

DEPARTMENT OF NATURAL RESOURCES

# RESEARCH

RETRIEVAL AND ANALYSIS SYSTEM  
USED IN WISCONSIN'S STATEWIDE FISH  
DISTRIBUTION SURVEY, SECOND EDITION\*

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### ABSTRACT

A statewide survey of the inland waters of Wisconsin was initiated in 1974 by the Bureau of Research, Wisconsin Department of Natural Resources, to establish a comprehensive data base on the distribution and relative abundance of all fish species. A Water Mileage System was devised to permit computer retrieval and analysis, and yet allow easy recognition of location by persons using the data base on over 12,500 streams and over 14,500 lakes. This system divided the state into 3 major basins and 30 minor basins. A unique series of mileages (codes) for each stream and non-landlocked lake in Wisconsin was then established and stored in a computer file (landlocked lakes within a basin were organized alphabetically by name). Another file was created using these water mileages to uniquely identify each fish sampling station and to store the data taken for each collection. Data included the collector, gear, effort, date, township description, county, number of specimens (up to 98) for each fish species taken, and various ecological data. There are presently approximately 17,500 collections dating from 1900 to 1983 in this file. Several Cobol and Mark IV computer programs were written to help in the retrieval and analysis of this data.

This report describes the Water Mileage System, the Master Stream and Lake File, and the Master Fish File. It is intended as a companion to the published reports on the distribution and relative abundance of fish in 15 completed Wisconsin basins and the study's final report (in progress), as a reference for persons who request computer printouts from the data base, and as a guide for other resource managers who may use the Water Mileage System in their work.

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\*This report is a revision of Research Report No. 126 (1984).

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## INTRODUCTION

The purpose of this report is to explain the Water Mileage System, the associated computer files, and available computer listings that resulted from a statewide survey of the inland water of Wisconsin. This survey was initiated in 1974 by the Bureau of Research, Wisconsin Department of Natural Resources (DNR), to establish a comprehensive data base on the distribution and relative abundance of all fish species. To identify the location of sampling stations and for storing and retrieving the massive amount of data collected for the statewide study, including published and unpublished data from other sources dating back to 1900, I developed the Water Mileage System, Master Stream and Lake File, and Master Fish File.

The Water Mileage System was devised to permit computer analysis of over 17,500 fish collections in Wisconsin spanning the period from 1900 to the present and still allow easy recognition of sampling locations by persons wishing to use the data. This was accomplished by using the town, range, section, quarter quarter section, and county along with basin numbers, a series of mileages, and the name of the body of water. A Master Stream and Lake File containing this information was generated for over 12,500 streams and 14,500 lakes in Wisconsin. In 1986 most of the Master Stream and Lake File was incorporated into the DNR's Master Waterbody File. A Master Fish File, which uses the Water Mileage System to organize the biological and environmental data, was also created.

Mark IV and Cobol computer programs were written to allow the data to be organized into numerous types of listings--for example, an alphabetical listing of streams and/or lakes in any basin or county from the Master Stream and Lake File; a listing of species and numbers of specimens collected in a stream, lake, basin, or county that can be restricted to certain collectors, time periods, or gear from the Master Fish File; a listing of stations also from the Master Fish File that met selected criteria for each species, including a summary table.

Field collecting was essentially terminated in 1980 due to reduced funding, with only limited sampling after that time. Of the 27 minor basins in the state (excluding Green Bay, Lake Michigan, and Lake Superior), sampling was completed in 15 and nearly completed in basin 100 (Fig. 1). Only scattered samples were taken in the remaining 11 basins. As of 1980, about 44% of the geographic area of the state was inventoried.

This report serves as an essential reference for three purposes. First, it can be used in conjunction with the 7 published fish distribution technical bulletins (Fago 1982, 1983, 1984a, 1984b, 1985a, 1985b, 1986). Second, this report serves as a guide to understanding the computer printouts requested by individuals

interested in the fish populations in particular rivers, lakes, or basins. Third, the description of the Water Mileage System is essential for other resource managers who may use this system to identify specific locations on Wisconsin waters.

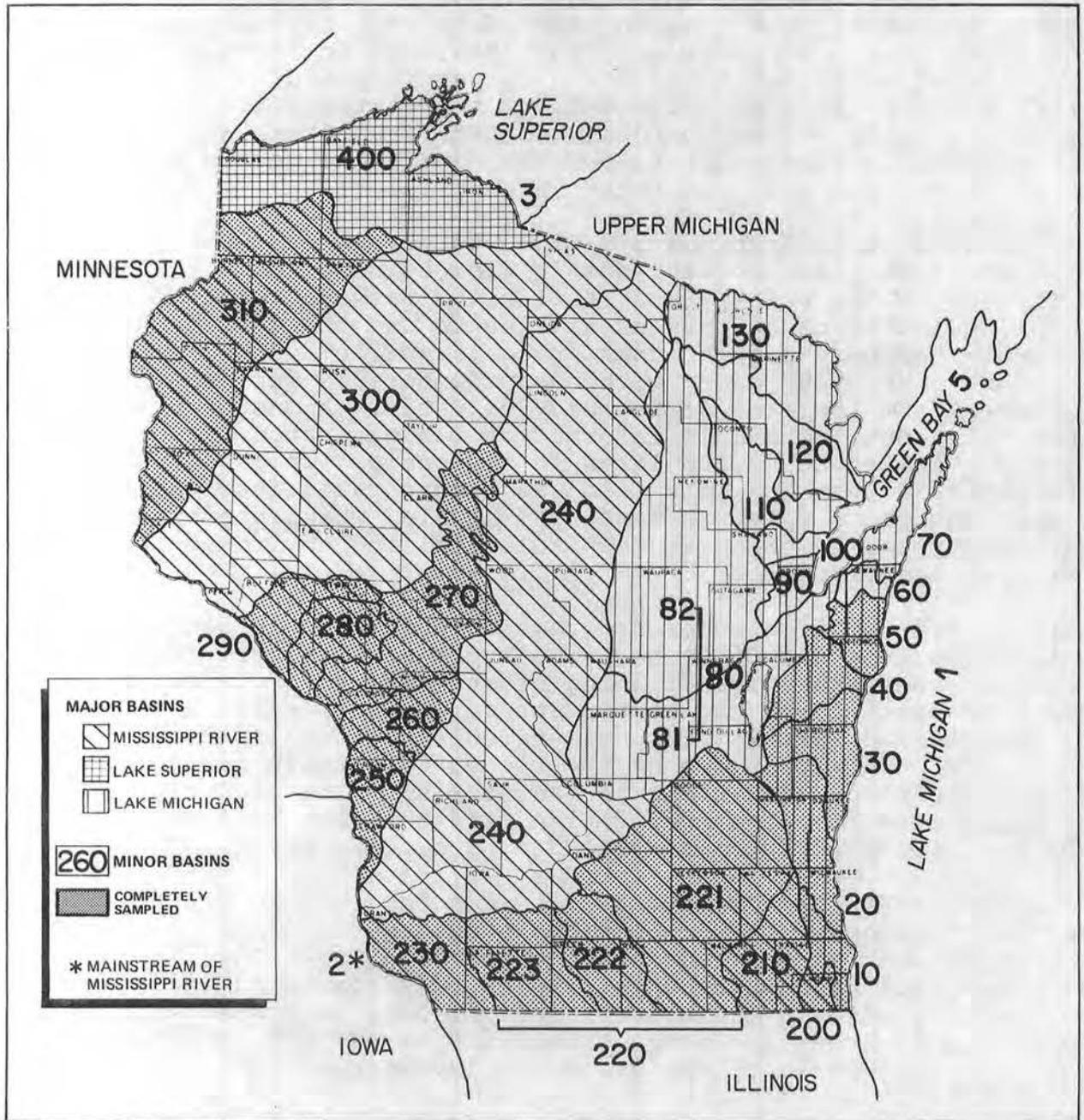


FIGURE 1. Major and minor river basins in Wisconsin.

## MASTER STREAM AND LAKE FILE

An example of a page of the Master Stream and Lake File from a computer printout is shown in Figure 2. In the Water Mileage System the location for any river or drainage lake (excluding landlocked lakes or landlocked systems) is designated by a series of numbers (or codes). They specify its major basin, minor basin, and a series of river mileages which indicate the distance (in 10th of miles) that the mouth of a river or lake is upstream from the beginning of the major basin in which it is located.

Mileages were determined through the use of a map wheel on 7 1/2 minute U.S. Geological Survey topographical maps.

### Major Basin

Wisconsin was divided into 3 major basins (Fig. 1). These 3 major basins and their corresponding code numbers are as follows:

Lake Michigan = 1  
Mississippi River = 2  
Lake Superior = 3

Under the heading "BASINS/MAJ" in Figure 2, a "2" indicates the Mississippi River basin.

### Minor Basin

I divided Wisconsin into 30 minor basins. The Lake Michigan basin has 13 (numbered 10 through 130) plus Lake Michigan proper, numbered 1, and Green Bay proper, numbered 5. The Mississippi River basin has 12 (numbered 200 through 310) plus the Mississippi River (mainstream), numbered 2. The Lake Superior basin has 1 (numbered 400) plus Lake Superior proper, numbered 3 (Fig. 1).

One of Lake Michigan's minor basins (Fox River - 80) is subdivided into 2 sub-basins: 81 - Upper and Lower Fox River and 82 - Wolf River.

One of the Mississippi River's minor basins (Greater Rock River - 220) is subdivided into 3 sub-basins: 221 - Rock River (proper), 222 - Sugar River (includes Raccoon Creek), and 223 - Pecatonica River (Fig. 1). The following is a list of minor basins and their numbers:

FIGURE 2. Sample page from the Master Stream and Lake File.

MAY 13, 1988		STREAM & LAKE FILE - MASTER										PAGE 1				
WB.I.C.	BASIN	ORDER M I L E A G E S										MI OR	D WL - - LOCATION - -			
MAJ	MIN	MB.MI.	1	2	3	4	5	6	7	ACRES	- - STREAM OR LAKE NAME - - C TSTWN RNGSECS43 QTQTCO					
872600	2	222								17	GOOSE POND	0	6N	8E	13	NENE13
872700	2	222								33	L HARRIETT	0	5N	9E	9	NWNW13
872800	2	222								10	MORSE POND	0	6N	8E	3	SESW13
872900	2	222								12	MORTENSON POND	0	5N	9E	26	NWSE13
873000	2	222									SUGAR R - OXBOW	0	1N	10E	27	NWSW54
873100	2	222								1	UN L	0	1N	10E	21	A NWSW54
873200	2	222								1	UN L	0	2N	3E	1	NWSW33
873300	2	222								4	UN L	0	4N	10E	4	SENE54
873400	2	222								1	UN L	0	4N	10E	13	NWNW54
873500	2	222								1	UN L	0	4N	10E	16	NENE54
873600	2	222								6	UN L	0	4N	10E	16	SENE54
873700	2	222								6	UN L	0	11N	10E	26	SWNE11
873800	2	222								1	UN SPRING	0	3N	10E	31	SWSW54
873900	2	222								8	VERONA GRAVEL PIT #12 (EAST	0	6N	8E	22	SENW13
874000	2	222	1434.BR	156.9L	.7R					11	RACCOON CR	2	46N	1E	22	80
874100	2	222	1434.BR	156.9L	.7R	6.9R				7	E FK RACCOON CR	2	46N	1E	8	80
874200	2	222	1434.BR	156.9L	.7R	6.9R	1.4				E FK RACCOON CR -WI-IL BD	6	1N	12E	31	SESW54
874300	2	222	1434.BR	156.9L	.7R	6.9R	2.7R			4	UN CR (CHAMBERLIN SPRINGS)	2	1N	12E	31	SWNE54
874400	2	222	1434.BR	156.9L	.7R	9.5					RACCOON CR -WI-IL BD	6	1N	11E	35	SESE54
874500	2	222	1434.BR	156.9L	.7R	10.9L					UN CR	2	1N	11E	35	SWNW54
874600	2	222	1434.BR	156.9L	.7R	10.9L	.1			1	UN SPRING	1	1N	11E	35	SWNW54
874700	2	222	1434.BR	156.9L	.7R	11.4					DAM-RACCOON CR -MILLPOND	1	1N	11E	34	NENE54
874800	2	222	1434.BR	156.9L	.7R	11.7R				3	UN CR	2	1N	11E	27	SWSE54
874900	2	222	1434.BR	156.9L	.7R	11.7R	.3R			3	UN CR	2	1N	11E	27	NWSE54
875000	2	222	1434.BR	156.9L	.7R	14.0L				2	UN CR	2	1N	11E	20	NWNW54
875100	2	222	1434.BR	156.9L	.7R	14.0L	1.8L				UN CR	2	1N	11E	20	NWNW54
875200	2	222	1434.BR	156.9L	.7R	14.0L	1.8L	.1		1	UN L	1	1N	11E	20	NWNW54
875300	2	222	1434.BR	156.9L	9.2R					79	SUGAR R	2	28N	11E	11	80
875400	2	222	1434.BR	156.9L	9.2R	10.7					SUGAR R -WI-IL BD	6	1N	10E	36	SESW54
875500	2	222	1434.BR	156.9L	9.2R	10.7L				9	GREEN DRAINAGE SYSTEM	2	1N	10E	36	SESW54
875600	2	222	1434.BR	156.9L	9.2R	10.7L	6.4R			1	UN CR	2	1N	9E	25	SENE54
875700	2	222	1434.BR	156.9L	9.2R	11.1R				3	UN DITCH	2	1N	10E	36	NWSW54
875800	2	222	1434.BR	156.9L	9.2R	11.1R	.7R			1	UN DITCH	2	1N	10E	36	NENW54
875900	2	222	1434.BR	156.9L	9.2R	11.7R				2	UN DITCH	2	1N	10E	35	SENE54
876000	2	222	1434.BR	156.9L	9.2R	16.0L				6	UN DITCH	2	1N	10E	28	NESW54
876100	2	222	1434.BR	156.9L	9.2R	18.8L					SUGAR R -W CHANNEL	2	1N	10E	20	SWNE54
876200	2	222	1434.BR	156.9L	9.2R	18.8L	.5L			1	UN DITCH	2	1N	10E	20	SWNW54
876300	2	222	1434.BR	156.9L	9.2R	19.8R				13	TAYLOR CR	2	1N	10E	18	SESE54
876400	2	222	1434.BR	156.9L	9.2R	19.8R	1.8R			10	WILLOW CR (NORTH)	2	1N	10E	7	NESW54
876500	2	222	1434.BR	156.9L	9.2R	19.8R	1.8R	6.7R		4	UN CR	2	1N	10E	11	SWNE54
876600	2	222	1434.BR	156.9L	9.2R	19.8R	1.8R	8.1R		1	UN CR	2	1N	10E	1	NWNW54
876700	2	222	1434.BR	156.9L	9.2R	19.8R	5.7R			7	SWAN CR	2	2N	10E	30	NESE54
876800	2	222	1434.BR	156.9L	9.2R	21.1					SUGAR R -CO BD	6	1N	9E	13	NESE23
876900	2	222	1434.BR	156.9L	9.2R	21.7L				1	UN CR	2	1N	9E	13	SENW23
877000	2	222	1434.BR	156.9L	9.2R	22.4L				10	SPRING CR	2	1N	9E	12	SESW23
877100	2	222	1434.BR	156.9L	9.2R	22.4L	5.8L			2	OAKLEY BR	2	1N	9E	19	SESE23
877200	2	222	1434.BR	156.9L	9.2R	22.9L				5	OK CR	2	1N	9E	12	NESW23
877300	2	222	1434.BR	156.9L	9.2R	22.9L	1.4R			2	UN CR	2	1N	9E	10	SENE23
877400	2	222	1434.BR	156.9L	9.2R	26.6L				14	SYLVESTER CR	2	1N	9E	3	NENE23
877500	2	222	1434.BR	156.9L	9.2R	26.6L	1.5L			8	JUDA BR	2	2N	9E	34	NWNW23
877600	2	222	1434.BR	156.9L	9.2R	26.6L	1.5L	3.1L		4	RILEY SCHOOL BR	2	2N	9E	31	SWSW23
877700	2	222	1434.BR	156.9L	9.2R	26.6L	1.5L	4.4R		3	N FK JUDA BR	2	1N	8E	1	SWNW23
877800	2	222	1434.BR	156.9L	9.2R	26.6L	1.5L	5.1R		2	UN CR	2	1N	8E	2	SENE23
877900	2	222	1434.BR	156.9L	9.2R	26.6L	5.6R			1	UN CR	2	2N	8E	24	NESE23

1	Lake Michigan (proper)	2	Mississippi River (mainstream)
5	Green Bay (proper)	200	Des Plaines River basin
10	Root River basin	210	Fox River basin
20	Milwaukee River basin	220	Greater Rock River basin
30	Sheboygan River basin	221	Rock River basin
40	Manitowoc River basin	222	Sugar River basin
50	Twin River basin	223	Pecatonica River basin
60	Kewaunee River basin	230	Grant & Platte river basin
70	Door Peninsula drainage basin	240	Wisconsin River basin
80	Fox River basin	250	Coon & Bad Axe river basin
81	Fox River basin (excluding Wolf River basin)	260	La Crosse River basin
82	Wolf River basin	270	Black River basin
90	Suamico River basin	280	Trempealeau River basin
100	Pensaukee River basin	290	Buffalo River basin
110	Oconto River basin	300	Chippewa River basin
120	Peshtigo River basin	310	St. Croix River basin
130	Menominee River basin		
		3	Lake Superior (proper)
		400	Lake Superior drainage basin

The minor or sub-basin number is shown just to the right of the major basin number in Figure 2, under the heading "BASINS/MIN". In this example, the "222" indicates the Sugar River basin.

