

DISTRIBUTION AND RELATIVE ABUNDANCE OF FISHES IN WISCONSIN

V. Grant & Platte, Coon & Bad Axe, and La Crosse River Basins

This report is dedicated to the nongame fish, whose interrelationships in the aquatic ecosystem is generally not well documented or appreciated.

PREFACE

Little attention has been given to nongame fish species which comprise over 75% of the 150 fish species in Wisconsin waters. Yet many of those species play a major role in maintenance of sport fish populations so vital to recreational and economic interests in the state. In essentially disregarding these species, their right to exist and their role in maintaining community stability through species diversity have been overlooked. The nongame fish not only make up the majority of fish species in Wisconsin but are also more abundant than sport fish species in both total number and total biomass.

Further attention by either research or management to nongame fish species must be preceded by an inventory of what we have and where we have it. In 1974, the Bureau of Research of the Wisconsin Department of Natural Resources (DNR), with inputs from field fish management personnel, began a statewide assessment of the distribution and relative abundance of fish species, emphasizing but not limited to nongame species. This assessment was begun using a basin approach to delineate location of sampling stations on the over 7,200 lakes (over 350,000 ha) and 11,000 streams (over 68,000 km) within the state. The 3 major basins (Mississippi River, Lake Michigan, and Lake Superior) were further divided into 30 minor basins.

The last report on the distribution of fish species throughout the state was made by C. W. Greene (1935) for the 1900-31 period. He covered about 1,400 sampling stations. Since then, other collectors, notably Dr. George Becker (1959, 1964a, 1964b, 1966, 1983), Professor Marlin Johnson (Johnson and Becker 1970), and the students at the University of Wisconsin at Madison (including McNaught 1963) and Stevens Point have added appreciably to knowledge of regional distribution of Wisconsin fishes.

The need to update our knowledge of statewide fish distribution is most clearly evident from the dearth of information available on nongame species in most watersheds for preparing environmental impact assessments and reports and department master plans. In addition, both federal and state law now require the establishment of an endangered and threatened species list. Furthermore, the Wisconsin Department of Natural Resources has been directed to "conduct research on endangered and threatened species of this state and shall implement programs directed at conserving, protecting, restoring, and propagating selected state endangered and threatened species to the maximum extent practicable." (Chap. 29.415, Wis. Stats.)

Field collecting under the research study initiated in 1974 was essentially terminated in 1980 due to reduced funding, with only limited sampling after that time. Of the 30 river basins in the state, sampling has now been completed in 17 and nearly completed in 1. Only scattered samples were taken in the other 12 basins. These samples inventoried about 45% of the state.

The results of the work so far completed on fish distribution are being published in a series of separate bulletins dealing with one or more minor basins. Reports on the following are now available: Greater Rock River basin (Fago 1982); Black, Trempealeau, and Buffalo river basins (Fago 1983a); Red Cedar River basin (Fago 1983b); and Root, Milwaukee, Des Plaines, and Fox river basins (Fago 1984a). The bulk of the data presented refers primarily to collections made during the Bureau of Research study. However, other fishery biologists and managers have made numerous collections over the years, and their published and unpublished records, when available to us, are included. Therefore, data from as early as 1900 are available for some

basins, permitting comparisons between historical and current records.

This series of reports, however, constitutes only an overview of a voluminous mass of data now permanently stored in computer files. For the field manager or investigator, the greatest value of this study lies in the availability of fish data on specific waters or on waters in close proximity to those of immediate concern. Data now in computer files (over 16,900 collections) have already, in over 200 cases, proven to be very useful to DNR personnel in several bureaus and to other state and federal agencies, environmental consultants, and students. They have used the data for various purposes; e.g., to make assessments on past as well as potential changes in the aquatic environment, indicate water quality through fish species composition, and determine ranges in Wisconsin for particular fish species.

Sufficient data were collected during the research study to recommend the revision of Wisconsin's endangered and threatened fish species lists in 1979 and again in 1982. The first revision added 15 species to both lists and removed 3 from the endangered list. The second revision added 2 to the endangered list, and removed 1 from the endangered and 3 from the threatened list.

The bulk of the preserved fish collections are curated at the Milwaukee Public Museum, further enhancing the value and significance of this study. There they are used by scientists and educators interested in taxonomy, systematics, and natural history. They also are serving as a baseline collection from which to determine changes in fish community structure and environmental loads of pollutants and toxicants.

This report deals with 3 separate basins in southwestern Wisconsin, the Grant & Platte, the Coon & Bad Axe, and the La Crosse river basins.

DISTRIBUTION AND RELATIVE ABUNDANCE OF FISHES IN WISCONSIN

V. GRANT & PLATTE, COON & BAD AXE, AND LA CROSSE RIVER BASINS

By
Don Fago

Technical Bulletin No. 152
Department of Natural Resources
Box 7921, Madison, Wisconsin 53707

1985

ABSTRACT

A statewide survey of the inland waters of Wisconsin was initiated 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. The Grant & Platte, and Coon & Bad Axe, and La Crosse river basins were sampled from 1975 through 1982 by personnel from research at 327 stations, from fish management at 14 stations, and from U.S. Fish and Wildlife Service at 2 stations. An additional 124 stations were partially sampled by fish management personnel.

A total of 74 species was collected from the Grant & Platte river basin, 63 from the Coon & Bad Axe river basin, and 60 from the La Crosse river basin. Included were the endangered goldeye and the threatened Ozark minnow. The weed shiner, pirate perch, and mud darter on the Department's watch list were also collected.

Data from recent collections for the Grant & Platte, Coon & Bad Axe, and La Crosse river basins were compared to those from the 1900-28 and the 1950-74 periods. Twenty-four species were collected which had not been previously reported from the Grant & Platte river basin, 14 from the Coon & Bad Axe river basin, and 23 from the La Crosse river basin. Four species have apparently been extirpated from the Grant & Platte river basin, 14 from the Coon & Bad Axe river basin, and 4 from the La Crosse river basin.

This report includes numerous tables, distribution maps of the species, and discussion on many aspects of fish distribution in the 3 basins. The continued use of this data base for the preparation of environmental impact assessments, for the development of master plans for the aquatic resource, and for research on nongame species, fish communities, and ecosystems is therefore recommended.

CONTENTS

3 STUDY AREA

7 METHODS

- Data Sources and Time Periods, 7
- Collection Methods and Gear, 8
- Sampling Effort, 8
- Data Handling, 8
- Fish Identification and Enumeration, 9
- Endangered, Threatened, and Watch Species, 12

13 RESULTS AND DISCUSSION

13 Grant & Platte River Basin (230)

- Species Found, 13
- Reproducing Populations, 13
- Common and Rare Species, 13
- Differences Between Time Periods, 13
- Species Diversity, 13

13 Coon & Bad Axe River Basin (250)

- Species Found, 13
- Reproducing Populations, 13
- Common and Rare Species, 16
- Differences Between Time Periods, 16
- Species Diversity, 18

18 La Crosse River Basin (260)

- Species Found, 18
- Reproducing Populations, 18
- Common and Rare Species, 18
- Differences Between Time Periods, 19
- Species Diversity, 19

20 Differences Between Basins

- 22 Endangered Species
- 22 Threatened Species
- 22 Watch Species

24 RECOMMENDATIONS

25 LITERATURE CITED

26 APPENDIXES

- A. Supplementary Data, 26
- B. Distribution maps for all species in the Grant & Platte, Coon & Bad Axe, and La Crosse river basins, 1975-82, 33
 - Index to maps, 112

STUDY AREA

Grant & Platte River Basin

The Grant & Platte river basin (230) is located in the southwestern corner of Wisconsin (Fig. 1). It encompasses parts of the following Wisconsin counties: Grant, Iowa, and Lafayette. This basin includes the Wisconsin portions of the following streams (all of which flow directly into the Mississippi River): Grant River, Platte River, Galena River (includes 3 tributaries which flow into the Galena River in Illinois), Apple River (includes 8 tributaries which flow into the Apple River in Illinois), Sinsinawa River, Menominee River, Little Menominee River, Snipee Creek, McCartney Branch, Mill Branch, Furnace Branch, Dewey Creek, Chase Creek, Sandy Creek, Glass Hollow Creek, and 10 unnamed creeks. The watershed in Wisconsin contains an area of approximately 2,525 km² (Holmstrom 1982). Within this area, we have defined 307 streams with a total length in Wisconsin of 1,688 km (Table 1)*. Of these, 219 are unnamed creeks and ditches. There are 2 lakes** in the basin, with a total area of only 9 ha.

The average annual precipitation within the Grant & Platte river basin varies between 81 and 84 cm (Wisconsin DNR 1978). The average gradient for the Grant River (71 km in length) is 78 cm/km and for the Platte River (76 km in length) is 190 cm/km. The average discharge of the Grant River at Burton, which includes 85% of its drainage area, is 4.7 m³/sec (U.S. Geol. Surv. 1982). The average discharge of the Platte River near Rockville, which includes 43% of its drainage area, is 2.8 m³/sec. The average discharge of the Galena River, which includes 88% of its watershed, is 2.2 m³/sec. The combined discharges (9.7 m³/sec) include



Grant River at County Trunk U, 22 miles from its mouth, is a narrow river...

...while at Highway 133, about 2 miles from its mouth, it widens and provides habitat for the goldeye.



*These were defined through a water mileage system that divided the state into 3 major and 30 minor basins (Fago 1984b).

**Lakes in this report refer to naturally occurring lakes as well as impoundments (bodies of water with dams at their outlet) unless otherwise specified.

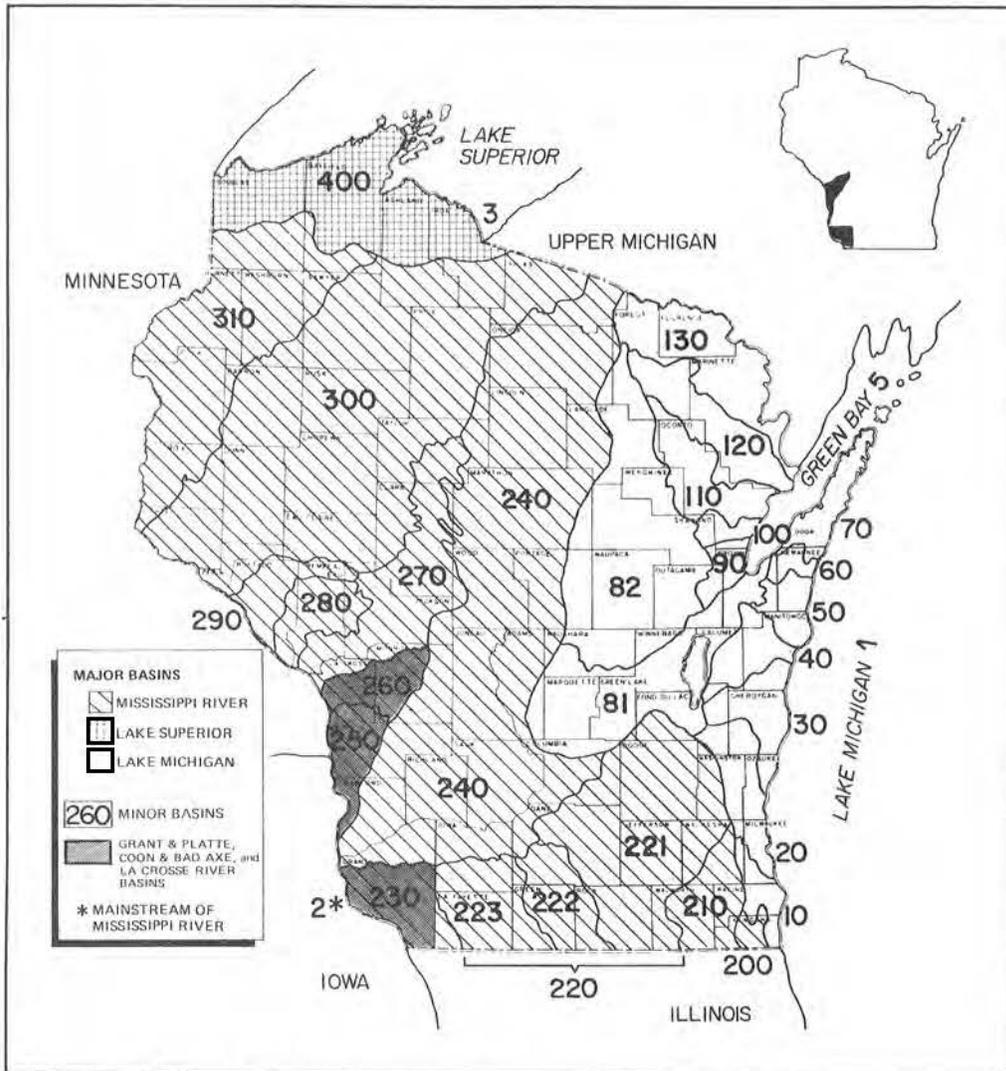


FIGURE 1. Major and minor river basins in Wisconsin.

55% of the drainage area for the entire Grant & Platte river basin. We determined from the data collected at our sampling stations that the Grant River is a moderately turbid river with a stream bottom composed of clay, gravel, and rubble with lesser amounts of silt, muck, and sand.

The dominant land use in the Grant & Platte river basin is agriculture (dairy farm and crops). Twenty-seven percent of the basin is wooded. Another important land use even though small in percentage is mining activity (Wisconsin DNR 1978). The population within the basin has increased 20% since 1950 to about 45,000 in 1970 (Wisconsin DNR 1971).

Coon & Bad Axe River Basin

The Coon & Bad Axe river basin (250) is located north of the mouth of the Wisconsin River and adjacent to the Mississippi River (Fig. 1). It is part of the Mississippi River basin and encompasses parts of the following Wisconsin counties: Crawford, Vernon, La Crosse, and Monroe. The basin includes Coon Creek, Bad Axe River, Pammel Creek, Mormon Creek, Rusk Creek, Sugar Creek, Buck Creek, Copper Creek, Du Charme Creek, Picatee Creek, and 10 unnamed creeks all of which flow directly into the Mississippi River. It contains an area of approximately 1,582 km² (Holmstrom 1982). Within this area we have defined 101



Platte River at Highway 35 with the Little Platte River coming in on right, 3 miles from its mouth.



Little Platte River north of Dickeyville, 4.4 miles from its mouth. Shows stream bank vegetation overhanging left side of the river with pasture on the right.

streams with a total length of 604 km (Table 1). Of these, 67 are unnamed creeks or ditches. There are only 6 lakes with a total area of 243 ha, the largest being 18 ha in size.

The average annual precipitation within the Coon & Bad Axe river basin varies between 76 and 79 cm (Wisconsin DNR 1980). The average gradient for Coon Creek (63 km in length) is 240 cm/km, for the Bad Axe River (8 km in length) is 313 cm/km, for the South Fork Bad Axe River (37 km in length) is 422 cm/km, and for the North Fork Bad Axe River (43 km in length) is 323 cm/km. The average discharge of Coon Creek near Stoddard (1935-40), which includes 85% of the drainage area, is 1.9 m³/sec (U.S. Geol. Surv. 1964). We determined from our sampling stations that Coon Creek is a clear to slightly turbid stream with a bottom composed of sand, rubble, gravel, and clay. The North and South Forks of the Bad Axe River are also clear to slightly turbid streams with bottoms composed of sand, rubble, and gravel. Klick and Threinen (1973) in their statements on these hardwater streams give basically the same stream bottom composition. The major land use (56%) is agriculture which is dominated by dairy farming. Woodlands account for 44% of the land use (Wisconsin DNR 1980).

La Crosse River Basin

The La Crosse River basin (260) is located adjacent to the northern edge of the Coon & Bad Axe river basin (Fig. 1). It encompasses parts of La Crosse and Monroe counties. The basin includes the La Crosse River, which flows directly into the Mississippi River. This watershed contains an area of approximately 1,264 km² (Holmstrom 1982). Within this area we have defined 106 streams with a total length of 674 km (Table 1). Of these 78 are unnamed creeks or ditches. There are 20 lakes with a total area of 358 ha, only 1 is larger than 13 ha in size.

The average annual precipitation is the same as for the Coon & Bad Axe river basin. The average gradient for the La Crosse River (108 km in length) is 124 cm/km. The average discharge near West Salem, which includes 79% of the watershed, is 8.2 m³/sec (U.S. Geol. Surv. 1982). We determined that the La Crosse River is generally a clear stream with a bottom dominated by sand, silt, and muck with limited areas of boulder, gravel, and rubble. This basically agrees with Klick et al. (1971) when he describes these hard water streams. The land use practices are similar to those in the Coon & Bad Axe river basins with pasture and forest dominating.



Galena River south of Lead Mine looking upstream, 29.7 miles from its mouth.



Galena River south of Lead Mine looking downstream at habitat of the smallmouth bass.

TABLE 1. Land area, streams, and lakes of the Grant & Platte, Coon & Bad Axe, and La Crosse river basins.

	Grant & Platte	Coon & Bad Axe	La Crosse
Land area (km ²)*	2,525	1,582	1,264
Streams			
Total number	307	101	106
(Unnamed creeks or ditches)	(219)	(67)	(78)
Total length (km)	1,688	604	674
Lakes/impoundments**			
Total number	2	6	20
Area (ha)	9	243	358
No. dams	2	9	22

*Drainage area in Wisconsin.

**Impoundments are bodies of water with dams at their outlets.



La Crosse River in the Fort McCoy Military Reservation, 60 miles from its mouth...



widens considerably at Interstate 90, 11 miles from its confluence with the Mississippi River.



Sinsinawa River at Highway 11, 13.9 miles from its confluence with the Mississippi River. Shows well-pastured stream banks and habitat of the rosyface shiner.



Shullsburg Branch at Highway 11, 10.4 miles from its confluence with the Galena River. Shows the pool-riffle-pool alternating pattern which is typical of most small-to-medium sized streams in southwestern Wisconsin.

METHODS

Data Sources and Time Periods

All collections are divided into 3 time periods: 1900-28, 1950-74, and 1975-82. The earlier records provide the basis for assessment of changes over time in distribution of fish species within the basins of the Grant & Platte, Coon & Bad Axe, and La Crosse rivers.

If a location was sampled within a time period more than once, only 1 collection is used in the counts of number of stations sampled and number of stations at which a species was taken.

Stations were classified in one of two ways, except for the 1900-28 period, depending on how the samples were taken: complete (those in which all species collected were recorded and identified), and partial (those in which sampling effort and/or species identification were incomplete and therefore did not yield adequate assessment of total species composition).

1900-28 Period. All collections were made between 1900-28 except for 2 stations in the La Crosse River basin (1 in 1931 and 1 in 1944), with 77% taken between 1927 and 1928). Collections from this time period had been made at 23 stations in the Grant & Platte river basin, 9 in the Coon & Bad Axe river basin, and 7 in the La Crosse River basin, by a number of collectors. They in-

cluded C. W. Greene, L. C. Stuart, E. P. Creases, G. Wagner, Schultz, C. Tarzwell, H. R. Rich, N. Enting, R. R. Pope, and W. E. Dickman (names taken from original field notes). Most specimens from these collections were verified by Dr. Carl Hubbs or Dr. Greene and cited by Greene (1935).

The stations sampled were located on 19 streams in the Grant & Platte river basin, 7 streams and 1 lake in the Coon & Bad Axe River basin, and 6 streams and 1 lake in the La Crosse River basin (Table 2). Thoroughness of sampling effort was unknown, and therefore calculation of percent occurrence of each species was not attempted (Table 5).

1950-74 Period. Complete collections from this period were made at 53 sampling stations on 31 streams in the Grant & Bad Axe river basin; 24 stations on 13 streams in the Coon & Bad Axe river basin; and 16 stations on 14 streams and 2 lakes in the La Crosse River basin (Table 2). An additional 23 partial collections in the Grant & Platte river basin, 123 in the Coon & Bad Axe river basin, and 147 in the La Crosse River basin increased the number of streams sampled by 13, 28, and 34 and lakes by 0, 1, and 3 in the Grant & Platte, Coon & Bad Axe, and La Crosse basins, respectively. The data from these partial samples were kept separate in Table 2 and not in-

cluded in the percentages of total stations sampled presented in Table 5. These additional 293 stations came from written records provided by DNR fish management.

The complete samples from the Grant & Platte, Coon & Bad Axe, and La Crosse river basins (84% collected between 1962-69) were collected by the following: Dr. George Becker and his students (unpubl. data) - 40 stations; Prof. Marlin Johnson (unpubl. data) - 39 stations; fish management personnel - 6 stations; Upper Mississippi River Conservation Commission (Smith and Lopinot 1967) - 1 station; Milwaukee Public Museum (unpubl. data) - 2 stations; and U.S. Fish and Wildlife Service (Bailey 1973) - 5 stations.

Total occurrences are defined as the sum of the number of species taken at each station. For example, if a collector took 10 species at one station, 20 at another, and 30 at another, the total species occurrences would be 60. This information has been calculated for collections since 1950, and reveals the volume of data from both complete and partial samples used (Table 3). For the earliest period, only a grand total of occurrences was calculated (Table 5). Total occurrences increased from 370 for the 1900-28 period to 1,751 for the 1950-74 period for the Grant & Platte, Coon & Bad Axe, and La Crosse river basins. During 1950-74, 51% of the

TABLE 2. Summary of stream and lake sampling efforts in the Grant & Platte, Coon & Bad Axe, and La Crosse river basins, 1900-82.

	Grant & Platte (230)			Coon & Bad Axe (250)			La Crosse (260)		
	1900-28	1950-74	1975-82	1900-28	1950-74	1975-82	1900-28	1950-74	1974-82
Streams									
No. sampled	19	31*(13)**100		7	13(28)	40(16)	6	14(34)	42(1)
No. stations	23	53(23)	187(8)	8	24(122)	72(95)	6	14(144)	76(20)
Lakes/impoundments									
No. sampled	0	0	0	1	(1)	0	1	2(3)	1(1)
No. stations	0	0	0	1	(1)	0	1	2(3)	8(1)
Total no. stations	23	53(23)	187(8)	9	24(123)	72(95)	7	16(147)	84(21)

*Complete samples.

