

Revised
GLEAS Procedure #31

Fish Contaminant Monitoring Program
Fish Collection and Processing Procedure

Introduction

The purpose of the Fish Contaminant Monitoring Program (FCMP) is to quantitatively assess the degree of chemical contamination in fish from waters throughout the state. This procedure describes the collection and processing techniques for fish samples to be obtained for contaminant analysis.

Pre-Collection

Staff should maintain a field notebook containing the following information (as a minimum):

- This Procedure
- Fisheries Division Contact List (District Offices and Fish Stations)
- Blank Field Data Sheets
- Current Michigan Fishing Guide

Staff with the responsibility for a specified site will be provided with a Fish Collection Assignment Sheet (Attachment 1) by the FCMP Specialist. The assignment sheet identifies the waterbody, location, contact people, id#, species (number and size ranges) and processing instructions. Staff should select appropriate fish sampling techniques and collection times after consultation with the appropriate District Fisheries Biologist. Staff collecting fish samples must have Cultural and Scientific Fish Collectors Permits which are issued by Fisheries Division.

The FCMP and biosurvey (stream shocker and backpack shocker sections) checklists can be used to identify equipment and supplies needed (Attachments 2 and 3). Vehicles, boats and major equipment (shockers, nets, etc.) must be signed out on the field calendar.

The appropriate Fisheries Division Office and Conservation Officers must be notified by the GLEAS staff assigned to a site prior to the fish collections. The names and phone numbers of the people to be contacted will be provided on the Fish Collection Assignment Sheet.

Fish Collections

Most fish will be collected by GLEAS and Fisheries Division staff using electrofishing equipment or nets. Since the desired species and size ranges are sometimes not found, the Fish Collection Assignment Sheet will indicate if substitutions can be made. Substitutions will be pursuant to the predator and bottom feeder preference lists (Attachment 4). Species substitutions can not be made for trend monitoring collections. Size ranges are generally goals and should be met as closely as possible unless noted otherwise on the Fish Collection Assignment Sheet.

The minimum safety training requirements for collection staff are: CPR, First Aid, Boating Safety and Water Safety. GLEAS staff should follow electrofishing safety procedures (GLEAS Procedure #48) and other appropriate safety procedures and requirements included in the Division Safety and Health Manual.

For fish collected for composite samples, when possible the length of the smallest fish should be within 90% of the largest fish.

Once fish are collected, they should be placed on ice and processed on-site or transported to the Filley Street facility. **Special sample processing and handling procedures may be necessary if chain-of-custody needs to be maintained and will be determined on a case-by-case basis.** The Fish Collection Assignment Sheet will indicate if chain-of-custody needs to be maintained.

If the fish are not going to be processed on-site, then they should be:

- 1) placed in plastic bags (GLEC bags or other large garbage bags) keeping different species separate and keeping the bags under 30 lbs. each;
- 2) labelled with the waterbody, location, date and species;
- 3) placed in one of the "Fish to be Processed" freezers; and
- 4) recorded on the Freezer Log Sheet (Attachment 5).

Staff should then notify the FCMP Specialist of the number and species of fish collected.

Fish Processing

The supplies needed to process fish are listed in the FCMP Check List (Attachment 2). Fresh fish should be sorted by species and kept on ice in a shady location until processing.

To thaw frozen fish for processing:

- 1) pull fish from Filley Street freezers the afternoon before the day they are to be processed;
- 2) place the fish in tubs/coolers or on clean plastic bags in the truck well, keeping sites and species separate;
- 3) take care to avoid contaminating other equipment, especially wooden materials, which are stored in the truck well;
- 4) try to separate the fish from each other as much as possible to facilitate thawing; and
- 5) keep the doors to the truck well closed and the fan on.

The following steps should be followed for processing fish:

1. If processing at the Filley Street Facility, keep the fan on and the interior doors to the truck well closed.
2. Rinse fillet board, cleaning table and knives with water.
3. Record site information, sample#, species name, length (cms), weight (gms), sex and sample type on the FCMP Data Sheet (Attachment 6).
4. The Fish Collection Assignment Sheet will identify the appropriate recording procedure for lengths and weights for composite samples. Generally, for smaller fish species (smelt, alewife, etc.) including caged fish study samples, a range for the lengths and a

total weight for the composite will be adequate. In these cases, the number of fish in the composite should be noted under the comments section of the FCMP Data Sheet. For larger fish species the length and weight of each fish in the composite is generally recorded. Attachment 6 shows an example of the data recorded for each case.