## River Mileages

### First Order Streams

The major basin mileage, under the heading "MB.MI.", locates the mouth of the 1st order stream (Fig. 2). The major basin mileage is determined in this way:

- (1) If the river is a tributary to Lake Michigan, its mileage is determined by the number of miles its mouth is up the shore from the Wisconsin-Illinois border. The letter "L" after the mileage indicates the river enters the west (left) shore of Lake Michigan.
- (2) If the river is a tributary to the Mississippi River, as in our example, its mileage is the number of miles its mouth is located upstream from the mouth of the Mississippi River. Figure 3 shows a map (not to scale) of some of the tributaries of the Rock River with water mileages. The "1434.8" in the example locates the mouth of the Rock River (Fig. 2). The letter "R" after this mileage indicates that the 1st order stream flows in on the east (right) side of the Mississippi River. (Right and left sides are determined when facing upstream throughout this system of coding.)
- (3) If the river is tributary to Lake Superior, its mileage is determined by the number of miles its mouth is east (to the right) of the mouth of the Superior Bay at Superior.

## Second Through Twelfth Order Streams or Drainage Lakes

Mouths of 2nd through 12th order streams and drainage lakes are assigned a mileage based on the number of miles their mouths are upstream from the mouth of the river into which they flow. Thus, mileage on a 1st order stream indicates the mouth of a 2nd order stream or lake. These mileages are shown under the heading "ORDER MILEAGES 1 2 3 4 5 6 7". In the example under the heading "1", "156.9" locates the mouth of a 2nd order stream, the Pecatonica River, and under "2", "9.2" locates the mouth of a 3rd order stream, the Sugar River (Fig. 3). The 1st through 7th order mileages are only shown on the primary printout. If more orders are needed, an asterisk appears after the 7th order mileage and those waterbodies are listed separately in a 2nd printout (Fig. 4). This 2nd printout has orders 1-7 on the first line of data for that waterbody and orders 8-11 on the 2nd line under the heading "ORDER MILEAGES 1 2 3 4/8 5/9 6/10 7/11" (Fig. 5). The last space of each order is used for 1 of 7 reference codes. They are "R", "L", "X", "Y", "A", "O", or a blank.

The letter "R" is used for streams that enter the previous order stream on the right. If the stream enters on the left, the letter "L" is used. When 2 rivers join and form a new river, the tributary (fork) entering the new river on the right is assigned the letter "X" while the letter "Y" is used for the tributary entering on the left. If a lake has a named river flowing through it, tributaries flowing into the lake are given an "R" or "L" designation after their mileage corresponding to their position with respect to the main river flowing through the lake. When no such continuous main stream exists, the lakes are arbitrarily divided into left and right halves. If a river enters the lake at the upper point of division, the letter "A" follows the mileage for this river.

The letter "O" is used so that the computer will print out ".0" which is needed in a few instances to designate the mouths of certain rivers or lakes. Superior Bay's major basin mileage "0.00" is an example. The mileage for a dam or lake on a stream has a blank in this column since it is neither left nor right of the stream.

When the mouth of a stream occurs outside the boundaries of Wisconsin, the mileage from its mouth to the Wisconsin border is recorded as if this location were a lake or dam on the stream. Thus, for the Sugar River, "10.7" in the 3rd order (number of miles from mouth of Sugar River to the Wisconsin-Illinois border) is shown in Figures 2 and 3.

If unnamed streams connect 2 or more lakes in succession, the order does not increase for each successive unnamed stream or lake. Instead, the shortest mileage from the mouth of the inlet stream to the mouth of the outlet is added to the mileage of the 1st unnamed stream in the series.

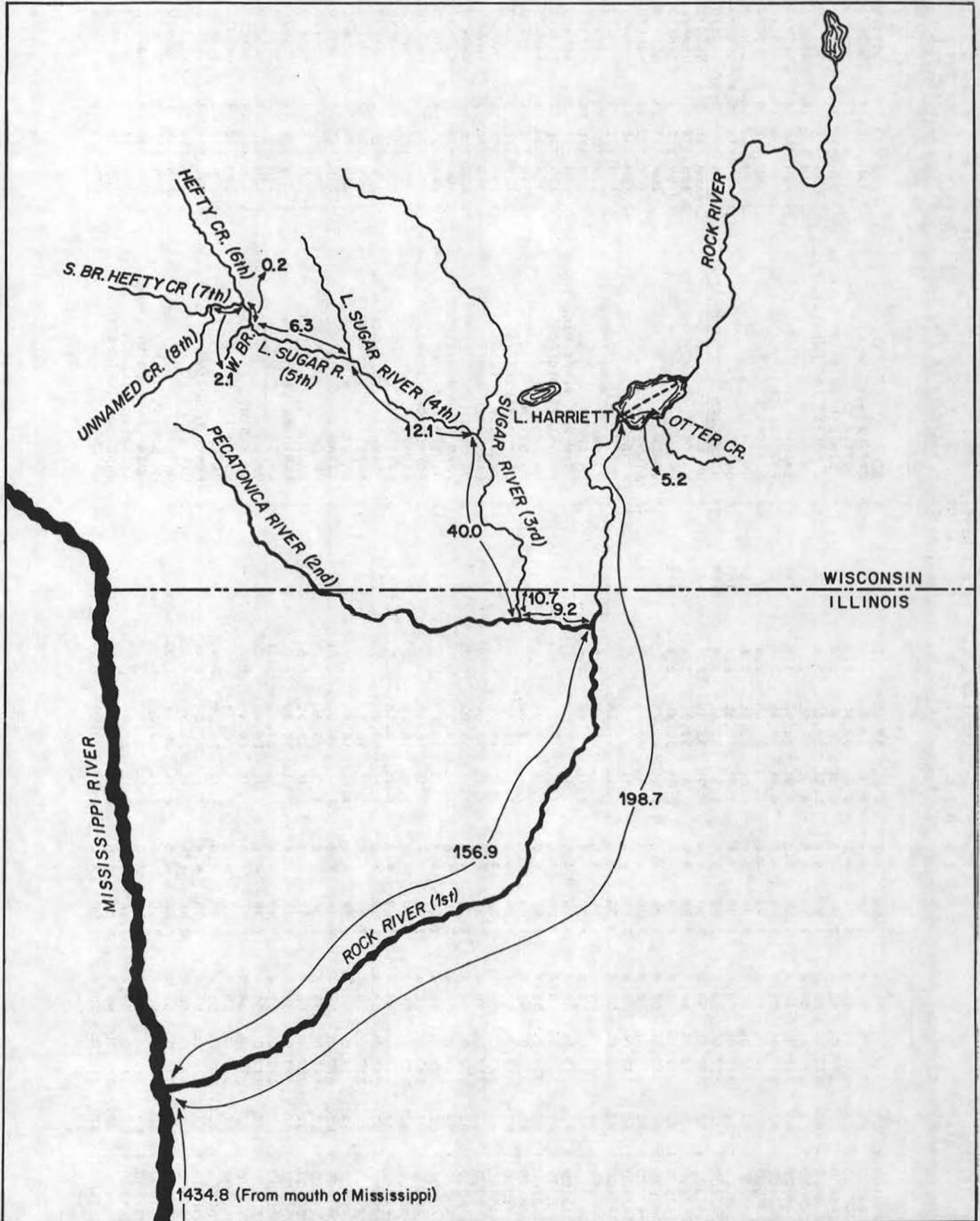


FIGURE 3. Illustration of the water mileage system as used in the computer printout shown in Figure 2 (1st, 2nd, 3rd, etc., order shown in parentheses).

MAY 13, 1988		STREAM & LAKE FILE - MASTER										PAGE 13							
WB.I.C.	BASIN	ORDER MILEAGES										MI OR	D WL - - LOCATION - -						
MAJ MIN	MB.MI.	1	2	3	4	5	6	7	ACRES	- - STREAM OR LAKE NAME - -				C	TSTWN	RNG	SEC	543	QTQTCO
246100	1 82	377.0L	58.4	7.9R	4.6	6.9L	32.8R	.2	5	COOKS L				1	19N	11E	14	SESE70	
246200	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L		2	RATTLESNAKE CR				2	19N	11E	14	SWSW70	
246300	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.1	6	LITTLE L				1	19N	11E	22	NWNW70	
246400	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4		DAM-L MORRIS (MT MORRIS)					19N	11E	16	SESE70	
246500	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	163	L MORRIS (MT MORRIS)				3	19N	11E	16	SESE70	
246600	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4		UN CR				2	19N	11E	16	SWSE70	
246700	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	.2L*	11	EMERALD L				1	19N	11E	16	SWSE70
246800	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	1.0L	2	PORTERS CR				2	19N	11E	17	NESE70
246900	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	1.0L*	68	PORTERS L				1	19N	11E	20	SWSE70
247000	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	1.1R	3	UN CR				2	19N	11E	16	SWNW70
247100	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	1.1R*	10	UN L				1	19N	11E	5 AC	SESE70
247200	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	1.1R*	94	NORWEGIAN L				1	19N	11E	5 BC	SESE70
247300	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	1.1R*	2	UN L				1	19N	11E	5	SESW70
247400	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	1.7A		UN CR				2	19N	11E	17	NENW70
247500	1 82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	1.7A*	1	UN L				1	19N	11E	18	SENE70
247600	1 82	377.0L	58.4	7.9R	4.6	6.9L	39.6R			1	UN CR				2	20N	11E	33	NESW70
247700	1 82	377.0L	58.4	7.9R	4.6	6.9L	39.6R	.7		48	SILVER L				1	20N	11E	32	NENE70
247800	1 82	377.0L	58.4	7.9R	4.6	7.1L				37	PINE R				2	19N	13E	13	NWNW70
247900	1 82	377.0L	58.4	7.9R	4.6	7.1L	1.6R			8	UN CR				2	19N	13E	15	SENE70
248000	1 82	377.0L	58.4	7.9R	4.6	7.1L	1.6R	3.6L		4	UN CR				2	20N	13E	33	SESW70
248100	1 82	377.0L	58.4	7.9R	4.6	7.1L	1.6R	3.6L	4.0	2	UN SPRING				1	20N	12E	25	NESW70
248200	1 82	377.0L	58.4	7.9R	4.6	7.1L	7.2				DAM-POY SIPPI MILLPOND					19N	13E	7	SENE70
248300	1 82	377.0L	58.4	7.9R	4.6	7.1L	7.2			57	POY SIPPI MILLPOND				3	19N	13E	7	SENE70
248400	1 82	377.0L	58.4	7.9R	4.6	7.1L	8.6R			1	UN CR				2	19N	12E	12	SWNW70
248500	1 82	377.0L	58.4	7.9R	4.6	7.1L	8.8L			1	UN DITCH				2	19N	12E	11	NESE70
248600	1 82	377.0L	58.4	7.9R	4.6	7.1L	11.7L			7	LITTLE SILVER CR				2	19N	12E	3	SESW70
248700	1 82	377.0L	58.4	7.9R	4.6	7.1L	11.7L	6.9		10	BROWNLOW L (MUD)				1	19N	11E	12	NWNE70
248800	1 82	377.0L	58.4	7.9R	4.6	7.1L	13.0R			6	CARPENTER CR				2	19N	12E	3	SWNW70
248900	1 82	377.0L	58.4	7.9R	4.6	7.1L	13.0R	1.3L		1	UN DITCH				2	20N	12E	34	NWSW70
249000	1 82	377.0L	58.4	7.9R	4.6	7.1L	13.9				DAM-PINE R MILLPOND					19N	12E	4	SENE70
249100	1 82	377.0L	58.4	7.9R	4.6	7.1L	13.9			28	PINE R MILLPOND				3	19N	12E	4	SENE70
249200	1 82	377.0L	58.4	7.9R	4.6	7.1L	18.1R			2	POPPLE CR (JAMES)				2	20N	12E	30	NESE70
249300	1 82	377.0L	58.4	7.9R	4.6	7.1L	18.1R	.9		26	KRISTINE L				1	20N	12E	30	NWNE70
249400	1 82	377.0L	58.4	7.9R	4.6	7.1L	18.1R	2.0		5	BAITENGER L				1	20N	12E	19	NWNE70
249500	1 82	377.0L	58.4	7.9R	4.6	7.1L	18.6				DAM-SAXEVILLE MILLPOND					20N	12E	30	NWSE70
249600	1 82	377.0L	58.4	7.9R	4.6	7.1L	18.6			13	SAXEVILLE MILLPOND				3	20N	12E	30	NWSE70
249700	1 82	377.0L	58.4	7.9R	4.6	7.1L	18.6	.3L			UN CR				2	20N	12E	30	SESW70
249800	1 82	377.0L	58.4	7.9R	4.6	7.1L	18.6	.3L	.5	9	TIMAN L				1	20N	12E	31	NWNW70
249900	1 82	377.0L	58.4	7.9R	4.6	7.1L	23.3L				UN CR				2	20N	11E	27	NENE70
250000	1 82	377.0L	58.4	7.9R	4.6	7.1L	23.3L	.5		81	WILSON L				1	20N	11E	27	SENE70
250100	1 82	377.0L	58.4	7.9R	4.6	7.1L	24.4L			2	KAMINSKI CR				2	20N	11E	22	NESW70
250200	1 82	377.0L	58.4	7.9R	4.6	7.1L	24.4L	.2L		1	UN CR				2	20N	11E	22	SESW70
250300	1 82	377.0L	58.4	7.9R	4.6	7.1L	24.4L	.2L	1.1	15	UN L				1	20N	11E	28	NESE70
250400	1 82	377.0L	58.4	7.9R	4.6	7.1L	24.4L	1.7		1	UN SPRING				1	20N	11E	29	NENE70
250500	1 82	377.0L	58.4	7.9R	4.6	7.1L	26.0R			4	HUMPHREY CR				2	20N	11E	15	NWSW70
250600	1 82	377.0L	58.4	7.9R	4.6	7.1L	26.0R	2.4L			UN CR				2	20N	11E	3	SWSW70
250700	1 82	377.0L	58.4	7.9R	4.6	7.1L	26.0R	2.4L	.1	2	FENRICH SPRING				1	20N	11E	3	SWSW70
250800	1 82	377.0L	58.4	7.9R	4.6	7.1L	26.3R			2	DAVIES CR (CLAYTON)				2	20N	11E	16	NESE70
250900	1 82	377.0L	58.4	7.9R	4.6	7.1L	26.3R	1.3R		1	UN CR				2	20N	11E	9	SWSW70
251000	1 82	377.0L	58.4	7.9R	4.6	7.1L	26.3R	1.3R	.6	1	UN SPRING				1	20N	11E	8	NWSE70
251100	1 82	377.0L	58.4	7.9R	4.6	7.1L	27.5				DAM-IDLEWILD MILLPOND					20N	11E	16	NWSW70
251200	1 82	377.0L	58.4	7.9R	4.6	7.1L	27.5			4	IDLEWILD MILLPOND				3	20N	11E	16	B NWSW70
251300	1 82	377.0L	58.4	7.9R	4.6	7.1L	29.5R			1	JONES CR (WEICHERING)				2	20N	11E	19	NENE70
251400	1 82	377.0L	58.4	7.9R	4.6	7.1L	30.5R				UN CR				2	20N	11E	19	NWSW70

FIGURE 4. Sample page from the Master Stream and Lake File showing some waterbodies that have an asterisk after the 7th order mileage.

FIGURE 5. Sample page from a secondary printout of the Master Stream and Lake File for those waterbodies that have more than 7 orders in their mileage system.