**Partial samples.

TABLE 3. List of collectors with number of species collected and total occurrences for samples from the Grant & Platte, Coon & Bad Axe, and La Crosse river basins.

Source of Data*	Grant & Platte (230)				Coon & Bad Axe (250)				La Crosse (260)			
	1950-74		1975-82		1950-74		1975-82		1950-74		1975-82	
	No. Species	Total Occurrences**	No. Species	Total Occurrences	No. Species	Total Occurrences	No. Species	Total Occurrences	No. Species	Total Occurrences	No. Species	Total Occurrences
Research 0	0	—	73	2,211(95)	0	—	61	657(68)	0	—	60	542(90)
Fish Mgt. 1	21	92(12)	26	118(5)	20	401(71)	25	314(32)	21	404(90)	9	46(8)
Becker 2	37	453(62)	0	—	0	—	0	—	13	17(4)	0	—
Johnson 3	37	163(22)	0	—	41	150(26)	0	—	8	8(2)	0	—
Milw. Pub. Mus. 5	19	26(4)	0	—	0	—	0	—	0	—	0	—
UMRCC 9	0	—	0	—	19	19(3)	0	—	0	—	0	—
US Fish & Wildl. 11	0	—	0	—	0	—	0	—	9	17(4)	10	13(2)
Grand Total of Occurrences	734		2,329		570		971		446		601	

*Collectors identified in Appendix A Table 18.

**Total occurrences are defined as the sum of the number of species collected at each station; percent of total occurrences in parentheses.

grand total of occurrences for the 3 basins were accounted for by fish management personnel. However, collections by Becker and Johnson and their students provided 33 species not taken by fish management in these 3 watersheds (Table 3 and Append. A Table 18).

1975-82 Period. Complete collections from this period were made at 187 stations (91% sampled in 1978) on 100 streams in the Grant & Platte river basin, 72 stations (88% in 1980) on 40 streams in the Coon & Bad Axe river basin, and 84 stations (96% in 1980 and 1982) on 42 streams and 1 lake in the La Crosse River basin. There were an additional 8 partial collections in the Grant & Platte river basin, 95 in the Coon & Bad Axe river basin, and 21 in the La Crosse River basin which increased the number of streams by 0, 16, and 1 and lakes by 0, 0, and 1 in the Grant & Platte, Coon & Bad Axe, and La Crosse river basins, respectively.

For the Grant & Platte, Coon & Bad Axe, and La Crosse river basins, the number of complete samples increased an average of 269% over the 1950-74 period with 343 stations sampled (Table 2). DNR research personnel sampled 327 (95%) of the complete samples, fish management personnel sampled 14 (4%), U.S. Fish and Wildlife Services (Bolton 1976) sampled 2 (1%). The 124 partial samples were collected by fish management personnel.

Total occurrences increased from 1,751 for the 1950-74 period to 3,901 for the Grant & Platte, Coon & Bad Axe, and La Crosse river basins; 87% of these were recorded by research personnel (Table 3). We also collected all of the 88 species found in the 3 basins (for list of species taken by all other collectors see Appendix A Table 18).

Collection Methods and Gear*

We used five types of electrofishing gear, depending on the size of the body of water. The types of gear and percentage of stations where each was used were: boom shocker (2%), minishocker (2%), stream shocker (40%), battery-powered backpack (27%), and longline shocker (25%). Small mesh seines were used at 4% of the stations, primarily in lakes and large rivers.

All generators produced direct current, with the boom shocker and minishocker permitting a choice of several pulse rates and frequencies. The boom shocker also produced alternating current and it was used occasionally when

the DC unit was inoperative. For more information concerning the boom and stream shocking equipment, see Novotny and Priegel (1971, 1974). The minishocker consisted of a 5 meter flat bottom boat with one boom in the bow and used the same 5 hp T&J gasoline powered generator as the stream shocker. One person sitting on a chair in the bow collected the fish in contrast to 2 people standing in the boom shocker. The battery-powered backpack uses a 12-volt deep cycle battery and pulses the DC at several frequency and pulse rates. The development and production of this unit, like all the electric fishing gear used, was a joint project between Wisconsin DNR and Instrumentation Systems Center - UW-Madison. The seines were 1.2-m and 9.1-m bag seines with 4.8-mm delta mesh.

Sampling Effort

We established sampling locations based on habitat diversity, the distance between stations, and accessibility. The length of a sampling station was approximately 100 m for all electrofishing gear except for the boom shocker and minishocker. Boom shocker and minishocker stations averaged 2.1 km. Areas seined averaged 288 m². Distance between stations on the main

*Only the methods and gear employed by DNR research personnel are described; fish management personnel used similar equipment.

stems of the Grant, Platte, Coon, Bad Axe (including north and south forks), and La Crosse rivers averaged 7.2 km. There was an average of 1 station/7 km of the total length of all sampled streams with one or more complete stations.

Complete collections were made on 33% of the streams and none of the lakes in the Grant & Platte river basin; 40% of the streams and none of the lakes in the Coon & Bad Axe river basin; and 40% of the streams and 5% of the lakes in the La Crosse River basin (Tables 1 and 2). While these percentages are relatively low, the streams that were sampled comprised 68%, 75%, and 78% of the total length of all streams in the Grant & Platte, Coon & Bad Axe, and La Crosse river basins, respectively. The sampled lakes comprised only 0%, 0%, and 83%, respectively, of the total surface area for all lakes in each basin. This was due to the fact that most lakes were small, averaging only 5 ha, 41 ha, and 18 ha, respectively.

Figure 2 shows the locations of 305 of the 343 complete and 86 of the 124 partial stations. Only one dot per lake was shown and dots were eliminated that would overlap another dot.

Data Handling

Data collected at the sampling stations were recorded in pencil on Form 8100-46 (Append. A Fig. 5), and include station and species information and ecological data. This form is made of polyethylene paper, is virtually unaffected by salt and fresh water, and is resistant to tearing, discoloration, and rotting.

In order to handle the data on over 980 collections from the Grant & Platte, Coon & Bad Axe, and La Crosse river basins, dating from 1900, Cobol and Mark IV computer programs were developed through a cooperative effort with the DNR's Bureau of Information Management to organize, store, and retrieve the data. Some programs are used to update the Fish Master File which contains all data on the stations in the 3 basins as well as on 15,920 additional stations throughout the state.

Other programs are used to help in the analysis of the data. One analysis uses a Cobol program to organize the data by species, and lists all stations for each species. This listing, based on a water mileage system developed for this study, was organized in 2 ways (Fig. 3a and b):

(1) All stations on a river are listed until a tributary of the river is reached (Fig. 3a). 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 first tributary before going back to the original river.

(2) All stations on a river are listed before going back to the first tributary of the original river and listing all stations on the tributary (Fig. 3b). This procedure is followed for all tributaries in the basin of the first tributary before going to the second tributary of the original river.

The program for both of these methods can be restricted to one or more of the following criteria: particular minor basins, a sub-basin or part of a sub-basin, individual collectors, dates, township and range (by entire township or contiguous townships), counties, water types, and selected species. At each station, 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 Appendix A Figure 6. 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 (Append. A Fig. 7).

Another type of analysis uses a Mark IV program to organize 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 the same two ways (Fig. 3). 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 the Mark IV listing is shown in Appendix A Figure 8.

A water mileage system was devised to permit computer analysis of the data and still allow easy recognition of the location by persons wishing to use the data. This was accomplished by using the town, range, section, 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 has been generated by this study for most streams and lakes in Wisconsin. Mark IV computer programs are available to obtain a variety of listings such as streams and/or lakes in each basin listed alphabetically.

An example of a page of the water mileage system from a computer printout of the Master Stream and Lake File is shown in Appendix A Figure 9. An example of a page of the Master Fish File which uses the water mileage system to organize the biological and environmental data is included in Appendix A Figure 8. A detailed explanation of the system as exemplified in these figures is presented in Fago (1984b).

Fish Identification and Enumeration

In order to reduce the volume of specimens taken back to the laboratory, larger fish were identified to species in the field and were usually returned to the water. Generally all others were preserved in 10% Formalin for later identification (using the unpublished keys of Dr. G. Becker) in the laboratory.

At least a few stonerollers at each station were keyed to species. The remainder were left as stonerollers (*Campostoma* spp.). Research personnel identified all fish for the 1975-82 period except for some specimens of 14 species (indicated by an asterisk in Appendix A Table 18) collected by fish management personnel, and 10 species caught by U.S. Fish and Wildlife Service. For the 1950-74 period species records are based upon the collectors' identification except 17 species listed in Appendix A Table 18 without asterisks by their names collected by fish management and identified by research personnel. The common and scientific names of fish species cited in this report (Table 4) follow names established by the American Fisheries Society's Committee on Names of Fishes (Robins 1980). All hybrids and specimens not keyed to species, except stonerollers, were not dealt with in this report.

At each station, the number of specimens for each species was counted to 98 and recorded on Form 8100-46 (Append. A Fig. 5). However, at many stations there were more than 98 specimens taken for certain species. They were recorded as 99. Therefore, the number of specimens recorded in Tables 6, 11, and 12 for some species is substantially lower than the number actually captured. Furthermore, there were up to 53 stations for certain spe-

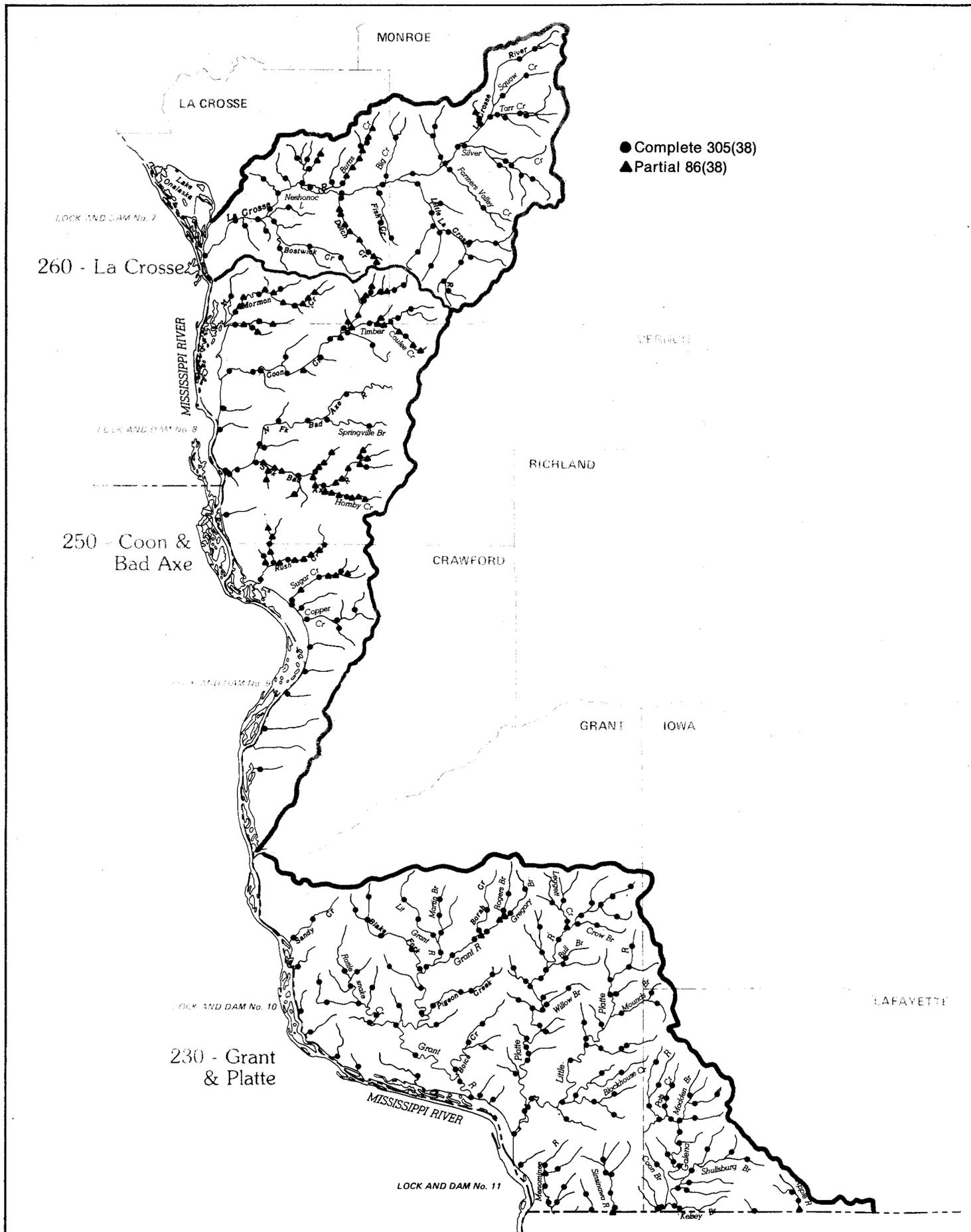


FIGURE 2. Location of 391 sampling stations in the Grant and Platte, Coon and Bad Axe, and La Crosse river basins. There were 305 complete and 86 partial stations. (Due to lack of space, 38 complete and 38 partial stations are not shown.)

TABLE 4. List of common and scientific names of all fish species cited in the report.

Computer No.	Common Name	Scientific Name	Computer No.	Common Name	Scientific Name
	Lampreys	Petromyzontidae	M52	Red shiner	<i>Notropis lutrensis</i>
A02	Chestnut lamprey	<i>Ichthyomyzon castaneus</i>		Suckers	Catostomidae
A04	Silvery lamprey	<i>Ichthyomyzon unicuspis</i>	N05	River carpsucker	<i>Carpiodes carpio</i>
A05	American brook lamprey	<i>Lampetra appendix</i>	N06	Quillback	<i>Carpiodes cyprinus</i>
	Gars	Lepisosteidae	N07	Highfin carpsucker	<i>Carpiodes velifer</i>
D01	Longnose gar	<i>Lepisosteus osseus</i>	N09	White sucker	<i>Catostomus commersoni</i>
D02	Shortnose gar	<i>Lepisosteus platostomus</i>	N13	Northern hog sucker	<i>Hypentelium nigricans</i>
	Bowfins	Amiidae	N17	Spotted sucker	<i>Minytrema melanops</i>
E01	Bowfin	<i>Amia calva</i>	N18	Silver redhorse	<i>Moxostoma anisurum</i>
	Freshwater eels	Anguillidae	N21	Golden redhorse	<i>Moxostoma erythrurum</i>
F01	American eel	<i>Anguilla rostrata</i>	N22	Shorthead redhorse	<i>Moxostoma macrolepidotum</i>
	Herrings	Clupeidae		Bullhead catfishes	Ictaluridae
G02	Gizzard shad	<i>Dorosoma cepedianum</i>	O05	Black bullhead	<i>Ictalurus melas</i>
	Mooneyes	Hiodontidae	O06	Yellow bullhead	<i>Ictalurus natalis</i>
H01	Goldeye	<i>Hiodon alosoides</i>	O07	Brown bullhead	<i>Ictalurus nebulosus</i>
H02	Mooneye	<i>Hiodon tergisus</i>	O08	Channel catfish	<i>Ictalurus punctatus</i>
	Trouts	Salmonidae	O10	Stonecat	<i>Noturus flavus</i>
I19	Rainbow trout	<i>Salmo gairdneri</i>	O11	Tadpole madtom	<i>Noturus gyrinus</i>
I21	Brown trout	<i>Salmo trutta</i>	O12	Flathead catfish	<i>Pylodictis olivaris</i>
I22	Brook trout	<i>Salvelinus fontinalis</i>		Pirate perches	Aphredoderidae
	Mudminnows	Umbridae	P01	Pirate perch	<i>Aphredoderus sayanus</i>
K01	Central mudminnow	<i>Umbra limi</i>		Codfishes	Gadidae
	Pikes	Esocidae	R01	Burbot	<i>Lota lota</i>
L01	Grass pickerel	<i>Esox americanus</i>		Silversides	Atherinidae
		<i>vermiculatus</i>	T01	Brook silverside	<i>Labidesthes sicculus</i>
L02	Northern pike	<i>Esox lucius</i>		Sticklebacks	Gasterosteidae
	Minnows and carps	Cyprinidae	U01	Brook stickleback	<i>Culaea inconstans</i>
M06	Central stoneroller	<i>Campostoma anomalum</i>		Temperate basses	Percichthyidae
M07	Largescale stoneroller	<i>Campostoma oligolepis</i>	V01	White bass	<i>Morone chrysops</i>
M12	Common carp	<i>Cyprinus carpio</i>	V02	Yellow bass	<i>Morone mississippiensis</i>
M14	Brassy minnow	<i>Hybognathus hankinsoni</i>		Sunfishes	Centrarchidae
M15	Silvery minnow	<i>Hybognathus nuchalis</i>	W04	Rock bass	<i>Ambloplites rupestris</i>
M15	Mississippi silvery minnow	<i>Hybognathus nuchalis</i>	W05	Green sunfish	<i>Lepomis cyanellus</i>
M16	Speckled chub	<i>Hybopsis aestivalis</i>	W06	Pumpkinseed	<i>Lepomis gibbosus</i>
M17	Silver chub	<i>Hybopsis storeriana</i>	W08	Orangespotted sunfish	<i>Lepomis humilis</i>
M19	Hornyhead chub	<i>Nocomis biguttatus</i>	W09	Bluegill	<i>Lepomis macrochirus</i>
M20	Golden shiner	<i>Notemigonus chrysoleucas</i>	W11	Smallmouth bass	<i>Micropterus dolomieu</i>
		<i>chrysoleucas</i>	W12	Largemouth bass	<i>Micropterus salmoides</i>
M23	Emerald shiner	<i>Notropis atherinoides</i>	W13	White crappie	<i>Pomoxis annularis</i>
M24	River shiner	<i>Notropis blennioides</i>	W14	Black crappie	<i>Pomoxis nigromaculatus</i>
M28	Common shiner	<i>Notropis cornutus</i>		Perches	Percidae
M29	Bigmouth shiner	<i>Notropis dorsalis</i>	X05	Mud darter	<i>Etheostoma asprigene</i>
M32	Blacknose shiner	<i>Notropis heterolepis</i>	X07	Rainbow darter	<i>Etheostoma caeruleum</i>
M33	Spottail shiner	<i>Notropis hudsonius</i>	X09	Iowa darter	<i>Etheostoma exile</i>
M34	Ozark minnow	<i>Notropis nubilis</i>	X10	Fantail darter	<i>Etheostoma flabellare</i>
M35	Rosyface shiner	<i>Notropis rubellus</i>	X12	Johnny darter	<i>Etheostoma nigrum</i>
M36	Spotfin shiner	<i>Notropis spilopterus</i>	X14	Banded darter	<i>Etheostoma zonale</i>
M37	Sand shiner	<i>Notropis stramineus</i>	X15	Yellow perch	<i>Perca flavescens</i>
M38	Weed shiner	<i>Notropis texanus</i>	X16	Logperch	<i>Percina caprodes</i>
M39	Redfin shiner	<i>Notropis umbratilis</i>	X18	Blackside darter	<i>Percina maculata</i>
M40	Mimic shiner	<i>Notropis volucellus</i>	X19	Slenderhead darter	<i>Percina phoxocephala</i>
M41	Suckermouth minnow	<i>Phenacobius mirabilis</i>	X21	Sauger	<i>Stizostedion canadense</i>
M42	Northern redbelly dace	<i>Phoxinus eos</i>	X22	Walleye	<i>Stizostedion vitreum vitreum</i>
M43	Southern redbelly dace	<i>Phoxinus erythrogaster</i>		Drums	Sciaenidae
M45	Bluntnose minnow	<i>Pimephales notatus</i>	Y01	Freshwater drum	<i>Aplodinotus grunniens</i>
M46	Fathead minnow	<i>Pimephales promelas</i>		Sculpins	Cottidae
M47	Bullhead minnow	<i>Pimephales vigilax</i>	Z01	Mottled sculpin	<i>Cottus bairdi</i>
M48	Blacknose dace	<i>Rhinichthys atratulus</i>	Z02	Slimy sculpin	<i>Cottus cognatus</i>
M49	Longnose dace	<i>Rhinichthys cataractae</i>			
M50	Creek chub	<i>Semotilus atromaculatus</i>			

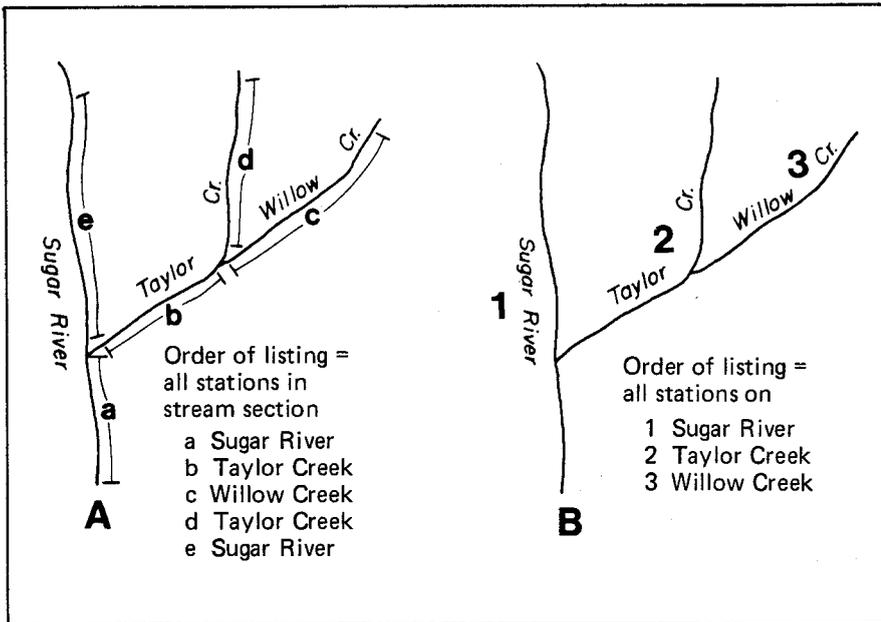


FIGURE 3. Two methods of organizing stations on computer printouts.

cies at which the number taken was unknown, further underestimating the total number of specimens.

