

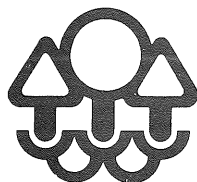


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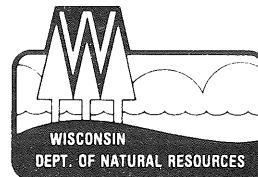


1982-84 PCB LEVELS IN COMMERCIAL FISH SPECIES OF THE LOWER ST. CROIX RIVER AND MISSISSIPPI RIVER, POOLS 2-10

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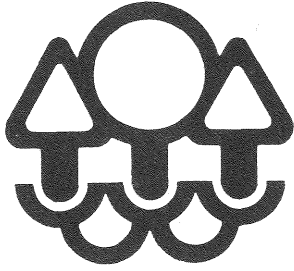


MINNESOTA POLLUTION
CONTROL AGENCY



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DEPT. OF NATURAL RESOURCES

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Minnesota Pollution Control Agency

Dear Commercial Fisherman:

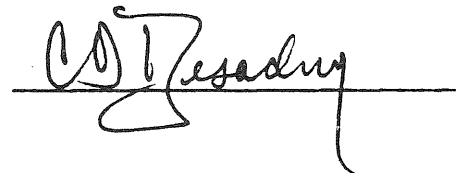
Attached is a report that represents a joint effort by the States of Minnesota and Wisconsin to summarize the current levels of PCBs in commercial fish species of the Lower St. Croix and Mississippi River (Pools 2-10).

If you have any questions about this material, please contact: Dan Helwig, St. Paul (612/296-7257); Lee Liebenstein, Madison (608/266-0164); Willis Fernholz, LaCrosse (608/785-9000); or Larry Gates, Lake City (612/345-4219).

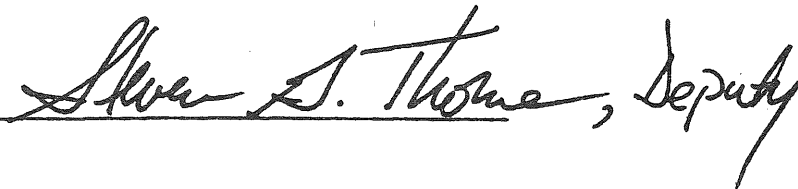
Thomas J. Kalitowski
Executive Director
Minnesota Pollution Control Agency



C.D. Besadny
Secretary
Wisconsin Department of
Natural Resources



Joseph N. Alexander
Commissioner
Minnesota Department of Natural Resources

By  Steven J. Thome, Deputy

Phone: _____

1935 West County Road B2, Roseville, Minnesota 55113-2785

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1982-1984 PCB Levels in Commercial Fish Species of the Lower
St. Croix River and the Mississippi River, Pools 2-10

MINNESOTA POLLUTION CONTROL AGENCY
Division of Water Quality

MINNESOTA DEPARTMENT OF NATURAL RESOURCES
Division of Fish and Wildlife

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
Bureau of Fish Management
Bureau of Water Resource Management

August, 1985

ACKNOWLEDGEMENTS

This report was prepared by Daniel D. Helwig of the Division of Water Quality, Minnesota Pollution Control Agency, and Lee Liebenstein of the Bureau of Water Resource Management, Wisconsin Department of Natural Resources.

Special thanks to the following agencies and their staff for their participation:

Fish Tissue Analyses

Minnesota Department of Health
Wisconsin State Lab of Hygiene

Fish Collection

Minnesota Department of Natural Resources
Lake City Area Fisheries Office
Ecological Services Section, St. Paul

Wisconsin Department of Natural Resources
Mississippi River Work Unit, LaCrosse

Manuscript Review

Minnesota Department of Agriculture
Wisconsin Department of Agriculture

Special thanks to Willis Fernholz, Wisconsin Department of Natural Resources, Larry Gates, Minnesota Department of Natural Resources and Mike Talbot, Wisconsin Department of Natural Resources who helped prepare and review this report.

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INTRODUCTION

In the spring of 1975, the U.S. Food and Drug Administration (USFDA) detected PCB concentrations in fish from Lake Pepin (pool 4) over the commercial action level of 5.0 ppm. This resulted in the destruction of approximately 60,000 pounds of carp fillets. A Task Force of state and federal agencies investigated the location and severity of the PCB problem in the Mississippi River and major tributaries (Hora, 1976). Based on the Task Force findings, a consumption advisory for sport and commercial fish was issued and periodic inspections of fish markets by state and federal agencies were initiated.