MAY 13, 1988												PAGE 1						
WB.I.C.	BASIN	MAJ MIN MB.MI.			ORDER M I L E A G E S							MI OR	LOCATION					
		1	2	3	4/8	5/9	6/10	7/11	ACRES	STREAM OR LAKE NAME	C	TSTWN	RNG	SECS	543	QTQTCO		
246700	1	82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	.2L	11	EMERALD L	1	19N	11E	16	SWSE70	
246900	1	82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	1.0L	68	PORTERS L	1	19N	11E	20	SWSE70	
247100	1	82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	1.1R	10	UN L	1	19N	11E	5	AC SESE70	
247200	1	82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	1.1R	94	NORWEGIAN L	1	19N	11E	5	BC SESE70	
247300	1	82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	1.1R	2	UN L	1	19N	11E	5	SESW70	
247500	1	82	377.0L	58.4	7.9R	4.6	6.9L	33.8L	2.4	1.7A	1	UN L	1	19N	11E	18	SENE70	
254600	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6X	10.8L	1.2R		DAM-UN L		21N	12E	19	A SENW69	
254700	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6X	10.8L	1.2R	35	UN L	3	21N	12E	19	A SENW69	
254800	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6X	10.8L	1.2R		DAM-BAILEY L		21N	12E	19	B SENW69	
254900	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6X	10.8L	1.2R	14	BAILEY L (BAILEYS)	3	21N	12E	19	B SENW69	
255200	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6X	12.0	.3L		DAM-BASS L		21N	11E	13	SESE69	
255300	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6X	12.0	.3L	19	BASS L	3	21N	11E	13	SESE69	
255500	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6X	12.0	.4A	1	UN SPRING	1	21N	11E	13	NWSE69	
255600	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6X	12.0	.4A	15	JENSON L	1	21N	11E	14	SENE69	
256300	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6Y	6.7	1.2A	3	MAGDANZ CR	2	20N	12E	2	SESW70	
256400	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6Y	6.7	1.2A		AUSTIN CR -CO BD		6	21N	12E	32	SESE69
256500	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6Y	6.7	1.2A	2	UN CR	2	21N	12E	32	SESE69	
256600	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6Y	6.7	1.2A	8	BIG CEDAR L	1	20N	12E	4	SESW70	
256700	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6Y	6.7	1.2A	2	LITTLE CEDAR L	1	20N	12E	5	SESE70	
256800	1	82	377.0L	58.4	7.9R	16.7	1.8L	7.6Y	6.7	1.2A	3	JACKLIN L	1	21N	12E	31	NESE69	
259500	1	82	377.0L	58.4	7.9R	21.3L	15.7L	10.3	.2L	3.9R		DAM-STRATTON L		21N	11E	16	SESW69	
259600	1	82	377.0L	58.4	7.9R	21.3L	15.7L	10.3	.2L	3.9R	87	STRATTON L	3	21N	11E	16	SESW69	
259800	1	82	377.0L	58.4	7.9R	21.3L	15.7L	10.3	.2L	4.4L	11	MUD L	1	21N	11E	21	SWNE69	
260000	1	82	377.0L	58.4	7.9R	21.3L	15.7L	10.3	.2L	4.9R	9	MYNYARD L	1	21N	11E	21	SWNW69	
260300	1	82	377.0L	58.4	7.9R	21.3L	15.7L	10.3	.2L	6.6R		DAM-MURRY CR		21N	11E	19	SWSW69	
260400	1	82	377.0L	58.4	7.9R	21.3L	15.7L	10.3	.2L	6.6R	2	UN L	3	21N	11E	19	SWSW69	
260500	1	82	377.0L	58.4	7.9R	21.3L	15.7L	10.3	.2L	6.6R		MURRY CR -CO BD		6	21N	10E	24	SESE50
261500	1	82	377.0L	58.4	7.9R	21.3L	15.7L	12.5	.8L	.5R	6	S EMMONS L	1	21N	11E	5	B SWSE69	

Unnamed ditches connecting 2 or more streams are coded only as a tributary of the lower order stream.

Dams, falls, rapids, and points where streams cross state borders are also listed in the Master Stream and Lake File. All dams are given a mileage as if they were a lake on the stream.

The mileage for the mouth of a stream flowing into a lake is the shortest water mileage from the center of the lake's outlet to the mouth of the stream.

### Miles or Acres

The total number of miles of the stream or acres of the lake or impoundment is shown under the heading "MI OR ACRES". The numbers are rounded to the nearest whole number. For streams and lakes that are only partially in Wisconsin, the miles or acres are only for that portion in Wisconsin. For these lakes, the number of acres for the entire lake are shown in parentheses after the name.

### Stream or Lake Name

The name of the stream, lake, or dam is taken from U.S. Geological Survey topographic maps (7 1/2 minute), DNR's "Decisions on Names in Wisconsin" (Marsh 1981), and DNR county surface water resources publications, and is shown under the heading "STREAM OR LAKE NAME" (Fig. 2). Secondary and local names are put in parentheses. The following is a list of abbreviations used in the name:

L = Lake	N = North	
R = River	S = South	
BR = Branch	E = East	
CR = Creek	W = West	
FL = Flowage	# = Number	
FK = Fork	WI = Wisconsin	} for border crossings
P = Pond	IL = Illinois	
BD = Border	MN = Minnesota	
SP = Spring(s)	MI = Michigan	} for the river
SP P = Spring Pond	Wis = Wisconsin	
M P = Mill Pond	Miss = Mississippi	

Words other than these are truncated if space is limited.

### Dam Code

A code for the possibility of fish migrating upstream past a dam is shown under the heading "DC". The code numbers are: 0 = dam no longer in existence, 1 = not possible, 2 = possible (such as spring flood), 3 = highly probable, and 4 = beaver dam.

## Water Type Code

All bodies of water are assigned 1 of 10 codes. They are: 0 = landlocked lakes; 1 = lakes or ponds; 2 = rivers, streams, or creeks; 3 = impoundments (any body of water with a dam controlling its water level); 4 = unknown or combination of any of the other types; 5 = backwater (of a stream); 6 = Wisconsin border crossing or county border crossing of a stream; 7 = pools remaining from a "drying-up" stream; 8 = marsh; 9 = a lake (water type code 1 or 3 only) that: no longer exists, is contained in another named lake, or which itself contains other named lakes; A = a landlocked lake that no longer exists; B = a stream that no longer exists; C = Wisconsin border or county border crossing of a lake; a blank = dam or lock. This code is shown under the heading "WT".

## Township Description and County

In addition to receiving a series of mileage codes, each river and lake is also described by the town, range, section, quarter quarter section, and county in which its mouth lies. These data are shown in Figure 2, under the heading "LOCATION". All townships in Wisconsin are North. If the range is West, the letter "W" is used, and if East, the letter "E" is used. An example of a quarter quarter section code is "SENE". This code means the southeast 1/4 of the northeast 1/4 of a particular section. If one or more landlocked lakes cannot be uniquely designated by a quarter quarter section, a 64th of a section appears to the right of the quarter quarter. One of 4 letters is used to designate the quarter of the quarter quarter. They are: A = northeast, B = northwest, C = southwest, and D = southeast. If a 64th section is not able to separate the lakes, a 256th and a 1,024th section can be used. These alpha codes are found in the last 4 columns of the "stream or lake name" in parentheses. The counties are arranged in alphabetical order and given a numeric code, e.g., Adams County is "1" and Wood County is "72" (Table 1). If a river or lake has its mouth outside of the state, the township description is for that state and the county code becomes a state code with the following code numbers: Illinois = 80, Michigan = 85, Minnesota = 90, and Iowa = 95.

## Landlocked Lakes

A landlocked lake is located with its proper major and minor code numbers. However, all other mileages are left blank. The township description and county of the lake are given just as for all other lakes or rivers (Fig. 2). Figure 3 shows Lake Harriett (landlocked), whose center is located in town 5 north, range 9 east, section 26, northwest quarter of the northwest quarter.

## Landlocked Systems

A landlocked system is a series of lakes and streams that do not flow above ground into the Mississippi River or Great Lakes. They have a "0.00" in their major basin mileage and a number in

TABLE 1. List of counties in Wisconsin with codes arranged alphabetically.

County Code	County Name	County Code	County Name
1	Adams	37	Marathon
2	Ashland	38	Marinette
3	Barron	39	Marquette
4	Bayfield	40	Menominee
5	Brown	41	Milwaukee
6	Buffalo	42	Monroe
7	Burnett	43	Oconto
8	Calumet	44	Oneida
9	Chippewa	45	Outagamie
10	Clark	46	Ozaukee
11	Columbia	47	Pepin
12	Crawford	48	Pierce
13	Dane	49	Polk
14	Dodge	50	Portage
15	Door	51	Price
16	Douglas	52	Racine
17	Dunn	53	Richland
18	Eau Claire	54	Rock
19	Florence	55	Rusk
20	Fond du Lac	56	St. Croix
21	Forest	57	Sauk
22	Grant	58	Sawyer
23	Green	59	Shawano
24	Green Lake	60	Sheboygan
25	Iowa	61	Taylor
26	Iron	62	Trempealeau
27	Jackson	63	Vernon
28	Jefferson	64	Vilas
29	Juneau	65	Walworth
30	Kenosha	66	Washburn
31	Kewaunee	67	Washington
32	La Crosse	68	Waukesha
33	Lafayette	69	Waupaca
34	Langlade	70	Waushara
35	Lincoln	71	Winnebago
36	Manitowoc	72	Wood

the landlocked system space which is located just before the township under the heading "LS".

### Organization of File

Each river, lake, and dam in the state is given a permanent 7-digit number. This waterbody identification code (WBIC) is assigned in the same order as the Master Stream and Lake File is organized - that is, it starts with the lowest major basin number (1) and goes to the highest (3). Within each major basin the file goes from the lowest minor basin to the highest minor basin. Within each minor basin landlocked lakes are first listed in alphabetical order, and then the streams and other lakes in the basin are listed in increasing mileage orders (Fig. 2). Last within each basin, the landlocked systems, if present, are also listed in increasing mileage order. This nonchangeable number is shown on the 2nd line under the heading "BASINS". It can be used to uniquely designate any stream or lake in the state instead of coding its major and minor basins and its water mileages (township description, county, and lake name for landlocked lakes). See the Mark IV glossary listing (N86002R) in Appendix Figure 1 for the file layout.

## MASTER FISH FILE

When a station is sampled by Fish Distribution Study personnel (Bureau of Research), all data about the station are first recorded onto Form 8100-46 (Fig. 6). After all fish have been identified in the laboratory, the data are coded onto Form 8100-58 (Fig. 7), keyed onto a computer tape, and entered into the Master Fish File through a series of updating programs.

An example of a page from a listing of the Master Fish File is shown in Figure 8. The codes for the major and minor basins and the water mileage for a station are similar to those of a stream or lake in the Master Stream and Lake File. However, the data are arranged on the computer printout a little differently and there are also some changes that occur between the name of the stream or lake and its township description as compared to the Master Stream and Lake File. For landlocked lakes in the Master Stream and Lake File (Fig. 2), the mileage orders are left blank; however, for a sampling station (Fig. 8), the township description, which appeared in the Master Stream and Lake File, appears in this space. Figure 9 shows the same type of listing, except that instead of the 3-digit fish species codes, the common names are given.

The Master Fish File is organized in the same manner as the Master Stream and Lake File, except that all sampling stations on a river are listed until a tributary of the river is reached (Fig. 10a). All stations on that tributary are then listed before going back to the confluence of the tributary with the original river. This procedure is followed for all tributaries in the basin of the 1st tributary before going back to the original river.

### Computer Reports

Two types of computer programs were developed to present the fish data. One is a Cobol program which presents the data from the Master Fish File (DNR.R860.Fish.Master) in a species listing and shows all stations for each species. This listing can be organized in the same manner as the Master Fish File (Fig. 10a). As an alternative, all stations on a river can be listed before going back to the first tributary of the original river and listing all stations on that tributary (Fig. 10b). This procedure is followed for all tributaries in the basin of the 1st tributary before going to the 2nd tributary of the original river.

Using the Cobol program, both of these methods of organization can be restricted to one or more of the following criteria: particular minor basins, a sub-basin or part of a sub-basin, particular WBIC or range of WBIC's, individual collectors, dates, township and range (by entire township or contiguous townships), counties, water types, and selected species. At each station,

FIGURE 6. Example of field collection form (8100-46), front and back shown.

M.B.		M.B.		M.B. MILE		FIRST ORDER MILE		1	1	UP				
SECOND		THIRD		FOURTH		FIFTH		S.D.	GEAR	EFFORT	DOWN	MO.	DAY	YR.
SIXTH		SEVENTH		EIGHTH		NINTH		SPECIES		NO.				
TENTH		ELEVENTH		STATION MILE										
LOCATION														
.....														
.....														
JAR	WTC	TOWN	RANGE	SEC.	1/16	1/4	CO.							
WIDTH			BOTTOM TYPE			STREAM BANK VEGETATION								
L			CONCRETE	A			CULTIVATED	A						
M			BEDROCK	B			FALLOW	B						
U			HARDPAN	C			UPLAND PASTURE	C						
DEPTH			BOULDER			UPLAND MEADOW								
L	●		RUBBLE	E			UPLAND HARDWOOD	E						
M	●		GRAVEL	F			UPLAND CONIFER	F						
U	●		SAND	G			UPLAND SHRUB	G						
VELOCITY			SILT & MUCK			LOWLAND PASTURE								
—			CLAY	I			LOWLAND HARDWOOD	I						
WATER TEMP.			MARL			LOWLAND CONIFER								
— °F			DETRITUS	K			LOWLAND SHRUB	K						
CONDUCTIVITY			RUBBISH			OPEN MARSH								
— μmhos			PEAT	L			CUT GRASSES	L						
TURBIDITY			AQUATIC VEG.			BEACH								
—			EMERGENT	—			LOWLAND MEADOW	O						
PH			SUBMERGENT	—			OPEN WATER	P						
—			DUCKWEED	—										
— ●			ALGAE (ATT)	—										
—			ALGAE (FF)	—										

WIS. DEPARTMENT OF  
NATURAL RESOURCES  
FORM 8100-46  
REV. 2-80

- 1 ADD
- 2 CHANGE
- 3 DELETE

F  
OR  
S

SEQUENCE \_\_\_\_\_

MAJOR BASIN \_\_\_\_\_

MINOR BASIN \_\_\_\_\_

CC1 MB MILES \_\_\_\_\_

ORDER MILEAGES 1) \_\_\_\_\_ 2) \_\_\_\_\_ 3) \_\_\_\_\_  
 4) \_\_\_\_\_ 5) \_\_\_\_\_ 6) \_\_\_\_\_  
 7) \_\_\_\_\_ 8) \_\_\_\_\_ 9) \_\_\_\_\_  
 10) \_\_\_\_\_ 11) \_\_\_\_\_

STATION MILEAGE \_\_\_\_\_

REPORT LOCATION

NAME \_\_\_\_\_

DAM OR JAR CODE \_\_\_\_\_ WATERTYPE \_\_\_\_\_ 64th \_\_\_\_\_ LANDLOCKED SEQUENCE NUMBER \_\_\_\_\_

STREAM OR LAKE LOCATION TOWNSHIP \_\_\_\_\_ RANGE \_\_\_\_\_ SEC. \_\_\_\_\_ 1/16 \_\_\_\_\_ 1/4 \_\_\_\_\_ COUNTY \_\_\_\_\_

STATION LOCATION TOWNSHIP \_\_\_\_\_ RANGE \_\_\_\_\_ SEC. \_\_\_\_\_ 1/16 \_\_\_\_\_ 1/4 \_\_\_\_\_ COUNTY \_\_\_\_\_

SOURCE OF DATA \_\_\_\_\_ GEAR \_\_\_\_\_ EFFORT \_\_\_\_\_ DATE MO / DAY / YR \_\_\_\_\_ HOUR \_\_\_\_\_

WIDTH \_\_\_\_\_ L \_\_\_\_\_ M \_\_\_\_\_ U \_\_\_\_\_ DEPTH \_\_\_\_\_ L \_\_\_\_\_ M \_\_\_\_\_ U \_\_\_\_\_

VELOCITY \_\_\_\_\_ TEMPERATURE \_\_\_\_\_ CONDUCTIVITY \_\_\_\_\_ TURBIDITY \_\_\_\_\_

F  
I  
S  
H  
S  
H

BOTTOM TYPES \_\_\_\_\_  
 AQUATIC VEG. \_\_\_\_\_  
 STRM. BANK VEG. \_\_\_\_\_  
 WB-I-C \_\_\_\_\_

FISH SPECIES

O  
N  
L  
Y

1) \_\_\_\_\_ 2) \_\_\_\_\_ 3) \_\_\_\_\_ 4) \_\_\_\_\_  
 5) \_\_\_\_\_ 6) \_\_\_\_\_ 7) \_\_\_\_\_ 8) \_\_\_\_\_  
 9) \_\_\_\_\_ 10) \_\_\_\_\_ 11) \_\_\_\_\_ 12) \_\_\_\_\_  
 13) \_\_\_\_\_ 14) \_\_\_\_\_ 15) \_\_\_\_\_ 16) \_\_\_\_\_

MORE DATA ON BACK:  YES

FISH SPECIES (CONTINUED)

17) \_\_\_\_\_ 18) \_\_\_\_\_ 19) \_\_\_\_\_ 20) \_\_\_\_\_  
 21) \_\_\_\_\_ 22) \_\_\_\_\_ 23) \_\_\_\_\_ 24) \_\_\_\_\_  
 25) \_\_\_\_\_ 26) \_\_\_\_\_ 27) \_\_\_\_\_ 28) \_\_\_\_\_  
 29) \_\_\_\_\_ 30) \_\_\_\_\_ 31) \_\_\_\_\_ 32) \_\_\_\_\_  
 33) \_\_\_\_\_ 34) \_\_\_\_\_ 35) \_\_\_\_\_ 36) \_\_\_\_\_  
 37) \_\_\_\_\_ 38) \_\_\_\_\_ 39) \_\_\_\_\_ 40) \_\_\_\_\_  
 41) \_\_\_\_\_ 42) \_\_\_\_\_ 43) \_\_\_\_\_ 44) \_\_\_\_\_

F  
I  
S  
H  
O  
N  
L  
Y

FIGURE 7. Example of Fish and Stream Data Input form (8100-58). (Fish species 17-44 are on back of form).