Questionable specimens were sent to Dr. George Becker at the University of Wisconsin-Stevens Point for verification.

Endangered, Threatened, and Watch Species

The State of Wisconsin currently has 8 species on its endangered list*, 6 species on its threatened list*, and 18 species on its unofficial watch list. These 3 categories are defined as follows:

Endangered: Any species or subspecies in danger of becoming extirpated. Its continued existence as part of the state's wildlife resources is in jeopardy.

Threatened: Any species or subspecies which appears likely, within the foreseeable future, to become endangered.

Watch: Species or subspecies that may or may not be holding their own at the present time. They will be under special observation to identify conditions that could cause further decline, or any factors that could help to insure their survival in the state.

*Chap. NR 27, Wis. Admin. Code.



A three-person stream shocker in operation on Squaw Creek, below an unnamed impoundment 1.2 miles from its confluence with the La Crosse River.

RESULTS AND DISCUSSION

Findings are presented individually for the Grant & Platte, Coon & Bad Axe, and La Crosse river basins followed by a discussion of differences between the basins for selected species, including those on the Wisconsin DNR endangered, threatened, or watch lists. Unless otherwise indicated, findings refer only to the 1975-82 period.

GRANT & PLATTE RIVER BASIN (230)

Species Found

Over 76,000 specimens representing 74 species were identified in samples from the Grant & Platte river basin (Tables 5 and 6). This includes the endangered goldeye, the threatened Ozark minnow, and the mud darter which is on the watch list. Eight species (shortnose gar, bowfin, gizzard shad, northern pike, golden shiner, spotted sucker, brook silverside, and yellow perch) were, however, only caught at the mouths of Sinnipee Creek, Grant or Platte rivers. Distribution maps for all species are presented in Appendix B., each map shows the location of stations where the species was collected. An index to the maps is contained in Table 5 and at the back of Appendix B.

Reproducing Populations

In the Grant & Platte river basin 73 species are believed to have reproducing populations. The presence of reproducing populations of the rainbow trout is questionable since all collections can be attributed to stocking (G. VanDyck, pers. comm.).

Common and Rare Species

The 5 most common species (caught at the highest percentage of complete stations) were central stoneroller

(86%), bluntnose minnow (82%), common shiner (81%), white sucker (79%), and creek chub (76%) (Table 5). The 5 most numerous species (most specimens caught) were central stoneroller (10,900), common shiner (10,000), bluntnose minnow (7,100), white sucker (6,900), and southern redbelly dace (6,800) (Table 6). The creek chub was the 7th most numerous species.

Of the 36 rarest species (caught at 5 or fewer of all the stations, Table 7) all but the rainbow darter were also represented by the smallest total number of specimens (Table 6).

Differences Between Time Periods

Twenty-four species of fish collected during the 1975-82 period have not been previously reported for this basin (Table 8).

Four species are apparently no longer present in the Grant & Platte river basin. The weed shiner was last taken before 1929 and the brook trout*, red shiner*, and mottled sculpin were most recently reported in the 1950-74 time period (Table 9). However, they were probably very rare even in the early 1900's when they were reported from only 1 to 3 stations.

Four species that we collected had not been reported between 1929 and 1975 from this basin (Table 10).

One of the most important results of this study was the documentation of changes in the known distribution of species within the Grant & Platte river basin in 1975-82 as compared to previous periods (Table 5). These changes have ranged from decreases in the number of stations for 6 species to increases for 45 species, and no change for 3 others. The decreases ranged from 100% for 4 species to 25% for the logperch. The increases ranged from 33% for the rainbow trout to 1,350%

*Naturally reproducing populations questionable.

for the black bullhead (average = 300%), and were due primarily but perhaps not entirely to increased sampling effort in 1975-82. In 1975-82 there were 69 more streams with at least 1 complete station as compared to 1950-74 and 81 more streams compared to 1900-28 (Table 2). When the total number of complete stations sampled in the 1975-82 period was compared with the 1950-74 and 1900-28 periods, there were increases of over 250% and 710%, respectively.

Species Diversity

Ten stations (6%) sampled by research personnel in the Grant & Platte river basin had 20 or more species and 1 station had more than 25 species (Fig. 4). The average number of species taken per station was 12.2.

COON & BAD AXE RIVER BASIN (250)

Species Found

Over 20,000 specimens representing 63 species were identified in samples from the Coon & Bad Axe river basin (Tables 5 and 11). This included 3 species (weed shiner, pirate perch, and mud darter) on the watch list. Six species (bowfin, silver chub, weed shiner, mimic shiner, brown bullhead, and yellow perch) were, however, only taken at the mouth of streams flowing into the Mississippi River. Distribution maps for all species are presented in Appendix B.

Reproducing Populations

In the Coon & Bad Axe river basin 62 species are believed to have reproducing populations. The presence of reproducing populations of the rainbow trout is questionable since all accounts can be attributed to stocking (K. Wright, pers. comm.).

TABLE 5. Number of stations and percent of total stations at which each species was collected and percent change in occurrence in the Grant & Platte, Coon & Bad Axe, and La Crosse river basins, 1900-82.

Map No.	Species	Grant & Platte (230)					Coon & Bad Axe 250					La Crosse (260)							
		1900-28		1950-74		Percent Change In Occurrence*	1900-28		1950-74		Percent Change In Occurrence	1900-28		1950-74		Percent Change In Occurrence			
		No. Stn.	Percent Total	No. Stn.	Percent Total		No. Stn.	Percent Total	No. Stn.	Percent Total		No. Stn.	Percent Total	No. Stn.	Percent Total				
1	Chestnut lamprey	0	0	-	0	-	0	0	-	2	3	-	0	0	-	0	-	-	
1	Silver lamprey	0	0	-	1	1	-	0	0	-	5	7	-	0	0	-	1	1	-
2	American brook lamprey	0	2	4	2	1	0	1	1	4	8	11	700	0	1	6	26	31	2,500
3	Longnose gar	0	0	-	1	1	-	0	0	-	0	-	-	0	0	-	1	1	-
3	Shortnose gar	0	0	-	1	1	-	0	0	-	0	-	-	0	0	-	0	-	-
4	Bowfin	0	0	-	1	1	-	0	0	-	2	3	-	0	0(2)**	-	1	1	-50
-	American eel (W) ¹	0	0	-	0	-	-	0	0	-	0	-	-	0	0(4)	-	0	-	-100
4	Gizzard shad	0	1	2	1	1	0	0	1	4	0	-	-100	0	0	-	3	4	-
5	Goldeye (E)	0	0	-	1	1	-	0	0	-	0	-	-	0	0	-	0	-	-
5	Mooneye	0	0	-	1	1	-	0	0	-	0	-	-	0	0	-	4	5	-
6	Rainbow trout	1	1(2)	2	2(2)	1	33	0	0(13)	-	0(10)	-	-23	0	3(12)	19	1	1	-93
7	Brown trout	0	4(18)	8	31(5)	17	64	0	4(78)	17	34(64)	47	20	0	1(68)	6	34(11)	41	-35
8	Brook trout	0	0(3)	-	0	-	-100	0	0(8)	-	9(15)	13	200	0	5(39)	31	34(12)	41	5
9	Central mudminnow	0	0	-	2	1	-	1	0(7)	-	14(9)	19	229	0	2(13)	13	11	13	-27
10	Grass pickerel	0	0	-	2	1	-	0	0	-	0	-	-	0	0	-	0	-	-
11	Northern pike	0	0	-	2	1	-	3	1(3)	4	5(7)	7	200	0	2(25)	13	2	2	-93
12	Central stoneroller	20	31	60	160	86	416	3	1	4	39	54	3,800	0	0	-	5	6	-
13	Largescale stoneroller	0	0	-	3	2	-	0	0	-	0	-	-	0	0	-	0	-	-
14	Common carp	0	4(2)	8	20(1)	11	250	2	1(30)	4	4(2)	6	-81	1	1(36)	6	10	12	-73
13	Brassy minnow	0	0	-	5	3	-	0	3	13	2	3	-33	0	0	-	0	-	-
15	Miss. silvery minnow	2	1	2	10	5	900	7	3	13	0	-	-100	0	0	-	0	-	-
-	Speckled chub (T)	0	0	-	0	-	-	1	0	-	0	-	-100	0	0	-	0	-	-
16	Silver chub	1	0	-	2	1	100	1	0	-	1	1	0	0	0	-	3	4	-
17	Hornyhead chub	12	46	88	121	65	163	0	1	4	5	7	400	0	0	-	0	-	-
18	Golden shiner	0	1	2	1	1	0	0	0	-	2	3	-	1	3	19	7	8	133
19	Emerald shiner	7	8	16	16	9	100	5	4	17	6	8	50	0	0	-	2	2	-
20	River shiner	3	0	-	11	6	267	3	4	17	6	8	50	0	0	-	1	1	-
21	Common shiner	19	51	98	150	81	194	1	6	25	16	22	167	0	0	-	0	-	-
22	Bigmouth shiner	15	34	65	96	52	182	5	6	25	10	14	67	0	0	-	10	12	-
-	Blacknose shiner	0	0	-	0	-	-	0	1	4	0	-	-100	0	0	-	0	-	-
23	Spottail shiner	0	1	2	5	3	400	3	2	8	8	11	300	0	1	6	7	8	600
24	Ozark minnow (T)	1	8	16	26	14	226	0	0	-	0	-	-	0	0	-	0	-	-
25	Rosyface shiner	7	25	49	53	28	112	0	2	8	1	1	-50	0	0	-	0	-	-
26	Spotfin shiner	3	6	12	38	20	533	8	6	25	18	25	200	0	0	-	21	25	-
27	Sand shiner	9	17	33	41	22	141	2	4	17	3	4	-25	0	0	-	0	-	-
28	Weed shiner (W)	2	0	-	0	-	-100	4	1	4	1	1	0	0	-	-	1	1	-
-	Redfin shiner (W)	0	0	-	0	-	-	0	0	-	0	-	-	1	0	-	0	-	-100
28	Mimic shiner	0	0	-	2	1	-	1	0	-	1	1	0	0	0	-	0	-	-
29	Suckermouth minnow	12	32	62	71	38	122	2	5	21	0	-	-100	0	0	-	0	-	-
30	Northern redbelly dace	0	0	-	0	-	-	0	0	-	2	3	-	1	0	-	1	1	0
31	Southern redbelly dace	14	32	62	136	73	325	0	1	4	3	4	200	0	1	6	0	-	-100
32	Bluntnose minnow	17	46	88	152	82	230	5	7	29	25	35	257	0	2	13	31	37	1,450
33	Fathead minnow	9	15	29	71	38	373	4	4	17	25	35	525	4	0	-	20	24	400
34	Bullhead minnow	0	1	2	7	4	600	2	2	8	9	13	350	0	0	-	3	4	-
35	Blacknose dace	5	8	15	61	33	663	3	14	58	50	69	257	1	3	19	41	49	1,267
36	Longnose dace	0	23	45	72	39	213	3	12	50	37	51	208	0	0	-	8	10	-
37	Creek chub	18	43	83	141	76	228	6	11	46	50	69	355	2	4	25	40	48	900
-	Red shiner (W)	0	2	4	0	-	-100	0	0	-	0	-	-	0	0	-	0	-	-
38	River carpsucker	0	0	-	3	2	-	0	0	-	0	-	-	0	0	-	0	-	-
39	Quillback	0	0	-	11	6	-	0	3	13	0	-	-100	0	0	-	2	2	-
38	Highfin carpsucker	0	0	-	1	1	-	0	0	-	0	-	-	0	0	-	0	-	-

TABLE 5. (Cont.)

Map No.	Species	Grant & Platte (230)					Coon & Bad Axe 250					La Crosse (260)							
		1900-28		1950-74		Percent Change In Occurrence*	1900-28		1950-74		Percent Change In Occurrence	1900-28		1950-74		Percent Change In Occurrence			
		No. Stn.	No. Stn.	Percent Total	No. Stn.		Percent Total	No. Stn.	No. Stn.	Percent Total		No. Stn.	No. Stn.	Percent Total	No. Stn.		Percent Total		
40	White sucker	16	47(21)	92	147(5)	79	124	7	9(118)	38	55(92)	76	16	4	4(105)	25	41(11)	49	-52
41	Northern hog sucker	1	3(1)	6	0(1)	-	-75	1	4(48)	17	12(20)	17	-38	0	0	-	0	-	-
42	Spotted sucker	1	0	-	2	1	100	0	0	-	5	7	-	0	0	-	0	-	-
43	Silver redhorse	0	1	2	4	2	300	0	1	4	0	-	-100	0	0	-	3	4	-
44	Golden redhorse	1	4	8	22	12	450	0	0	-	2	3	-	0	0	-	0	-	-
45	Shorthead redhorse	0	7	14	27	15	286	0	1	4	6	8	500	0	0	-	5	6	-
46	Black bullhead	1	2	4	29	16	1,350	2	0	-	8	11	300	1	1	6	3	4	200
47	Yellow bullhead	0	2	4	7	4	250	0	0	-	10	14	-	0	1	6	0	-	-100
47	Brown bullhead	0	0	-	0	-	-	0	0	-	1	1	-	0	0	-	0	-	-
48	Channel catfish	0	0(1)	-	3	2	200	0	0(1)	-	0	-	-100	0	0(18)	-	4	5	-78
49	Stonecat	1	14	27	50	27	257	0	1	4	5	7	400	0	0	-	1	1	-
50	Tadpole madtom	0	1	2	3	2	200	0	1	4	6	8	500	0	2	13	2	2	0
51	Flathead catfish	0	0	-	0	-	-	0	0	-	0	-	-	0	0(8)	-	3	4	-63
51	Pirate perch (W)	0	0	-	0	-	-	1	0	-	1(1)	1	100	0	0	-	0	-	-
52	Burbot	0	0	-	0	-	-	0	0(5)	-	0(2)	-	-60	0	0(1)	-	1	1	0
52	Brook silverside	0	0	-	1	1	-	0	1	4	0	-	-100	0	0	-	1	1	-
53	Brook stickleback	1	2(1)	4	35(1)	19	1,100	1	9(53)	38	35(53)	49	42	3	3(35)	19	32(5)	38	-3
54	White bass	0	0	-	2	1	-	0	1	4	0	-	-100	0	0	-	1	1	-
-	Yellow bass	0	0	-	0	-	-	0	1	4	0	-	-100	0	0	-	0	-	-
55	Rock bass	0	0	-	5	3	-	0	0	-	5	7	-	1	1	6	4	5	300
56	Green sunfish	1	12	24	40	22	233	0	1	4	11	15	1,000	0	1	6	3	4	200
57	Pumpkinseed	0	0	-	2	1	-	0	2	8	7	10	250	1	1	6	4	5	300
58	Orangespotted sunfish	1	1	2	8	4	700	0	0	-	1	1	-	0	0	-	6	7	-
59	Bluegill	0	3	6	11	6	267	0	1	4	6	8	500	1	1	6	7	8	600
60	Smallmouth bass	1	23(22)	45	63(6)	34	53	1	2(21)	8	3(4)	4	-70	0	0(2)	-	2	2	0
61	Largemouth bass	0	6	12	9	5	50	2	1(4)	4	9(4)	13	160	2	0(10)	-	12(1)	14	30
62	White crappie	0	0	-	4	2	-	1	1	4	0	-	-100	0	0	-	0	-	-
63	Black crappie	0	2	4	5	3	150	0	2	8	1	1	-50	3	0	-	5	6	67
64	Mud darter (W)	1	0	-	2	1	100	2	0	-	11	15	450	0	0	-	0	-	-
65	Rainbow darter	0	0	-	1	1	-	0	0	-	0	-	-	0	0	-	0	-	-
66	Iowa darter	0	0	-	0	-	-	1	1	4	5	7	400	2	0	-	1	1	-50
67	Fantail darter	10	38	73	130	70	242	0	10	42	22	31	120	1	0	-	2	2	100
68	Johnny darter	18	47	90	138	74	194	5	7	29	42	58	500	4	4	25	41	49	925
69	Banded darter	0	0	-	0	-	-	0	0	-	0	-	-	0	0	-	4	5	-
70	Yellow perch	0	0	-	1	1	-	0	0	-	1	1	-	1	0(3)	-	4	5	33
71	Logperch	0	4	8	3	2	-25	0	0	-	4	6	-	0	0	-	7	8	-
72	Blackside darter	0	0	-	0	-	-	0	0	-	0	-	-	2	0	-	7	8	250
72	Slenderhead darter	0	1	2	3	2	200	0	0	-	0	-	-	0	0	-	0	-	-
73	Sauger	0	0	-	10	5	-	0	2	8	0	-	-100	0	0	-	3	4	-
74	Walleye	0	0	-	7	4	-	0	1(1)	4	2(2)	3	100	0	0(5)	-	2	2	-60
75	Freshwater drum	0	0	-	0	-	-	0	1(1)	4	0	-	-100	0	0(10)	-	2	2	-80
76	Mottled sculpin	0	1	2	0	-	-100	0	0	-	3	4	-	2	2	13	17	20	750
77	Slimy sculpin	0	0	-	0	-	-	0	7	29	4	6	-43	0	0	-	0	-	-
	No. of Species	33	49		74			35	57		63			21	34	60			
	Total No. of occurrences (Sum of number of species taken at each station)	231	735		2,329			100	570		971			39	446	601			

*Percent change over next most recent period in which species was collected (partial stations included in calculations).

**Number in parentheses indicates partial stations. They are kept separate since not all of the fish from the station were adequately keyed to species.

¹E = Endangered, T = Threatened, W = Watch.

TABLE 6. Number of specimens and number of stations for each species collected in the Grant & Platte river basin, 1975-82.

Common Name	No. Specimens*	No. Stations**			Common Name	No. Specimens*	No. Stations**		
		<99	>98	"Unknown"			<99	>98	"Unknown"
Central stoneroller ¹	1,400(9,500)	158(58)	2(70)		Logperch	25	3		
Common shiner	10,000	73	77		Spottail shiner	24	5		
Bluntnose minnow	7,100	111	41		Largemouth bass	23	9		
White sucker	6,900	111	36	5	Gizzard shad	22	1		
Southern redbelly dace	6,800	93	43		Silver redhorse	18	4		
Fantail darter	5,800	98	32		Mud darter	16	2		
Creek chub	5,000	123	18		River carpsucker	14	3		
Hornyhead chub	4,700	105	16		Black crappie	14	5		
Johnny darter	3,400	129	8	1	Tadpole madtom	12	3		
Bigmouth shiner	2,200	85	11		White crappie	12	4		
Longnose dace	1,900	65	7		Rainbow trout	11	4		
Blacknose dace	1,600	53	8		Slenderhead darter	11	3		
Suckermouth minnow	1,100	67	4		Brassy minnow	10	5		
Smallmouth bass	1,100	68	1		Silver chub	10	2		
Fathead minnow	1,000	69	2		Largescale stoneroller	8	3		
Rosyface shiner	890	51	2		Rock bass	8	5		
Brown trout	830	36			White bass	7	2		
Spotfin shiner	730	36	2		Mooneye	6	1		
Sand shiner	600	40	1		Central mudminnow	6	2		
Emerald shiner	450	14	2		Mimic shiner	4	2		
Common carp	400	18	2	1	Spotted sucker	4	2		
Brook stickleback	380	33	2	1	Channel catfish	4	3		
Green sunfish	330	40			Northern pike	3	2		
Miss. silvery minnow	270	9	1		Highfin carpsucker	3	1		
River shiner	260	10	1		Brook silverside	3	1		
Ozark minnow	250	26			American brook lamprey	2	2		
Shorthead redhorse	230	27			Longnose gar	2	1		
Quillback	140	10	1		Bowfin	2	1		
Stonecat	140	50			Grass pickerel	2	2		
Black bullhead	130	29			Pumpkinseed	2	2		
Bluegill	130	11			Silver lamprey	1	1		
Sauger	130	10			Shortnose gar	1	1		
Golden redhorse	120	22			Goldeye	1	1		
Bullhead minnow	110	7			Golden shiner	1	1		
Orangespotted sunfish	94	8			Yellow perch	1	1		
Walleye	57	7			Northern hog sucker	-		1	
Rainbow darter	44	1							
Yellow bullhead	35	7							
					Total	76,543	2,058	390	9

*Rounded to 2 significant figures for each species.

** < 99 = 98 or fewer specimens taken/station.

> 98 = 99 or more specimens taken/station.

Unknown = counts of specimens were not made.

¹Number in parentheses is for stonerollers. Most were probably central stonerollers.

Common and Rare Species

The 5 most common species (caught at the highest percentage of complete stations) were white sucker (76%), blacknose dace (69%), creek chub (69%), Johnny darter (58%), and central stoneroller (54%) (Table 5). The 6 most numerous species (most specimens caught) were white sucker (6,600), brown trout (2,900), blacknose dace (1,700), central stoneroller (1,120), fantail darter (1,100), and longnose dace (1,100) (Table 11). The creek chub and Johnny darter were the 7th and 8th most numerous species.

Of the 28 rarest species (caught at 5 or fewer of all the stations, Table 7) all but 6 (bowfin, hornyhead chub, stonecat, logperch, mottled sculpin, and slimy sculpin) were also represented by the smallest number of specimens (Table 11).

Differences Between Time Periods

Fourteen species of fish that we collected have not been previously reported for this basin (Table 8).

Fourteen species are apparently no longer present in the Coon & Bad Axe river basin (Table 9). The speckled chub was taken only before 1929, and 13 others were most recently reported in the 1950-74 time period. The gizzard shad, speckled chub, blacknose shiner, white bass, yellow bass, silver redhorse, channel catfish, brook silverside, and white crappie were probably rare even before the 1975-82 period because they were reported from only a single station.

Five species were not taken between 1929 and 1975 from this basin (Table 10).

As in the Grant & Platte river basin,

TABLE 7. List of species collected at 5 or fewer stations from the Grant & Platte, Coon & Bad Axe, and La Crosse river basins, 1975-82.

