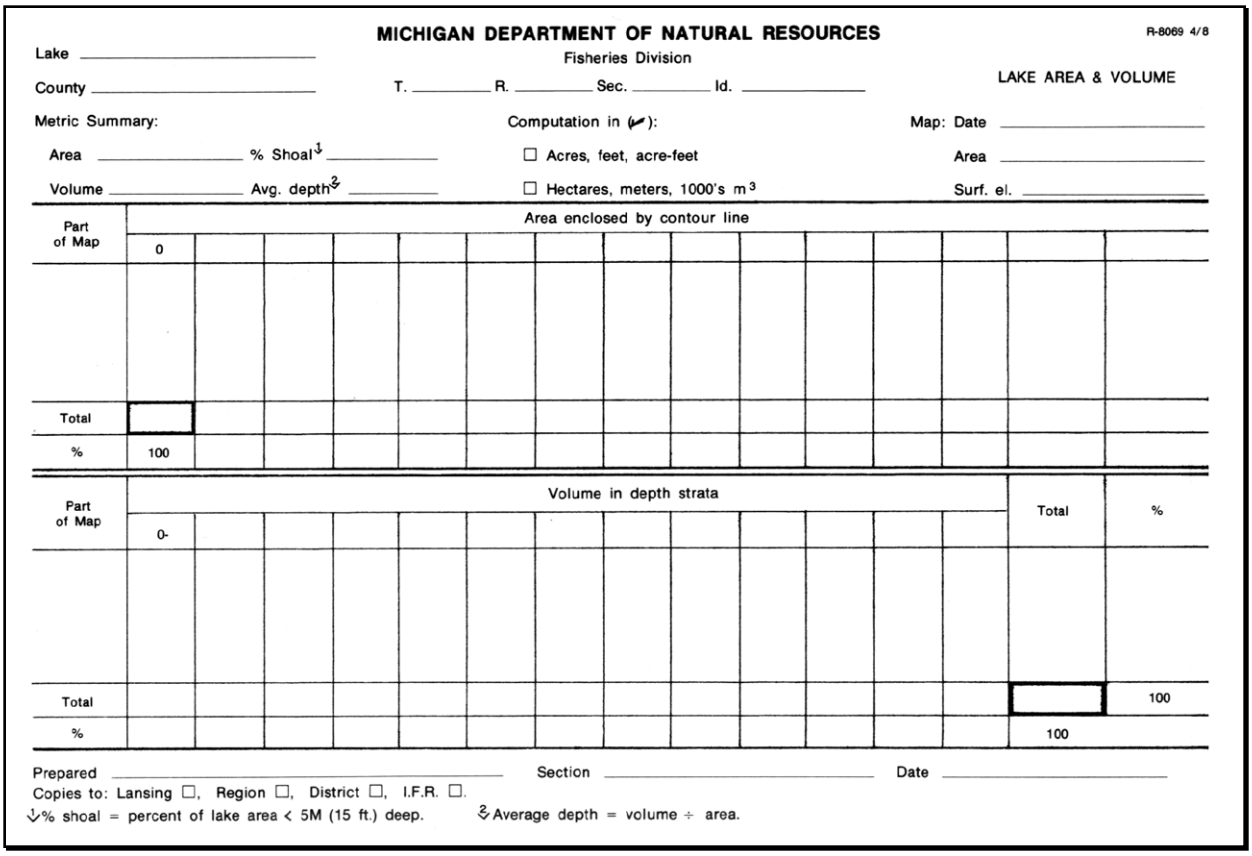
1. Marsh, William M. and Thomas E. Borton. 1974. Michigan Inland Lakes and their Watersheds (an atlas). Michigan Dept. Natural Resources, Water Resources Comm., 166p. (Data for lakes larger than 100 acres. Based on USGS topographic maps and may be in error if shoreline alteration has taken place since mapping.)
2. Fisheries Division lake maps (cite date of mapping).
3. Miller, J. B. and T. Thompson, 1970. Compilation of data for Michigan lakes. U.S. Dept. Interior Geol. Surv., in cooperation with Mich. Dept. Nat. Resources.
4. Anonymous. 1975. A compendium of lake and reservoir data collected by the National Eutrophication Survey in the Northeast and North-central United States. U.S. Environ. Protection Agency, National Eutrophication Survey Working Paper No. 474.
5. Humphrys, C. R. and R. F. Green. 1962. Michigan lake inventory bulletins 1-83. Mich. State Univ., Dept. Resource Devel., East Lansing, Michigan.
6. Fisheries Division files (e.g., lake volume analysis).
7. Land Resource Programs files.
8. Water Management Division files.
9. Water Quality Division files.
10. U. S. Forest Service files.
11. Derived by the preparer of this form.
    Other publications and sources (number and cite below). (e.g., P. W. Laarman, Fisheries Research, has estimated many mean depths.)