5. The comments section of the FCMP Data Sheet should be used to record the following types of information: collection date (native fish not all collected on the same date and caged fish samples), anomalies such as tumors or lamprey marks, fin clips (see Attachment 7 for fin clip codes), sample identification information for split samples...etc.
6. If instructed to collect scale/spine/otolith samples for aging follow the guidance provided in Attachment 8. This will generally only apply to trend monitoring samples.
7. If fish are to be processed whole proceed to step 10.
8. Starting with the species expected to be least contaminated (i.e. panfish) and working from the smallest to the largest specimen, process according to the Standard Edible Portion list (Attachment 9). Fillet specimen according to the figure in Attachment 10. Staff will be trained on appropriate fillet techniques.
9. Waste materials should be placed in a trash container lined with garbage bags. Thin garbage bags should be tripled, while thicker bags (i.e. garbage disposal bags) don't need to be. Bags should weigh no more than 30 lbs. Waste bags should be placed in the "Guts" freezer at the Filley Street facility unless they can be disposed of properly on-site.
10. Between each fish, the cutting board and knife(s) should be rinsed with water.
11. Wrap whole fish or edible portion sample in aluminum foil with dull side to fish. Secure package with 2" masking tape by taping lengthwise around the package along aluminum foil seam. Each fish in a composite sample must be wrapped and labeled individually, unless otherwise indicated on the Fish Collection Assignment Sheet.
12. Label each package with the following information on the masking tape using a waterproof marker:
 - date
 - waterbody
 - species
 - sample id#
 - composite number (composite samples only)
13. Place each aluminum foil package in a separate clear plastic bag (1 quart or 1 gallon zip-lock bag, or large GLEC bag; depending on size). However, for composite samples more than one package can go in the same bag.
14. Label the plastic bag with the sample id# using a waterproof marker. If more than 1 plastic bag is necessary per sample (i.e. composite samples) mark each bag with the same sample id# and label 1 of 3, 2 of 3, etc.
15. Place all the bags from a given site id# in a large plastic bag (GLEC or other garbage bag) not to exceed 30 lbs. and label bag with site id# and waterbody. If more than 1 bag is required for a given site id#, also label the bags 1 of 3, 2 of 3, etc.

16. Samples should be kept on ice until they are placed in the "Processed Fish" freezers at Filley Street and recorded on the Freezer Log.
17. Clean all of the processing equipment and return it to its proper place. If processing at the Filley Street facility, rinse floors with diluted chlorine bleach.

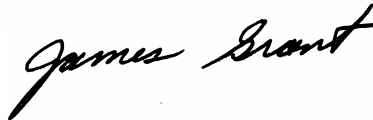
Post Processing

Laboratory Analysis Request Forms (Attachment 11) should be filled out and turned into the FCMP Specialist along with the completed Field Data Sheets. The forms will be maintained in the FCMP site files.

Aquatic Toxicity Laboratory staff will be responsible for transferring the bags from the guts freezer to dumpster on the morning of garbage pick-up days (currently Tuesdays).

The FCMP specialist will coordinate delivery of the fish samples to the MDPH for analysis. Aquatic Toxicity Laboratory staff will assist in the delivery.

Approved:

A handwritten signature in black ink that reads "James Grant". The signature is written in a cursive style with a large, prominent "J" and "G".

Date: 1/31/95

Attachment 1

FCMP COLLECTION ASSIGNMENT

SITE I.D. #: _____ ASSIGNED TO: _____

WATERBODY: _____

LOCATION: _____

FUNDING SOURCE: _____ NONPOINT: _____

FISH DIV. CONTACT _____ PHONE: _____

SPECIES TO BE COLLECTED _____ LENGTH (in.)
NUMBER

SPECIAL INSTRUCTIONS:

** YOU CAN SUBSTITUTE ANOTHER SPECIES USING PREFERENCE LISTS

Attachment 2

FCMP CHECK LIST

Boat

Boat Plug _____
Oars _____
Anchor & Rope _____
Motor _____
Gas & Oil _____
Cushions _____
Life Jackets _____
Hitch Lock & Key _____

Fish Processing Tools

Scale & Tripod _____
Measuring Board _____
GLECS Plastic Bags _____
Ziploc Bags _____
 Gallon _____
 Quart _____
Trash Bags _____
Trash Can _____
Table _____
Tape _____
Tubs _____
Scale Envelopes _____
Pens & Markers _____
Fillet Knives & Steel _____
Labels _____
Aluminum Foil _____
Sharpening Stone _____
Wash Brush _____
Cutting Board _____
Fish Data Field Sheets _____
Fish Collection Notebook _____

Fishing Gear

Fyke/Hoop/Trap/Gill Nets _____
Net Anchors w/Ropes _____
Net Floats w/Ropes _____
Seine _____
Waders/Hip Boots/Knee Boots _____
Gill Net Picks _____