Since 1975, several state and federal laws have been enacted to control the environmental release of PCBs including disposal regulations, labeling requirements and use restrictions. As a result, PCB concentrations dropped below the 5.0 ppm action level for many species and sizes of fish for much of the Mississippi River. On August 20, 1984, the USFDA lowered the PCB action level from 5.0 ppm to 2.0 ppm based on new research showing harmful effects from PCB exposure. This caused new concern among commercial fishermen and fish buyers along the Mississippi River because it was not clear which species and sizes of fish exceeded the 2.0 ppm action level.

The objective of this report is to provide guidance to commercial fisherman and fish buyers to which species and sizes of fish are "safe" (less than 2.0 ppm) to market for human consumption from the lower St. Croix River and the Mississippi River from pool 2 through pool 10. It is hoped that this guidance will allow fishermen to use the river's vast fisheries resources to the fullest extent while providing a safe product to the public who purchase fish taken from the St. Croix and Mississippi Rivers.

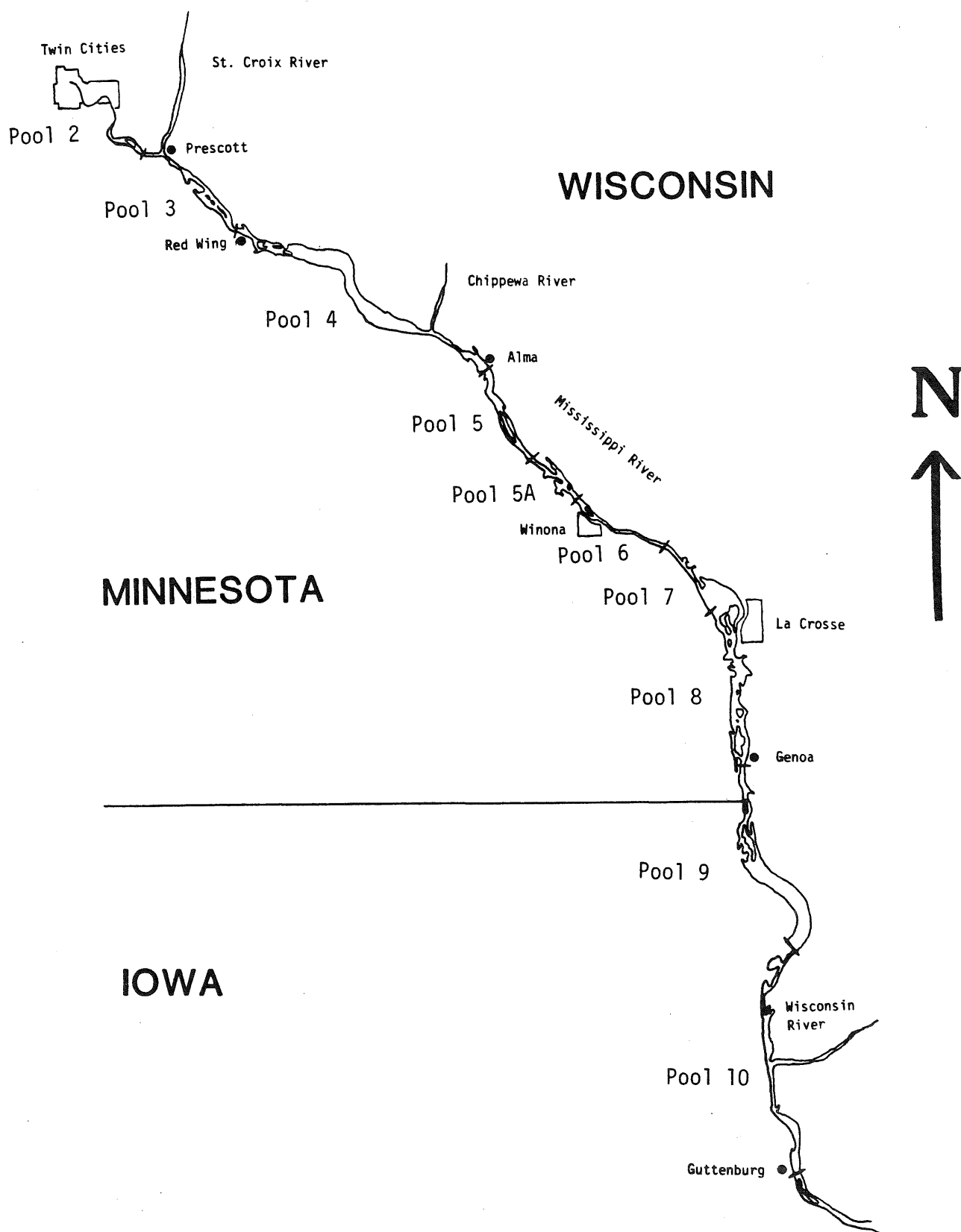
METHODS

Buffalo (bigmouth and smallmouth), carp, channel catfish, freshwater drum and flathead catfish were collected by the Minnesota Department of Natural Resources (MDNR) and Wisconsin Department of Natural Resources (WDNR) from the lower St. Croix River and the Mississippi River, pools 2-10 (See Figure 1). Five-hundred seventy-nine (579) fish were collected from 1982-1984 by electroshocking in areas of fish aggregation near commercially fished sites when possible. The fish were weighed and measured in the field to the nearest 0.1 pound and 0.1 inch. The fish were individually wrapped in aluminum foil, labeled and frozen whole.