Reference for item 4

Van Den Brink, C., N. D. Strommen, and A. L. Kenworthy. 1971. Growing degree days in Michigan. Mich. State Univ. Agr. Exp. Sta., Res. Rep. No. 131, 48 p.

Continuations (use item numbers):

LAKE AREA AND VOLUME ANALYSIS form, R-8069 (reduced to fit on this page).



MICHIGAN DEPARTMENT OF NATURAL RESOURCES R-8069 4/8

Fisheries Division

LAKE AREA & VOLUME

Lake _____ County _____ T. _____ R. _____ Sec. _____ Id. _____

Metric Summary: Computation in (✓): Map: Date _____

Area _____ % Shoal[1] _____ ☐ Acres, feet, acre-feet Area _____

Volume _____ Avg. depth[2] _____ ☐ Hectares, meters, 1000's m^3 Surf. el. _____

Part of Map	Area enclosed by contour line														
	0														
Total															
%	100														

Part of Map	Volume in depth strata												Total	%
	0-													
Total														100
%													100	

Prepared _____ Section _____ Date _____

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[1] % shoal = percent of lake area < 5M (15 ft.) deep. [2] Average depth = volume ÷ area.

FISH COLLECTION form, R-8058 (reduced to fit on this page).

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

Fisheries Division

FISH COLLECTION

Water _____

County _____ T. _____ R. _____ Sec. _____ Date _____

I.D. _____ Sheet 1 of _____

Summary of: ( ) All sites ( ) Coll. site No. _____ ( ) Index site No. _____ ( ) All gear ( ) Gear _____

Sample site(s): Number of | Depth Range | Temperature range

Location(s) (describe or map below):

Cover (abundance, type):

Fish foods:

Water clarity, level, etc.: | Cond.: | Electro. eff.:

Weather: Present | Preceding

Temperature: Air | Water surface | Time of day

Stream: Length | Avg. width | Avg. depth

Velocity: Ave. | Surface | Discharge

Bottom type:

Gear Description:

Effort: Net lifts | Net nights | Area covered | Hours shocked

Purpose of collection:

Data collected (✓): ( ) CATCH SUMMARY ( ) LENGTH-FREQUENCY ( ) LENGTH-BIOMASS ( ) LENGTH-WEIGHT REGRESSION
( ) GROWTH ( ) MARK & RECAPTURE ESTIMATES ( ) AGE-FREQUENCY & SURVIVAL

Analysis, map, remarks, fishing reports:

FOLD
HERE

Analysis by _____ Sec. _____

Collection by _____ Sec. _____ Identification by _____ Sec. _____

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R8058
Rev. 3/82

FISH COLLECTION form, R-8058 reverse side (reduced to fit on this page).

CATCH SUMMARY BY GEAR Gear = _____ or as indicated.