Miscellaneous

Fathometer (connectors & battery) _____
Maps _____
Cooler(s)/Ice _____
Camera & Film _____
Mosquito Repellant _____
Fish Finder/Depth Finder _____
Global Positioning System _____
Sun Block/Sunglasses _____
Raingear _____
Collectors Permit _____

Attachment 3

BIOSURVEY CHECK LIST

Stream Shocker

Sport Yak w/ Bottom Board _____
 Control Box _____
 Ground (Floating) _____

Probes _____

Safety Switch _____
 Generator _____
 Gas _____
 Rubber Gloves _____
 Nets _____
 Collection Tub _____

Clothing

Waders/Hip & Knee Boots _____
 Raingear _____
 Socks _____
 Hat _____

Miscellaneous

Measuring Tape _____
 Camera & Film _____
 Polarized Sunglasses _____
 Mosquito Repellant _____
 Sunblock/Sunglasses _____
 Maps _____
 Sample Jars/Bottles _____
 Cooler/Ice _____
 Stainless Steel Bowl/Spoon _____
 (Sediment Samples)
 Data Forms _____
 Preservative Kits _____
 Global Positioning System _____
 Business Cards _____

Backpack Shocker

Backpack Shocker _____
 Charged Batteries _____
 Probes _____

Ground (Floating) _____

Nets _____
 Collection Tub _____
 Rubber Gloves _____

Fish & Benthos Processing Gear

Measuring Board _____
 Porcelain Pan _____
 Bucket _____
 Sieve Bucket _____
 Aquarium Net _____
 Tweezers/Forceps _____
 Eye Dropper _____
 Tubs _____
 Dip Nets _____
 Vials (2 oz.) _____
 Station Cards _____
 Pens _____
 Clipboard & Paper _____
 Alcohol _____
 Formalin _____
 Thermometer _____
 Hand Lens _____

Attachment 4

Predator Preference List

When predator is indicated, please apply the following guidance. Our first preference is to substitute a top line predator from Group 1. If we are unable to obtain a species from Group 1, then a Group 2 species may be substituted. Size ranges are goals.

	<u>Species</u>	<u># of Fish</u>	<u>Size Range</u>
Group 1:	Walleye	5	15" - 18"
5 19" +	Northern Pike	5	24" - 25"
5 26" +	Smallmouth Bass	5	14" - 15"
5 16" +	Largemouth Bass	5	14" - 15"
5 16" +			
Group 2:	Yellow Perch	10	9" +
	Black Crappie	10	9" +
	Rock Bass	10	9" +

Bottom Feeder Preference List

When bottom feeder is indicated, carp is always the preferred species. If carp are not available, one of the other species listed below can be substituted.

<u>Species</u>	<u># of Fish</u>	<u>Size Range</u>
Carp	5	18" - 22"
5 23" +		
Sucker sp.*	10	12" +
Channel Catfish	10	12" +
Bullhead sp.*	10	6" - 8"
	10	9" +

* Please do not mix different species in a sample (i.e. use 10 white sucker or 10 redhorse sucker).

Attachment 7

(electronic copy not available)

Attachment 8

Procedure for Collecting Samples for Aging Fish

1. Scale samples should be taken from the appropriate location on the fish (see diagram below). Take the knife point and pull the scales away from the skin. Do not take scales by scraping against them.
2. Scale samples are not adequate for aging some fish species. For the species listed below collect the appropriate items as indicated.

Walleye – scale sample and the dorsal fin spines

Carp – scale sample and dorsal fin spines

Lake Trout – otoliths

Redhorse Sucker – pectoral fin spines

Sturgeon – pectoral fin spines

When collecting the dorsal and pectoral fin spines de-articulate the spine from the fish, do not cut the spines. De-articulating is what you are doing when you pull a drumstick off a whole chicken. This is important because we need to get the base of the spine to get an accurate age reading.

3. Samples should be placed in scale sample envelopes and the pertinent information as indicated below should be filled out.

Attachment 8 cont'd

Otolith Collection Process

Remove gills and scrape away the soft tissues at the base of the brain.

Locate knife across pseudobranchs inside the gill covers, slightly posterior to the point of the arrow-shaped bony structure (prootic bone) at the base of the brain cavity where the vertebral column begins (exposed portion of prootic bone).

Apply enough pressure on the knife to sever midway through pair of bulla in the prootic bone taking care not to cut all the way through the cavities containing the two otoliths. Break the prootic bulla bone open as you would a single shotgun, being careful not to tear the fish in half. Each of the otoliths should now be readily observable nestled in its cavity. If the lake trout was subdued with too much zeal (clubbed too hard), the contents of the cavities may be bloody, making otoliths nearly impossible to locate. The moral of this is use just enough force to subdue the fish.