Grant & Platte (230)	Coon & Bad Axe (250)	La Crosse (260)
Silver lamprey	Chestnut lamprey	Silver lamprey
American brook lamprey	Silver lamprey	Longnose gar
Longnose gar	Bowfin	Bowfin
Shortnose gar	Brassy minnow	Gizzard shad
Bowfin	Silver chub	Mooneye
Gizzard shad	Hornyhead chub	Rainbow trout*
Goldeye	Golden shiner	Northern pike
Mooneye	Rosyface shiner	Central stoneroller
Rainbow trout*	Sand shiner	Silver chub
Central mudminnow	Weed shiner	Emerald shiner
Grass pickerel	Mimic shiner	River shiner
Northern pike	Northern redbelly dace	Weed shiner
Largescale stoneroller	Southern redbelly dace	Northern redbelly dace
Brassy minnow	Spotted sucker	Bullhead minnow
Silver chub	Golden redbhorse	Quillback
Golden shiner	Brown bullhead	Silver redbhorse
Spottail shiner	Stonecat	Shorthead redbhorse
Mimic shiner	Pirate perch	Black bullhead
River carpsucker	Burbot	Channel catfish
Highfin carpsucker	Rock bass	Stonecat
Northern hog sucker	Orangespotted sunfish	Tadpole madtom
Spotted sucker	Black crappie	Flathead catfish
Silver redbhorse	Iowa darter	Burbot
Channel catfish	Yellow perch	Brook silverside
Tadpole madtom	Logperch	White bass
Brook silverside	Walleye	Rock bass
White bass	Mottled sculpin	Green sunfish
Rock bass	Slimy sculpin	Pumpkinseed
Pumpkinseed		Smallmouth bass
White crappie		Black crappie
Black crappie		Iowa darter
Mud darter		Fantail darter
Rainbow darter		Banded darter
Yellow perch		Yellow perch
Logperch		Sauger
Slenderhead darter		Walleye
		Freshwater drum

*Naturally reproducing population questionable.

TABLE 8. Fish species collected for the first time during the 1975-82 period from the Grant & Platte, Coon & Bad Axe, and La Crosse river basins.

Grant & Platte (230)	Coon & Bad Axe (250)	La Crosse (260)
Silver lamprey	Chestnut lamprey	Silver lamprey
Longnose gar	Silver lamprey	Longnose gar
Shortnose gar	Bowfin	Gizzard shad
Bowfin	Golden shiner	Mooneye
Goldeye	Northern redbelly dace	Central stoneroller
Mooneye	Spotted sucker	Silver chub
Central mudminnow	Golden redbhorse	Emerald shiner
Grass pickerel	Yellow bullhead	River shiner
Northern pike	Brown bullhead	Bigmouth shiner
Largescale stoneroller	Rock bass	Spotfin shiner
Brassy minnow	Orangespotted sunfish	Weed shiner
Mimic shiner	Yellow perch	Bullhead minnow
River carpsucker	Logperch	Longnose dace
Quillback	Mottled sculpin	Quillback
Highfin carpsucker		Silver redbhorse
Brook silverside		Shorthead redbhorse
White bass		Stonecat
Rock bass		Brook silverside
Pumpkinseed		White bass
White crappie		Orangespotted sunfish
Rainbow darter		Banded darter
Yellow perch		Logperch
Sauger		Sauger
Walleye		

TABLE 9. *Fish species apparently no longer present in the Grant & Platte, Coon & Bad Axe, and La Crosse river basins.*

Last Period Recorded	Grant & Platte (230)	Coon & Bad Axe (250)	La Crosse (260)
1900-28	Weed shiner	Speckled chub	Redfin shiner
1950-74	Brook trout*	Gizzard shad	American eel**
	Red shiner*	Miss. silvery minnow	Southern redbelly dace
	Mottled sculpin	Blacknose shiner	Yellow bullhead
		Suckermouth minnow	
		Quillback	
		Silver redhorse	
		Channel catfish	
		Brook silverside	
		White bass	
		Yellow bass	
		White crappie	
		Sauger	
		Freshwater drum	

*Naturally reproducing population questionable.

**Does not spawn in fresh water.

TABLE 10. *Fish species reported prior to 1929, but not collected again until 1975-82.*

Grant & Platte (230)	Coon & Bad Axe (250)	La Crosse (260)
Silver chub	Silver chub	Northern redbelly dace
River shiner	Mimic shiner	Fathead minnow
Spotted sucker	Black bullhead	Black crappie
Mud darter	Pirate perch	Iowa darter
	Mud darter	Fantail darter
		Blackside darter

one of the most important results of this study was documentation of changes in the known distribution of species within the Coon & Bad Axe river basin in 1975-82 as compared to previous periods (Table 5). These changes have ranged from decreases in the number of stations for 24 species to increases for 36 species, and no change for 3 others. The decreases ranged from 100% for 14 species to 23% for the rainbow trout. The increases ranged from 16% for the white sucker to 3,800% for the central stoneroller (average = 390%). The reasons for the increases are generally the same as for the Grant & Platte river basin. In 1975-82 there were 27 more streams with at least 1 complete station as compared to 1950-74, and 33 streams as compared to 1900-28 (Table 2). When the total number of complete stations sampled in the 1975-82 period was compared with the 1950-74 and 1900-28 periods, there were increases of 200% and 700%, respectively.

Species Diversity

There was only 1 station (1%) sampled by research personnel that had 20 or more species (Fig. 4). The average number of species taken per station was 9.7.

LA CROSSE RIVER BASIN (260)

Species Found

Over 10,000 specimens representing 60 species were identified in samples from the La Crosse River basin (Tables 5 and 12). This included the weed shiner which is on the watch list. Three species (river shiner, weed shiner, and brook silverside) were, however, only captured at the mouth of the La Crosse River. Distribution maps for all species are presented in Appendix B.

Reproducing Populations

In the La Crosse River basin 59 species are believed to have reproducing populations. The presence of reproducing populations of the rainbow trout is questionable since all records can be attributed to stocking (K. Wright, pers. comm.).

Common and Rare Species

The 6 most common species (caught at the highest percentage of complete stations) were blacknose dace (49%), white sucker (49%), Johnny darter (49%), creek chub (48%), brown trout (41%), and brook trout (41%) (Table 5). The 5 most numerous species (most specimens caught) were white sucker (1,400), bluntnose minnow (1,100), spotfin shiner (1,000), blacknose dace (1,000), and brook trout (1,000) (Table

12). The creek chub and Johnny darter were the 6th and 7th most numerous species.

Of the 37 rarest species (caught at 5 or fewer of all the stations, Table 7) all but 6 (gizzard shad, central stoneroller, bullhead minnow, silver redhorse, shorthead redhorse, and green sunfish) were also represented by the smallest total number of specimens (Table 12).

Differences Between Time Periods

Twenty-three species of fish that we collected have not been previously reported for this basin (Table 8).

Four species are apparently no longer present in the La Crosse River basin, (Table 9). The redbfin shiner was taken only before 1929, and the American eel (does not spawn in fresh water) southern redbelly dace and yellow bullhead were most recently taken in the 1950-74 time period. Before the 1975-82 period, these species may have been rare for they had been reported at only a single station.

The northern redbelly dace, fathead minnow, black crappie, Iowa darter, fantail darter, and blackside darter were not taken between 1929 and 1974 from this basin (Table 10).

Again, one of the most important results of this study was documentation of changes in the known distribution of species within the La Crosse River basin in 1975-82 as compared to previous periods (Table 5). These changes have ranged from decreases in the number of stations for 17 species to increases for 20 species, and no change for 4 others. The decreases ranged from 100% for 4 species to 3% for brook stickleback. The increases ranged from 5% for the brook trout to 2,500% for the American brook lamprey (average = 550%). The reasons for the increases are the same as for the other 2 basins. In 1975-82 there were 28 more streams with at least 1 complete station as compared to 1950-74 and 36 streams compared to 1900-28 (Table 2). When the total number of complete stations sampled in 1975-82 is compared with the 1950-74 and 1900-28 periods, there were increases of 425% and 1,100%, respectively.

Species Diversity

There was only 1 station (1%) sampled by research personnel that had more than 20 species (Fig. 4). The average number of species taken per station was 6.7.

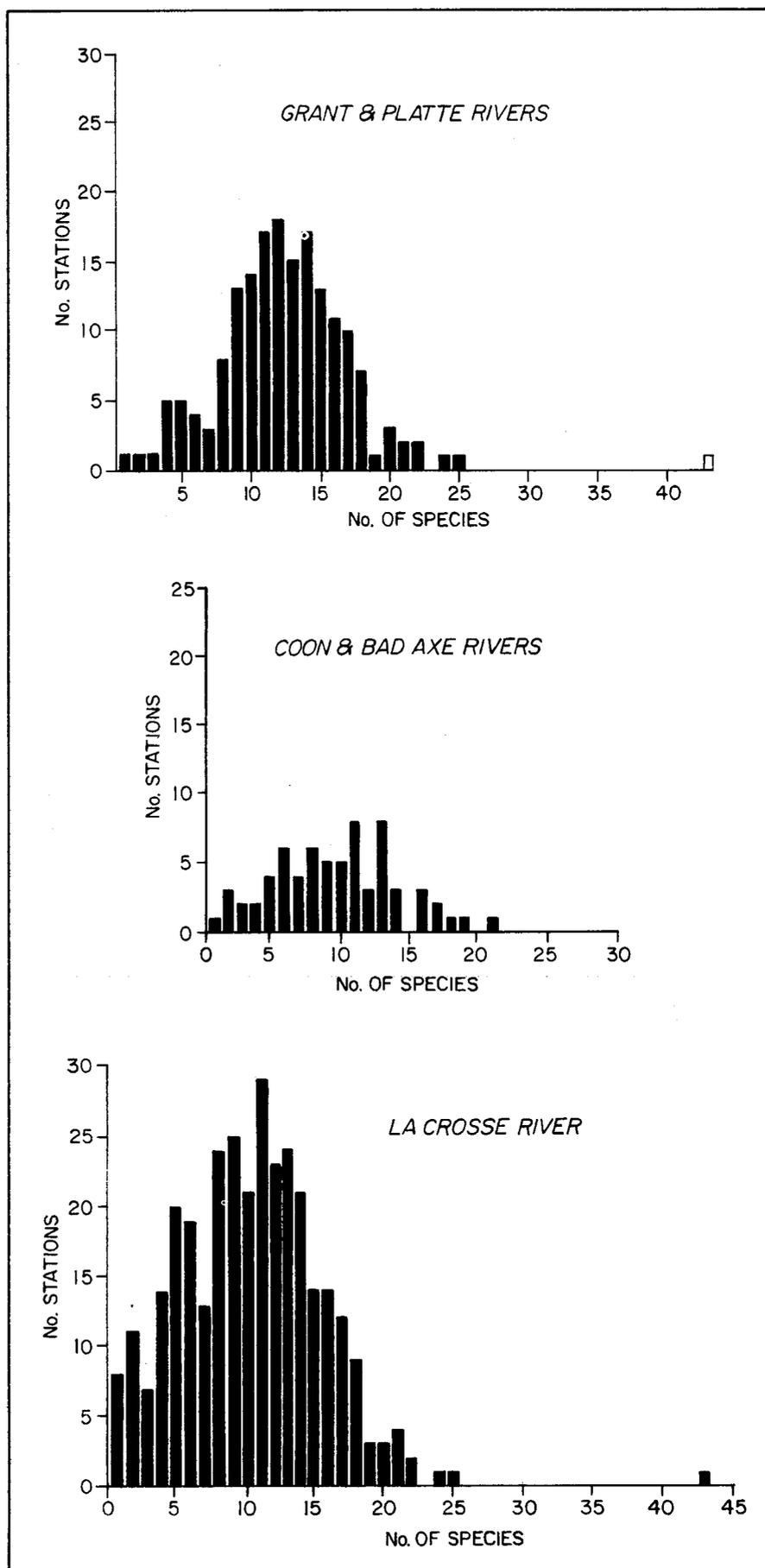


FIGURE 4. Number of stations at which varying numbers of species were taken in the Grant and Platte, Coon and Bad Axe, and La Crosse river basins.

TABLE 11. Number of specimens and number of stations for each species collected in the Coon & Bad Axe river basin, 1975-82.

Common Name	No. Specimens*	No. Stations**			Common Name	No. Specimens*	No. Stations**		
		<99	>98	"Unknown"			<99	>98	"Unknown"
White sucker	6,600	103	32	12	Stonecat	37	5		
Brown trout	2,900	87	11		Logperch	32	4		
Blacknose dace	1,700	41	9		River shiner	31	6		
Central stoneroller ¹	200(920)	39(11)	(5)		Largemouth bass	30	11		2
Fantail darter	1,100	15	7		Shorthead redhorse	30	6		
Longnose dace	1,100	33	4		Yellow bullhead	29	10		
Johnny darter	830	41	1		Golden shiner	25	2		
Creek chub	730	49	1		Weed shiner	25	1		
Brook stickleback	550	33	2	53	Tadpole madtom	25	6		
Northern hog sucker	430	28		4	Rock bass	20	5		
Fathead minnow	420	23	2		Northern redbelly dace	16	2		
Spotfin shiner	210	17	1		Common carp	14	4		2
Mottled sculpin	200	1	2		Northern pike	13	5		7
Hornyhead chub	200	4	1		Iowa darter	13	5		
Bluntnose minnow	190	25			Golden redbelly dace	11	2		
Common shiner	180	15	1		Walleye	9	3		1
Brook trout	180	24			Black crappie	8	1		
Slimy sculpin	140	3	1		Yellow perch	8	1		
Mud darter	130	11			Rosyface shiner	7	1		
Bluegill	110	6			Sand shiner	7	3		
Bowfin	100	1	1		Southern redbelly dace	7	3		
Bigmouth shiner	97	10			Spotted sucker	6	5		
Smallmouth bass	69	7			Pirate perch	5	1		1
Emerald shiner	59	6			Silver lamprey	5	5		
Pumpkinseed	58	7			Brassy minnow	3	2		
Rainbow trout	54	10			Mimic shiner	3	1		
Green sunfish	54	11			Chestnut lamprey	2	2		
Spottail shiner	53	8			Silver chub	1	1		
Central mudminnow	42	14		9	Brown bullhead	1	1		
American brook lamprey	42	8			Orangespotted sunfish	1	1		
Black bullhead	40	8			Burbot	-			2
Bullhead minnow	37	9			Total	20,149	814	81	93

*Rounded to 2 significant figures for each species.

**<99 = 98 or fewer specimens taken/station.

>98 = 99 or more specimens taken/station.

Unknown = counts of specimens were not made.

¹Number in parentheses is for stonerollers. Most were probably central stonerollers.

DIFFERENCES BETWEEN BASINS (230, 250, 260)

Of the 74 species found in the Grant & Platte river basin, 12 were not found in the Coon & Bad Axe or La Crosse river basins (Table 13). Of the 63 species found in the Coon & Bad Axe river

basin, 4 were not captured in the other 2. Of the 60 species found in the La Crosse River basin, 4 were not taken in the Grant & Platte or Coon & Bad Axe river basins.

The Grant & Platte river basin has a more diverse aquatic habitat, 60% larger watershed, and 190% more

streams (with 150% more kilometers in length) than the Coon & Bad Axe or La Crosse river basins. These are important factors which may help to explain the larger number of species (74 as compared to 63 and 60) and larger average number of species per station (12.2 as compared to 9.7 and 6.7).

TABLE 12. Number of specimens and number of stations for each species collected in the La-Crosse River basin, 1975-82.

Common Name	No. Specimens*	No. Stations**			Common Name	No. Specimens*	No. Stations**		
		<99	>98	"Unknown"			<99	>98	"Unknown"
White sucker	1,400	46	5	1	Bluegill	30	7		
Bluntnose minnow	1,100	22	9		Flathead catfish	21	3		
Spotfin shiner	1,000	13	8		Freshwater drum	19	2		
Blacknose dace	1,000	36	5		Channel catfish	18	4		
Brook trout	1,000	43	3		Black crappie	15	5		
Creek chub	780	38	2		Pumpkinseed	14	4		
Johnny darter	770	40	1		River shiner	13	1		
Brown trout	460	45			Mooneye	9	4		
Mottled sculpin	410	16	1		Banded darter	8	4		
Brook stickleback	380	32	1	4	Sauger	7	3		
Bigmouth shiner	270	10			Yellow perch	6	4		
Shorthead redhorse	260	3	2		Fantail darter	5	2		
Fathead minnow	250	20			Silver chub	4	3		
American brook lamprey	220	26			Tadpole madtom	4	2		
Common carp	210	9	1		Smallmouth bass	4	2		
Longnose dace	130	7	1		Iowa darter	4	1		
Central mudminnow	110	11			Northern pike	3	2		
Gizzard shad	100	2	1		Emerald shiner	3	2		
Orangespotted sunfish	93	6			Black bullhead	3	3		
Central stoneroller ¹	27(38)	5(3)			White bass	3	1		
Bullhead minnow	60	3			Walleye	3	2		
Silver redhorse	57	3			Bowfin	2	1		
Green sunfish	56	3			Weed shiner	2	1		
Largemouth bass	56	13			Brook silverside	2	1		
Rock bass	55	4			Silver lamprey	1	1		
Logperch	45	7			Longnose gar	1	1		
Golden shiner	42	7			Northern redbelly dace	1	1		
Spottail shiner	38	7			Stonecat	1	1		
Blackside darter	37	7			Burbot	1	1		
Rainbow trout	32	1							
Quillback	30	2							
					Total	10,728	559	40	5

*Rounded to 2 significant figures for each species.

** < 99 = 98 or fewer specimens taken/station.

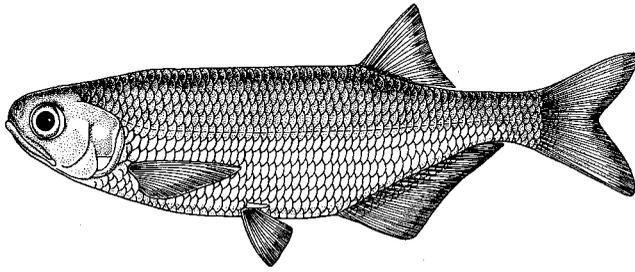
> 98 = 99 or more specimens taken/station.

Unknown = counts of specimens were not made.

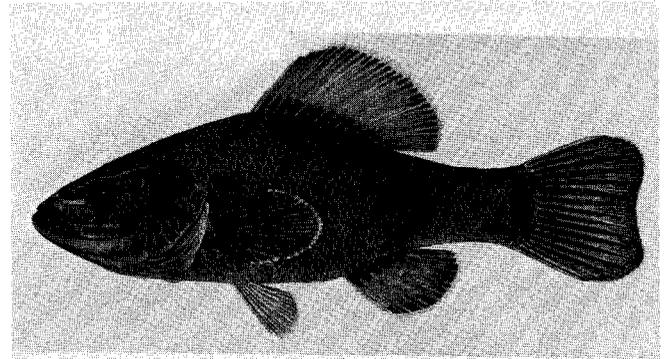
¹Number in parentheses is for stonerollers. Most were probably central stonerollers.

TABLE 13. Fish species found in only one of the three basins, 1975-82.

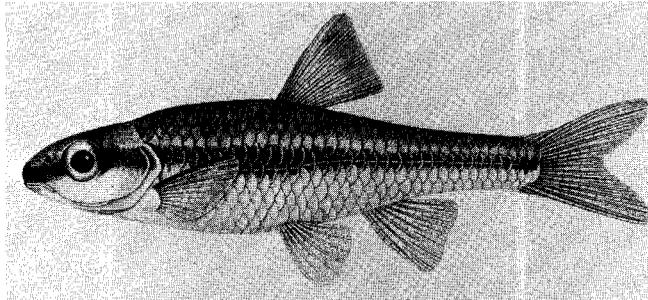
Grant & Platte (230)	Coon & Bad Axe (250)	La Crosse (260)
Shortnose gar	Chestnut lamprey	Flathead catfish
Goldeye	Brown bullhead	Banded darter
Grass pickerel	Pirate perch	Blackside darter
Largescale stoneroller	Slimy sculpin	Freshwater drum
Miss. silvery minnow		
Ozark minnow		
Suckermouth minnow		
River carpsucker		
Highfin carpsucker		
White crappie		
Rainbow darter		
Slenderhead darter		



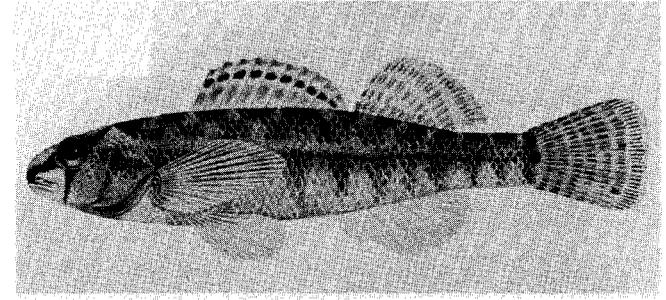
The goldeye, presently an endangered species, prefers larger rivers.



The pirate perch, a species currently on the watch list, prefers small streams or backwaters or sloughs of medium to larger rivers.



The Ozark minnow, now a threatened species, inhabits moderately fast streams with gravel bottoms. When this study began, it was on Wisconsin's endangered list.



The mud darter, presently on the watch list, prefers slow-moving weedy areas adjacent to the stream.

ENDANGERED SPECIES

Only 1 species on the state's endangered species list was found in the Grant & Platte river basin (none in the 2 other basins). One specimen of the goldeye was taken at a station within 3 miles of the mouth of the Grant River (Table 14) (Append. B Map 5). This species had not been previously reported from this basin.

THREATENED SPECIES

One threatened species was found in the Grant & Platte river basin and none in the 2 other basins (Table 15). A total of 249 Ozark minnows were taken at 26 stations on 15 streams in the Grant & Platte river basin (Append. B Map 24). Previously, this straw-colored minnow had been taken on 5 streams in this basin, 2 of which we failed to find them in.

The Ozark minnow was usually found in the small to medium sized slightly turbid streams 5 to 12 meters in width. Habitat characteristics for

this minnow and the mud darter (watch species) are shown in Table 16.