Species														
Gear														
Length[a]														
Avg. Wt.														
	No.	Lb.	No.	Lb.	No.	Lb.	No.	Lb.	No.	Lb.	No.	Lb.	No.	Lb.
Total														
%[b]														
CPE														
% L-A[c]														
Inches[d] 1														
2														
3														
4														
5														
6														
7														
8														
9														
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27														
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29														
30														
31														
32														
33														
34														
35														
36														
37														
38														
39														
40														
Sample total														

LENGTH-FREQUENCY & LENGTH-BIOMASS SAMPLE

ALL SPECIES TOTAL

Gear	No.	Lb.

[a] Record average length or range in length of fish.
[b] Total % = percent contribution of the species to the total catch in the gear.
[c] L-A = Legal- or acceptable- size game fish: bluegill, sunfish, rock bass-6"+ ; crappie, perch, bullhead-7"+ ; bass-12"+ ; walleye-15"+; pike-20"+ muskie-30"+ ; trout-7"+ in U.P. streams, 8"+ in L.P. streams, 10"+ in lakes.
*OR:
[d] Inch groups: 1=1.0-1.9, 2=2.0-2.9, etc.

FISH COLLECTION (CON'T) form, R-8058-1 (reduced to fit on this page).

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
Fisheries Division

FISH COLLECTION (CON'T.)

Water _____ T._____ R._____ Sec. _____ Date _____

County _____ I.D. _____ Sheet _____ of _____

Summary of: ( ) All sites ( ) Coll. site No._____ ( ) Index site No._____ ( ) All gear ( ) Gear _____

Species														
Gear														
Length														
Avg. Wt.														
	No.	Lb.	No.	Lb.	No.	Lb.	No.	Lb.	No.	Lb.	No.	Lb.	No.	Lb.
Total														
%														
CPE														
% L-A														
Inches														
1														
2														
3														
4														
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29														
30														
31														
32														
33														
34														
35														
36														
37														
38														
Sample total														

LENGTH-FREQUENCY & LENGTH-BIOMASS SAMPLE

F 1

R8058-1
Rev. 3/82

FISH COLLECTION (CON'T) form, R-8058-1 reverse side (reduced to fit on this page).

CATCH SUMMARY BY GEAR Gear = _____ or as indicated.

Species														
Gear														
Length[1]														
Avg. Wt.														
	No.	Lb.	No.	Lb.	No.	Lb.	No.	Lb.	No.	Lb.	No.	Lb.	No.	Lb.
Total														
%[2]														
CPE														
% L-A[3]														

LENGTH-FREQUENCY & LENGTH-BIOMASS SAMPLE

Inches[4]														
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
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36														
37														
38														
39														
40														
Sample total														

ALL SPECIES TOTAL

Gear	No.	Lb.

[1] Record average length or range in length of fish.
[2] Total % = percent contribution of the species to the total catch in the gear.
[3] L-A = Legal- or acceptable- size game fish: bluegill, sunfish, rock bass-6"+ ; crappie, perch, bullhead-7"+ ; bass-12"+ ; walleye-15"+; pike-20"+ muskie-30"+ ; trout-7"+ in U.P. streams, 8"+ in L.P. streams, 10"+ in lakes.
*OR:
[4] Inch groups: 1=1.0-1.9, 2=2.0-2.9, etc.

LENGTH-WEIGHT FIELD DATA form, R-8059 (reduced to fit on this page).

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

Fisheries Division

Water ____________________ T. _____ R. _____ Sec. __________ LENGTH-WEIGHT FIELD DATA

County ____________________ Gear ____________________ Date ____________________

Record species, individual weights, and total and average weight per inch group.