MAY 13, 1988

FISH MASTER FILE (MARK 4)

BASIN	MBM	ORDER MILEAGE S						MILE	STREAM OR LAKE NAME	SD G EF	DATE	TWNRNGSECQTQTCO
JAR WT		1	2/7	3/8	4/9	5/10	6/11	WB-I-C				
2 222		1N	10E	27 NW	SW 54			+ SUGAR R - OXBOW	46 5	8/ 0/63	1N10E27NWSW54	
	0 0							0873000				
	SP=04	HY=00	UNSP=00	FISH	M20	+	005	+	S02	+	W08	+
2 222	1434.8R	156.9L	.7R	6.9R				2.3 E FK RACCOON CR	61 5	12/12/65	1N12E31NWSE54	
	2							0874100				
	SP=13	HY=00	UNSP=02	FISH	M04	+	M05	+	M14	+	M28	+
					N09	+	U01	+	X10	+	X12	+
2 222	1434.8R	156.9L	.7R	6.9R				2.4 E FK RACCOON CR	11 2 06	5/15/74	1N12E31SWNE54	
	3 2							0874100				
	SP=15	HY=01	UNSP=01	FISH	A05	4	I21	10	L02	6	L07	1
					M50	4	N09	28	W05	3	W09	1
									X10	13	X12	31
									X14	2	Z01	6
2 222	1434.8R	156.9L	.7R	6.9R	2.7R			1.5 UN CR (CHAMBERLIN SPRINGS)	71 5	10/ 5/77	1N12E29SWNW54	
	2							0874300				
	SP=08	HY=00	UNSP=00	FISH	M06	1	M29	27	M43	10	M48	29
									M50	99	N09	3
									U01	5	X12	11
2 222	1434.8R	156.9L	.7R	6.9R	2.7R			3.8 UN CR	11 3 06	5/15/74	1N12E21NWNW54	
	3 2							0874300				
	SP=07	HY=00	UNSP=01	FISH	M05	99	M43	19	M46	4	M48	75
									M50	53	N09	30
									U01	8	X12	2
2 222	1434.8R	156.9L	.7R	6.9R				3.2 E FK RACCOON CR	11 2 05	11/ 5/75	1N12E31NENW54	
	1 2							0874100				
	SP=17	HY=00	UNSP=01	FISH	A05	2	K01	6	L01	2	M05	33
					N09	47	W05	10	W09	6	X07	1
									X10	30	X12	25
									X14	2	X18	10
									M50	16	Z01	27
									(006	030	0	40)
									(1 49	3	0001	)
									(ET F1 G2 H5 I2			)
									(D3 FT K4 M2 01			)
2 222	1434.8R	156.9L	.7R	6.9R				3.3 E FK RACCOON CR	61 5	6/10/65	1N12E31NENW54	
	2							0874100				
	SP=07	HY=00	UNSP=01	FISH	M05	+	M28	+	M39	+	M43	+
									M45	+	M50	+
									N09	+	X10	+
2 222	1434.8R	156.9L	.7R	6.9R				7.8 E FK RACCOON CR	11 2 06	5/15/74	1N11E12SESW54	
	3 2							0874100				
	SP=16	HY=00	UNSP=01	FISH	I21	2	K01	2	M05	99	M09	1
					N09	99	U01	99	W05	5	W08	1
									X10	99	X11	46
									X12	61	X12	61
									Z01	2		
2 222	1434.8R	156.9L	.7R					10.7 RACCOON CR	11 2 06	7/ 0/74	1N11E35SESW54	
	3 2							0874000				
	SP=19	HY=00	UNSP=01	FISH	L02	8	M05	15	M12	7	M19	6
					N09	11	O05	1	O06	13	O10	2
									U01	2	W04	2
									W05	2	W06	1
									X12	3		
									X14	4	X18	4
2 222	1434.8R	156.9L	.7R					10.7 RACCOON CR	61 5	6/10/65	1N11E35SESW54	
	2							0874000				
	SP=12	HY=00	UNSP=00	FISH	K01	+	L02	1	M39	+	M45	+
					W05	+	X12	+	X18	+	N09	+
									005	+	006	+
									S02	+	U01	+

FIGURE 8. Sample page from the Master Fish File using a Mark IV program (Listing method a, Fig. 10, used here).

MAY 13, 1988		FISH MASTER FILE (MARK IV) WITH COMMON NAMES										PAGE 1	
BASIN MBM		-----ORDER MILEAGES-----										STATION LOCATION	
JAR WT		1	2/7	3/8	4/9	5/10	6/11	MILE	----STREAM OR LAKE NAME----	SD G EF	--DATE--	TWNRNGSECQTOTCO	
		WB-I-C											
2	222	0 0	1N	10E	27 NW	SW 54		+	SUGAR R - OXBOW	46 5	8/ 0/63	1N10E27NWSW54	
		SP=04	HY=00	UNSP=00	FISH	GOLDEN SHINER +	BLACK BULLHEAD +	BLACKSTRIPE	TOPMINNOW +				
						ORANGESPOTTED	SUNFISH +						
2	222	1434.8R	156.9L	.7R	6.9R		2.3	E FK RACCOON CR	0874100	61 5	12/12/65	1N12E31NWSW54	
		SP=13	HY=00	UNSP=02	FISH	SHINERS +	STONEROLLERS +	BRASSY MINNOW +	COMMON SHINER +				
						BIGMOUTH SHINER +	SUCKERMOUTH MINNOW +	SOUTHERN REDBELLY DACE +					
						BLUNTNOSE MINNOW +	CREEK CHUB +	WHITE SUCKER +	BROOK				
						STICKLEBACK +							
						FANTAIL DARTER +	JOHNNY DARTER +	BANDED DARTER +	BLACKSIDE				
						DARTER +							
2	222	1434.8R	156.9L	.7R	6.9R		2.4	E FK RACCOON CR	0874100	11 2 06	5/15/74	1N12E31SWNE54	
		SP=15	HY=01	UNSP=01	FISH	AMERICAN BROOK LAMPREY 4	BROWN TROUT 10	NORTHERN PIKE 6	NORTHERN				
						PIKE X GRASS PICKEREL 1	STONEROLLERS 6	COMMON CARP 1	COMMON				
						SHINER 1	BIGMOUTH SHINER 1	BLUNTNOSE MINNOW 13	CREEK CHUB 4				
						WHITE SUCKER 28	GREEN SUNFISH 3	BLUEGILL 1					
						FANTAIL DARTER 13	JOHNNY DARTER 31	BANDED DARTER 2	MOTTLED				
						SCULPIN 6							
2	222	1434.8R	156.9L	.7R	6.9R	2.7R	1.5	UN CR (CHAMBERLIN SPRINGS)	0874300	71 5	10/ 5/77	1N12E29SWNW54	
		SP=08	HY=00	UNSP=00	FISH	CENTRAL STONEROLLER 1	BIGMOUTH SHINER 27	SOUTHERN REDBELLY DACE 10					
						BLACKNOSE DACE 29	CREEK CHUB 99	WHITE SUCKER 3	BROOK STICKLEBACK				
						JOHNNY DARTER 11							
2	222	1434.8R	156.9L	.7R	6.9R	2.7R	3.8	UN CR	0874300	11 3 06	5/15/74	1N12E21NWNW54	
		SP=07	HY=00	UNSP=01	FISH	STONEROLLERS 99	SOUTHERN REDBELLY DACE 19	FATHEAD MINNOW 4					
						BLACKNOSE DACE 75	CREEK CHUB 53	WHITE SUCKER 30	BROOK STICKLEBACK				
						JOHNNY DARTER 2							
2	222	1434.8R	156.9L	.7R	6.9R		3.2	E FK RACCOON CR	0874100	11 2 05	11/ 5/75	1N12E31NENW54	
		SP=17	HY=00	UNSP=01	FISH	AMERICAN BROOK LAMPREY 2	CENTRAL MUDMINNOW 6	GRASS PICKEREL 2	(006 030 0 40)				
						STONEROLLERS 33	COMMON SHINER 2	BLUNTNOSE MINNOW 11	FATHEAD	(1 49 3 0001)			
						MINNOW 3	BLACKNOSE DACE 20	CREEK CHUB 16	WHITE SUCKER 47	GREEN	(ET F1 G2 H5 I2)		
						SUNFISH 10	BLUEGILL 6			(D3 FT K4 M2 O1)			
						RAINBOW DARTER 1	FANTAIL DARTER 30	JOHNNY DARTER 25	BANDED DARTER				
						2	BLACKSIDE DARTER 10	MOTTLED SCULPIN 27					
2	222	1434.8R	156.9L	.7R	6.9R		3.3	E FK RACCOON CR	0874100	61 5	6/10/65	1N12E31NENW54	
		SP=07	HY=00	UNSP=01	FISH	STONEROLLERS +	COMMON SHINER +	REDFIN SHINER +	SOUTHERN				
						REDBELLY DACE +	BLUNTNOSE MINNOW +	CREEK CHUB +	WHITE SUCKER +				
						FANTAIL DARTER +							

FIGURE 9. Sample page from the Master Fish File using a Mark IV program (listing method a, Fig. 10, used here) and showing common names of the fish taken.

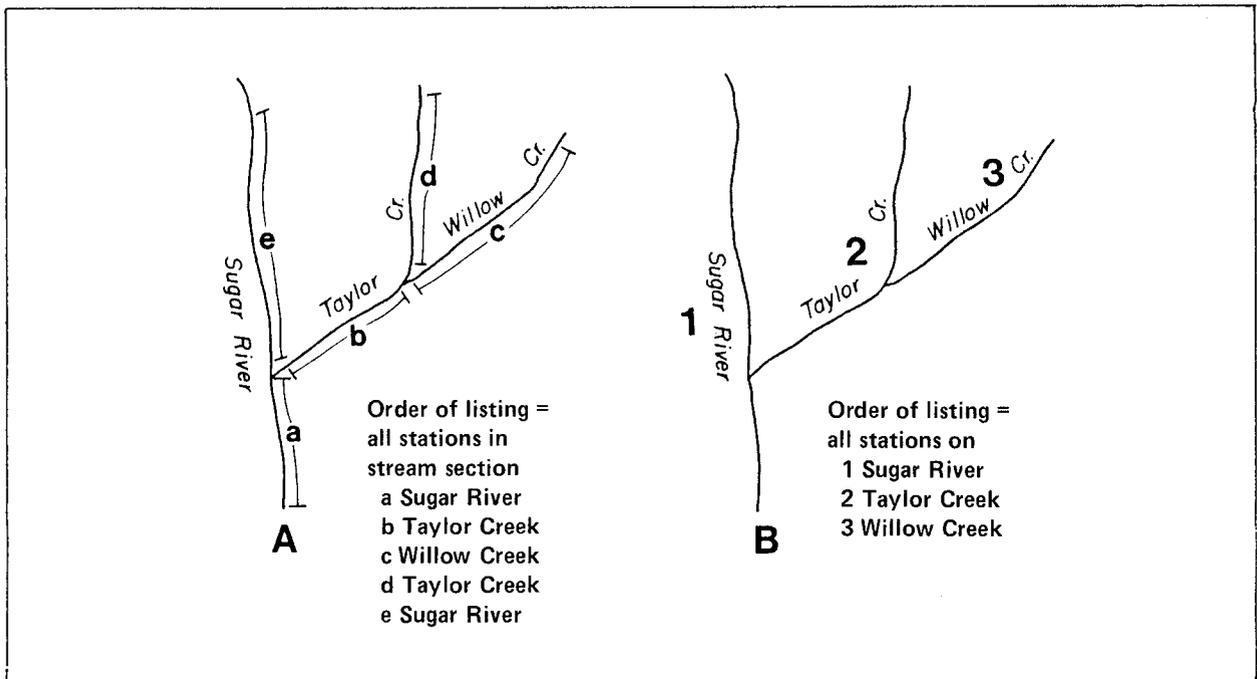


FIGURE 10. Two methods of organizing stations on computer printouts.

the stream name along with water type, number of fish taken, collector, gear, effort, date, township description, and county are listed. An example of the Cobol listing for one species is shown in Figure 11. At the end of each species listing, the total number of stations, total number of specimens, average number of fish/station, and number of stations for each collector is computed. At the end of the printout, a summary table is given that lists each species, the number of stations at which it was taken, the percent of the total stations possible, grand total of species occurrences, totals for each collector, and totals for number of species and hybrids (Fig. 12). See the Mark IV glossary listing (N86003R) in Appendix Figure 2 for the file layout which has fixed length records.

The second computer program, written in Mark IV which needs a different file (DNR.R860.Fish.Work), organizes the data by stations and lists for each station all information (number of specimens of each species, and the total number of species, hybrids, and unspecified categories). The program can be restricted to the same criteria cited above for the Cobol program and the listing can be organized in the same two ways (Fig. 10, a and b). However, only the Mark IV listing can be restricted to gear or any of the 10 ecological variables. This program can be organized in still different ways, including: (1) by county and then alphabetically by name of stream or lake, (2) by county and then by basin, or (3) by township, range, and section. An example of a Mark IV listing is shown in Figure 8. See the Mark IV glossary listing (N86000R) in Appendix Figure 3 for the file layout which has variable length records.

FIGURE 11. Sample listing for a species using the Cobol program (listing method b, Fig. 10, used here).

BASINS=223, . , .		SOURCENOT40 81 94 95 99				MILE LIMIT ON SPECIES LIMIT P. 02									
RESTRICTED TO =		-----				S.M. = FROM TO									
MONTH = TO		YEAR = 1950 TO 1973		COUNTY=-----		-----N-----		WBIC# -----							
X12 JOHNNY DARTER		ETHEOSTOMA NIGRUM				DATE RUN 10/10/88									
		-----ORDER MILEAGES-----				N86007A									
BASIN	MBM	1	2/7	3/8	4/9	5/10	6/11	MILE	LAKE OR STREAM NAME	WT	NO	SD	GEF	--DATE--	TWNRNGSECQTQTCO
2 223	1434.8R	156.9L						139.1	PECATONICA R	2	2	46	5	6/27/60	2N 3E12SESE33
2 223	1434.8R	156.9L						182.4	PECATONICA R -MIFFLIN	2	11	46	5	8/15/62	5N 1E27SESE25
2 223	1434.8R	156.9L	72.8R					30.5	RICHLAND CR	2		61	5	11/28/65	1N 8E 7SENE23
2 223	1434.8R	156.9L	72.8R	27.0R				1.8E	TWIN GROVE BR	2		61	5	10/20/64	1N 8E29NWNE23
2 223	1434.8R	156.9L	102.8R	13.8Y				1.3	BUCKSKIN SCHOOL CR	2		61	5	7/ 5/65	2N 7E 5SWSW23
2 223	1434.8R	156.9L	105.8R					30.2	E BR PECATONICA R	2	44	46	5	6/30/60	4N 5E26SESE33
2 223	1434.8R	156.9L	105.8R					40.3	E BR PECATONICA R	2	27	46		6/30/60	4N 5E 4SENE25
2 223	1434.8R	156.9L	105.8R					53.4	E BR PECATONICA R	2		61	5	10/15/64	5N 5E 4NWNW25
2 223	1434.8R	156.9L	105.8R					58.3	E BR PECATONICA R	2	3	61	5	8/ 1/69	6N 5E22SWSE25
2 223	1434.8R	156.9L	105.8R	10.9L				0.5	WHITESIDE CR	2	3	46		6/30/60	2N 5E 3SESW33
2 223	1434.8R	156.9L	105.8R	10.9L	1.6R			1.9	APPLE BR	2		61	5	10/ 7/65	3N 5E32 NE33
2 223	1434.8R	156.9L	105.8R	10.9L	1.6R			3.3E	APPLE BR	2	19	46		6/29/60	3N 5E30SESE33
2 223	1434.8R	156.9L	105.8R	15.0R				5.3	DOUGHERTY CR	2		61	5	10/ 6/64	3N 6E19NWSE23
2 223	1434.8R	156.9L	105.8R	19.2L				0.3	MUD BR	2	24	46		6/29/60	3N 5E22 SW33
2 223	1434.8R	156.9L	105.8R	19.2L				3.7	MUD BR	2		61	5	10/ 1/64	3N 5E20NWNW33
2 223	1434.8R	156.9L	105.8R	19.2L				9.6	MUD BR	2	24	46		6/29/60	3N 4E15NENW33
2 223	1434.8R	156.9L	105.8R	19.7L				6.1E	YELLOWSTONE R	2	5	46		6/29/60	3N 5E 8SENE33
2 223	1434.8R	156.9L	105.8R	19.7L				17.0	YELLOWSTONE R	2	9	46		6/28/60	4N 4E23SESE33
2 223	1434.8R	156.9L	105.8R	25.4R				1.3	SAWMILL CR	2		61	5	10/ 7/64	3N 5E 2NESE33
2 223	1434.8R	156.9L	105.8R	25.4R				6.5E	SAWMILL CR	2		61	5	10/ 6/64	4N 6E20SESW23
2 223	1434.8R	156.9L	105.8R	27.5L				1.0	UN CR	2	27	46		6/28/60	4N 5E27NWSE33
2 223	1434.8R	156.9L	105.8R	33.5R				0.9	GORDON CR	2		61	5	10/ 1/64	4N 5E13NWSW25
2 223	1434.8R	156.9L	105.8R	44.2L	6.1R			6.3	CONLEY LEWIS CR	2	1	61	5	8/ 1/69	6N 4E34SWNE25
2 223	1434.8R	156.9L	139.3L					1.2	AMES BR	2	3	46		6/27/60	2N 3E11SESE33
2 223	1434.8R	156.9L	140.8R					0.4	OTTER CR	2	2	46		6/27/60	2N 4E 6SENW33
2 223	1434.8R	156.9L	153.4L					5.1	BONNER BR	2	7	46		8/15/62	3N 2E11SENW33
2 223	1434.8R	156.9L	159.0R					9.9	MINERAL POINT BR	2	3	46	5	8/15/62	4N 2E10 NE25
2 223	1434.8R	156.9L	159.0R	8.8L				13.7	MINERAL POINT BR	2	1	46		8/ 9/62	5N 2E36SWNE25
2 223	1434.8R	156.9L	159.0R	8.8L	10.6R			8.3	SUDAN BR	2	4	46		8/14/62	5N 2E29SWSE25
2 223	1434.8R	156.9L	159.0R	8.8L	10.6R			0.4	PEDLER CR	2	2	46		8/14/62	5N 2E21SWNE25
2 223	1434.8R	156.9L	172.9L					1.5	JONES BR	2		45		7/11/62	4N 1E23SWSE33

NUMBER OF STATIONS WITH FISH = 31    NUMBER OF STATIONS WITH 1-98 FISH = 20    NUMBER OF STATIONS WITH 99 OR MORE FISH = 0  
 TOTAL NUMBER OF FISH = 221    AVERAGE NUMBER OF FISH = 11.1 (ESTIMATE)  
 PERCENT OF TOTAL NUMBER OF STATIONS = 79.49    NUMBER OF STATIONS WITH A " " = 11  
 \* STATIONS/SD: SD-11= 0    SD-14,16= 0    SD-15,17,19= 0    SD-23-33= 0    SD-40= 0    SD-45,46= 19    SD-50= 0    SD-55,56= 0  
                   SD-61= 12    SD-66= 0    SD-72= 0    SD-75= 0    SD-76= 0    SD-77= 0    SD-78= 0    SD-80= 0  
                   SD-83= 0    SD-86= 0    SD-88= 0    SD-89= 0    SD-94= 0    SD-98= 0    SD-99= 0    SD-36= 0  
 TOTAL NUMBER OF SPECIES OCCURRENCES    31

FIGURE 12. Sample summary report for species listing.