The fish were processed by the Bureau of Water Resource Management, WDNR and the Minnesota Pollution Control Agency (MPCA). They were unwrapped and rinsed with tap water to remove any debris. The fish were sorted by location, species and size. A boneless skin-on fillet without scales was taken from the fish according to USDA procedures (USFDA, 1979). For catfish, the skin was removed. A total of 161 samples were prepared. Usually 3-5 fillets from similarly sized fish were composited into a sample. The fillets were ground to the consistency of hamburger, homogenized, placed into glass jars with aluminum lined caps and sent to the lab for analyses.

The Wisconsin State Lab of the Hygiene and the Minnesota Department of Health performed the PCB analyses according to procedures that are approved by the U.S. Environmental Protection Agency (USEPA) and USFDA. In general, the procedures involve: 1) extracting the PCBs with hexane, 2) initial fat removal with gel

FIGURE 1. MAP OF THE LOWER ST. CROIX RIVER AND
THE MISSISSIPPI RIVER, POOLS 2 - 10



permeation, 3) final clean-up with a flourosil column and 4) quantification with gas chromatography with an electron detector.

The PCB data for the period (1982-1984) was grouped by river pools. Data from pools with more than one station were combined. Total PCBs (ppm) were plotted against fish length (inches) for each location and species (See Figure 2 for an example). The calculated "line of best fit" was drawn through the points and the length at 2.0 ppm was taken from the intersection of this line with the reference line.

RESULTS AND DISCUSSION

Marketing recommendations for commercial fish species of the lower St. Croix River and the Mississippi River, Pools 2-10 are listed in Table 1. Fish in the "OK To Market" category contain less than 2 ppm in most cases. Fish in the "Do Not Market" category exceed 2 ppm of PCBs in most cases. Since there is some natural variation of PCB levels in fish, these recommendations should be considered reference points. The PCB levels in each species are discussed below:

Buffalo

Few (6) smallmouth and bigmouth buffalo samples were collected. PCBs in smallmouth buffalo from the lower St. Croix were 1.1 and 3.1 ppm for fish 20 and 25 inches long. Consequently, smallmouth buffalo over 23" should not be marketed from the lower St. Croix. Buffalo (20 inches) from pool 4 contained 3.2 ppm of PCBs which is not enough data to recommend safe sizes. However,

FIGURE 2. "PCB" CONCENTRATIONS (ppm) PLOTTED AGAINST LENGTH (inches) FOR CARP IN POOL 3
The length at which carp contain 2 ppm of PCBs occurs where the calculated
"line of best fit" crosses the 2 ppm reference line.