Fish length (Define inch groups)

.0		.0		.0		.0		.0	
.1		.1		.1		.1		.1	
.2		.2		.2		.2		.2	
.3		.3		.3		.3		.3	
.4		.4		.4		.4		.4	
.5		.5		.5		.5		.5	
.6		.6		.6		.6		.6	
.7		.7		.7		.7		.7	
.8		.8		.8		.8		.8	
.9		.9		.9		.9		.9	

.0		.0		.0		.0		.0	
.1		.1		.1		.1		.1	
.2		.2		.2		.2		.2	
.3		.3		.3		.3		.3	
.4		.4		.4		.4		.4	
.5		.5		.5		.5		.5	
.6		.6		.6		.6		.6	
.7		.7		.7		.7		.7	
.8		.8		.8		.8		.8	
.9		.9		.9		.9		.9	

.0		.0		.0		.0		.0	
.1		.1		.1		.1		.1	
.2		.2		.2		.2		.2	
.3		.3		.3		.3		.3	
.4		.4		.4		.4		.4	
.5		.5		.5		.5		.5	
.6		.6		.6		.6		.6	
.7		.7		.7		.7		.7	
.8		.8		.8		.8		.8	
.9		.9		.9		.9		.9	

.0		.0		.0		.0		.0	
.1		.1		.1		.1		.1	
.2		.2		.2		.2		.2	
.3		.3		.3		.3		.3	
.4		.4		.0		.4		.4	
.5		.5		.5		.5		.5	
.6		.6		.6		.6		.6	
.7		.7		.7		.7		.7	
.8		.8		.8		.8		.8	
.9		.9		.9		.9		.9	

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LENGTH-WEIGHT FIELD DATA form, R-8059 reverse side (reduced to fit on this page).

Fish length (Define inch groups)

.0	.0	.0	.0	.0
.1	.1	.1	.1	.1
.2	.2	.2	.2	.2
.3	.3	.3	.3	.3
.4	.4	.4	.4	.4
.5	.5	.5	.5	.5
.6	.6	.6	.6	.6
.7	.7	.7	.7	.7
.8	.8	.8	.8	.8
.9	.9	.9	.9	.9

.0	.0	.0	.0	.0
.1	.1	.1	.1	.1
.2	.2	.2	.2	.2
.3	.3	.3	.3	.3
.4	.4	.4	.4	.4
.5	.5	.5	.5	.5
.6	.6	.6	.6	.6
.7	.7	.7	.7	.7
.8	.8	.8	.8	.8
9	.9	.9	.9	.9

.0	.0	.0	.0	.0
.1	.1	.1	.1	.1
.2	.2	.2	.2	.2
.3	.3	.3	.3	.3
.4	.4	.4	.4	.4
.5	.5	.5	.5	.5
.6	.6	.6	.6	.6
.7	.7	.7	.7	.7
.8	.8	.8	.8	.8
.9	.9	.9	.9	.9

.0	.0	.0	.0	.0
.1	.1	.1	.1	.1
.2	.2	.2	.2	.2
.3	.3	.3	.3	.3
.4	.4	.4	.4	.4
.5	.5	.5	.5	.5
.6	.6	.6	.6	.6
.7	.7	.7	.7	.7
.8	.8	.8	.8	.8
.9	.9	.9	.9	.9

LENGTH-WEIGHT REGRESSION form, R-8059-1 (reduced to fit on this page).