WATCH SPECIES

A total of 3 watch species were taken in the 3 basins (Table 17). The weed shiner was taken at a total of 2 stations near the mouths of the Bad Axe and La Crosse rivers (Append. B Map 28). Previously, this species was reported from 5 streams in the Coon & Bad Axe basin; we failed to collect the

weed shiner in any of these five streams. The pirate perch was captured at a total of 2 stations in 2 streams in the Coon & Bad Axe basin (Append. B Map 51). This species was previously reported from only 1 station near the mouth of Coon Creek. The mud darter was caught at a total 13 stations (2 in Grant & Platte and 11 in Coon & Bad Axe) on 13 streams (Append. B Map 64). Previously, this species was found in 1 stream in the Grant & Platte basin and 2 streams in the Coon & Bad Axe basin.

TABLE 14. *Endangered species collected in the Grant & Platte river basin during 1975-82 and records from stations in other Wisconsin basins since 1974.*

Species	Body of Water	County	No. Stations	No. Fish	Avg. No. Fish/Station	No. Records From Other Basins*
Goldeye	Grant R.	Grant	1	1	1	9(2,240,300)

*Basin numbers shown in parentheses (Fig. 1).

TABLE 15. Endangered species collected in the Grant & Platte river basin during 1975-82 and records from stations in other Wisconsin basins since 1974.

Species	Body of Water	County	No. Stations	No. Fish	Avg. No. Fish/Station	No. Records From Other Basins*
Ozark minnow	Apple R.	Lafayette	1	58		24(221,223,300)
	Un. Cr.	Lafayette	1	1		
	Un. Cr.	Lafayette	1	1		
	Pats Cr.	Lafayette	3	10		
	Platte R.	Grant	7	59		
	L. Platte R.	Grant	3	45		
	McAdam Br.	Grant	1	21		
	Blockhouse Cr.	Grant	2	17		
	Rountree Br.	Grant	1	2		
	Un. Cr.	Grant	1	4		
	Willow Br.	Grant	1	11		
	Austin Br.	Grant	1	2		
	Un. Cr.	Grant	1	6		
	Leggett Cr.	Grant	1	6		
	Un. Cr.	Grant	1	6		
		Total	26	249	10	

*Basin numbers shown in parentheses (Fig. 1).

TABLE 16. Characteristics of stream habitat for selected species* taken in the Grant & Platte, Coon & Bad Axe, and La Crosse river basins, 1975-82.

Species	Stream Width (m)	Stream Depth (m)	Velocity**	Turbidity**	Cond. (µmhos)	Temp. (F)
THREATENED						
Ozark minnow	5-12	0.2-1.0	moderate	slightly turbid	390-900	46-70
WATCH						
Mud darter	7-18	0.2-1.2	sluggish to moderate	slightly turbid	420-560	47-58

*Endangered, threatened, or watch species for which we have collected data from 3 or more stations.

**Terms are defined in Fago (1984b).

TABLE 17. Watch species collected in the Grant & Platte, Coon & Bad Axe, and La Crosse river basins during 1975-82 and records from stations in other Wisconsin basins since 1974.

Species	Basin	Body of Water	County	No. Stations	No. Fish	Avg. No. Fish/Station	No. Records From Other Basins*
Weed shiner	250	Bad Axe R.	Vernon	1	25		70(2,82,120,222, 240,270,290, 300)
		La Crosse R.	La Crosse	1	2		
			Total	2	27	14	
Pirate perch	250	Un. Cr.	Vernon	1	5		23(200,240,270, 280,290)
		Mormon Cr.	La Crosse	1	1		
			Total	2	6	3	
Mud darter	230	Platte R.	Grant	1	2		65(2,240,270,280 290)
		Sandy Cr.	Grant	1	14		
	250	Du Charme Cr.	Crawford	1	1		
		Un. Cr.	Crawford	1	1		
		Copper Cr.	Crawford	1	6		
		Buck Cr.	Crawford	1	4		
		Sugar Cr.	Crawford	1	7		
		Rush Cr.	Crawford	1	37		
		Bad Axe R.	Vernon	1	3		
		Un. Cr.	Vernon	1	6		
		Un. Cr.	Vernon	1	33		
		Mormon Cr.	La Crosse	1	25		
		Pammel Cr.	La Crosse	1	4		
		Total	13	143	11		

*Basin numbers shown in parentheses (Fig. 1).

RECOMMENDATIONS

CONTINUING USE OF FISH DISTRIBUTION DATA

The data in both the Master Fish and Master Stream and Lake Files* are available and should be used by interested persons when preparing environmental impact assessments, forming master plans, and planning future research studies.

FUTURE RESEARCH STUDIES

This series of reports on fish distribution does not deal generally with the ecological data collected since 1974. Analysis of these data should be the subject of another study. The species composition of fish communities and their relationship to the ecological data collected are two other subjects for study.

*See section on Data Handling in this report and Fago 1984b—for explanation of these files.

The potential integration of the data compiled by the study with data collected by other researchers on, for example, water quality, open up further areas for study and analysis.

PROTECTION OF ENDANGERED AND THREATENED SPECIES AND THEIR HABITATS

Goldeye. Any proposed manipulation of the aquatic environment near the mouth of the Grant River where the endangered goldeye was captured (Append. B Map 5) should recognize the presence of this species.

Ozark minnow. The state's largest and most diverse population of Ozark minnows is found in the Grant & Platte river basin. Only 3 other basins in the state contain this species, one of which only has them in a very small section of one stream. Streams containing this species should continue to have their good water quality maintained.

UPDATING PRESENT RECORDS

District fish management personnel should in the course of routine surveys preserve at least 1 specimen of each endangered, threatened, and watch species they observe (except paddlefish, lake sturgeon, and American eel) and notify the Bureau of Research. Such collections will permit continuing reassessment of the endangered and threatened species lists as required by law and of the watch list as well.

COMPLETION OF THIS SURVEY

Completion of a statewide survey has not been achieved due to funding reduction; only 45% of the state has been covered. When additional funds become available for investigations of endangered, threatened, and/or non-game species, high priority should be accorded to completion of the surveys in compliance with the legislative mandate.

LITERATURE CITED

- BAILEY, MERRYLL M.
1973. Annual project report, 1973. Fishery management program. Bur. Sport Fish. and Wildl. Serv. 8 pp.
- BECKER, GEORGE C.
1959. Distribution of central Wisconsin fishes. Trans. Wis. Acad. Sci., Arts, and Lett. 48:65-102.
- 1964a. The fishes of Lakes Poygan and Winnebago. Trans. Wis. Acad. Sci., Arts, and Lett. 53:29-52.
- 1964b. The fishes of Pewaukee Lake. Trans. Wis. Acad. Sci., Arts, and Lett. 53:19-27.
1966. Fishes of southwestern Wisconsin. Trans. Wis. Acad. Sci., Arts, and Lett. 55:87-117.
1983. Fishes of Wisconsin. Univ. Wis. Press, Madison. 1052 pp.
- BOLTON, HANNIBAL
1976. Annual project report, 1975. Fishery management program. Bur. Sport Fish. and Wildl. Serv. 10 pp.
- FAGO, DON
1982. Distribution and relative abundance of fishes in Wisconsin. I. Greater Rock River basin. Wis. Dep. Nat. Resour. Tech. Bull. No. 136. 120 pp.
- 1983a. Distribution and relative abundance of fishes in Wisconsin. II. Black, Trempealeau, and Buffalo river basins. Wis. Dep. Nat. Resour. Tech. Bull. No. 140. 120 pp.
- 1983b. Distribution and relative abundance of fishes in Wisconsin. III. Red Cedar River basin. Wis. Dep. Nat. Resour. Tech. Bull. No. 143. 69 pp.
- 1984a. Distribution and relative abundance of fishes in Wisconsin. IV. Root, Milwaukee, Des Plaines, and Fox river basins. Wis. Dep. Nat. Resour. Tech. Bull. No. 147. 128 pp.
- 1984b. Retrieval and analysis system used in Wisconsin's statewide fish distribution survey. Dep. Nat. Resour. Res. Rep. No. 126. 35 pp.
- GREENE, C. W.
1935. The distribution of Wisconsin fishes. Wis. Conserv. Comm., Madison. 235 pp.
- HOLMSTROM, B. K.
1982. Drainage area data for Wisconsin streams. U.S. Geol. Surv. and Wis. Dep. Transp. Div. Highw. Madison.
- JOHNSON, M. AND G. BECKER
1970. Annotated list of the fishes of Wisconsin. Wis. Acad. Sci., Arts, and Lett. 58:265-300.
- KLICK, THOMAS A. AND C. W. THREINEN
1973. Surface water resources of Vernon County. Wis. Dep. Nat. Resour. 66 pp.
- KLICK, THOMAS A., D. F. GEBKEN, AND C. W. THREINEN
1971. Surface water resources of La Crosse County. Wis. Dep. Nat. Resour. 55 pp.
- MCNAUGHT, D. C.
1963. The fishes of Lake Mendota. Trans. Wis. Acad. Sci., Arts, and Lett. 52:37-55.
- NOVOTNY, D. W. AND G. R. PRIEGEL
1971. A guideline for portable direct current electrofishing systems. Wis. Dep. Nat. Resour. Tech. Bull. No. 51. 22 pp.
1974. Electrofishing boats improved design and operational guidelines to increase the effectiveness of boom shockers. Wis. Dep. Nat. Resour. Tech. Bull. No. 73. 48 pp.
- ROBINS, C. R. ED.
1980. A list of common and scientific names from the United States and Canada (4th ed.). Am. Fish. Soc. Spec. Publ. No. 12. 176 pp.
- SMITH P. W. AND A. C. LOPINOT
1967. The 1966 survey of fishes from mouths of Mississippi River tributaries. Proc. 23rd Ann. Meet., Upper Mississippi River Conserv. Comm.
- U.S. GEOLOGICAL SURVEY
1964. Compilation of records of surface waters of the U.S., October 1950 to September 1960. Part 5. Hudson Bay and Upper Mississippi River basins. Water Supply Paper. 1728. 567 pp.
1982. Water-data report WI-81-1. Prepared in cooperation with the State of Wisconsin. 413 pp.
- WISCONSIN DEPARTMENT OF NATURAL RESOURCES
1971. Grant-Platte basin. Pollution investigation survey. 22 pp.
1978. Grant - Platte river basin report. 38 pp.
1980. Bad Axe - La Crosse river basin report. 32 pp.

APPENDIX A. Supplementary Data

TABLE 18. List of species reported from the Grant & Platte, Coon & Bad Axe, and La Crosse river basins by collectors other than DNR research personnel.

Species	Grant & Platte (230)		Coon & Bad Axe (250)		La Crosse (260)	
	1950-74	1975-82	1950-74	1975-82	1950-74	1975-82
American brook lamprey	2		3	1	3	1
Bowfin*					1	
American eel*					1	
Gizzard shad	3		9			
Rainbow trout*	1,5	1	1	1	1,11	
Brown trout*	1,2	1	1,3	1	1,3	1,11
Brook trout*	1		1	1	1,11	1,11
Central mudminnow*			1	1	1,2	1,11
Northern pike*			1,9	1	1,2	11
Stonerollers	3,5		3		3	
Central stoneroller	1,2	1	1	1		
Common carp*	1,2	1	1,3	1	1,2	
Brassy minnow		1	3			
Miss. silvery minnow	2		3			
Hornyhead chub	1,2,3,5	1	3			
Golden shiner	3			1	2,11	
Emerald shiner	2,3,5		3,9			
River shiner			3,9			
Common shiner	1,2,3,5	1	3	1		
Bigmouth shiner	2,3,5	1	3			
Blacknose shiner			1			
Spottail shiner	3		3,9		2	
Ozark minnow	2,3,5	1				
Rosyface shiner	1,2,3,5	1	3			
Spotfin shiner	2,3		3,9			
Sand shiner	1,2,3	1	3			
Weed shiner			3			
Suckermouth minnow	1,2,3,5	1	3			
Northern redbelly dace				1		
Southern redbelly dace	2,3,5	1	3		3	
Bluntnose minnow	1,2,3,5	1	3	1	2	
Fathead minnow	2,3	1	3	1		11
Bullhead minnow	3		3,9			
Blacknose dace	2,3,5	1	1,3	1	1,3	11
Longnose dace	2,3,5	1	3	1		
Creek chub	1,2,3,5	1	1,3	1	1,3,11	
Red shiner	2					
Quillback			3,9			
White sucker*	1,2,3,5	1	1,3	1	1,2,11	1,11
Northern hog sucker*	1,2,3	1	1,3	1		
Silver redhorse	3		3			
Golden redhorse	1,2,3					
Shorthead redhorse	1,2,3		9			
Black bullhead	2,3				11	
Yellow bullhead	2				2	
Channel catfish*	1		1		1	
Stonecat	2,3	1	3			
Tadpole madtom	2		3		2	
Flathead catfish*					1	
Pirate perch*				1		
Burbot*			1	1	1	
Brook silverside*			3			
Brook stickleback*	2,3,5	1	1,3	1	1,3,11	1,11
White bass			9			
Yellow bass			9			
Rock bass					2	
Green sunfish	1,2,3	1	3		2	
Pumpkinseed			3,9		2	11
Orangespotted sunfish	3					
Bluegill	1,2		9		11	
Smallmouth bass*	1,2,3,5	1	1,3	1	1	
Largemouth bass*	2,3		1,9	1	1	1,11

Species	Grant & Platte (230)		Coon & Bad Axe (250)		La Crosse (260)	
	1950-74	1975-82	1950-74	1975-82	1950-74	1975-82
White crappie			9			
Black crappie	3		3,9			
Iowa darter			3			
Fantail darter	2,3,5	1	3			
Johnny darter	1,2,3,5	1	3	1	2,3,11	1
Yellow perch*					1	
Logperch	2					
Slenderhead darter	3					
Sauger			3,9			
Walleye*			1,9	1	1	
Freshwater drum*			1,9		1	
Mottled sculpin	3				1	1
Slimy sculpin			1,3			

*Records of this species collected by Fish Management are based upon their identification.

KEY TO COLLECTORS' CODE

- 1 = All Fish Management collections
- 2 = Dr. George Becker and his students
- 3 = Professor Marlin Johnson and his students
- [4 = Dr. George Seeburger and his students]
- 5 = Milwaukee Public Museum
- [6 = UW-Madison students]
- [7 = Commercial fishermen]
- [8 = Sport fishermen]
- 9 = Upper Mississippi River Conservation Commission (UMRCC)
- [10 = N.U.S. Corporation, Pittsburgh, PA]
- 11 = U.S. Fish and Wildlife Service
- [] = Collector not used in this report.

- 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 _____ 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 _____

BOTTOM TYPES _____

AQUATIC VEG. _____

STRM. BANK VEG. _____

FISH SPECIES

1) _____ 2) _____ 3) _____ 4) _____

5) _____ 6) _____ 7) _____ 8) _____

9) _____ 10) _____ 11) _____ 12) _____

13) _____ 14) _____ 15) _____ 16) _____

MORE DATA ON BACK: YES

17) _____ 18) _____ 19) _____ 20) _____ F

21) _____ 22) _____ 23) _____ 24) _____ I

25) _____ 26) _____ 27) _____ 28) _____ S

29) _____ 30) _____ 31) _____ 32) _____ H

33) _____ 34) _____ 35) _____ 36) _____ O

37) _____ 38) _____ 39) _____ 40) _____ N

41) _____ 42) _____ 43) _____ 44) _____ L

Y

FIGURE 5. Examples of field collection form (8100-46).

MINOR=223SELECTION=223
 MIN. MONTH = MAX. MONTH =

SOURCE=NOT 40 81 94 95 99
 COUNTY = OR < 72

MILE ON

PAGE 43

X12 JOHNNY DARTER

ETHEOSTOMA NIGRUM

DATE RUN 11/09/83

-----O R D E R M I L E A G E S-----										N86006A						
BASIN	MBM	1	2/7	3/8	4/9	5/10	6/11	MILE	LAKE OR STREAM NAME	WT	NO	SD	GEF	--DATE--	TWRRNG	SECQTQTCO
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	8E29NWN23
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	5E22 SE25
2 223	1434.8R	156.9L	105.8R	10.9L				.5	WHITESIDE CR	2	3	46		6/30/60	2N	5E 3SES33
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				.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				.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	139.5L					1.2	AMES BR	2	3	46		6/27/60	2N	3E11SESE33
2 223	1434.8R	156.9L	141.0R					.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					13.7	MINERAL POINT BR	2	1	46		8/ 9/62	5N	2E36SWNE25
2 223	1434.8R	156.9L	159.0R	8.8L				8.3	SUDAN BR	2	4	46		8/14/62	5N	2E29SWSE25
2 223	1434.8R	156.9L	159.0R	8.8L	10.6R			.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 6. Sample listing for a species using the Cobol program (listing method B, Figure 3, used here).

MINOR=223SELECTION=223

SOURCE=NOT 40 81 94 95 99

MILE ON

PAGE 50

A86006

NUMBER OF STATIONS

PERCENT OF TOTAL STATIONS

DATE RUN 11/09/83

Code	Species Name	Number of Stations	Percent of Total Stations
I21	BROWN TROUT	1	2.56
KO1	CENTRAL MUDMINNOW	4	10.26
MO5	STONEROLLERS	13	33.33
MO6	CENTRAL STONEROLLER	19	48.72
MO7	LARGESCALE STONEROLLER	4	10.26
M12	COMMON CARP	5	12.82
M14	BRASSY MINNOW	5	12.82
M19	HORNYHEAD 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
NO2	SUCKERS	1	2.56
NO4	REDHORSES	1	2.56
NO6	QUILLBACK	1	2.56
NO9	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
DO8	CHANNEL CATFISH	1	2.56
O10	STONECAT	5	12.82
SO2	BLACKSTRIFE TOPMINNOW	1	2.56
UO1	BROOK STICKLEBACK	12	30.77
WO4	ROCK BASS	5	12.82
WO5	GREEN SUNFISH	6	15.38
WOB	ORANGESPOTTED SUNFISH	5	12.82
WO9	BLUEGILL	10	25.64
W11	SMALLMOUTH BASS	14	35.90
W12	LARGEMOUTH BASS	6	15.38
XO7	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
ZO1	MOTTLED SCULPIN	7	17.95

# STATIONS/SD:	SD-11=	SD-14,16=	SD-15,17,19=	SD-23-33=	SD-40=	SD-45,46=	SD-50=	SD-55,56=
	0	0	0	0	0	283	0	0
	SD-61= 158	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 441

TOTAL NUMBER OF STATIONS	
(WITH MILE RULE)	39
(WITHOUT MILE RULE)	42
TOTAL NUMBER OF SPECIES	45
TOTAL NUMBER OF HYBRIDS	1

FIGURE 7. Sample summary report for species listing shown in Figure 6.

NOV 23, 1983		FISH MASTER FILE						MILE OFF		PAGE 1													
SEQ.	JAR WT	ORDER MILEAGES						STATION LOCATION		TWN RNG SEC Q T Q T C O													
BASIN	MBM	1	2/7	3/8	4/9	5/10	6/11	MILE	STREAM OR LAKE NAME	SD G EF	DATE	TWN RNG SEC Q T Q T C O											
2 222		1N	10E	27	SW	54		+	SUGAR R - OXBOW	46 5	8/ 0/63	1N10E27NWSW54											
		SP=04	HY=00	UNSP=00	FISH	M20	+	005	+	S02	+	W08	+										
2 222	1434.8R	156.9L	.7R	6.9R				2.3	E FORK RACCOON CR	61 5	12/12/65	1N12E31NWSE54											
		SP=13	HY=00	UNSP=02	FISH	MO4	+	MO5	+	M14	+	M28	+	M29	+	M41	+	M43	+	M45	+	M50	+
						NO9	+	U01	+	X10	+	X12	+	X14	+	X18	+						
2 222	1434.8R	156.9L	.7R	6.9R				2.4	E FORK RACCOON CR	11 2 06	5/15/74	1N12E31SWNE54											
		SP=15	HY=01	UNSP=01	FISH	A05	4	I21	10	LO2	6	LO7	1	MO5	6	M12	1	M28	1	M29	1	M45	13
						M50	2	NO9	28	W05	3	W09	1	X10	11	X12	25	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											
		SP=08	HY=00	UNSP=00	FISH	MO6	1	M29	27	M43	10	M48	29	M50	99	NO9	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											
		SP=07	HY=00	UNSP=01	FISH	MO5	99	M43	19	M46	4	M48	75	M50	53	NO9	30	U01	8	X12	2		
2 222	1434.8R	156.9L	.7R	6.9R				3.2	E FORK RACCOON CR	11 2 05	11/ 5/75	1N12E31NENW54											
		SP=17	HY=00	UNSP=01	FISH	A05	2	K01	6	LO1	2	MO5	33	M28	2	M45	11	M46	3	M48	20	M50	16
						NO9	47	W05	10	W09	6	X07	1	X10	30	X12	25	X14	2	X18	10	Z01	27