BASINS=223, , ,		SOURCENOT40 81 94 95 99		MILE LIMIT ON ----- P. 01					
		NUMBER OF STATIONS	PERCENT OF TOTAL STATIONS	DATE RUN 10/10/88					
I21	BROWN TROUT	1	2.56						
K01	CENTRAL MUDMINNOW	4	10.26						
M05	STONEROLLERS	13	33.33						
M06	CENTRAL STONEROLLER	19	48.72						
M07	LARGESCALE STONEROLLER	4	10.26						
M12	COMMON CARP	5	12.82						
M14	BRASSY MINNOW	5	12.82						
M19	HORNHEAD CHUB	21	53.85						
M23	EMERALD SHINER	1	2.56						
M28	COMMON SHINER	28	71.79						
M29	BIGMOUTH SHINER	5	12.82						
M35	ROSYFACE SHINER	17	43.59						
M36	SPOTFIN SHINER	16	41.03						
M37	SAND SHINER	14	35.90						
M41	SUCKERMOUTH MINNOW	8	20.51						
M43	SOUTHERN REDBELLY DACE	18	46.15						
M45	BLUNTNOSE MINNOW	29	74.36						
M46	FATHEAD MINNOW	6	15.38						
M48	BLACKNOSE DACE	2	5.13						
M50	CREEK CHUB	27	69.23						
M76	COMMON SHINER X ROSYFACE SHINER	1	2.56						
N02	SUCKERS	1	2.56						
N04	REDHORSES	1	2.56						
N06	QUILLBACK	1	2.56						
N09	WHITE SUCKER	29	74.36						
N13	NORTHERN HOG SUCKER	10	25.64						
N15	BIGMOUTH BUFFALO	3	7.69						
N18	SILVER REDHORSE	9	23.08						
N21	GOLDEN REDHORSE	8	20.51						
N22	SHORTHEAD REDHORSE	13	33.33						
O08	CHANNEL CATFISH	1	2.56						
O10	STONECAT	5	12.82						
S02	BLACKSTRIPE TOPMINNOW	1	2.56						
U01	BROOK STICKLEBACK	12	30.77						
W04	ROCK BASS	5	12.82						
W05	GREEN SUNFISH	6	15.38						
W08	ORANGESPOTTED SUNFISH	5	12.82						
W09	BLUEGILL	10	25.64						
W11	SMALLMOUTH BASS	14	35.90						
W12	LARGEMOUTH BASS	6	15.38						
X07	RAINBOW DARTER	2	5.13						
X10	FANTAIL DARTER	13	33.33						
X12	JOHNNY DARTER	31	79.49						
X14	BANDED DARTER	5	12.82						
X15	YELLOW PERCH	3	7.69						
X18	BLACKSIDE DARTER	7	17.95						
X19	SLENDERHEAD DARTER	4	10.26						
X22	WALLEYE	1	2.56						
Z01	MOTTLED SCULPIN	7	17.95						
		TOTAL NUMBER OF SPECIES OCCURRENCES	441						
# STATIONS/SD:	SD-11-36 = 0	SD-40 = 0	SD-45-47 = 283	SD-50 = 0	SD-55,56 = 0	SD-60,61 = 158	SD-66 = 0	SD-72 = 0	
	SD-75 = 0	SD-76 = 0	SD-77 = 0	SD-78 = 0	SD-79 = 0	SD-80 = 0	SD-81 = 0	SD-83 = 0	
	SD-86 = 0	SD-88 = 0	SD-89 = 0	SD-90 = 0	SD-93 = 0	SD-97 = 0	SD-98 = 0	SD-01 = 0	
	SD-65 = 0	SD-70 = 0	SD-71 = 0	SD-87 = 0	SD-94 = 0	SD-99 = 0			
		TOTAL NUMBER OF SPECIES OCCURRENCES	441						
TOTAL NUMBER OF STATIONS									
( WITH MILE RULE)		39							
( WITHOUT MILE RULE)		42							
TOTAL NUMBER OF SPECIES		45							
TOTAL NUMBER OF HYBRIDS		1							
TOTAL NUMBER OF UNSPECIFIED		3							

## Station Location

The exact location of the station on the river or drainage lake is given by the station mileage. The exact location on a landlocked lake is given only by the township description located under the heading "STATION LOCATION" (Fig. 8). Station mileages on streams are the number of miles upstream the station is from the stream's mouth. The station's location is that part of the station which is farthest downstream. For stations at bridges, the station mileage is at the bridge unless the station is started more than 0.05 mile (264 ft) downstream or upstream. The station mileage is shown under the heading "MILE". The space immediately following the station mileage can have 1 of 16 codes: "R", "S", "T", or "U" (all = right side of body of water sampled); "L", "M", "N", or "O" (all = left side of body of water sampled)\*; "B" (area sampled is 100% downstream of bridge); "C" (area sampled is more than 50% but less than 100% downstream of bridge); "D" (area sampled is more than 50% but less than 100% upstream of bridge); "E" (area sampled is 100% upstream of bridge); "F" (area sampled is 50% upstream and 50% downstream of bridge); blank (no specific information on area sampled is given; however, it is usually mostly upstream of bridge and both sides of the body of water); "+" (area sampled is from a combination of stations usually in lakes under 200 acres); and "?" (station mileage is not precisely known).

Station mileage on a drainage lake is determined in the same way the mileage is determined for a tributary coming into a lake. For a station on a landlocked lake over 200 acres, an arbitrary number ".1" is used for the station mileage of 1 station on the lake and the next station is assigned ".2", etc. Samples normally were combined from all stations in lakes under 200 acres but for lakes over 200 acres samples were kept separate. A combined sample is recorded as 1 station using the town-range-section system at either the center (for landlocked lakes) or the outlet of the lake for its location and is shown with a "+" in its station mileage. For boom or mini-shocking stations, a "+" is used when all or most of the lake is sampled. All stations at the exact same location have the same mileage code.

All stations in the Master Fish File have their station mileages recorded on the Fish Distribution Study's master set of U.S. Geological Survey topographic maps.

## Source of the Data

The collector of the fish at a particular station is shown by a 2-digit code under the heading "SD" (Fig. 8). In order to group related collectors, five categories were created. They are: Historic (1900-50), Research, Fisheries Management, University of Wisconsin System, and Miscellaneous (Table 2).

---

\*Four different codes for right and left are available since several locations on lakes can have the same water mileage from the mouth.

TABLE 2. Fish collectors' codes.

Historic (1900-50) SD 01-10

- 01 - Early Wisconsin fish collections (1900-31) (reported by Greene, 1935).
- 02 - Greenbank et al. (1940s) (from the UW-Madison Zoology Museum).
- 04 - UW-Madison's Catalog of Wis. Conserv. Dep. collections.

Research SD 11-19

- 11 - Fish Distribution Study personnel.
- 12 - Fish Distribution Study's stocking.
- 13 - Research personnel - identified by trained ichthyologist.
- 14 - Fish Research - collecting done for Fish Distribution Study; identification of specimens handled as in SD 33; however, their identification of sunfishes is also accepted.
- 15 - Fish Research - similar to SD 14, except it is a partial\* sample.
- 16 - Fish Research - sample identified by Fish Distribution Study personnel, except for same species as SD 14.
- 17 - Fish Research - similar to SD 16, except it is a partial sample.
- 18 - Other Research personnel - sample identified by Fish Distribution Study personnel.
- 19 - Other Research personnel - not identified by Fish Distribution Study personnel.

Fisheries Management SD 20-39, 94-96

- 23 - Youth Camp - identified by Fish Distribution Study personnel.
- 25 - Rock River Chemical Treatment and Lake Koshkonong Power Plant site - identified by Fish Distribution Study personnel or Dr. G. Becker.
- 32 - All specimens were identified by Fish Distribution Study personnel, except for some specimens of 35 species\*\* (depending on each species' distribution in the state) that are assumed to be easily identifiable by Fisheries Management personnel.
- 33 - In addition to accepting Fisheries Management's identification of up to 35 species (mentioned above), their identification of other species is also accepted if at least 1 fish of that species was identified by Fish Distribution Study personnel. Therefore, while species should be accurate, numbers of specimens caught may not be accurate due to fish returned to the water.

- 36<sup>a</sup> - Similar to 33 except that Fish Distribution Study personnel did not receive specimens of 1 or more species (excluding the 35 accepted species). Therefore, the specimens had to be generalized to family or genus.
- 94 - Fisheries Management survey - based on reports only.
- 95 - Literature not based on any particular survey - e.g., surface water resource publications.
- 96 - Restocking of fish after chemical treatment.

University of Wisconsin System SD 40-74

- 40 - UW-Madison students
- 45 - UW-Stevens Point students
- 46 - Dr. George Becker
- 47 - UW-Stevens Point, Dr. Coble and students
- 50 - UW-Milwaukee, Dr. Norden and students
- 55 - Dr. George Seeburger
- 56 - UW-Whitewater students
- 60 - UW-Waukesha students
- 61 - Prof. Marlin Johnson and UW-Madison students
- 65 - UW-Parkside students
- 66 - UW-Eau Claire, Dr. Crowe
- 70 - Beloit College students
- 71 - Dr. J. Lutz
- 72 - Prof. Held and UW-La Crosse students

Miscellaneous SD 75-93, 97-99

- 73 - Wisconsin DNR, Bureau of Water Resources Management district personnel
- 75 - Milwaukee Public Museum
- 76 - ENCAP, Inc., Dr. Greenfield, Dekalb Univ., Dekalb, Ill.
- 77 - Dairyland Power Cooperative, La Crosse
- 78 - Northern States Power Co.
- 79 - N.U.S. Corp., Pittsburg, Pa.
- 80 - Bio Test, Inc., Chicago, Ill.
- 81 - Dames and Moore, Park Ridge, Ill.
- 82 - Wis. Electric Power Co., Milwaukee
- 83 - Upper Mississippi River Conservation Comm.
- 84 - Illinois Natural History Survey, Urbana, Ill.
- 86 - Commercial fishermen identified by Fish Distribution Study or Dr. G. Becker
- 87 - Dr. Underhill and Univ. Minnesota students
- 88 - Iowa Coop. Fish Research Unit, Ames, Ia.
- 89 - Minnesota DNR
- 90 - U.S. Fish and Wildlife Service
- 91 - Michigan DNR
- 92 - Michigan DNR - identified by Univ. Michigan, Ann Arbor, Mich.
- 93 - Miscellaneous collectors
- 97 - U.S. Army Corps of Engineers
- 98 - Commercial fishermen
- 99 - Unknown collector - e.g., sport fisherman

\*Partial = those in which sampling effort and/or species identification were incomplete and therefore did not yield adequate assessment of total species composition.

\*\*These 35 species are identified in Table 2 with double asterisks.

<sup>a</sup>Computer printouts of the species taken may not be the same as Fisheries Management's records due to fish returned to the water.

## Gear and Effort

Type of gear is shown under the heading "G", and an estimate of the effort is shown under the heading "EF" (Fig. 8 and Table 3). When the effort is unknown, it is left blank. If 99 appears, it means the effort was greater than 98.

## Date

The date on which the sample was taken is shown under the heading "DATE". Thus, 6/23/75 would mean 23 June 1975.

## Township Description

The town, range, section, quarter quarter section, and county are shown under the heading "STATION LOCATION".

TABLE 3. Gear and effort.

<u>Gear</u>	<u>Units of Effort</u>
<u>Code Description</u>	
1 = DC boom shocker	Tenths of miles shocked (1 mile = 10)
2 = DC stream shocker	Hundredths of miles shocked (100 yd = 06)
3 = DC backpack shocker	Hundredths of miles shocked
4 = Survey seine	Area covered (acres)
5 = Small-mesh seine	Area covered (ft <sup>2</sup> /100) x no. hauls (e.g., 100 ft x 15 ft/100 x 1 = 15)
6 = Gill, trammel, or entanglement net	Length of net (ft/10) x no. days
7 = Fyke, hoop, trap, or drop net	No. nets x no. days in water
8 = Mini boom shocker	Tenths of miles shocked
9 = Trawl	Minutes x no. hauls
A = Dip net	Left blank
B = DC long line shocker	Hundredths of miles shocked
C = Poison	Tenths of miles poisoned
D = Hook and line, spear, or arrow	Left blank
E = Minnow trap	No. traps x no. days
F = Pond net	No. nets x no. days
G = Miscellaneous (found dead, winterkill, etc.)	Left blank
H = Combination of gear	Left blank
I = Boom shocker and mini boom shocker	Tenths of miles shocked
J = Slat trap	No. traps x no. days
K = Any type of shocking gear and any type of net	Left blank
L = Any type of shocking gear and any type of seine	Left blank
M = Any type of net and any type of seine	Left blank
N = Combination of any types of nets	Left blank
O = Combination of any types of seines	Left blank
P = Combination of any types of shocking gear	Left blank
Q = AC boom shocker	Tenths of miles shocked
R = AC stream shocker	Hundredths of miles shocked
S = AC backpack shocker	Hundredths of miles shocked
T = AC long line shocker	Hundredths of miles shocked

### Jar Code

Usually a station jar was kept with a few specimens of each of the species and the remaining specimens were given to the Milwaukee Public Museum for curation. The station jars are temporarily housed at the Nevin Fish Hatchery in Madison. A jar code was used to record information on the fish kept. These codes are shown in Figure 8 under the heading "JAR", which is on the 2nd line of data for a station. When a jar was kept, a "1" was used. It was left blank or a zero was used, when no jar was kept. If 1 or more specimens were kept for a synoptic collection, a "2" was used. If both a station jar and a synoptic collection were kept, a "3" was used.

### Water Type Code

Stations are given a water type code, which is the same as the codes described in the Master Stream and Lake File. They are shown on the 2nd line of data after the Jar Code under the heading "WT".

### Waterbody Identification Code

Every waterbody in Wisconsin has been assigned a permanent 7-digit code. It is shown on the 2nd line of data under the heading "WB-I-C".

### Fish Species Data

On the 3rd line of data for a station appears the total number of species ("SP"), hybrids ("HY"), and unspecified categories ("UNSP") captured. The unspecified category is used for specimens not identified to species. On this same line of data, after the heading "FISH", the fish species' codes and number of specimens taken is given. The fish species code is composed of an alphabetical character which is unique for each family and 2 numeric characters which are unique for each species, hybrid, or unspecified category in the family. Table 4 shows the codes for all species, hybrids, and unspecified groups in Wisconsin. If more than 98 fish were captured, a 99 is given. A "+" or blank in this space means the number collected is unknown. Each station can have up to 44 species.

### Ecological Data

Ecological data were recorded onto Form 8100-46 (Fig. 6) for most stations sampled by Fish Distribution Study personnel (Bureau of Research). An example of the data appears in Figure 8; on the far right quarter of the printout are located 4 lines in parentheses. Blanks in the listing indicate the data were not taken. Many of the terms and their definitions are similar to those found in the Fish Management Handbook.

TABLE 4. List of common and scientific names of all fish species, hybrids, and groups\* found in Wisconsin.