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
Fisheries Division

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Rev. 3/82

Water _____ T. _____ R. _____ Sec. _____ **LENGTH-WEIGHT REGRESSION**

County _____ Id. _____ Collection date _____

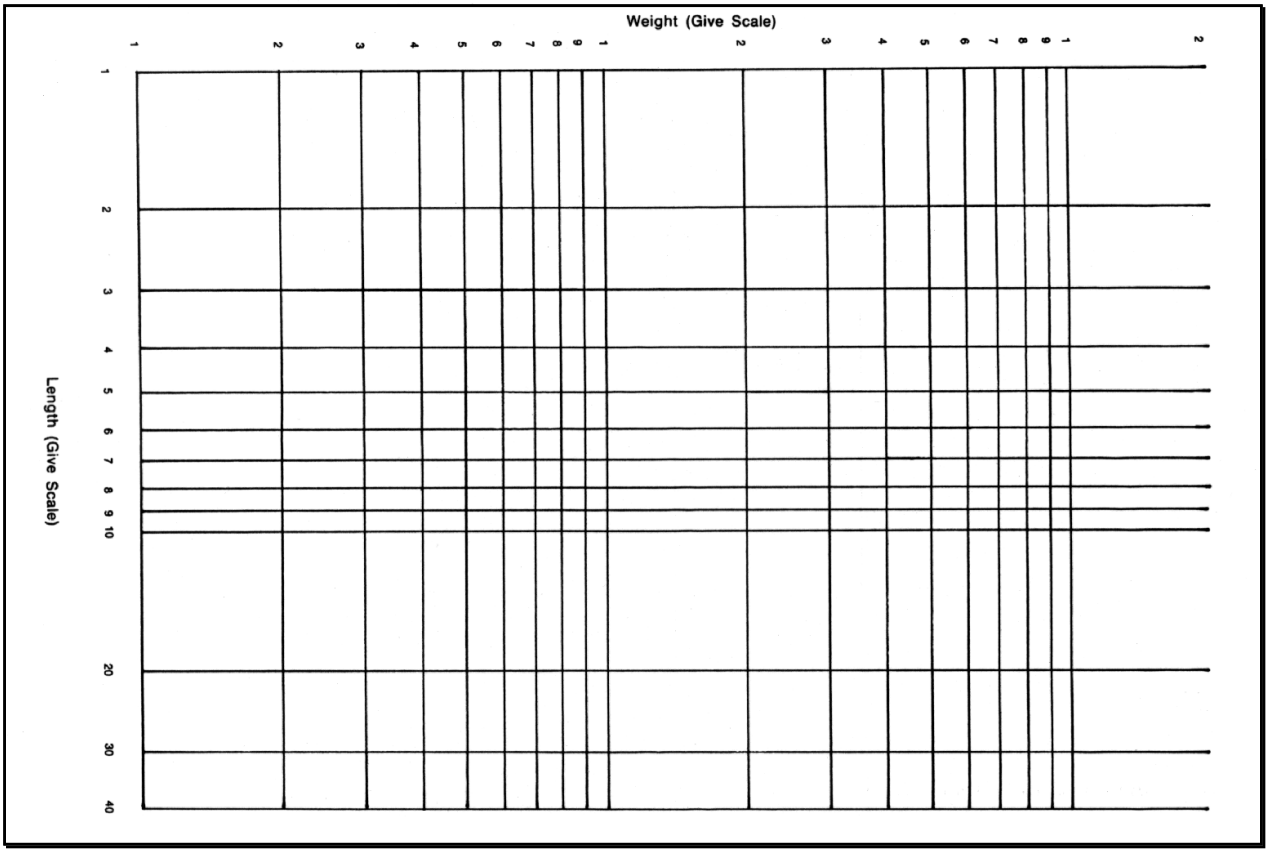
Gear _____ Units of Measurement (✓): ( ) inches or ( ) mm; ( ) pounds or ( ) grams

Species	Number Measured	Length range	Equation: log W = log c + n log L

Analysis:

Prepared by _____ Section _____

Copies to (✓): ( ) Lansing, ( ) Region, ( ) District, ( ) I.F.R.



FISH GROWTH form, R-8070 (reduced to fit on this page).

R-8070 4/81

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

Water _____ T. _____ R. _____ Sec. _____ FISH GROWTH ANALYSIS

County _____ Id. _____ Collection Date _____

Gear and Methods _____

Collected By _____ Section _____ Aged By _____ Section _____

Species [1]	Age Group [2]	Number of fish	Lenth range in inches	Mean length in inches	State avg. length	Growth index (by age group)	Mean growth index for species

[1] Several species may be listed on one sheet.
[2] Age in years. Fish become one year older on January 1.