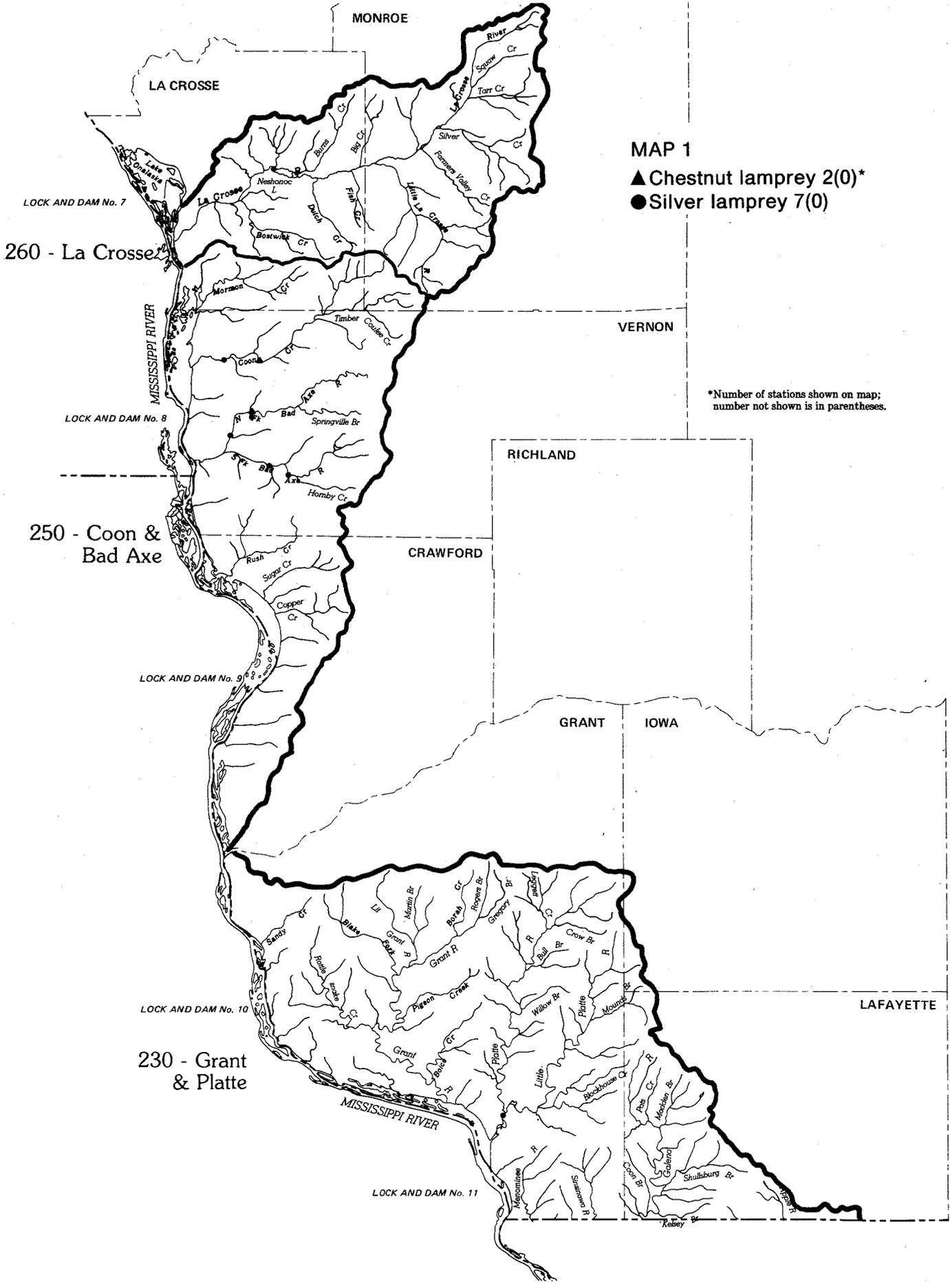
NOV 29, 1983

STREAM & LAKE FILE - MASTER

PAGE 1

BASINS MAJ MIN	MB. MI.	ORDER				M I L E A G E S				MI OR ACRES	- - STREAM OR LAKE NAME - -	D WL - - LOCATION - -				
		1	2	3		4/8	5/9	6/10	7/11			C	TSTWN	RNGSEC	QTQT64CO	
2 222 62640										17	GOOSE POND	0	6N	8E	13 NENE	13
2 222 62650										33	L HARRIETT	0	5N	9E	9 NWNW	13
2 222 62660										10	MORSE POND	0	6N	8E	3 SESW	13
2 222 62670										12	MORTENSON POND	0	5N	9E	26 NWSE	13
2 222 62680											SUGAR R - OXBOW	0	1N	10E	27 NWSW	54
2 222 62690										8	VERONA GRAVEL PIT #12 (EAST	0	6N	8E	22 SENW	13
2 222 62700	1434.8R	156.9L	.7R							11	RACCOON CR	2	46N	1E	22	80
2 222 62710	1434.8R	156.9L	.7R	6.9R						7	E FORK RACCOON CR	2	46N	1E	8	80
2 222 62720	1434.8R	156.9L	.7R	6.9R	1.4						E FORK RACCOON CR WI-IL BD	6	1N	12E	31 SESW	54
2 222 62730	1434.8R	156.9L	.7R	6.9R	2.7R					4	UN CR (31-3,CHAMBERLIN SPR.	2	1N	12E	31 SWNE	54
2 222 62740	1434.8R	156.9L	.7R	9.5							RACCOON CR WIS-ILL BD	6	1N	11E	35 SESE	54
2 222 62750	1434.8R	156.9L	.7R	11.4							DAM-RACCOON CR-MILLPOND		1N	11E	34 NENE	54
2 222 62760	1434.8R	156.9L	.7R	11.7R						3	UN CR	2	1N	11E	27 SWSE	54
2 222 62770	1434.8R	156.9L	.7R	11.7R	.3R					3	UN CR	2	1N	11E	27 NWSE	54
2 222 62780	1434.8R	156.9L	9.2R							76	SUGAR R	2	28N	11E	11	80
2 222 62790	1434.8R	156.9L	9.2R	10.7							SUGAR R WIS-ILL BD	6	1N	10E	36 SESW	54
2 222 62800	1434.8R	156.9L	9.2R	10.8L						9	GREEN DRAINAGE SYSTEM	2	1N	10E	36 SESW	54
2 222 62810	1434.8R	156.9L	9.2R	10.8L	6.4R					1	UN CR	2	1N	9E	25 SENE	54
2 222 62820	1434.8R	156.9L	9.2R	11.2R						3	UN DITCH	2	1N	10E	36 NWSW	54
2 222 62830	1434.8R	156.9L	9.2R	11.2R	.7R					1	UN DITCH	2	1N	10E	36 NENW	54
2 222 62840	1434.8R	156.9L	9.2R	11.7R						2	UN DITCH	2	1N	10E	35 SENE	54
2 222 62850	1434.8R	156.9L	9.2R	16.0L						6	UN DITCH	2	1N	10E	28 NESW	54
2 222 62860	1434.8R	156.9L	9.2R	18.8L							SUGAR R -W CHANNEL	2	1N	10E	20 SWNE	54
2 222 62870	1434.8R	156.9L	9.2R	18.8L	.5L					1	UN DITCH	2	1N	10E	20 SWNW	54
2 222 62880	1434.8R	156.9L	9.2R	19.8R						13	TAYLOR CR	2	1N	10E	18 SESE	54
2 222 62890	1434.8R	156.9L	9.2R	19.8R	1.8R					10	WILLOW CR (NORTH)	2	1N	10E	7 NESW	54
2 222 62900	1434.8R	156.9L	9.2R	19.8R	1.8R	6.7R				4	UN CR	2	1N	10E	11 SWNE	54

APPENDIX B. Distribution Maps for all Species
Collected During 1975-82



MAP 1

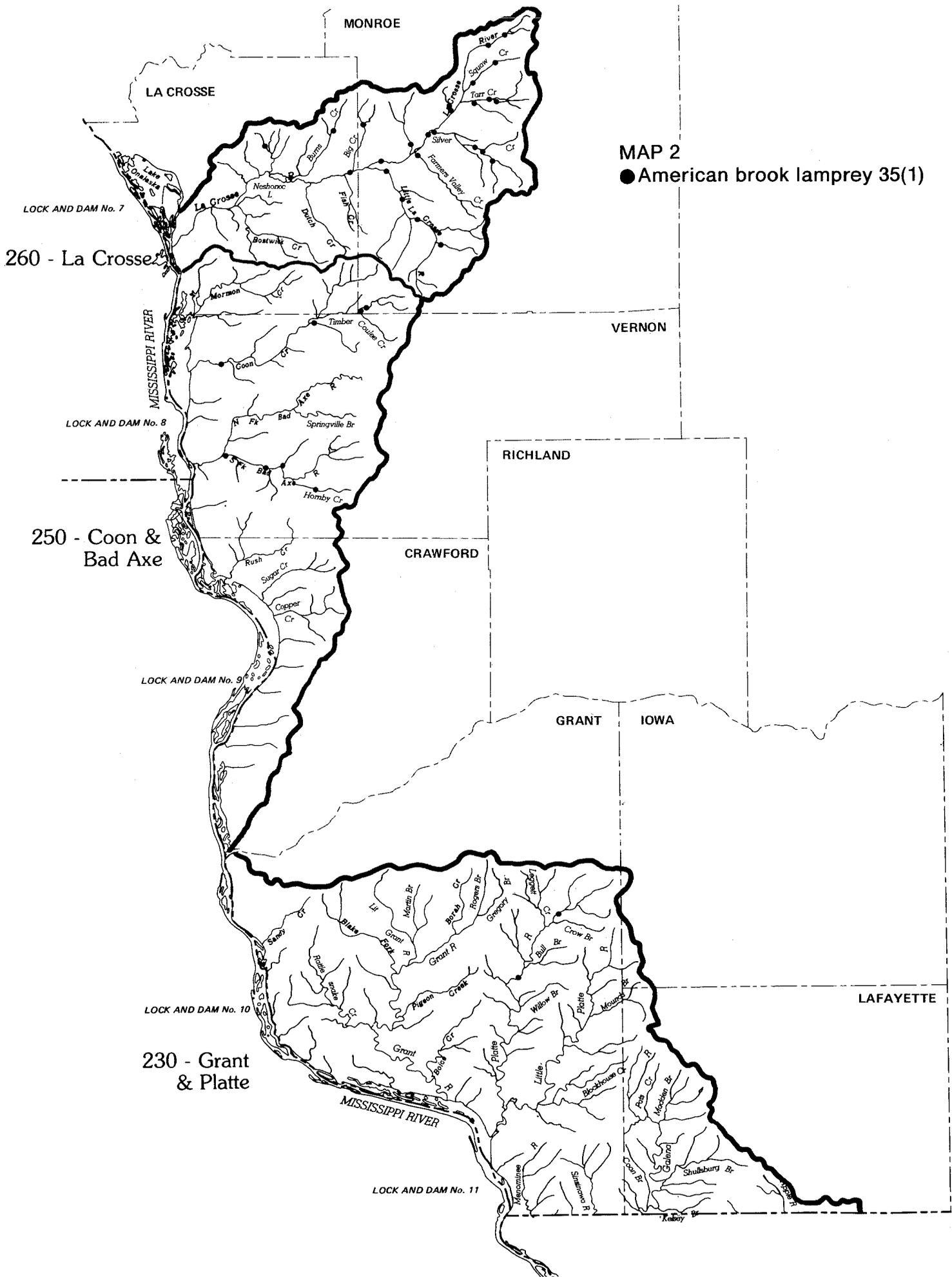
- ▲ Chestnut lamprey 2(0)*
- Silver lamprey 7(0)

*Number of stations shown on map; number not shown is in parentheses.

260 - La Crosse

250 - Coon & Bad Axe

230 - Grant & Platte



MONROE

LA CROSSE

MAP 4

● Bowfin 4(0)

▲ Gizzard shad 4(0)

LOCK AND DAM No. 7

260 - La Crosse

VERNON

LOCK AND DAM No. 8

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

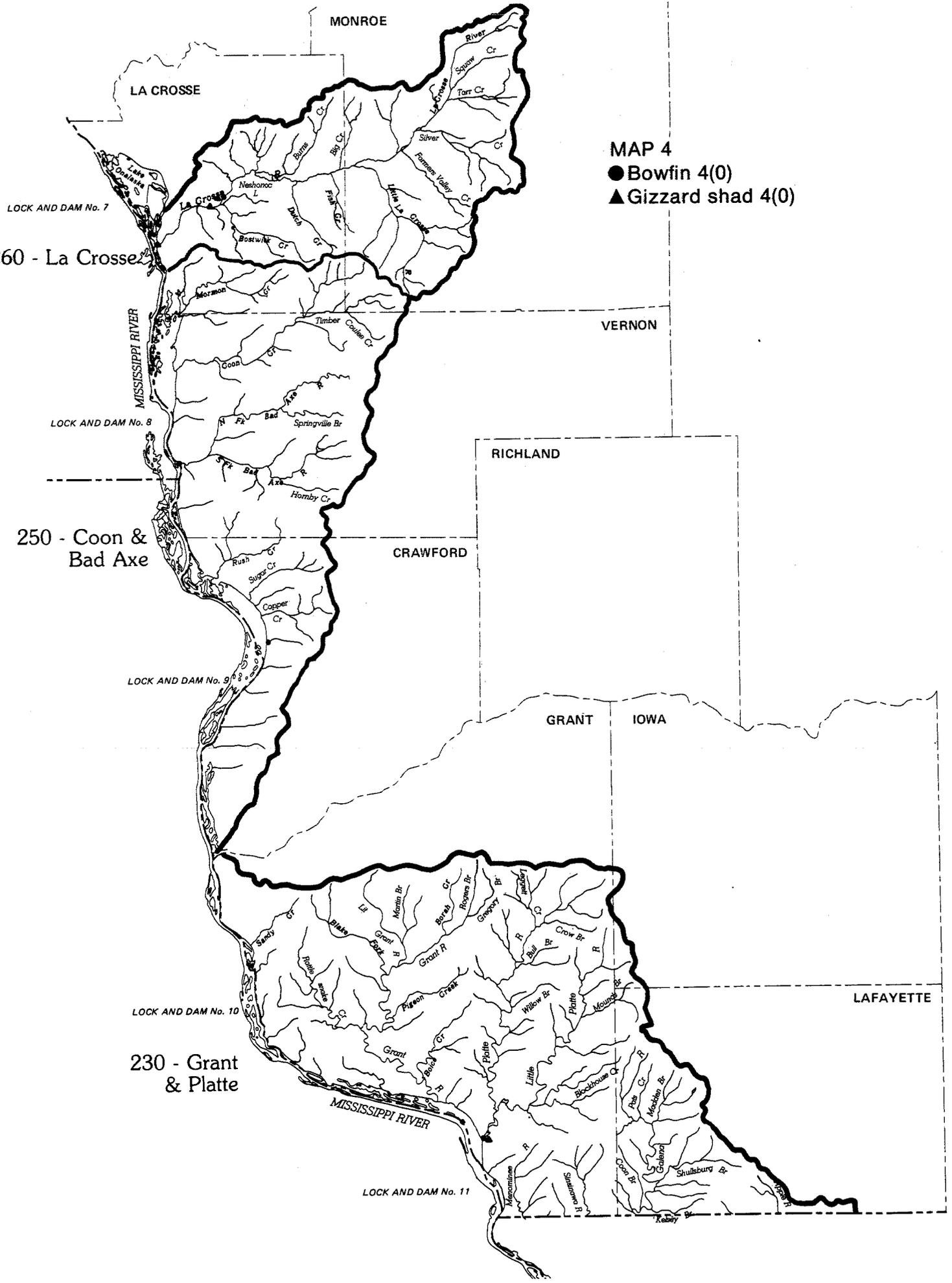
LOCK AND DAM No. 10

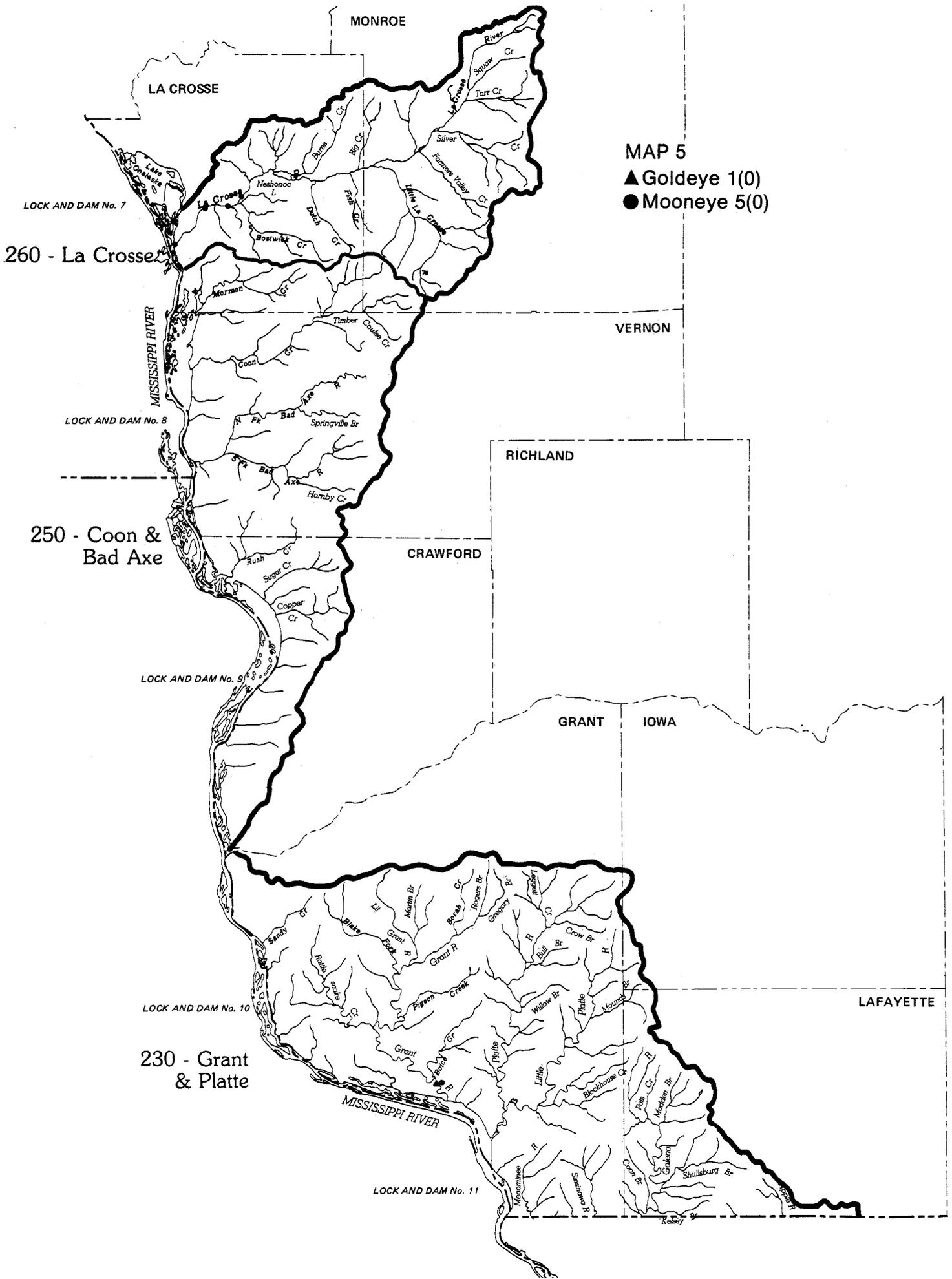
230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11





MONROE

LA CROSSE

MAP 6

● Rainbow trout 14(1)