Pick each otolith out with a pair of forceps and put them on the back of your fillet gloved hand. Tease all the soft tissue of the sacculus away from the otoliths until they are stripped clean of any membranes. Now pick them off the glove and place them in a scale sample envelope for storage.

*Richard T. Jansen, Fisheries Boat Captain
Michigan Dept. of Natural Resources
3/93*

Attachment 9

Standard edible portions of Michigan's sport and commercial fishes.

Listed below are the "standard edible portions" for Michigan fishes. The "standard edible portion" will be used for preparing fish for contaminant analyses. The "standard edible portion" is that portion of the listed species of fish that people generally eat.

Standard edible portion	Common Name	Scientific Name	
Skin -On	Yellow Perch	<i>Perca flavescens</i>	
	Walleye	<i>Stizostedion vitreum</i>	
	Sauger	<i>Stizostedion canadense</i>	
	Largemouth Bass	<i>Micropterus salmonids</i>	
	Smallmouth Bass	<i>Micropterus dolomieu</i>	
	Bluegill	<i>Lepomis macrochirus</i>	
	Pumpkin seed	<i>Lepomis gibbosus</i>	
	Rock Bass	<i>Amploplites rupestris</i>	
	Fillet	White Bass	<i>Morone chrysops</i>
		Black Crappie	<i>Pomoxis nigromaculatus</i>
		White Crappie	<i>Pomoxis annularis</i>
		Green Sunfish	<i>Lepomis cyanellus</i>
		Longear Sunfish	<i>Lepomis megalotis</i>
		Warmouth	<i>Lepomis gulosus</i>
		Sucker family	<i>Catastomidae</i>
		Lake Whitefish	<i>Coregonus clupeaformis</i>
		Lake Trout (lean & siscowet)	<i>Salvelinus namaycush</i>
Rainbow Trout (steelhead)		<i>Oncorhynchus mykiss</i>	
Brown Trout		<i>Salmo trutta</i>	
Brook Trout		<i>Salvelinus fontinalis</i>	
Splake		<i>Salvelinus fontinalis</i> x <i>Salvelinus namaycush</i>	
Atlantic Salmon		<i>Salmo salar</i>	
Coho Salmon		<i>Oncorhynchus kisutch</i>	
Chinook Salmon		<i>Oncorhynchus tshawytscha</i>	
Pink Salmon		<i>Oncorhynchus gorbuscha</i>	
Skin - Off	Black Bullhead	<i>Ictalurus melas</i>	
	Brown Bullhead	<i>Ictalurus nebulosus</i>	
	Yellow Bullhead	<i>Ictalurus natalis</i>	
	Channel Catfish	<i>Ictalurus punctatus</i>	
	Muskellunge	<i>Esox masquinongy</i>	
	Northern Pike	<i>Esox lucius</i>	
	Round Whitefish (Menominee)	<i>Prosopium cylindraceum</i>	
	Lake Herring	<i>Coregonu artedii</i>	
	Chubs	<i>Coregonus hovi</i>	
	Fillet	Carp	<i>Cyprinus carpio</i>
Freshwater Drum (Sheepshead)		<i>Aplodinotus grunniens</i>	
Buffalo		<i>Ictiobus cyprinellus</i>	
Burbot		<i>Lota lota</i>	
Quillback		<i>Carpiodes cyprinus</i>	
Sturgeon		<i>Acipenser fulvescens</i>	
Skin - Off Steak*			
Headless, Gutted	Rainbow Smelt	<i>Osmerus mordax</i>	

* 3" wide full cross section from the area 9" - 12" anterior to the dorsal fin

9/9/97

Attachment 10

1. Make a cut behind the entire length of the operculum (gill cover) cutting through the skin and flesh to the spinal column. Dorsal to ventral cut.
2. Make a shallow cut through the skin (to spinal column) from the base of head to the posterior end of the caudal peduncle.
3. Make a ventral cut along the belly from the base of the pectoral fin to the posterior end of the caudal peduncle. Cut around all fins.
4. Remove the fillet and then remove any major bones.

Attachment 11

Michigan Department of Natural Resources
Michigan Department of Public Health

Fish Contaminant Monitoring Program
Laboratory Analysis Request Form

Waterbody: _____ Site ID#: _____

Location: _____

Contact Person: _____ Send Results to: _____

Address: _____ Address: _____

Sample Comments: _____

Sample Number	Field ID Number	Species	W/F
1	93001-01	Smelt	W
2	93001-02	Lake Trout	F
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

ANALYSIS

% Lipids

Organics & Mercury

Mercury

Dioxins & Furans

Special Analysis: _____