(over)

Species [1]	Age Group [2]	Number of fish	Lenth range in inches	Mean length in inches	State avg. length	Growth index (by age group)	Mean growth index for species

Analysis:

Prepared by _____ Section _____ Date _____

Copies to: ☐ Lansing, ☐Region, ☐District, ☐ I.F.R.

POPULATION ESTIMATES form, R-8073 (reduced to fit on this page).

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
Fisheries Division

R8073
Rev. 3/82

POPULATION ESTIMATES

Water_____

County_____ T._____ R._____ Sec._____ Sheet_____ of_____

Site _____ Id._____ Date: Mark_____ Recap._____

Gear_____ Formula_____ Acres_____

Species_____ Estimated: No./acre_____ Lb./acre _____ % L-A: By No._____ By Lb._____

Inch Group	No. Marked	Recapture run		Estimates			No. Aged	Estimates by age group						
		Recaps	Unmark	No.	95% limits	Lb.								
Total														
							% survival							

Methods, analysis, remarks:

Prepared by_____ Sec._____ COPIES TO: ( ) LANSING ( ) REGION ( ) DISTRICT ( ) I.F.R.

Species_____ Estimated: No./acre _____ Lb./acre _____ % L-A: By No _____ By Lb._____

Inch Group	No. Marked	Recapture run		Estimates			No. Aged	Estimates by age group						
		Recaps	Unmark	No.	95% limits	Lb.								
Total														
							% survival							

Methods, analysis, remarks:

NOTES AND REFERENCES form, R-8077 (reduced to fit on this page).

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

Fisheries Division

R-8077 4/81

Lake or Stream _____

County _____ T. _____ R. _____ Sec. _____ NOTES AND REFERENCES

Subject:

Prepared by Section Date

Copies to: Lansing ☐, Region ☐, District ☐, I.F.R. ☐

LAKE SURVEY SUMMARY form, R-8063 (reduced to fit on this page).

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
Fisheries Division

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Lake _____ T. ____ R. ____ Sec. _____

County _____ Id. _____

LAKE SURVEY SUMMARY

1. Other names of lake
2. Accessibility (how reached, condition of roads)
3. Outlet (immediate and main drainage)
   Permanency — Size
4. Dam in outlet — Distance from lake — Height
   Effect on level — Owner — Use
   Effect on fish movements
5. Inlets (name, size)
   Drainage area
6. Pollution (kind, source, severity)
7. Shoreline type (%): Bog — Swamp — Marsh — Upland
8. Surrounding country (topography, soil, cover)
9. Use (private, public, semi-private) — Public fishing site
10. Approximate number Cottages — Homes — Resorts — Boat Liveries
11. Intensity of fishing (heavy, medium, light, or angler days) Summer — Winter
12. Other uses
13. Area — Shore Development — Maximum depth
14. Area of Vegetation (acres) — Per cent shoal (less than 15 ft.)
15. Slope at drop-off (gradual, steep)
16. Bottom Soil: Shoal — Deep water
17. Color — Secchi disk (range)
18. Temperature (range): Surface — Bottom
19. Thermocline Location — Temperature (range)
20. Dissolved oxygen (range): Above thermocline (in upper 20 feet if absent)
    In Thermocline — Below thermocline (near bottom if absent)
    Depth range where temperature is below 70° F., and 0_2 above 4 ppm. — Oxygen-thermal type
21. pH (range) — CO_2 — Methyl Orange Alk. (range)

Copies to: Lansing ( ), Region ( ), District ( ), I.F.R. ( )

(Over)

22. Cover (kind, abundance)
23. Vegetation (type, abundance)
24. Food (abundance, dominant organisms): Plankton
    Bottom: Shoal — Depths
    Vegetation
25. Spawning grounds (summarize observations and reports)
26. Predators (kind and abundance)
27. Fish parasites
    Fish mortalities (observed or reported)
28. Fishing: general reputation
    History
    Reported by
29. Recent stocking

30. Fish species	Abundance	Predominant size	Growth rate (poor, average, good)

Continuations (use item numbers):

Prepared by — Section — Date of survey(s)

STREAM SURVEY SUMMARY form, R-8064 (reduced to fit on this page).