LOCK AND DAM No. 7

260 - La Crosse

LOCK AND DAM No. 8

250 - Coon & Bad Axe

LOCK AND DAM No. 9

LOCK AND DAM No. 10

230 - Grant & Platte

LOCK AND DAM No. 11

VERNON

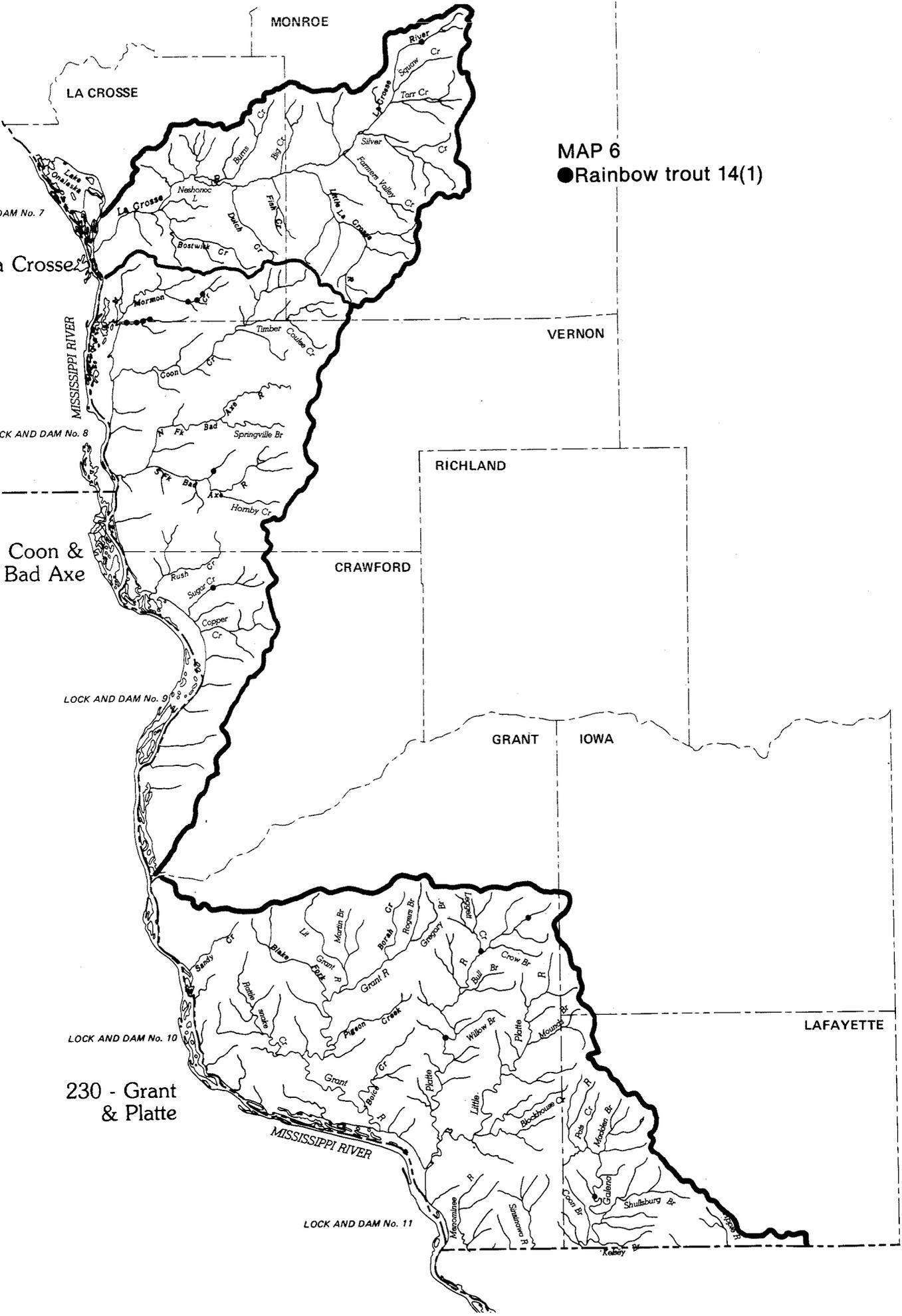
RICHLAND

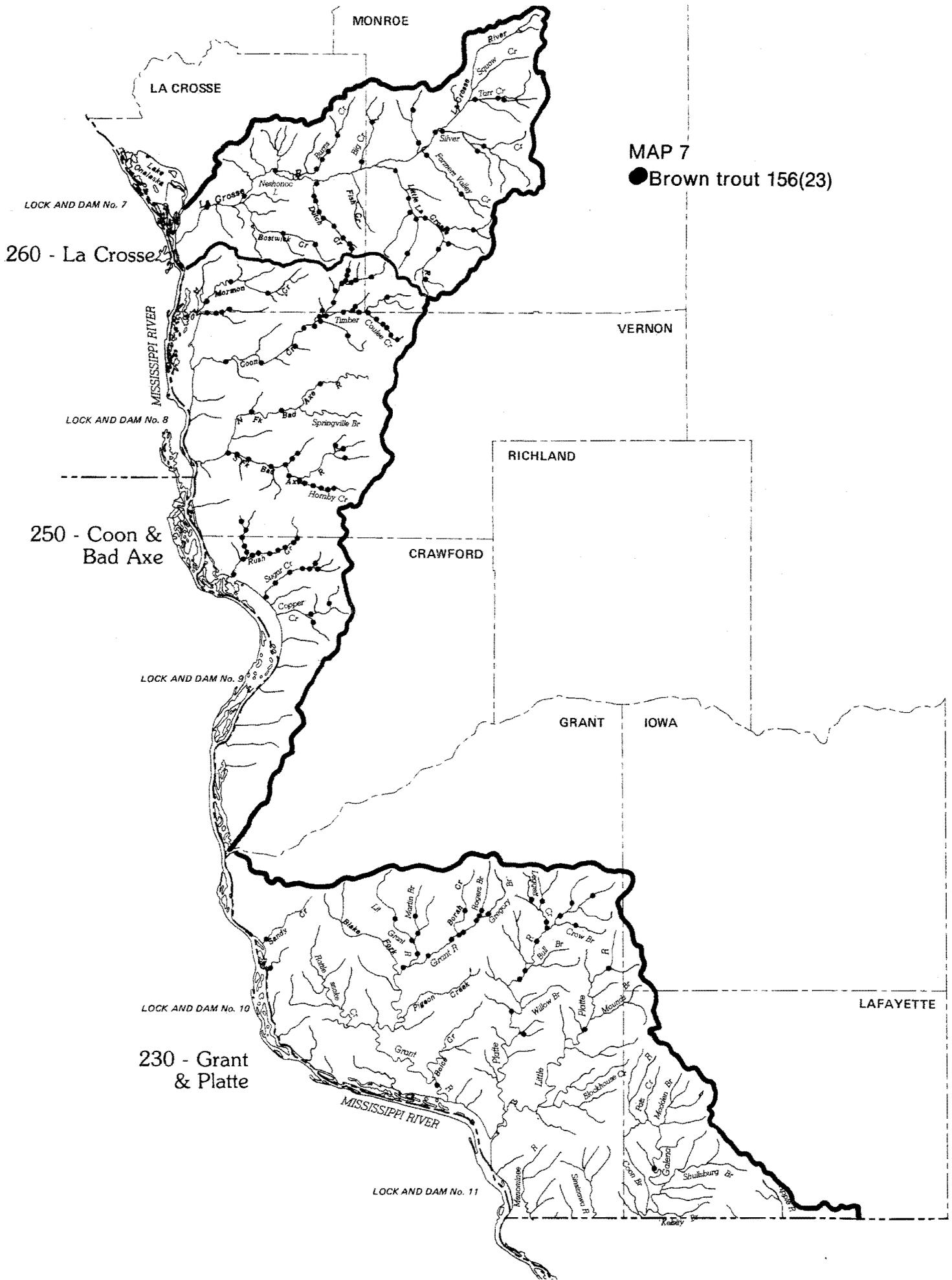
CRAWFORD

GRANT

IOWA

LAFAYETTE





MONROE

LA CROSSE

MAP 9

● Central mudminnow 35(1)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

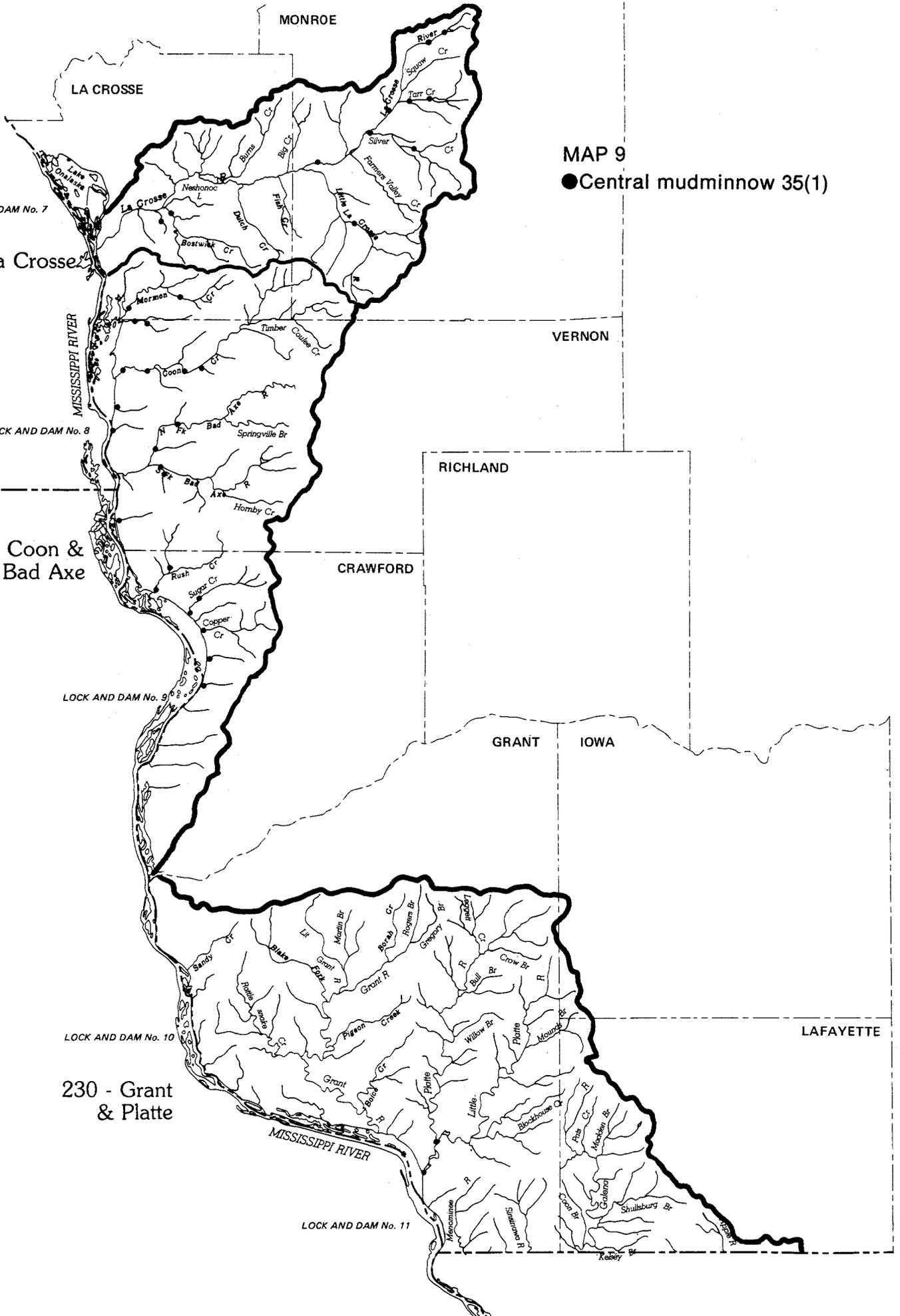
LOCK AND DAM No. 10

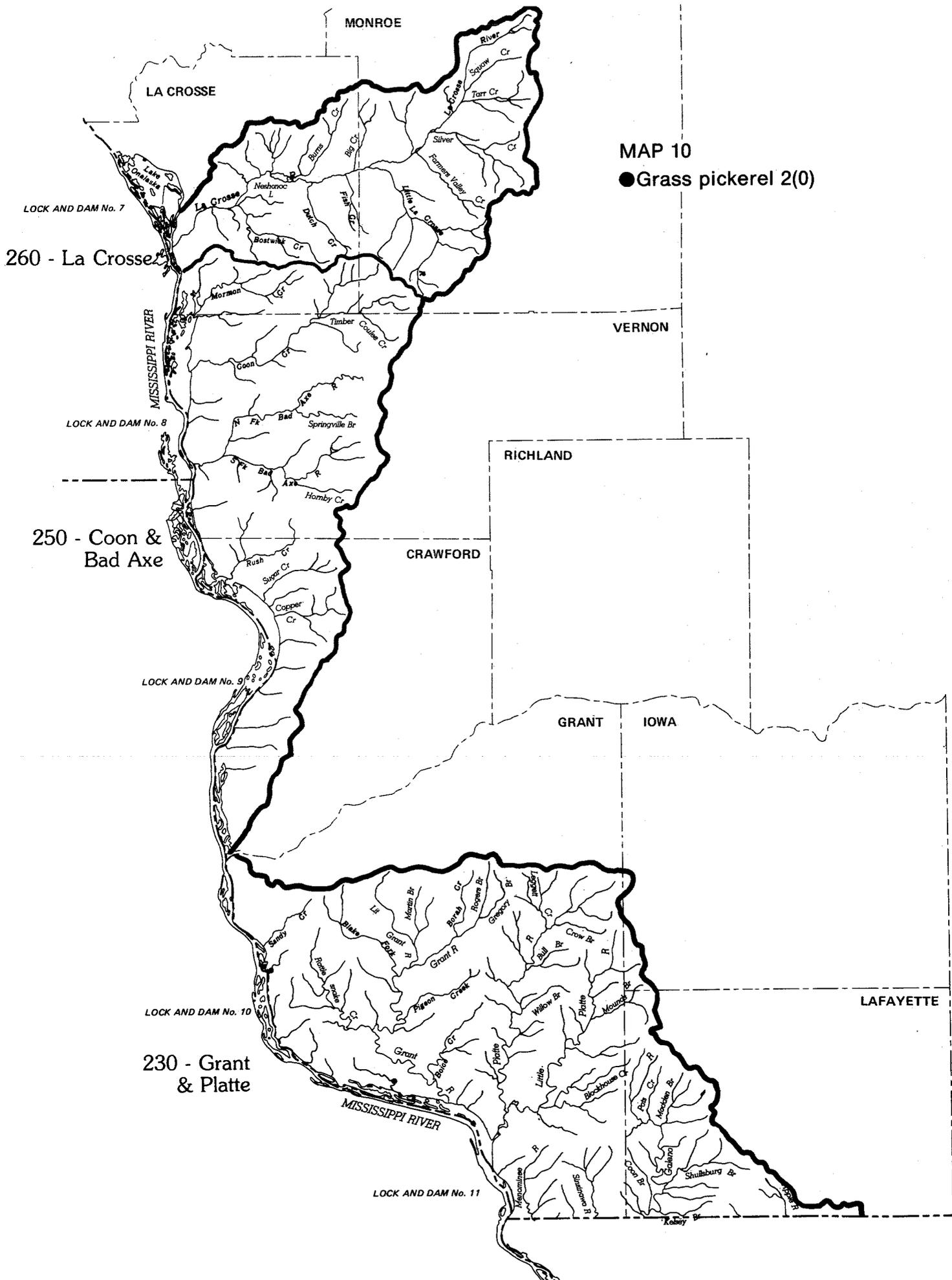
230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11





MONROE

LA CROSSE

MAP 10
● Grass pickerel 2(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

VERNON

LOCK AND DAM No. 8

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11

MONROE

LA CROSSE

MAP 12

● Central stoneroller 188(16)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

RICHLAND

250 - Coon & Bad Axe

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

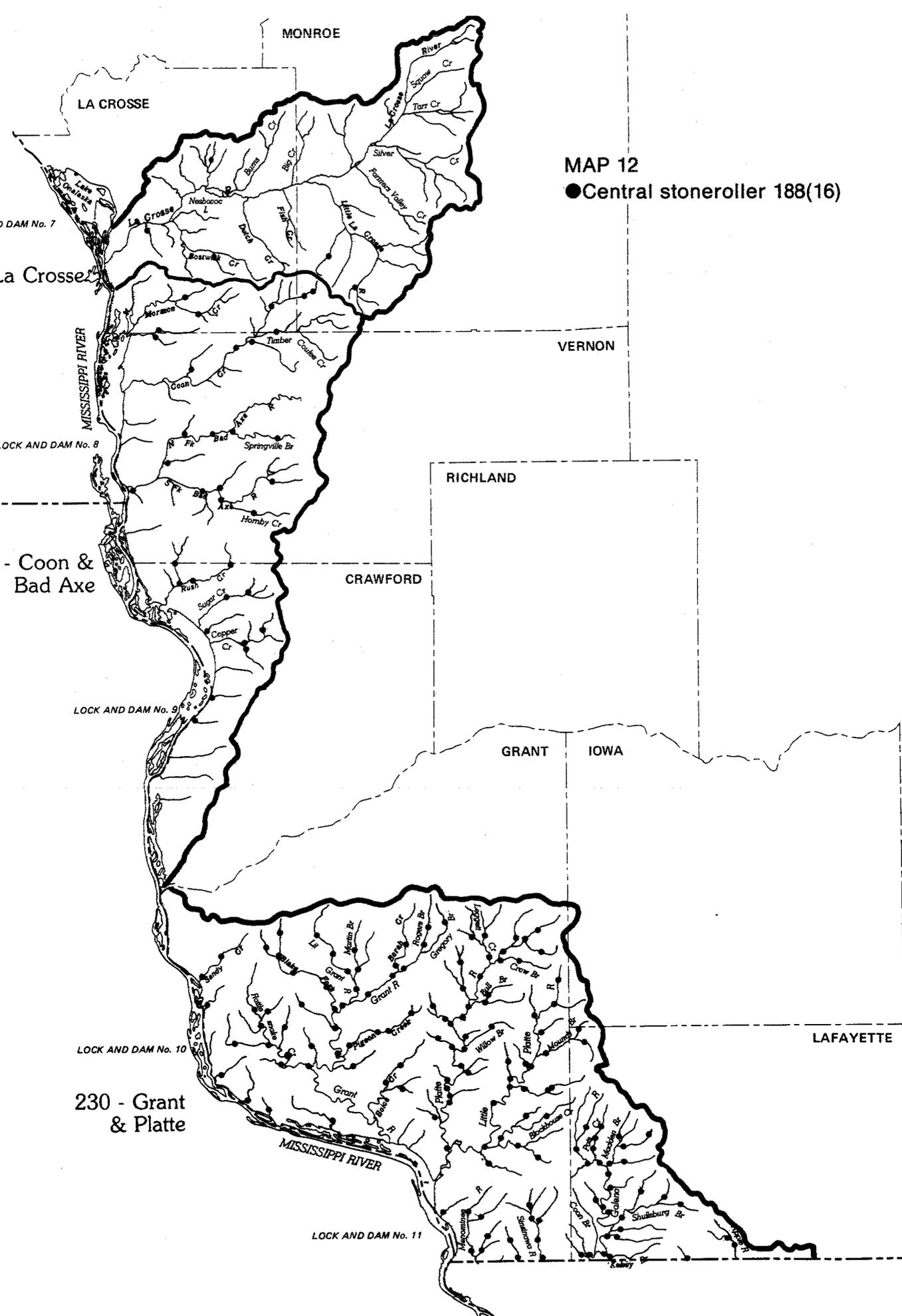
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 13

- Largescale stoneroller 3(0)
- ▲ Brassy minnow 7(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

250 - Coon & Bad Axe

VERNON

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

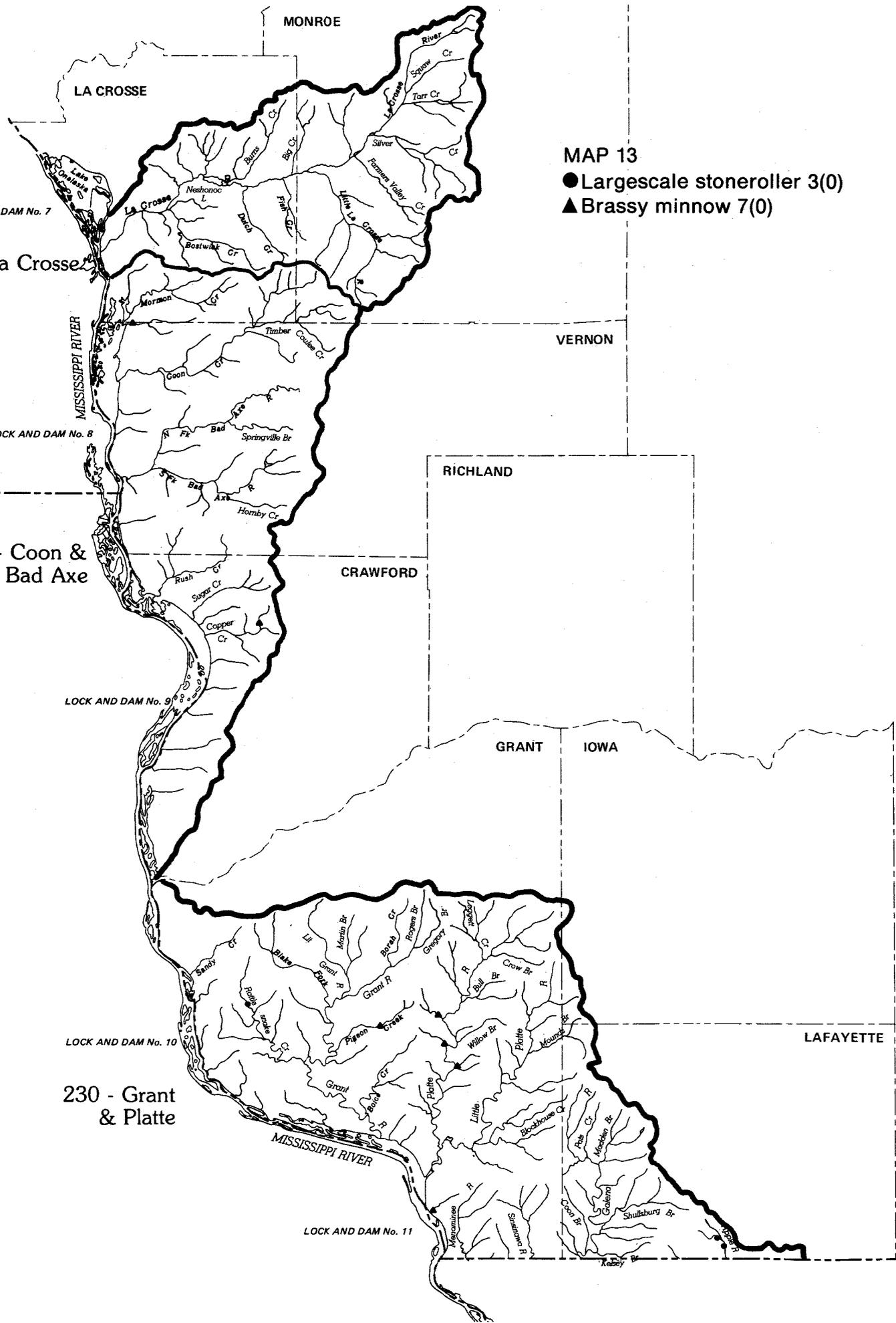
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 14

● Common carp 34(3)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

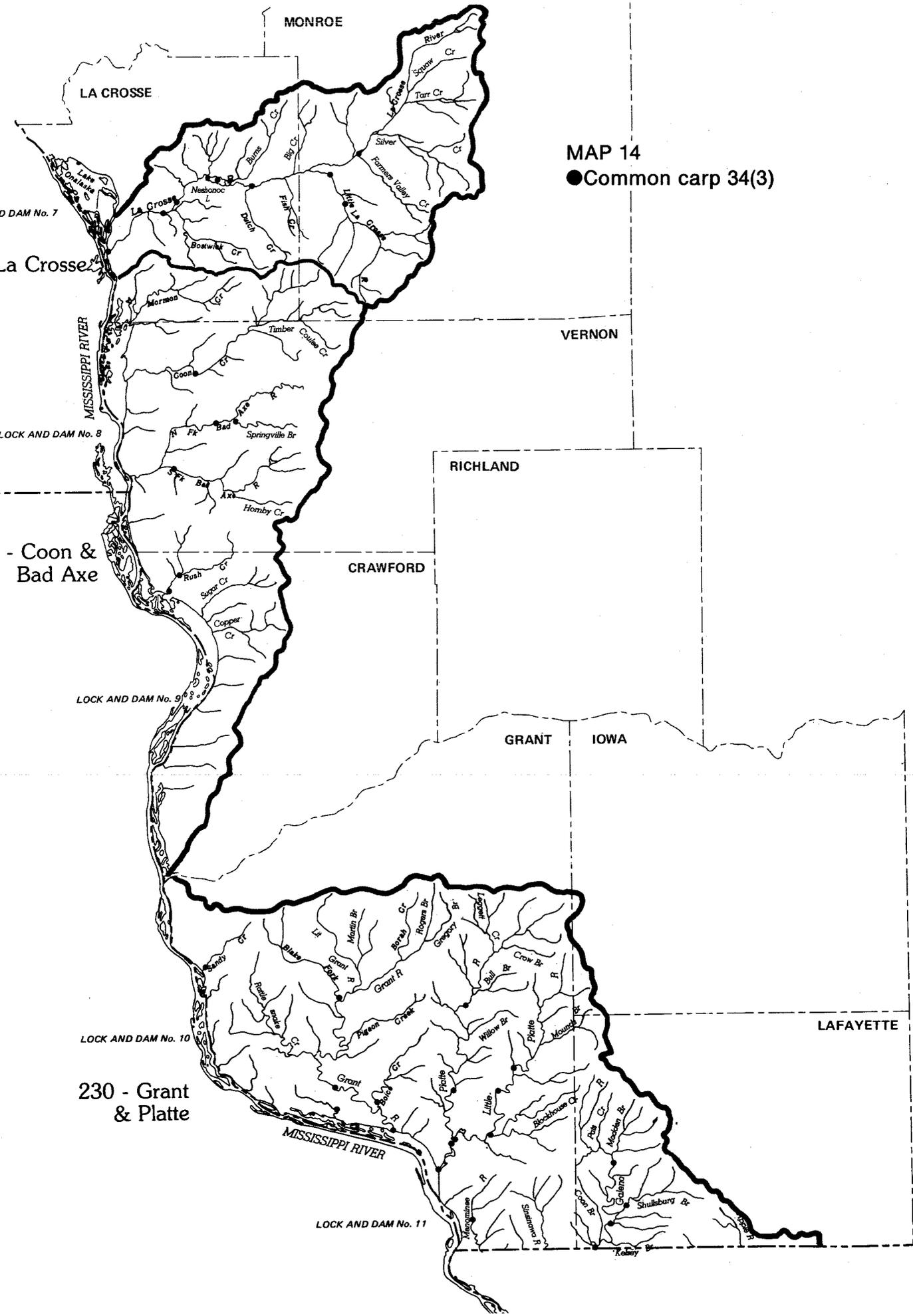
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 15