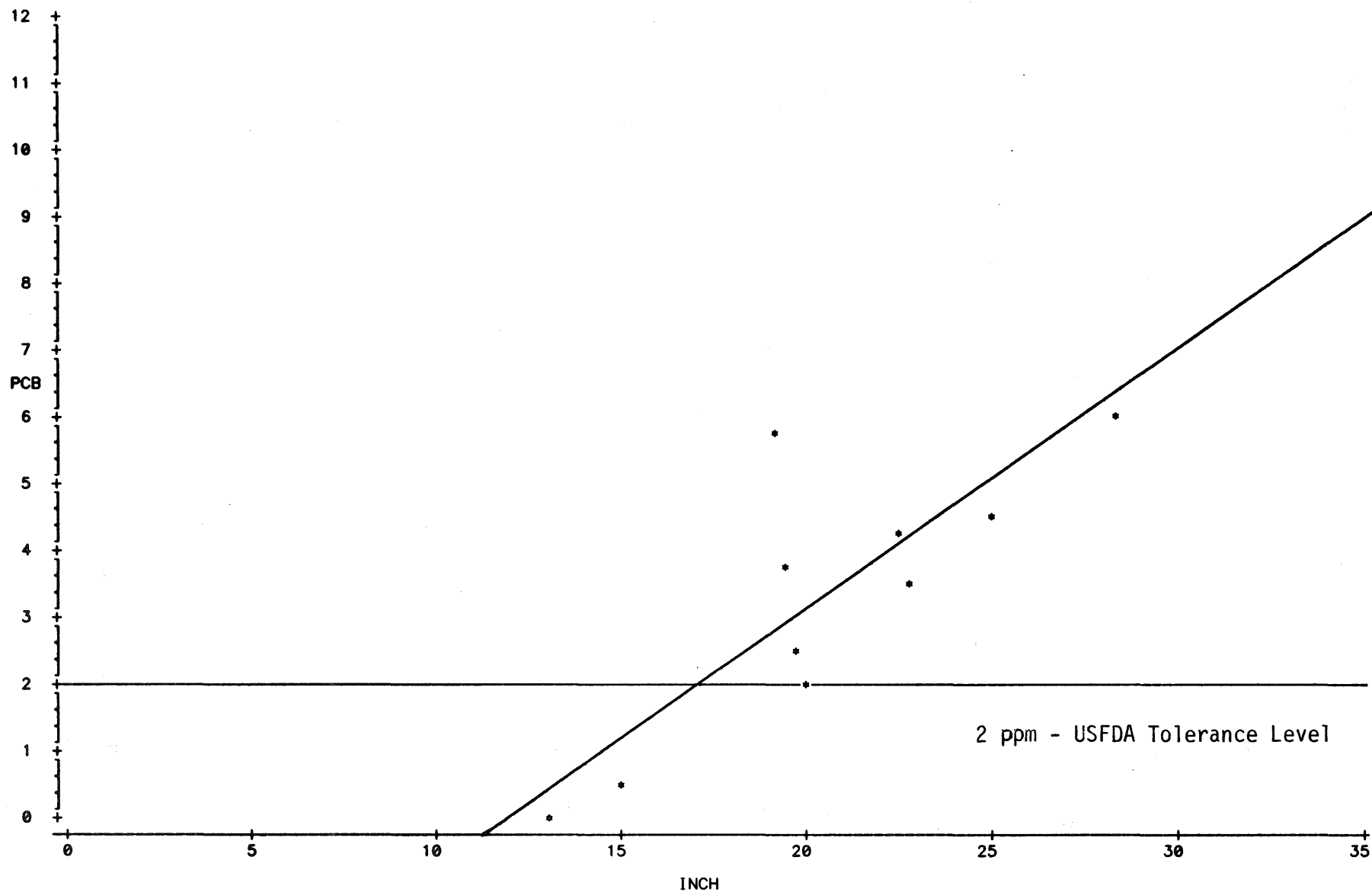


TABLE 1. MARKETING RECOMMENDATIONS FOR COMMERCIAL FISH SPECIES OF THE LOWER ST. CROIX RIVER AND THE MISSISSIPPI RIVER, POOLS 2-10. These are recommendations only and are not enforcement standards.

Location	OK TO MARKET (fish under 2 ppm)	DO NOT MARKET (fish over 2 ppm)	NOT ENOUGH DATA (OK to market pending further fish sampling)
Pool 2		Carp (all sizes) Channel catfish* Flathead catfish*	Buffalo Freshwater drum
Pool 3	Carp under 17" (3 lbs)	Carp over 17" (3 lbs) Channel catfish (all sizes)**	Buffalo Freshwater drum Flathead catfish
Lower St. Croix River (Hudson- Prescott)	Carp under 23" (6 lbs) Buffalo under 23"	Carp over 23" (6 lbs) Channel catfish (all sizes)** Buffalo over 23"	Freshwater drum Flathead catfish
Pool 4	Carp under 21" (5 lbs) Channel catfish under 20" Freshwater drum Flathead catfish under 22"	Carp over 21" (5 lbs) Channel catfish over 20" Flathead catfish over 22"	Buffalo
Pool 5	Carp under 24" (7 lbs) Channel catfish under 23" Freshwater drum	Carp over 24" (7 lbs) Channel catfish over 23"	Buffalo Flathead catfish
Pool 5A	Carp Channel catfish under 23" Freshwater drum	Channel catfish over 23"	Buffalo Flathead catfish
Pool 6			Buffalo Carp Channel catfish Flathead catfish Freshwater drum
Pool 7	Buffalo Carp under 28" (12 lbs) Channel catfish under 23" Freshwater drum	Carp over 28" (12 lbs) Channel catfish over 23"	Flathead catfish
Pool 8	Buffalo Carp Freshwater drum		Channel catfish Flathead catfish
Pool 9	Buffalo** Carp Channel catfish Freshwater drum** Flathead catfish**		
Pool 10	Buffalo** Carp Channel catfish Freshwater drum** Flathead catfish**		

* Commercial fishing for catfish in pool 2 is prohibited by MDNR regulations. This is not due to contaminant levels.

**Based on best professional judgement using data from other species in the same pool.

since the other species contain high PCB levels in these areas, buffalo from pool 4 or upstream should be marked with caution. In contrast, buffalo from pools 7 and 8 contained less than 0.8 ppm. Because PCB levels from other species were also low, buffalo of all sizes should be below the action level. Not enough data was available to recommend safe sizes in pools 5 - 6. Buffalo were not sampled from pools 9 and 10 but because the other species were low in PCBs, they should be below the action level at all sizes.