Species Code	Common Name	Scientific Name	Species Code	Common Name	Scientific Name
	<b>LAMPREYS</b>	<b>PETROMYZONTIDAE</b>	109	Blackfin cisco	<u>Coregonus nigripinnis</u>
A00*	Lampreys unsp.	Petromyzontidae			
A01*	Lampreys	<u>Ichthyomyzon</u> spp.	110	Shortnose cisco	<u>Coregonus reighardi</u>
A02	Chestnut lamprey	<u>Ichthyomyzon castaneus</u>	111	Shortjaw cisco	<u>Coregonus zenithicus</u>
A03	Northern brook lamprey	<u>Ichthyomyzon fossor</u>	112	Pink salmon	<u>Oncorhynchus gorbuscha</u>
A04	Silver lamprey	<u>Ichthyomyzon unicuspis</u>	113	Chum salmon	<u>Oncorhynchus keta</u>
A05	American brook lamprey	<u>Lampetra appendix</u>	114	Coho salmon	<u>Oncorhynchus kisutch</u>
A06**	Sea lamprey	<u>Petromyzon marinus</u>	115	Kokanee (Sockeye salmon)	<u>Oncorhynchus nerka</u>
	<b>STURGEONS</b>	<b>ACIPENSERIDAE</b>	116	Chinook salmon	<u>Oncorhynchus tshawytscha</u>
B00*	Sturgeons unsp.	Acipenseridae	117	Pygmy whitefish	<u>Prosopium coulteri</u>
B01**	Lake sturgeon	<u>Acipenser fulvescens</u>	118	Round whitefish	<u>Prosopium cylindraceum</u>
B02**	Shovelnose sturgeon	<u>Scaphirhynchus platorynchus</u>	119	Rainbow trout	<u>Salmo gairdneri</u>
	<b>PADDLEFISHES</b>	<b>POLYODONTIDAE</b>	120	Atlantic salmon	<u>Salmo salar</u>
C01**	Paddlefish	<u>Polyodon spathula</u>	121	Brown trout	<u>Salmo trutta</u>
	<b>GARS</b>	<b>LEPISOSTEIDAE</b>	122	Brook trout	<u>Salvelinus fontinalis</u>
D00*	Gars unsp.	Lepisosteidae			
D01**	Longnose gar	<u>Lepisosteus osseus</u>	123	Lake trout	<u>Salvelinus namaycush</u>
D02	Shortnose gar	<u>Lepisosteus platostomus</u>	124	Siscowet	<u>Salvelinus namaycush</u>
	<b>BOWFINS</b>	<b>AMIIDAE</b>	127	Tiger trout (brook trout x brown trout)	<u>Salvelinus namaycush siscowet</u>
E01**	Bowfin	<u>Amia calva</u>	128	Splake (brook trout x lake trout)	
	<b>FRESHWATER EELS</b>	<b>ANGUILLIDAE</b>			
F01**	American eel	<u>Anguilla rostrata</u>			
	<b>HERRINGS</b>	<b>CLUPEIDAE</b>			
G00*	Herrings unsp.	Clupeidae			
G01**	Alewife	<u>Alosa pseudoharengus</u>	J01**	RAINBOW SMELTS	<b>OSMERIDAE</b>
G02	Gizzard shad	<u>Dorosoma cepedianum</u>		Rainbow smelt	<u>Osmerus mordax</u>
G03	Skipjack herring	<u>Alosa chrysochloris</u>			
	<b>MOONEYES</b>	<b>HIODONTIDAE</b>			
H00*	Hiodons unsp.	Hiodontidae			
H01	Goldeye	<u>Hiodon alosoides</u>			
H02	Mooneye	<u>Hiodon tergisus</u>			
	<b>TROUTS</b>	<b>SALMONIDAE</b>			
I00*	Salmons	<u>Oncorhynchus</u> spp.			
I01*	Trouts	<u>Salvelinus</u> spp. and <u>Salmo</u> spp.			
I02*	Ciscoes and whitefishes	<u>Coregonus</u> spp. and <u>Prosopium</u> spp.			
I03	Longjaw cisco	<u>Coregonus alpenae</u>			
I04**	Cisco or lake herring	<u>Coregonus artedii</u>			
I05	Lake whitefish	<u>Coregonus clupeaformis</u>			
I06	Bloater	<u>Coregonus hoyi</u>			
I07	Deepwater cisco	<u>Coregonus johanna</u>			
I08	Kiyi	<u>Coregonus kiyi</u>			
				<b>MINNOWS AND CARPS</b>	<b>CYPRINIDAE</b>
			M00*	Minnows and carps unsp.	Cyprinidae
			M01*	Chubs, M10, M16-19, M50	( <u>Couesius plumbeus</u> , <u>Hybopsis</u> spp., <u>Nocomis biguttatus</u> , and <u>Semotilus atromaculatus</u> )

TABLE 4. Continued.

Species			Species		
Code	Common Name	Scientific Name	Code	Common Name	Scientific Name
M02*	Daces, M09, M42-44, M48, M49, M51	<u>Clinostomus</u> <u>elongatus</u> , <u>Phoxinus</u> spp., <u>Rhinichthys</u> spp., and <u>Semotilus</u> <u>margarita</u> )	M41	Suckermouth minnow	<u>Phenacobius</u> <u>mirabilis</u>
M03	Redbelly dace, M42, M43	( <u>Phoxinus eos</u> and <u>P.</u> <u>erythrogaster</u>	M42	Northern redbelly	<u>Phoxinus eos</u>
M04	Shiners, M20-29, M31-33, M35-40	( <u>Notemigonus</u> <u>crysoleucas</u> and <u>Notropis</u> spp.) exc. <u>Notropis</u> <u>emiliae</u> , <u>Notropis nubilus</u>	M43	Southern redbelly dace	<u>Phoxinus</u> <u>erythrogaster</u>
M05	Stonerollers	<u>Campostoma</u> spp.	M44	Finescale dace	<u>Phoxinus neogaeus</u>
M06	Central stoneroller	<u>Campostoma anomalum</u>	M45	Bluntnose minnow	<u>Pimephales notatus</u>
M07	Largescale stoneroller	<u>Campostoma</u> <u>oligolepis</u>	M46	Fathead minnow	<u>Pimephales promelas</u>
M08**	Goldfish	<u>Carassius auratus</u>	M47	Bullhead minnow	<u>Pimephales vigilax</u>
M09	Redside dace	<u>Clinostomus</u> <u>elongatus</u>	M48	Blacknose dace	<u>Rhinichthys atratulus</u>
M10	Lake chub	<u>Couesius plumbeus</u>	M49	Longnose dace	<u>Rhinichthys</u> <u>cataractae</u>
M11**	Grass carp	<u>Ctenopharyngodon</u> <u>idella</u>	M50	Creek chub	<u>Semotilus</u> <u>atromaculatus</u>
M12**	Common carp	<u>Cyprinus carpio</u>	M51	Pearl dace	<u>Semotilus margarita</u>
M14	Brassy minnow	<u>Hybognathus</u> <u>hankinsoni</u>	M52	Red shiner	<u>Notropis luntrensis</u>
M15	Mississippi silvery minnow	<u>Hybognathus</u> <u>nuchalis</u>	M53	European rudd	<u>Scardinus</u> <u>erythrophthalmus</u>
M16	Speckled chub	<u>Hybopsis aestivalis</u>	M55	Undetermined cyprinid hybrid	
M17	Silver chub	<u>Hybopsis storeniana</u>	M56	Stonerollers x unknown	
M18	Gravel chub	<u>Hybopsis x-punctata</u>	M57	Stonerollers x hornyhead chub	
M19	Hornyhead chub	<u>Nocomis biguttatus</u>	M58	Stonerollers x southern redbelly dace	
M20	Golden shiner	<u>Notemigonus</u> <u>crysoleucas</u>	M59	Stonerollers x longnose dace	
M21	Pallid shiner	<u>Notropis amnis</u>	M60	Stonerollers x creek chub	
M22	Pugnose shiner	<u>Notropis anogenus</u>	M61	Stonerollers x pearl dace	
M23	Emerald shiner	<u>Notropis</u> <u>atherinoides</u>	M62	Common carp x goldfish	
M24	River shiner	<u>Notropis blennius</u>	M63	Redside dace x unknown	
M25	Ghost shiner	<u>Notropis buchmanii</u>	M64	Redside dace x common shiner	
M26	Ironcolor shiner	<u>Notropis chalybaeus</u>	M65	Redside dace x redbelly dace	
M27	Striped shiner	<u>Notropis</u> <u>chrysocephalus</u>	M66	Redside dace x southern redbelly dace	
M28	Common shiner	<u>Notropis cornutus</u>	M67	Redside dace x creek chub	
M29	Bigmouth shiner	<u>Notropis dorsalis</u>	M69	River shiner x emerald shiner	
M30	Pugnose minnow	<u>Notropis emiliae</u>	M70	Pugnose shiner x blackchin shiner	
M31	Blackchin shiner	<u>Notropis heterodon</u>	M71	Common shiner x unknown	
M32	Blacknose shiner	<u>Notropis</u> <u>heterolepis</u>	M72	Common shiner x stonerollers	
M33	Spottail shiner	<u>Notropis hudsonius</u>	M73	Common shiner x hornyhead chub	
M34	Ozark minnow	<u>Notropis nubilus</u>	M74	Common shiner x emerald shiner	
M35	Rosyface shiner	<u>Notropis rubellus</u>	M75	Common shiner x striped shiner	
M36	Spotfin shiner	<u>Notropis</u> <u>spilopterus</u>			
M37	Sand shiner	<u>Notropis stramineus</u>			
M38	Weed shiner	<u>Notropis texanus</u>			
M39	Redfin shiner	<u>Notropis umbratilis</u>			
M40	Mimic shiner	<u>Notropis volucellus</u>			

TABLE 4. Continued.

Species Code	Common Name	Scientific Name	Species Code	Common Name	Scientific Name
M76	Common shiner x rosyface shiner		N08**	Longnose sucker	<u>Catostomus catostomus</u>
M77	Common shiner x redbelly shiner		N09**	White sucker	<u>Catostomus commersoni</u>
M78	Common shiner x northern redbelly dace		N10	Blue sucker	<u>Cycleptus elongatus</u>
M79	Common shiner x southern redbelly dace		N11	Creek chubsucker	<u>Erimyzon oblongus</u>
M80	Common shiner x bluntnose minnow		N12**	Lake chubsucker	<u>Erimyzon sucetta</u>
M81	Common shiner x creek chub		N13**	Northern hog sucker	<u>Hypentelium nigricans</u>
M82	Common shiner x pearl dace		N14	Smallmouth buffalo	<u>Ictiobus bubalus</u>
M86	Sand shiner x bigmouth shiner		N15	Bigmouth buffalo	<u>Ictiobus cyprinellus</u>
M87	Sand shiner x rosyface shiner		N16	Black buffalo	<u>Ictiobus niger</u>
M88	Weed shiner x mimic shiner		N17	Spotted sucker	<u>Minytrema melanops</u>
M89	Redbelly dace x unknown		N18	Silver redhorse	<u>Moxostoma anisurum</u>
M90	Northern redbelly dace x finescale dace		N19	River redhorse	<u>Moxostoma carinatum</u>
M91	Southern redbelly dace x hornyhead chub		N20	Black redhorse	<u>Moxostoma duquesnei</u>
M92	Southern redbelly dace x creek chub		N21	Golden redhorse	<u>Moxostoma erythrurum</u>
M93	Northern redbelly dace x pearl dace		N22	Shorthead redhorse	<u>Moxostoma macrolepidotum</u>
M94	Bluntnose minnow x fathead minnow		N23	Greater redhorse	<u>Moxostoma valenciennesi</u>
M95	Bluntnose minnow x bullhead minnow		N27	Quillback x highfin carpsucker	
M97	Creek chub x unknown			BULLHEAD CATFISHES	ICTALURIDAE
M98	Creek chub x hornyhead chub		000*	Bullhead catfishes unsp.	Ictaluridae
			001*	Catfishes, 004, 008, 012	( <u>Ictalurus furcatus</u> , <u>I. punctatus</u> , and <u>Pylodictis olivaris</u> )
			002*	Bullheads, 005-07	( <u>Ictalurus melas</u> , <u>I. natalis</u> , and <u>I. nebulosus</u> )
			003*	Madtoms	<u>Noturus</u> spp.
			004	Blue catfish	<u>Ictalurus furcatus</u>
			005	Black bullhead	<u>Ictalurus melas</u>
			006	Yellow bullhead	<u>Ictalurus natalis</u>
			007	Brown bullhead	<u>Ictalurus nebulosus</u>
			008**	Channel catfish	<u>Ictalurus punctatus</u>
			009	Slender madtom	<u>Noturus exilis</u>
			010	Stonecat	<u>Noturus flavus</u>
			011	Tadpole madtom	<u>Noturus gyrinus</u>
			012**	Flathead catfish	<u>Pylodictis olivaris</u>
			013	Black bullhead x brown bullhead	
			014	Yellow bullhead x brown bullhead	
				PIRATE PERCHES	APHREDODERIDAE
			P01**	Pirate perch	<u>Aphredoderus sayanus</u>
				TROUT-PERCHES	PERCOPSIDAE
			Q01**	Trout-perch	<u>Percopsis omiscomaycus</u>
	SUCKERS	CATOSTOMIDAE			
N00*	Carpsuckers	<u>Cariodes</u> spp.			
N01*	Carpsucker	<u>Cariodes carpio</u> and <u>C. velifer</u>			
N02*	Suckers, N08-13, N17	( <u>Catostomus</u> spp., <u>Cycleptus eelongatus</u> , <u>Erimyzon</u> spp., <u>Hypentelium nigricans</u> , and <u>Minytrema melanops</u> )			
N03*	Buffalos	<u>Ictiobus</u> spp.			
N04*	Redhorses	<u>Moxostoma</u> spp.			
N05	River carpsucker	<u>Cariodes carpio</u>			
N06	Quillback	<u>Cariodes cyprinus</u>			
N07	Highfin carpsucker	<u>Cariodes velifer</u>			

TABLE 4. Continued.

Species Code	Common Name	Scientific Name	Species Code	Common Name	Scientific Name
R01**	CODFISHES Burbot	GADIDAE <u>Lota lota</u>	W20	Green sunfish x pumpkinseed	
	KILLIFISHES	CYPRINODONTIDAE	W21	Green sunfish x warmouth	
S00*	Killifishes unsp.	Cyprinodontidae	W22	Green sunfish x orangespotted sunfish	
S01	Banded killifish	<u>Fundulus diaphanus</u>	W23	Green sunfish x bluegill	
S02	Blackstripe topminnow	<u>Fundulus notatus</u>	W24	Green sunfish x longear sunfish	
S03	Starhead topminnow	<u>Fundulus notti</u>	W25	Green sunfish x pumpkinseed x bluegill	
T01**	SILVERSIDES Brook silverside	ATHERINIDAE <u>Labidesthes sicculus</u>	W27	Pumpkinseed x unknown	
U00*	STICKLEBACKS Sticklebacks unsp.	GASTEROSTEIDAE Gasterosteidae	W28	Pumpkinseed x warmouth	
U01**	Brook stickleback	<u>Culaea inconstans</u>	W29	Pumpkinseed x orangespotted sunfish	
U02	Ninespine stickleback	<u>Pungitius pungitius</u>	W30	Pumpkinseed x bluegill	
U03	Threespine stickleback	<u>Gasterosteus aculeatus</u>	W31	Pumpkinseed x longear sunfish	
V00*	TEMPERATE BASSES Temperatge basses unsp.	PERCICHTHYIDAE Percichthyidae	W34	Warmouth x unknown	
V01	White bass	<u>Morone chrysops</u>	W35	Warmouth x orangespotted sunfish	
V02	Yellow bass	<u>Morone mississippiensis</u>	W36	Warmouth x bluegill	
V03	White perch	<u>Morone amincana</u>	W37	Warmouth x longear sunfish	
V05	White bass x yellow bass		W40	Orangespotted sunfish x unknown	
W00*	SUNFISHES Sunfishes unsp.	CENTRARCHIDAE Centrarchidae	W41	Orangespotted sunfish x bluegill	
W01*	Basses	<u>Micropterus</u> spp.	W42	Orangespotted sunfish x longear sunfish	
W02*	Crappies	<u>Pomoxis</u> spp.	W45	Bluegill x unknown	
W03*	Sunfishes	<u>Lepomis</u> spp. and <u>Ambloplites rupestris</u>	W46	Bluegill x longear sunfish	
W04	Rock bass	<u>Ambloplites rupestris</u>			
W05	Green sunfish	<u>Lepomis cyanellus</u>			
W06	Pumpkinseed	<u>Lepomis gibbosus</u>			
W07	Warmouth	<u>Lepomis gulosus</u>			
W08	Orangespotted sunfish	<u>Lepomis humilis</u>	X00*	PERCHES Perches unsp.	PERCIDAE Percidae
W09	Bluegill	<u>Lepomis macrochirus</u>	X01*	Darters, X03-14, X16-20	( <u>Ammocrypta</u> spp., <u>Etheostoma</u> spp., and <u>Percina</u> spp.)
W10	Longear sunfish	<u>Lepomis megalotis</u>	X02*	Stizostedions	<u>Stizostedion</u> spp.
W11**	Smallmouth bass	<u>Micropterus dolomieu</u>	X03	Crystal darter	<u>Ammocrypta asprella</u>
W12**	Largemouth bass	<u>Micropterus salmoides</u>	X04	Western sand darter	<u>Ammocrypta clara</u>
W13	White crappie	<u>Pomoxis annularis</u>	X05	Mud darter	<u>Etheostoma asprigene</u>
W14	Black crappie	<u>Pomoxis nigromaculatus</u>	X06	Greenside darter	<u>Etheostoma blennioides</u>
W18	Undetermined Centrarchidae hybrid		X07	Rainbow darter	<u>Etheostoma caeruleum</u>
W19	Green sunfish x unknown		X08	Bluntnose darter	<u>Etheostoma chlorosomum</u>
			X09	Iowa darter	<u>Etheostoma exile</u>
			X10	Fantail darter	<u>Etheostoma flabellare</u>

TABLE 4. Continued.