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
Fisheries Division

R8064
4/81

Stream _____ T._____ R._____ Sec. _____

County _____ Id. _____

STREAM SURVEY SUMMARY

1. Drainage system _____
2. Station: Location _____
   Length (m) _____ Avg. width (m) _____ Area (ha) _____
   Avg. depth (m) _____ Velocity (m/sec) _____ Discharge _____
   Color and turbidity _____
   Dredged? _____
   Classification[1] _____
3. Names of tributaries _____
4. Water source (springs, groundwater, etc.) _____
5. Stability of flow _____
6. Barriers (dams, waterfalls, wiers, etc.) _____

Location	Owner	Use	Head

7. Surrounding country (topography, soil, cover, use) _____
8. Access _____
9. Erosion (source, severity) _____
10. Pollution _____
11. Mortalities _____
12. Parasites _____
13. Diseases _____
14. Predators _____
15. Beaver _____
16. Shade _____
17. Pools (✓): Size -- large_____ medium_____ small_____; Type -- deep_____ moderate_____ shallow_____
    Frequency -- many_____ frequent_____ infrequent_____
18. Bottom types[2]: Pools _____
    Riffles _____
19. Spawning grounds _____
20. Aquatic vegetation (% of stream bed): Abundant_____ Moderate_____ Sparse_____
21. Fish food organism abundance (✓): Exceptional_____ Average_____ Poor_____
22. Fishing (reputation, history) _____
23. Recent stocking _____
24. Recent management _____
25.

Fish species	Relative abundance	Predominate size	Growth (good, avg., poor)

26. Notes and continuations (use item number) _____

Prepared by _____ Sec. _____ Date of survey _____

[1] See Michigan Stream Classification System (Appendix VI A15).
[2] Bedrock, boulder (10"), cobble (3-10"), gravel (⅛-3"), sand, silt, clay, muck, detritus

COPIES TO: LANSING ( ), REGION ( ), DISTRICT ( ), I.F.R. ( )

HERPS POPULATION ESTIMATES form, R-8001 (reduced to fit on this page).

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
FISHERIES DIVISION

Water _____ HERPS POPULATION ESTIMATES

County _____ T. ___ R. ___ Sec. ___ Sheet ____ of ____ Sheets

Site _____ Date: Mark _____ Recapture _____

Gear: ☐ Traps ☐ Seine ☐ Gill Net ☐ Electro ☐ Other ☐ Visual Acres _____

Turtles:									
Snapper					**Leopard**				
Softshell					**Mink**				
Spotted* **					**Wood**				
Wood* **									
E. Box* **					**Snakes:**				
Blandings* **					**Kirtlands****				
Map					**Copperbelly****				
Painted					**N. Water**				
Slider					**Queen**				
Musk					**Brown**				
					Red-Bellied				
Lizards:					**E. Garter**				
5-Lined Skink					**Butler's Garter**				
6-Lined Race Runner					**Ribbon**				
					Ringneck				
Salamanders:					**E. Hognose**				
Tiger					**Blue Racer**				
Spotted					**Black Rat**				
Blue Spotted					**Fox ***				
Marbled					**E. Milk**				
Small-Mouthed					**E. Smooth Green**				
4-Toed					**E. Massasauga*** **				
Mudpuppy									
Central Newt									
Red-Spotted Newt									
Red-Backed									
West. Lesser Siren									
Frogs-Toads:									
E.American Toad									
Fowlers Toad									
Blanchard's Cricket									
Gray Tree									
Spring Peeper									
Chorus									
Bullfrog									
Green									
Pickerel									

*Threatened ** Endangered ***Special Concern

Prepared by: _____ Date_____

Copies to: ( ) Lansing; ( ) Region; ( ) District; ( ) Research

R8001