Carp

A total of 93 carp samples were taken. PCBs in carp from pool 2 exceeded the action level in all but one case. Even small carp (15.4 inches) contained 3.4 ppm of PCBs. Consequently, commercial fishing for carp in pool 2 is not recommended. In the downstream pools, the length at which carp exceed the action level increases from 17 inches (pool 3) to 24 inches (pool 5). All sizes of carp should be below the action level in pool 5A. There is insufficient data for recommendations in pool 6. In pool 7, carp smaller than 28 inches should be below the action level. PCBs are low in carp from pools 9 (less than 2.0 ppm in very large carp) and pool 10 (less than 0.3 ppm) and should be safe to market at all sizes in these pools.

Channel Catfish

A total of 34 channel catfish samples were taken. PCB levels in channel catfish are more variable than those in carp. In pool 2, it is not legal to commercially fish catfish (MDNR Inland Mississippi River Commissioners Order 1643). However, a sample of 22.7 inch channel catfish was high (5.9 ppm) indicating that pool 2 is high in PCBs. In pool 3 and in the lower St. Croix

River, all of the channel catfish PCB levels were over the action level. Commercial fishing for channel catfish in these areas are not recommended. The length at 2.0 ppm increases from 20 to 23 in pools 4, 5, 5A and 7. There is not enough data to make a recommendation for pool 6. In pool 8, the catfish data is variable and more sampling is needed to recommend a safe length. Fish of all sizes should meet the action level in pools 9 and 10 based on a limited number of samples which were all less than 0.7 ppm and the data from the other species which also contained low levels of PCBs.

Drum

Seventeen (17) freshwater drum PCB samples were taken in pools 4, 5, 5A, 7, and 8. All of the samples were less than 1.0 ppm except for one which was 1.7 ppm. Freshwater drum contain less PCBs because their fat content is generally low. Fish of all sizes should be below the action level in pool 4 and in downstream pools. In the upstream areas, there was no data to make any recommendations. However, these areas contain more PCBs than the downstream locations and freshwater drum could accumulate PCB levels exceeding the PCB action level.

Flathead Catfish

Very little PCB data for flathead catfish (11 samples) was available for this study. There were sufficient samples to recommend a safe length in pool 4 where fish less than 22 inches should be below the action level. Additional data is needed for pools 3, 5, 5A, 6, 7 and 8 as well as the lower St. Croix. Fish of all sizes, should be below the action level in pools 9 and 10 based on data from the other species in these pools.

PCB Trends

PCB levels were determined in carp from 8 Mississippi River stations between Sartell, Minnesota and Alma, Wisconsin in 1975, 1976, 1979, 1980 and 1982 for trend analyses (Hora and Helwig, 1985). The levels in 1979-1980 and 1982 were compared to the 1975-1976 base-line years when PCBs were identified as an environmental problem in the Mississippi River. Significant decreases occurred from 1975-1976 to 1979-1980. However smaller decreases (not statistically significant) occurred between 1979-1980 and 1982. These observations suggest that regulations to control the environmental release of PCBs in 1977 have reduced PCB levels in the River. Current levels may not decrease as rapidly because of PCB recycling from the sediment, through the aquatic food chain. Carp will be monitored in the future to see how PCB levels in fish change with time.

CONCLUSIONS AND RECOMMENDATIONS

In general, pool 2 is the most contaminated area with carp at all lengths likely to exceed the 2.0 ppm action level. Catfish from pool 2 also exceed the action level but cannot be legally commercially fished. Fish in downstream pools contain progressively lower levels of PCBs with the exception of fish in pool 7 where large carp and catfish may exceed the action level.

The MNDR and WDNR do not at this time intend to limit or control commercial fishing activities due to contaminant levels in fish from the Lower St. Croix and Mississippi River, pools 2 - 10. However, the Agencies responsible for regulating contaminants in food (the USFDA, the Minnesota Department of

Agriculture and the Wisconsin Department of Agriculture) are likely to target their inspection samples to fish in Table 1 in the "Do Not Market" category.

Additional PCB data for several species and sizes is needed to make complete recommendations. These are summarized in Table 2. Every effort to collect and analyze these samples will be made in 1985. If monies or manpower run short, the buffalo samples will receive priority because of their commercial value.

All species of fish will be periodically resampled in future years in an ongoing effort to monitor PCB levels in fish from the lower St. Croix and Mississippi Rivers. This report will be updated as new results become available.

TABLE 2. SPECIES AND SIZE OF FISH TO MONITOR FOR
PCBs IN 1985.