Species Code	Common Name	Scientific Name	Species Code	Common Name	Scientific Name
X11	Least darter	<u>Etheostoma microperca</u>	Y01	DRUMS Freshwater drum	SCIAENIDAE <u>Aplodinotus grunniens</u>
X12	Johnny darter	<u>Etheostoma nigrum</u>			
X13	Orangethroated darter	<u>Etheostoma spectabile</u>		SCULPINS	COTTIDAE
X14	Banded darter	<u>Etheostoma zonale</u>	Z00*	Sculpin, Z01, Z02	( <u>Cottus bairdi</u> and <u>C. cognatus</u> )
X15**	Yellow perch	<u>Perca flavescens</u>			<u>Cottus bairdi</u>
X16	Logperch	<u>Percina caprodes</u>	Z01	Mottled sculpin	<u>Cottus cognatus</u>
X17	Gilt darter	<u>Percina evides</u>	Z02	Slimy sculpin	<u>Cottus ricei</u>
X18	Blackside darter	<u>Percina maculata</u>	Z03	Spoonhead sculpin	<u>Myoxocephalus thompsoni</u>
X19	Slenderhead darter	<u>Percina phoxocephala</u>	Z04	Deepwater sculpin	
X20	River darter	<u>Percina shumardi</u>	Z08	Mottled sculpin x	
X21	Sauger	<u>Stizostedion canadense</u>		slimy sculpin	
X22**	Walleye	<u>Stizostedion vitreum vitreum</u>	Z96	Unknown species	
			Z97	Panfish includes:	
X23	Blackside darter x Iowa darter			white bass, yellow bass, rock bass, sunfishes ( <u>Lepomis</u> spp.), black crappie, white crappie, and yellow perch	
X24	Blackside darter x logperch			No fish captured at station	
X25	Walleye x sauger			Invalid fish species code	
X26	Ruffe	<u>Gymnocephalus cernua</u>	Z98		
			Z99		

\*Group name (plural) followed by "unsp." (abbreviation for unspecified). It is used only to refer to all members of a family and was developed in order to distinguish between groups of fishes where the name for the family is the same as that for 1 or more genera within that family. Thus, for computer codes A00 and A01, "Lampreys unsp." means all members of the family, Petromyzontidae, whereas just "Lampreys" is used to refer only to members of the Ichthyomyzon genus. Similarly, "Sunfishes unsp." means all Centrarchidae and "Sunfishes" means Lepomis spp. (see W00 and W03).

Group name (plural) not followed by "unsp.". This category is used mainly to refer to all species in a genus. All species of a particular genus are designated by the abbreviation "spp." which follows the genus name; this abbreviation stands for species. Thus "Trouts" (I01) refers to all species in the genera Salvelinus and Salmo.

Occasionally this category [group name (plural) not followed by "unsp."] may also include a single species from 1 genus along with all members of 1 or more other genera. These single species may be the sole representative in Wisconsin of a particular genus. Thus the category "Shiners" (M04) includes all members of the genus Notropis (except N. emiliae and N. nubilus) plus Notemigonus crysoleucas which is also a shiner and is the only species of Notemigonus in the state. The single species included in a group category may also be part of a genus split between groups. For example, the category "Catfishes" (001) includes 2 species from the genus Ictalurus; all other Ictalurids are included in "Bullheads" (002). "Chubs" (M01) and "Daces" (M02) are other examples; one of these categories includes 1 of the 2 species of Semotilus and the other category includes the other species of Semotilus.

Group name (singular). This category was created for groups of fish in which only certain members are hard to separate. For example, there are 3 species of the genus Carpionides in Wisconsin. This genus is distinct enough from other groups within the Catostomidae family that it has its own designation as "Carp suckers" (N00). Persons trying to key out members of the genus Carpionides should be able to identify Carpionides cyprinus, but may have trouble distinguishing in juveniles between C. carpio and C. velifer. Thus the category "Carp sucker" (N01) was created for these 2 species. The same is true for the groups labelled "Redbelly dace" (M03) and "Sculpin" (Z00) which refer to only 2 of 3 members of the genus Phoxinus and Cottus, respectively.

\*\*Assumed to be easily identifiable by all Fisheries Management personnel. See Fisheries Management section in Table 2 for further details.

### First Line

Stream Width. The estimated minimum, mean, and maximum widths of the sampling station are recorded in feet. Three spaces are allowed for each number with a blank between each. In the example (Fig. 8), the mean was not recorded.

Stream Depth. The estimated minimum, mean, and maximum depths of the stream's main channel in the area actually sampled are recorded down to 10ths of feet. Each number has 3 spaces without a decimal point and is separated by a blank. In the example, "40" equals 4.0 and the mean was not recorded.

### Second Line

Velocity. The first space on this line is used to record 1 of 4 codes:

"0" - None - No perceptible current.

"1" - Sluggish - Current scarcely perceptible in most of the stream and little turbulence. Current less than 1/2 ft/sec. Sand ripples on bottom not evident; bottom smooth, except for rocks.

"2" - Moderate - Current evident; moderate turbulence from helical movements and deflection. Generally, sand ripples on bottom and little white water evident. Velocity more than 1/2 ft/sec, but not more than 1 1/2 ft/sec.

"3" - Rapid - Strong current evident, strong turbulence from helical movements and deflection, and white water where bottom is covered with coarse materials; strong sand ripples. Velocity more than 1 1/2 ft/sec.

Water Temperature. The water temperature in degrees Fahrenheit was taken just below the surface and is recorded in the 3rd and 4th spaces of the 2nd line.

Conductivity. The conductivity (usually temperature compensated) was measured with a conductivity meter in umhos and is recorded in spaces 6-9. The conductivity in the example was not recorded.

Turbidity (Visibility). For stations where the water's depth is equal to or over 4 ft, a Secchi disk is lowered to 4 ft and brought up slowly until it becomes visible. A number "1" through "4" is used to record the turbidity in the 12th space.

"1" - Clear - Secchi disk visible at a depth of over 4 ft.

"2" - Slightly turbid - Secchi disk becomes visible between 2 and 4 ft.

"3" - Moderately turbid - Secchi disk becomes visible between 1 and 2 ft.

"4" - Turbid - Secchi disk becomes visible only at a depth of less than 1 ft.

For stations where the water's depth is under 4 ft, the Secchi disk is lowered until it disappears. If it disappears before it reaches the bottom, the appropriate number ("1" through "4") is recorded. If it does not disappear, the appropriate letter ("A" through "H") is used to record the turbidity (Table 5).

TABLE 5. Turbidity measurements when Secchi disk does not disappear.

Station's Water Depth	Letter	Secchi Disk on Bottom
Less than 1 ft	"A"	Not distinct - moderately turbid
	"B"	Distinct - clear
1 to 1.9 ft	"C"	Not distinct - moderately turbid
	"D"	Distinct - clear
2 to 2.9 ft	"E"	Not distinct - slightly turbid
	"F"	Distinct - clear
3 to 3.9 ft	"G"	Not distinct - slightly turbid
	"H"	Distinct - clear

Aquatic Vegetation. One of the 4 following code numbers is used to describe each of the 5 types of aquatic vegetation:

"0" - None - None observed.

"1" - Scarce - Occasional plants or only small clumps of plants noted.

"2" - Common - Sizable beds at intervals.

"3" - Abundant - Thick, frequent beds covering more than 50% of the stream bottom.

Description of these 5 types of vegetation are listed below.

Emergent (15th space) - Plants rising above the water surface, usually found growing in shallow water areas or along the shoreline of lakes and ponds. Common examples include cattails, water lilies, arrowhead, water smartweed, or watershield.

Submergent (16th place) - Plants in which the main portion of the plant is under the water surface. They usually are attached or rooted to the lake or pond bottom. These plants are commonly coontail, milfoil, bladderwort, pondweeds, or waterweed.

Duckweed (17th space) - Plants which float freely on the surface of the water.

Algae (attached) (18th space) - A group of small, primitive chlorophyll-bearing plants distinguished by their lack of true leaves and flowers. Attached to substrate such as rocks.

Algae (free floating) (19th space) - Same as algae (attached) but free floating. It is left blank in this example.

### Third Line (Bottom Type)

A combination of up to 8 different bottom type codes each followed by its percent occurrence can be listed. The percent of the bottom type is rounded to the nearest ten without the zero (e.g., F4 = 40% gravel). For less than 5% the letter "T" is used and for 100% the number "0".

- "A" - Concrete - Stream has been channelized and bottom is poured concrete.
- "B" - Bedrock - Solid rock forming a continuous surface.
- "C" - Hardpan - A compacted surface consisting of cemented bottom materials.
- "D" - Boulder - Rocks 12 inches in diameter.
- "E" - Rubble. Rocks from 3-12 inches in diameter.
- "F" - Gravel - Stones from 0.125 to 3 inches in diameter.
- "G" - Sand - Particles ranging from 0.0625 mm to 1.9 mm inclusive. Will feel rough between fingers.
- "H" - Muck and silt - Particles from 0.0039 mm to 0.0624 mm. Generally this is fine material which feels greasy between fingers. This includes organic materials.
- "I" - Clay - Particles less than 0.0039 mm usually forming a dense gummy surface.
- "J" - Marl - Deposits of calcium carbonate. Usually whitish in color. Fizzes profusely when weak hydrochloric acid (muriatic acid) is applied to a sample.
- "K" - Detritis - Dead organic matter covering bottom. This would include sticks, leaf skeletons, and other items.
- "L" - Rubbish - Items deposited by man, such as tires, bottles, cans, and fencing.
- "M" - Peat.

#### Fourth Line (Streambank Vegetation/Habitat)

This refers to vegetation present generally from the water's edge up to approximately 16 ft on either side of the stream. The 16 ft can be extended somewhat if there is some other habitat that may have a significant effect upon the stream. Since this is a report for a single station, it is descriptive of vegetation for only that station.

The streambank vegetation is listed in the same manner as bottom type. A combination of 8 different streambank vegetation types (code and percent) are possible.

- "A" - Cultivated - Presence of row crops such as corn, oats, etc.
- "B" - Fallow - Cultivated land that has lain idle one or more growing seasons.
- "C" - Upland\* pasture - Grazed land.
- "D" - Upland meadow - Area supporting only grasslike vegetation or leafy ground cover of nonwoody types such as reed canary grass.
- "E" - Upland hardwood - Area supporting deciduous trees such as hard maple, basswood, oak, black cherry, fruit trees, yellow and white birch, popples, and others over 15 ft in height.
- "F" - Upland conifer - Area supporting evergreens such as white pine, red pine, jack pine, spruce, or balsam fir.
- "G" - Upland shrub - Species such as red osier dogwood, spirea, elderberry, other berry bushes, and other woody plants and trees with low total height (under 15 ft) such as tag alder, box elder, willow, and ninebark.
- "H" - Lowland\*\* pasture - Grazed land which becomes hummocky with extended use.
- "I" - Lowland hardwood - Area supporting species such as silver or soft maple, green ash, swamp white oak, river birch, willow, cottonwood, and box elder over 15 ft in height.
- "J" - Lowland conifer - Area supporting species such as tamarack, white cedar, and black spruce.
- "K" - Lowland shrub - Area supporting species such as red osier dogwood, spirea, elderberry, other berry bushes, and other woody plants and trees with low total height (under 15 ft) such as tag alder, box elder, willow, and ninebark.

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\*Upland refers to substrate that is well drained.

\*\*Lowland refers to substrate that is wet.

- "L" - Open marsh - Very wet area supporting only grasslike vegetation such as sedges or leafy ground cover or nonwoody types including cattails and rushes.
- "M" - Cut grasses - Area supporting various types of grasses that are cut periodically by man, such as lawn grasses.
- "N" - Beach - Sandy swimming beaches and gravel parking lots.
- "O" - Lowland meadow - Same as upland meadow but not well drained.
- "P" - Open water - Such as in the middle of a large river or lake that is away from any shore.

DETAILED GLOSSARY BY LOCATION FOR  
FILE DEFINITION - N86002R

DATE CATALOGED - 01/01/01 01:01:01  
CATALOGED BY -  
EXPIRATION DATE -

DATE LAST UPDATED - 03/11/86 13:14:54  
LAST UPDATED BY -  
DATE LAST USED - 07/08/88 10:37:52

FILE IDENTIFICATION =  
NUMBER OF SEGMENTS IN FILE = 1  
NUMBER OF FIELDS IN FILE = 62

RECORD FORMAT = FIXED BLOCKED  
RECORD SIZE = 136  
BLOCK SIZE = 4080

\*\*\*\*\*  
\* SEGMENT 1, LEVEL 1 \*  
\*\*\*\*\*

SEGMENT OCCURS N TIMES = 1 KEY FIELD 1 = SEQUENCE TYPE = C LENGTH = 7  
SEGMENT SIZE = 136  
NUMBER OF FIELDS IN SEGMENT = 62

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FOR SGMT	FIELD EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ *** COLUMN HEADING ***
A	A C	1	1					1	16	1	*** DNR ***
										2	***UPDATED 02/17/81***
										3	***D ZAUG 6-9928***
										4	***FILE DEFINITION ***
										5	*** FOR FAGO'S 860 ***
										6	*** STREAM MASTER ***
										7	*** FILE..... ***
SEQUENCE	C	1	7					7	7		
S-CODE	C	8	1					1	1		
MAJMIN	Z	9	4					4	4		
MAJBASIN	Z	9	1				(2) ( ) ( )	1	1		
B-ORDERS	C	9	76					76	76		
MINBASIN	Z	10	3				(2) ( ) ( )	3	3		
MBMBLNK	C	13	1					1	1		
ORDERS	C	14	72					72	72		
MB-MILES	C	14	6					6	6		
MBM	Z	14	5		1		(2) ( ) ( )	5	5		
MBM-X	C	19	1					1	1		
ORD-01	C	20	6					6	6		

APPENDIX FIGURE 1. Mark IV glossary listing (N86002R) of the Master Stream and Lake File showing the variables and their locations in a record.

DETAILED GLOSSARY BY LOCATION FOR  
 FILE DEFINITION - N86002R  
 SEGMENT 1, LEVEL 1 (CONTINUED)

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FIELD FOR SGMT	EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ *** COLUMN HEADING ***
ORDER-1	Z	20	5		1			8	8		
01-X	C	25	1					1	1		
ORD-02	C	26	6					6	6		
ORDER-2	Z	26	5		1			8	8		
02-X	C	31	1					1	1		
ORDER-3	Z	32	5		1			8	8		
ORD-03	C	32	6					6	6		
03-X	C	37	1					1	1		
ORD-04	C	38	6					6	6		
ORDER-4	Z	38	5		1			8	8		
04-X	C	43	1					1	1		
ORD-05	C	44	6					6	6		
ORDER-5	Z	44	5		1			8	8		
05-X	C	49	1					1	1		
ORD-06	C	50	6					6	6		
ORDER-6	Z	50	5		1			8	8		
06-X	C	55	1					1	1		
ORDER-7	Z	56	5		1			8	8		
ORD-07	C	56	6					6	6		
07-X	C	61	1					1	1		
ORD-08	C	62	6					6	6		
ORDER-8	Z	62	5		1			8	8		
08-X	C	67	1					1	1		
ORD-09	C	68	6					6	6		
ORDER-9	Z	68	5		1			8	8		

APPENDIX FIGURE 1. Continued.

DETAILED GLOSSARY BY LOCATION FOR  
 FILE DEFINITION - N86002R  
 SEGMENT 1, LEVEL 1 (CONTINUED)

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FOR	FIELD SGMT	EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ *** COLUMN HEADING ***
09-X	C	73	1						1	1		
ORDER-10	Z	74	5		1				8	8		
ORD-10	C	74	6						6	6		
010-X	C	79	1						1	1		
ORD-11	C	80	6						6	6		
ORDER-11	Z	80	5		1				8	8		
011-X	C	85	1						1	1		
ACRES	C	86	5						5	5		
NAME	C	92	27						27	27		
SEC-256	C	116	1						1	1		
SEC-1024	C	117	1						1	1		
DAM-CODE	C	119	1						1	1		
WATERTYP	C	120	1						1	1		
SEC-1/64	C	121	1						1	1		
LLSEQNO	C	122	1						1	1		
L-LOCAT	C	123	12						12	12		
TOWNSHIP	C	123	3						3	3		
LOCATION	C	123	12						12	12		
RANGE	C	126	3						3	3		
SECTION	C	129	2						2	2		
SEC-1/16	C	131	2						2	2		
SEC-1/4	C	133	2						2	2		
COUNTY	C	135	2						2	2		
COUNTYX	C	135	2						2	6		
											1	*** COUNTY ***
											2	*** NUMBER ***

APPENDIX FIGURE 1. Continued.