Location	Length (inches) of fish to collect				
	Buffalo	Carp	Channel Cats	Drum	Flathead Cats
Pool 2	15,18,21,24			15,18	18,21,24,27
Pool 3	15,18,21,24			15,18	18,21,24,27
St. Croix	15,18,21,24		21,24,27	15,18	18,21,24,27
Pool 4	15,18,21,24				
Pool 5	15,18,21,24		18,21,24,27		18,21,24,27
Pool 5A	15,18,21,24		21,24,27		18,21,24,27
Pool 6	15,18,21,24	18,24	21,24,27	15,18	18,21,24,27
Pool 7			21,24,27		18,21,24,27
Pool 8			21,24,27		18,21,24,27
Pool 9					
Pool 10					

REFERENCES

- Hora, M.E. 1976. Polychlorinated Biphenyls (PCBs) in the Upper Mississippi River Basin, Minnesota-Wisconsin Interagency Task Force, Minnesota Pollution Control Agency, Roseville, Minnesota. 55 pp.
- Hora, M.E. and D.D. Helwig. 1985. Polychlorinated Biphenyls (PCBs) in Common Carp (Cyprinus Carpio) of the Upper Mississippi River (1975-1982). Minnesota Pollution Control Agency, Roseville, Minnesota. 27 pp.
- U.S. Food and Drug Administration. 1979. An assessment of Risk Associated with Human Consumption of Some Species of Fish Contaminated with Polychlorinated Biphenyls (PCBs). PCB Risk Assessment Workforce. 29 pp.

APPENDIX A. 1982-1984 FISH PCB DATA

PCBS(PPM) IN COMMERCIAL FISH SPECIES 1982-1984
LOWER ST.CROIX RIVER AND MISSISSIPPI RIVER (POOLS 2-10)

POOL=2

YR	SP	NO	LBS	INCH	FAT	PCB
82	CARP	10	3.1	18.9	5.6	2.1
83	CARP	10	3.6	19.2	7.7	1.1
82	CARP	5	1.8	15.4	3.2	3.5
82	CARP	7	3.2	18.7	8.0	3.4
82	CARP	2	5.4	22.0	2.9	4.2
82	CARP	1	7.8	25.0	3.0	2.6
83	CARP	9	3.8	19.8	5.3	2.2
83	CARP	10	3.5	19.4	6.3	7.5
83	CHANNEL CATFISH	5	4.7	22.7	8.8	5.9
83	FLATHEAD CATFISH	2	3.0	20.2	0.3	0.4

POOL=3

YR	SP	NO	LBS	INCH	FAT	PCB
82	CARP	5	1.1	13.0	1.1	0.1
82	CARP	5	3.8	19.8	4.7	2.4
82	CARP	5	5.8	22.5	6.3	4.3
82	CARP	5	11.8	28.3	16.0	6.0
83	CARP	5	3.2	19.1	13.0	5.8
83	CARP	10	3.7	19.9	6.9	2.1
82	CARP	5	1.7	14.9	2.9	0.4
82	CARP	5	3.8	19.5	4.6	3.8
82	CARP	5	5.8	22.7	4.7	3.4
82	CARP	5	8.6	24.9	8.4	4.6
83	CHANNEL CATFISH	5	2.4	18.9	5.4	7.1
83	CHANNEL CATFISH	8	1.5	15.8	6.6	2.8
83	CHANNEL CATFISH	2	3.3	21.0	6.6	2.3
83	FLATHEAD CATFISH	4	6.7	24.9	1.5	2.6

LOWER ST.CROIX RIVER

YR	SP	NO	LBS	INCH	FAT	PCB
84	CARP	3	4.7	20.7	9.2	4.1
84	CARP	2	8.6	25.8	6.9	2.0
82	CARP	4	1.8	15.8	1.2	0.2
82	CARP	10	3.9	20.3	7.2	7.2
82	CARP	5	5.4	22.8	6.7	2.4
83	CARP	10	3.4	19.7	4.3	1.3
84	CARP	10	3.4	18.8	5.5	1.4
84	CHANNEL CATFISH	2	1.9	18.5	3.2	3.4
84	SM BUFFALO	3	10.0	25.0	7.7	3.1
84	SM BUFFALO	3	5.3	20.0	12.0	1.1

PCBS (PPM) IN COMMERCIAL FISH SPECIES 1982-1984
LOWER ST. CROIX RIVER AND MISSISSIPPI RIVER (POOLS 2-10)

POOL=4

YR	SP	NO	LBS	INCH	FAT	PCB
82	CARP	5	1.4	13.9	2.1	0.2
82	CARP	5	3.4	18.8	3.6	0.6
82	CARP	5	5.7	22.8	3.1	2.8
82	CARP	5	10.8	28.1	6.8	6.4
82	CARP	5	2.0	15.4	2.7	0.4
82	CARP	3	3.3	19.2	4.1	0.8
82	CARP	4	4.8	21.0	6.3	2.0
82	CARP	3	7.2	24.2	8.4	7.2
82	CARP	4	6.6	25.0	6.8	6.4
82	CARP	3	8.7	25.3	8.3	6.5
83	CARP	3	3.3	18.9	5.4	0.6
83	CARP	3	3.9	20.3	8.1	1.4
82	CARP	3	14.0	29.0	18.0	11.0
83	CARP	3	4.4	21.4	6.2	1.0
83	CARP	3	5.7	23.3	12.0	3.7
83	CARP	3	6.9	24.4	9.7	4.6
83	CARP	3	8.0	25.5	9.0	2.0
83	CARP	3	9.3	26.8	8.2	6.6
84	CARP	3	4.4	20.4	11.0	1.1
84	CARP	3	5.1	21.2	10.0	2.8
84	CARP	3	8.6	26.0	10.0	1.5
84	CARP	3	9.5	26.0	9.8	1.1
84	CARP	3	5.1	21.4	6.5	0.7
84	CARP	3	12.8	29.0	10.0	6.3
84	CARP	3	9.1	27.0	18.0	10.0
83	CARP	5	4.0	18.9	7.5	0.8
84	CARP	1	9.0	25.0	2.3	7.8
83	CHANNEL CATFISH	2	0.8	17.6	10.0	1.8
83	CHANNEL CATFISH	2	2.7	24.5	6.0	1.7
83	CHANNEL CATFISH	2	1.8	22.1	6.1	3.1
83	CHANNEL CATFISH	1	2.4	20.1	1.8	0.7
83	CHANNEL CATFISH	5	0.9	16.1	3.9	3.6
83	CHANNEL CATFISH	3	2.0	18.5	4.0	0.8
84	CHANNEL CATFISH	2	1.4	16.1	5.2	1.3
83	DRUM	3	1.2	13.2	2.1	0.9
83	DRUM	3	1.4	15.0	0.8	0.5
83	DRUM	3	2.4	17.0	2.7	0.8
83	DRUM	3	3.0	18.7	0.9	0.2
83	DRUM	3	2.4	17.1	1.3	0.2
83	FLATHEAD CATFISH	1	1.8	16.7	0.8	0.4
83	FLATHEAD CATFISH	2	0.7	12.6	0.4	0.2
83	FLATHEAD CATFISH	1	12.5	30.5	2.0	2.4
83	FLATHEAD CATFISH	2	1.1	11.6	0.5	0.2
83	FLATHEAD CATFISH	1	12.5	30.5	5.7	7.0
83	FLATHEAD CATFISH	1	2.6	20.7	0.6	0.3
83	FLATHEAD CATFISH	3	2.6	20.7	1.9	0.8
84	FLATHEAD CATFISH	1	2.4	17.3	1.6	0.4
84	SM BUFFALO	3	4.8	20.0	12.0	3.2

PCBS (PPM) IN COMMERCIAL FISH SPECIES 1982-1984
LOWER ST. CROIX RIVER AND MISSISSIPPI RIVER (POOLS 2-10)

POOL=5

YR	SP	NO	LBS	INCH	FAT	PCB
83	CARP	3	4.3	19.8	8.9	0.6
83	CARP	3	5.7	22.2	7.0	0.5
83	CARP	3	7.0	24.4	9.4	1.2
83	CARP	2	9.6	26.0	8.1	4.8
83	CARP	3	13.0	29.0	8.7	1.8
84	CARP	3	11.7	28.0	10.0	2.3
84	CARP	3	4.6	20.4	8.4	1.0
84	CARP	3	4.3	20.4	8.7	1.5
84	CARP	3	6.8	24.9	12.0	3.1
84	CARP	3	9.0	26.0	9.5	5.4
83	CHANNEL CATFISH	1	4.5	23.0	0.7	1.9
83	CHANNEL CATFISH	4	0.7	12.7	1.5	0.3
84	CHANNEL CATFISH	3	1.5	17.7	3.1	0.6
84	CHANNEL CATFISH	3	2.5	21.2	5.7	2.4
83	DRUM	3	1.4	14.8	3.8	1.0
83	DRUM	3	1.6	15.5	4.0	1.7
83	DRUM	3	2.2	16.9	1.0	0.3
83	DRUM	3	2.9	18.2	7.0	0.6
83	DRUM	3	1.5	14.3	2.1	0.7
83	DRUM	2	1.3	13.7	1.5	0.4