DATE CATALOGED - 12/04/85 17:02:07  
CATALOGED BY -  
EXPIRATION DATE -

DATE LAST UPDATED - 12/04/85 17:02:07  
LAST UPDATED BY -  
DATE LAST USED - 10/17/88 15:55:23

FILE IDENTIFICATION =  
NUMBER OF SEGMENTS IN FILE = 1  
NUMBER OF FIELDS IN FILE = 150

RECORD FORMAT = FIXED UNBLOCKED  
RECORD SIZE = 279  
BLOCK SIZE = 279

\*\*\*\*\*  
\* SEGMENT 1, LEVEL 1 \*  
\*\*\*\*\*

SEGMENT OCCURS N TIMES = 1  
SEGMENT SIZE = 279  
NUMBER OF FIELDS IN SEGMENT = 150

KEY FIELD 1 = SEQUENCE TYPE = C LENGTH = 7  
KEY FIELD 2 = CODE TYPE = C LENGTH = 1

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FOR	FIELD SGMT	EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ *** COLUMN HEADING ***
SEQUENCE	C	1	7						7	7		
ST-DUMP1	C	1	100						100	100		
F-CODE	C	8	1						1	1		
BASIN	C	9	4						4	4		
FISH-1	C	9	5						5	5		
MAJOR B	C	9	1						1	1		
B-ORDERS	C	9	76						76	76		
MINOR B	C	10	3						3	3		
SP-1	C	14	1						1	1		
MB MILES	C	14	6						6	6		
FISH-2	C	15	5						5	5		
SP-2	C	20	1						1	1		
ORDERS	C	20	66						66	66		
ORDER 1	C	20	6						6	6		
FISH-3	C	21	5						5	5		
SP-3	C	26	1						1	1		
ORDER 2	C	26	6						6	6		

APPENDIX FIGURE 2. Mark IV glossary listing (N86003R) of the Master Fish File which is used in numerous Cobol programs to obtain various listings of the file. It shows the variables and their locations in a fixed length record.

DETAILED GLOSSARY BY LOCATION FOR  
 FILE DEFINITION - N86003R  
 SEGMENT 1, LEVEL 1 (CONTINUED)

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FIELD FOR SGM	EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ *** COLUMN HEADING ***
FISH-4	C	27	5					5	5		
SP-4	C	32	1					1	1		
ORDER 3	C	32	6					6	6		
FISH-5	C	33	5					5	5		
ORDER 4	C	38	6					6	6		
SP-5	C	38	1					1	1		
FISH-6	C	39	5					5	5		
SP-6	C	44	1					1	1		
ORDER 5	C	44	6					6	6		
FISH-7	C	45	5					5	5		
SP-7	C	50	1					1	1		
ORDER 6	C	50	6					6	6		
FISH-8	C	51	5					5	5		
ORDER 7	C	56	6					6	6		
SP-8	C	56	1					1	1		
FISH-9	C	57	5					5	5		
SP-9	C	62	1					1	1		
ORDER 8	C	62	6					6	6		
FISH-10	C	63	5					5	5		
ORDER 9	C	68	6					6	6		
SP-10	C	68	1					1	1		
FISH-11	C	69	5					5	5		
ORDER 10	C	74	6					6	6		
SP-11	C	74	1					1	1		
FISH-12	C	75	5					5	5		

APPENDIX FIGURE 2. Continued.

DETAILED GLOSSARY BY LOCATION FOR  
 FILE DEFINITION - N86003R  
 SEGMENT 1, LEVEL 1 (CONTINUED)

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FIELD FOR SGMT	EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ *** COLUMN HEADING ***
ORDER 11	C	80	6					6	6		
SP-12	C	80	1					1	1		
FISH-13	C	81	5					5	5		
SP-13	C	86	1					1	1		
ST MILES	C	86	6					6	6		
FISH-14	C	87	5					5	5		
NAME	C	92	27					27	27		
SP-14	C	92	1					1	1		
FISH-15	C	93	5					5	5		
SP-15	C	98	1					1	1		
FISH-16	C	99	5					5	5		
ST-DUMP2	C	101	100					100	100		
SP-16	C	104	1					1	1		
FISH-17	C	105	5					5	5		
SP-17	C	110	1					1	1		
FISH-18	C	111	5					5	5		
SP-18	C	116	1					1	1		
FISH-19	C	117	5					5	5		
INFO	C	119	4					4	4		
DAM-JAR	C	119	1					1	1		
WATERTYP	C	120	1					1	1		
L-1/64	C	121	1					1	1		
LL-SEQ	C	121	2					2	2		
L-SEQ	C	122	1					1	1		
SP-19	C	122	1					1	1		

APPENDIX FIGURE 2. Continued.

DETAILED GLOSSARY BY LOCATION FOR  
 FILE DEFINITION - N86003R  
 SEGMENT 1, LEVEL 1 (CONTINUED)

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FOR	FIELD FOR SGMT	EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ *** COLUMN HEADING ***
LOCATION	C	123	28						28	28		
FISH-20	C	123	5						5	5		
L-TOWN	C	123	3						3	3		
L-RANGE	C	126	3						3	3		
SP-20	C	128	1						1	1		
L-SEC	C	129	2						2	2		
FISH-21	C	129	5						5	5		
L-1/16	C	131	2						2	2		
L-1/4	C	133	2						2	2		
SP-21	C	134	1						1	1		
FISH-22	C	135	5						5	5		
L-CO	C	135	2						2	2		
S-TOWN	C	137	3						3	3		
SP-22	C	140	1						1	1		
S-RANGE	C	140	3						3	3		
FISH-23	C	141	5						5	5		
S-SEC	C	143	2						2	2		
S-1/16	C	145	2						2	2		
SP-23	C	146	1						1	1		
FISH-24	C	147	5						5	5		
S-1/4	C	147	2						2	2		
S-CO	C	149	2						2	2		
SOURCE	C	151	2						2	2		
ECO DATA	C	151	79						79	79		
SP-24	C	152	1						1	1		

APPENDIX FIGURE 2. Continued.

DETAILED GLOSSARY BY LOCATION FOR  
 FILE DEFINITION - N86003R  
 SEGMENT 1, LEVEL 1 (CONTINUED)

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FIELD FOR SGMT	EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ *** COLUMN HEADING ***
GEAR	C	153	1					1	1		
FISH-25	C	153	5					5	5		
EFFORT	C	154	2					2	2		
DATE	C	156	6					6	6		
SP-25	C	158	1					1	1		
FISH-26	C	159	5					5	5		
HOUR	C	162	2					2	2		
SP-26	C	164	1					1	1		
WIDTH	C	164	9					9	9		
FISH-27	C	165	5					5	5		
SP-27	C	170	1					1	1		
FISH-28	C	171	5					5	5		
DEPTH	C	173	9					9	9		
SP-28	C	176	1					1	1		
FISH-29	C	177	5					5	5		
SP-29	C	182	1					1	1		
VELOCITY	C	182	1					1	1		
TEMP	C	183	2					2	2		
FISH-30	C	183	5					5	5		
CONDUCT	C	185	4					4	4		
SP-30	C	188	1					1	1		
FISH-31	C	189	5					5	5		
TURBID	C	189	1					1	1		
BOTTOM	C	190	16					16	16		
SP-31	C	194	1					1	1		

APPENDIX FIGURE 2. Continued.

DETAILED GLOSSARY BY LOCATION FOR  
 FILE DEFINITION - N86003R  
 SEGMENT 1, LEVEL 1 (CONTINUED)

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FIELD FOR SGMT	EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ *** COLUMN HEADING ***
FISH-32	C	195	5					5	5		
SP-32	C	200	1					1	1		
FISH-33	C	201	5					5	5		
STDUMP3A	C	201	31					31	31		
ST-DUMP3	C	201	79					79	79		
AQUADIC	C	206	8					8	8		
SP-33	C	206	1					1	1		
FISH-34	C	207	5					5	5		
SP-34	C	212	1					1	1		
FISH-35	C	213	5					5	5		
STRM VEG	C	214	16					16	16		
SP-35	C	218	1					1	1		
FISH-36	C	219	5					5	5		
SP-36	C	224	1					1	1		
FISH-37	C	225	5					5	5		
SP-37	C	230	1					1	1		
FISH-38	C	231	5					5	5		
WB-I-C	C	232	7					7	7		
SP-38	C	236	1					1	1		
FISH-39	C	237	5					5	5		
STDUMP3B	C	239	41					41	41		
SP-39	C	242	1					1	1		
FISH-40	C	243	5					5	5		
SP-40	C	248	1					1	1		
FISH-41	C	249	5					5	5		

APPENDIX FIGURE 2. Continued.

DETAILED GLOSSARY BY LOCATION FOR  
FILE DEFINITION - N86003R  
SEGMENT 1, LEVEL 1 (CONTINUED)

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FIELD FOR SGMT	EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME / *** COLUMN HEADING ***
SP-41	C	254	1					1	1		
FISH-42	C	255	5					5	5		
SP-42	C	260	1					1	1		
FISH-43	C	261	5					5	5		
SP-43	C	266	1					1	1		
FISH-44	C	267	5					5	5		
SP-44	C	272	1					1	1		
CODE	C	279	1					1	1		

\*\* CLSGB00 TYPE 0 END OF FILE DEFINITION GLOSSARY.

\*\*\*\*\*

APPENDIX FIGURE 2. Continued.

DATE CATALOGED - 01/01/01 01:01:01  
CATALOGED BY -  
EXPIRATION DATE -

DATE LAST UPDATED - 01/27/88 09:10:20  
LAST UPDATED BY -  
DATE LAST USED - 10/17/88 15:47:27

FILE IDENTIFICATION =  
NUMBER OF SEGMENTS IN FILE = 2  
NUMBER OF FIELDS IN FILE = 97

RECORD FORMAT = VARIABLE BLOCKED  
RECORD SIZE = 792  
BLOCK SIZE = 800

\*\*\*\*\*  
\* SEGMENT 1, LEVEL 1 \*  
\* SEGMENT NAME = ROOT \*  
\*\*\*\*\*

SEGMENT OCCURS N TIMES = 1  
SEGMENT SIZE = 208  
NUMBER OF FIELDS IN SEGMENT = 94

KEY FIELD 1 = SEQUENCE TYPE = P LENGTH = 4

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FOR SGMNT	FIELD EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ COLUMN HEADING
A	A C	1	1					1	16	1	*** DNR ***
										2	***UPDATED 12/03/79***
										3	***D ZAUG 6-9928 ***
										4	***FISH MASTER FILE***
										5	*** DEFFINITION. ***
SEQUENCE	P	1	4					10	10		
MAJOR B	Z	5	1					2	2		
MINOR B	P	6	3					7	7		
MBM BLNK	C	9	1					1	1		
MB MILES	P	10	3		1			8	8		
ORDERS	C	10	48					48	48		
MBM-X	C	13	1					1	1		
ORDER-1	P	14	3		1			8	8		
O-1X	C	17	1					1	1		
ORDER-2	P	18	3		1			8	8		
O-2X	C	21	1					1	1		
ORDER-3	P	22	3		1			8	8		
O-3X	C	25	1					1	1		

APPENDIX FIGURE 3. Mark IV glossary listing (N86000R) of the Master Fish File which is used in the Mark IV programs. It shows the variables and their locations in a variable length record.

DETAILED GLOSSARY BY LOCATION FOR  
 FILE DEFINITION - N86000R  
 SEGMENT 1, LEVEL 1 (CONTINUED)

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FIELD FOR SGMT	EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ *** COLUMN HEADING ***
ORDER-4	P	26	3		1			8	8		
O-4X	C	29	1					1	1		
ORDER-5	P	30	3		1			8	8		
O-5X	C	33	1					1	1		
ORDER-6	P	34	3		1			8	8		
O-6X	C	37	1					1	1		
ORDER-7	P	38	3		1			8	8		
O-7X	C	41	1					1	1		
ORDER-8	P	42	3		1			8	8		
O-8X	C	45	1					1	1		
ORDER-9	P	46	3		1			8	8		
O-9X	C	49	1					1	1		
ORDER-10	P	50	3		1			8	8		
O-10X	C	53	1					1	1		
ORDER-11	P	54	3		1			8	8		
O-11X	C	57	1					1	1		
MILES	P	58	3		1			8	8		
MILES-X	C	61	1					1	1		
NAME	C	62	27					27	27		
DAM-CODE	C	89	1					1	1		
WATERTYP	C	90	1					1	1		
L-1/64	C	91	1					1	1		
LL-SEQ	C	92	1					1	1		
STRM-LOC	C	93	12					12	12		
L-TOWN	C	93	3					3	3		

APPENDIX FIGURE 3. Continued.

DETAILED GLOSSARY BY LOCATION FOR  
 FILE DEFINITION - N86000R  
 SEGMENT 1, LEVEL 1 (CONTINUED)

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FIELD FOR SGMT	EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ *** COLUMN HEADING ***
L-RANGE	C	96	3					3	3		
L-SECT	C	99	2					2	2		
L-1/16	C	101	2					2	2		
L-1/4	C	103	2					2	2		
L-COUNTY	C	105	2					2	2		
S-TOWN	C	107	3					3	3		
STAT-LOC	C	107	12					12	12		
S-RANGE	C	110	3					3	3		
S-SECT	C	113	2					2	2		
S-1/16	C	115	2					2	2		
S-1/4	C	117	2					2	2		
S-COUNTY	C	119	2					2	2		
W-MIN	C	121	3					3	3		
W-AVG	C	124	3					3	3		
W-MAX	C	127	3					3	3		
D-MIN	C	130	3					3	3		
D-AVG	C	133	3					3	3		
D-MAX	C	136	3					3	3		
VELOCITY	C	139	1					1	1		
TEMP	C	140	2					2	2		
CONDUCT	C	142	4					4	4		
TURB	C	146	1					1	1		
BTM-1	C	147	2					2	2		
BTM-2	C	149	2					2	2		
BTM-3	C	151	2					2	2		

APPENDIX FIGURE 3. Continued.

DETAILED GLOSSARY BY LOCATION FOR  
 FILE DEFINITION - N86000R  
 SEGMENT 1, LEVEL 1 (CONTINUED)

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FIELD FOR SGMT	EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ *** COLUMN HEADING ***
BTM-4	C	153	2					2	2		
BTM-5	C	155	2					2	2		
BTM-6	C	157	2					2	2		
BTM-7	C	159	2					2	2		
BTM-8	C	161	2					2	2		
AQ-1	C	163	1					1	1		
AQ-2	C	164	1					1	1		
AQ-3	C	165	1					1	1		
AQ-4	C	166	1					1	1		
AQ-5	C	167	1					1	1		
AQ-6	C	168	1					1	1		
AQ-7	C	169	1					1	1		
AQ-8	C	170	1					1	1		
SB-VEG-1	C	171	2					2	2		
SB-VEG-2	C	173	2					2	2		
SB-VEG-3	C	175	2					2	2		
SB-VEG-4	C	177	2					2	2		
SB-VEG-5	C	179	2					2	2		
SB-VEG-6	C	181	2					2	2		
SB-VEG-7	C	183	2					2	2		
SB-VEG-8	C	185	2					2	2		
SOURCE	C	187	2					2	2		
GEAR	C	189	1					1	1		
EFFORT	C	190	2					2	2		
MONTH	C	192	2					2	2		

APPENDIX FIGURE 3. Continued.



DETAILED GLOSSARY BY LOCATION FOR  
FILE DEFINITION - N86000R

\*\*\*\*\*  
\* SEGMENT 2, LEVEL 2 \*  
\* SEGMENT NAME = FISH \*  
\*\*\*\*\*

COUNT FIELD FOR SEGMENT = COUNT      SEGMENT ORDER = ASCENDING      KEY FIELD 1 = F-CODE      TYPE = C      LENGTH = 3  
SEGMENT SIZE = 6  
NUMBER OF FIELDS IN SEGMENT = 3

FIELD NAME	FIELD TYPE	FIELD LOCATION	FIELD LENGTH	FIELD RNDING	DEC PLACES	CNT FIELD FOR SGMT	EDIT CODES ( ) ( ) ( )	EDIT LENGTH	OUTPUT WIDTH	LINE NO	DATA BASE NAME/ *** COLUMN HEADING ***
F-CODE	C	1	3					3	3		
F-AMNT	Z	4	2				(Z) ( ) ( )	2	2		
F-SPECIE	C	6	1					1	1		

\*\* CLSGB00 TYPE 0 END OF FILE DEFINITION GLOSSARY. \*\*\*\*\*  
(N86003R ) (FD) (ORIGINAL) 5  
COMMENT \*\*\*\*\* (ORIGINAL) 6

APPENDIX FIGURE 3. Continued.

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Don Fago is a fisheries biologist with the Bureau of Research who has been in charge of the statewide Fish Distribution Study since its inception in 1974 (DNR, 3911 Fish Hatchery Road, Fitchburg, Wisconsin 53711).

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