POOL=5.5

YR	SP	NO	LBS	INCH	FAT	PCB
83	CARP	3	4.2	19.8	7.7	0.7
83	CARP	3	4.2	19.8	5.1	0.9
83	CARP	3	5.4	21.9	10.0	1.4
83	CARP	3	6.6	23.8	10.0	1.5
83	CARP	3	8.0	25.2	6.0	1.1
83	CARP	1	15.8	30.1	2.1	1.2
83	CARP	3	4.7	20.8	7.8	0.6
83	CHANNEL CATFISH	2	3.7	20.9	3.9	1.0
83	CHANNEL CATFISH	3	1.8	16.9	2.4	0.4
84	CHANNEL CATFISH	3	1.2	16.2	3.1	0.4
84	CHANNEL CATFISH	1	3.0	20.2	2.9	2.2
83	DRUM	3	2.7	17.8	1.8	0.7
83	DRUM	2	3.3	19.0	0.4	0.5
83	DRUM	2	6.6	23.0	1.9	0.4
83	DRUM	3	2.3	16.2	1.9	0.3
83	FLATHEAD CATFISH	2	1.4	14.1	0.4	0.2

POOL=6

YR	SP	NO	LBS	INCH	FAT	PCB
84	CARP	3	4.3	20.2	7.9	0.6
84	CARP	3	11.7	26.5	12.0	2.3
84	CHANNEL CATFISH	2	2.2	19.2	1.1	0.2
84	CHANNEL CATFISH	3	4.3	23.2	7.3	1.0

PCBS (PPM) IN COMMERCIAL FISH SPECIES 1982-1984
LOWER ST. CROIX RIVER AND MISSISSIPPI RIVER (POOLS 2-10)

POOL=7

YR	SP	NO	LBS	INCH	FAT	PCB
83	BIGMOUTH BUFFALO	5	4.4	18.9	6.3	0.1
83	CARP	5	2.2	15.0	3.8	0.1
83	CARP	5	3.8	18.8	5.2	0.7
83	CARP	5	6.0	22.4	8.5	1.8
83	CARP	6	9.6	25.6	8.0	1.9
84	CARP	3	4.5	20.5	12.0	1.1
84	CARP	3	11.4	27.1	11.0	1.2
83	CHANNEL CATFISH	4	1.6	16.1	4.3	1.0
83	CHANNEL CATFISH	2	7.2	25.9	4.4	2.2
84	CHANNEL CATFISH	1	3.5	20.7	9.2	2.2
84	CHANNEL CATFISH	3	2.0	17.7	6.8	0.5
83	DRUM	5	1.7	14.8	1.5	0.6

POOL=8

YR	SP	NO	LBS	INCH	FAT	PCB
83	BIGMOUTH BUFFALO	2	4.5	18.6	7.9	0.3
83	CARP	5	3.4	18.4	5.0	0.7
83	CARP	5	5.6	21.5	6.2	1.0
83	CARP	3	9.5	26.8	8.2	1.1
84	CARP	5	5.7	21.0	9.2	1.5
84	CARP	3	10.1	26.8	11.0	1.0
84	CARP	3	9.9	25.8	11.0	1.0
84	CARP	5	4.1	20.0	8.4	1.1
84	CARP	2	4.2	25.0	9.5	1.0
83	CARP	5	2.1	15.8	2.9	0.1
83	CHANNEL CATFISH	8	2.2	18.4	5.1	1.4
83	CHANNEL CATFISH	6	3.2	20.3	4.7	3.2
84	CHANNEL CATFISH	3	4.4	22.0	9.1	0.6
84	CHANNEL CATFISH	3	2.1	18.1	6.9	0.8
83	DRUM	4	2.3	16.8	1.2	0.4
83	SM BUFFALO	5	3.0	16.4	5.6	0.8

POOL=9

YR	SP	NO	LBS	INCH	FAT	PCB
84	CARP	2	8.4	25.5	11.0	1.1
84	CARP	3	4.6	20.6	12.0	0.5
84	CARP	3	11.4	27.8	11.0	1.4
84	CARP	3	8.1	25.7	10.0	1.3
84	CARP	1	15.0	31.0	9.0	1.7
84	CHANNEL CATFISH	3	3.0	19.0	7.7	0.7
84	CHANNEL CATFISH	3	3.0	20.6	9.9	0.6

PCBS (PPM) IN COMMERCIAL FISH SPECIES 1982-1984
 LOWER ST. CROIX RIVER AND MISSISSIPPI RIVER (POOLS 2-10)

POOL=10						
YR	SP	NO	LBS	INCH	FAT	PCB
84	CARP	3	3.7	21	6.6	0.3
84	CARP	3	11.8	28	10.0	0.2
84	CHANNEL CATFISH	3	2.6	18	9.0	0.3
84	CHANNEL CATFISH	3	4.2	22	8.0	0.5