●Mississippi silvery minnow 10(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

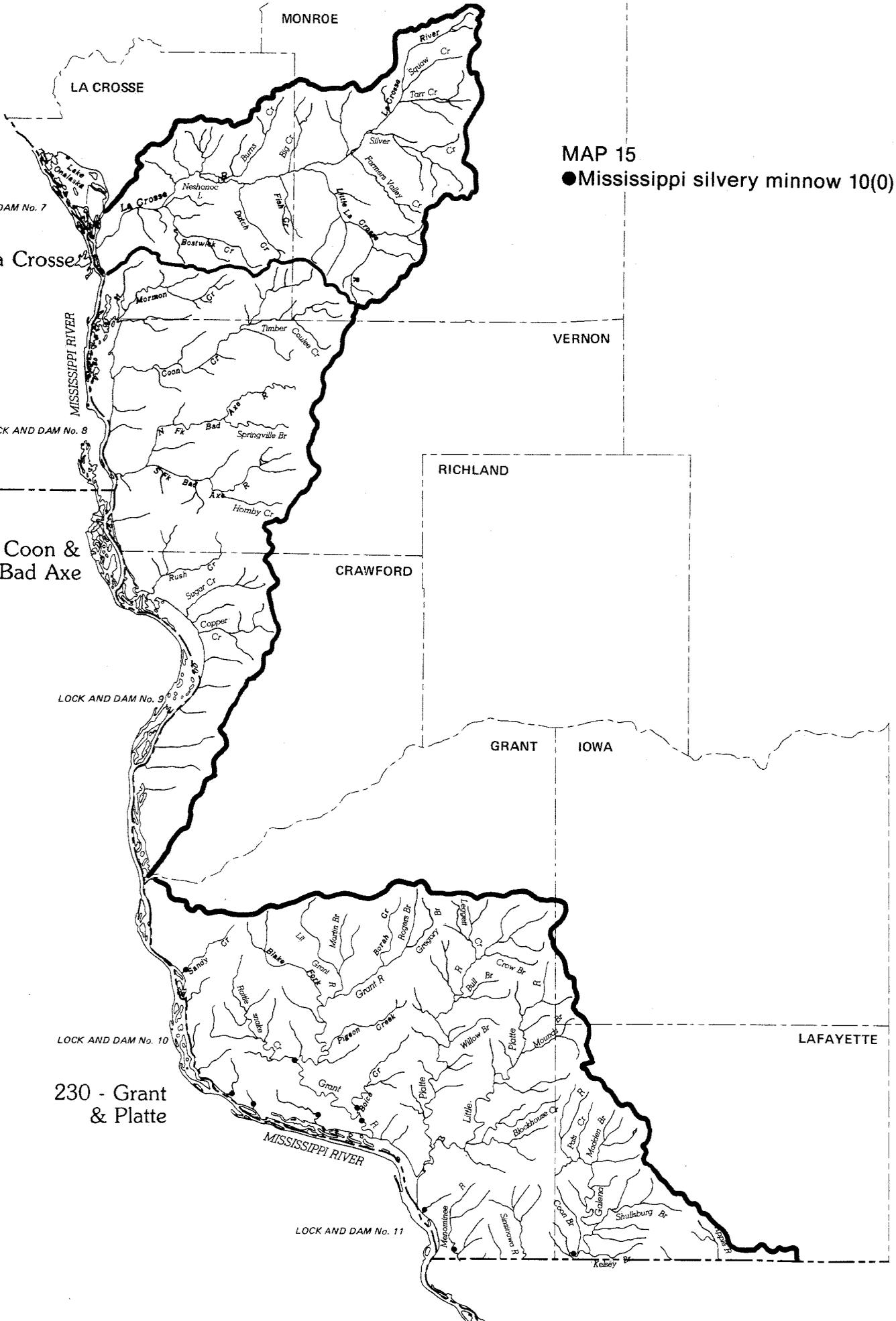
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 16

● Silver chub 6(0)

LOCK AND DAM No. 7

260 - La Crosse

VERNON

LOCK AND DAM No. 8

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

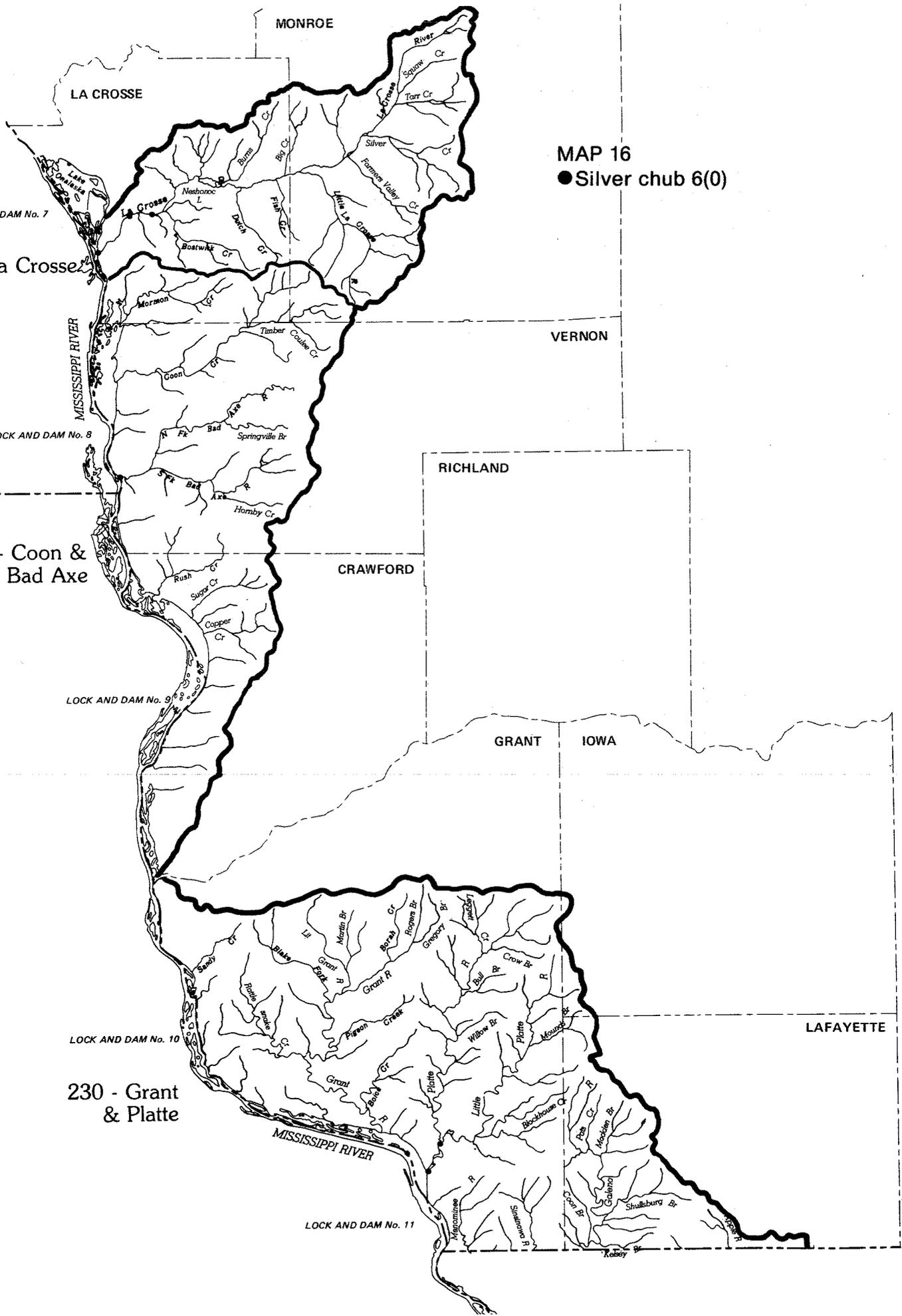
IOWA

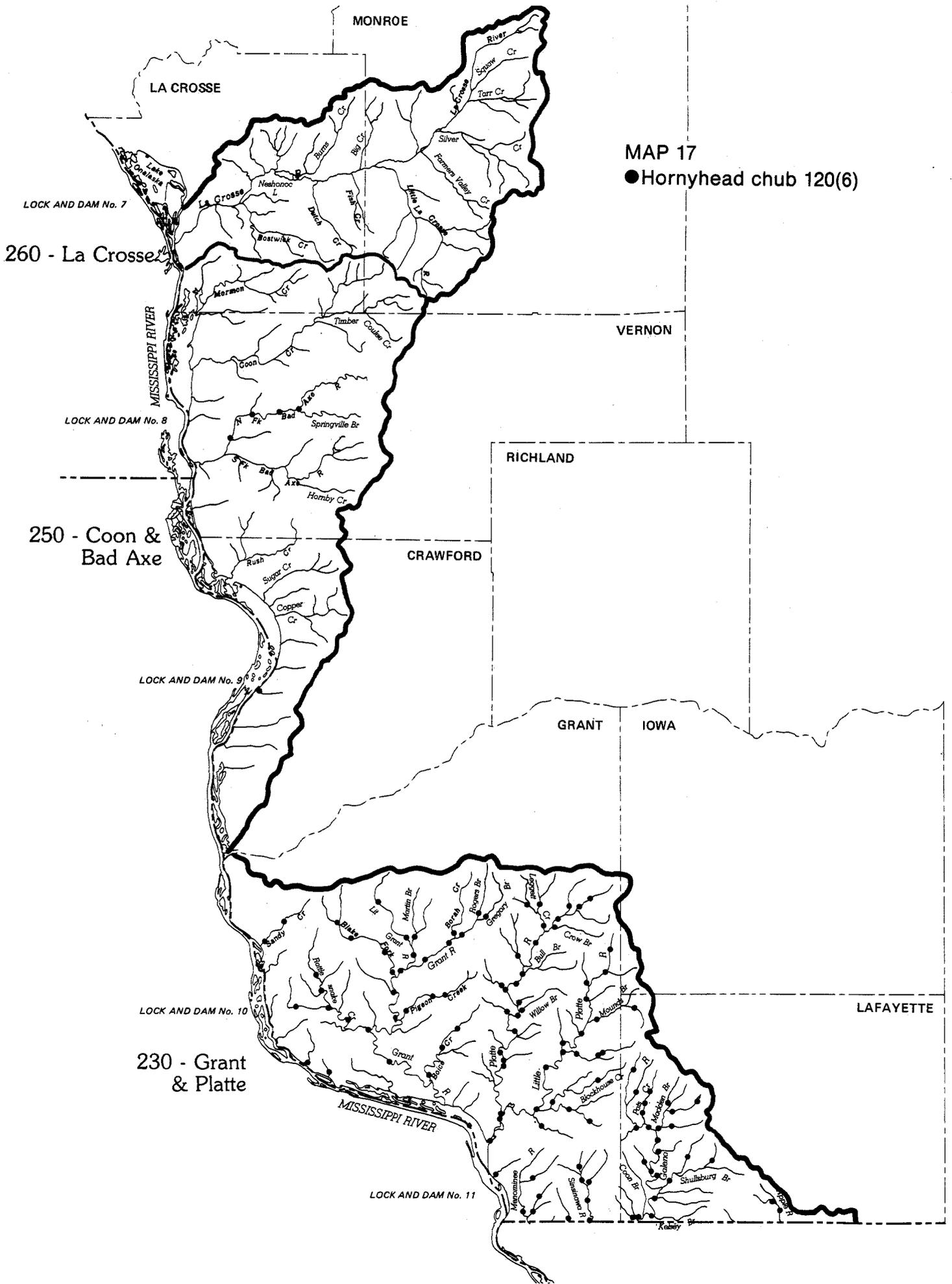
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

LOCK AND DAM No. 11





MAP 17
 ●Hornyhead chub 120(6)

260 - La Crosse

250 - Coon & Bad Axe

230 - Grant & Platte

LOCK AND DAM No. 7

LOCK AND DAM No. 8

LOCK AND DAM No. 9

LOCK AND DAM No. 10

LOCK AND DAM No. 11

LA CROSSE

MONROE

VERNON

RICHLAND

CRAWFORD

GRANT

IOWA

LAFAYETTE

MISSISSIPPI RIVER

MISSISSIPPI RIVER

Lake Onalaska

La Crosse

Mazoni Cr.

Coon Cr.

Bad Axe Cr.

Springville Br.

Hornby Cr.

Rush Cr.

Sugar Cr.

Copper Cr.

Sandy Cr.

Black Cr.

Grant R.

Pigeon Creek

Willow Br.

Platte R.

Little Platte

Bookhouse Cr.

Chalk Cr.

Moulton Br.

Shullaburg Br.

Kelsey Br.

La Crosse River

Silver River

Neshonoc L.

Timber Coulee Cr.

Springville Br.

Hornby Cr.

Barre Cr.

MONROE

LA CROSSE

MAP 18

● Golden shiner 9(1)

LOCK AND DAM No. 7

260 - La Crosse

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

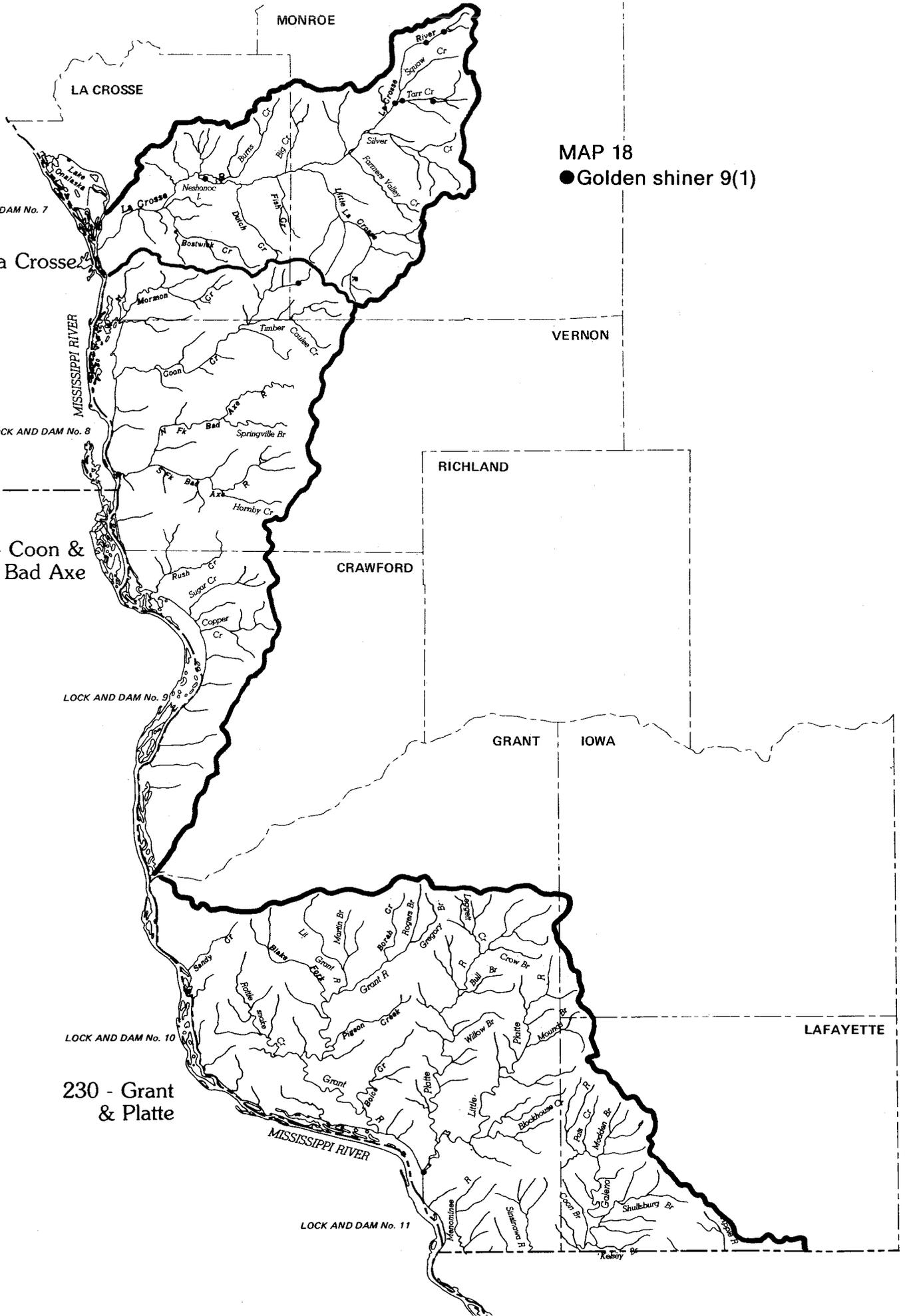
IOWA

LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 19

● Emerald shiner 19(5)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

250 - Coon & Bad Axe

LOCK AND DAM No. 9

CRAWFORD

RICHLAND

VERNON

GRANT

IOWA

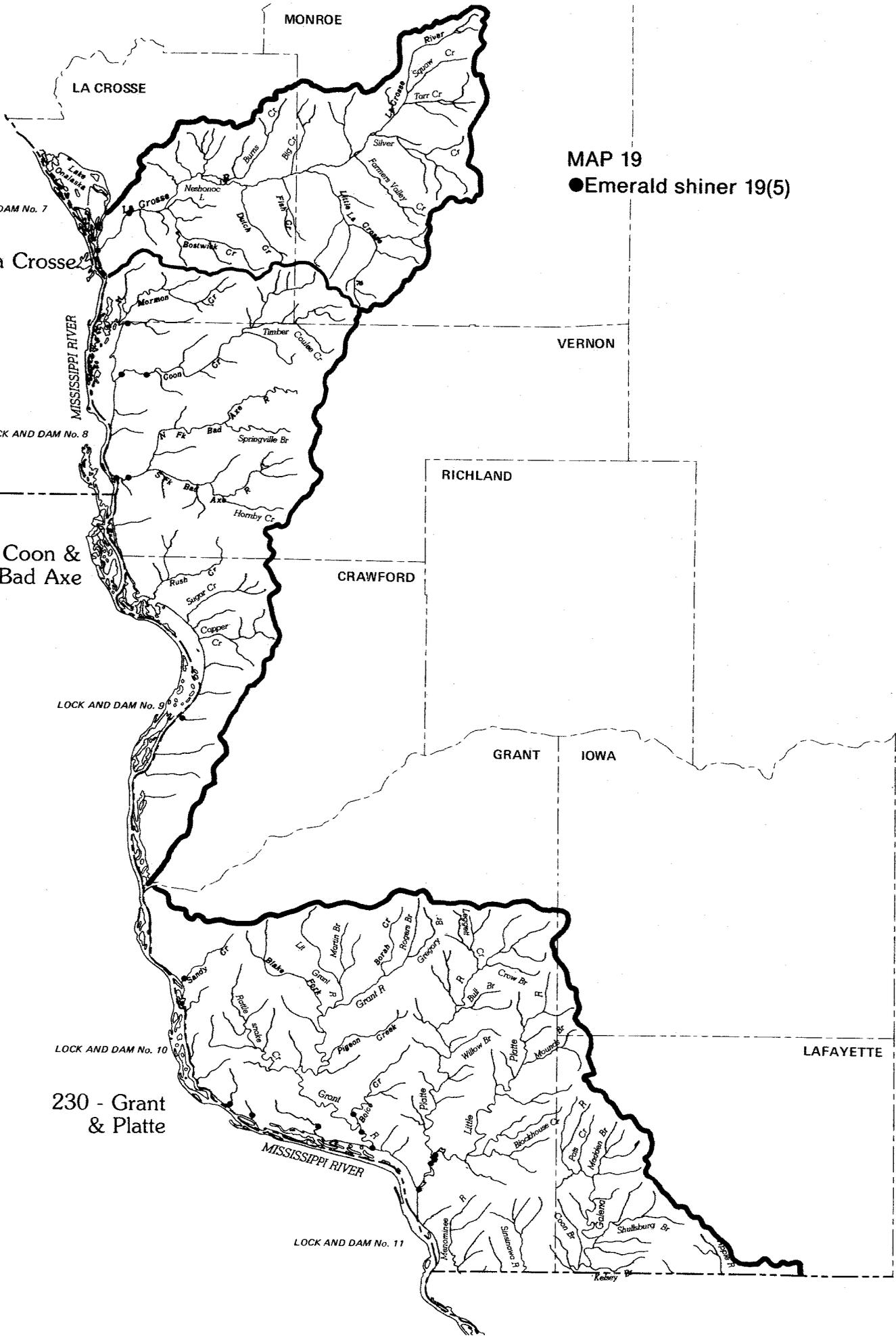
LOCK AND DAM No. 10

230 - Grant & Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

LAFAYETTE



MONROE

LA CROSSE

MAP 20

●River shiner 15(3)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

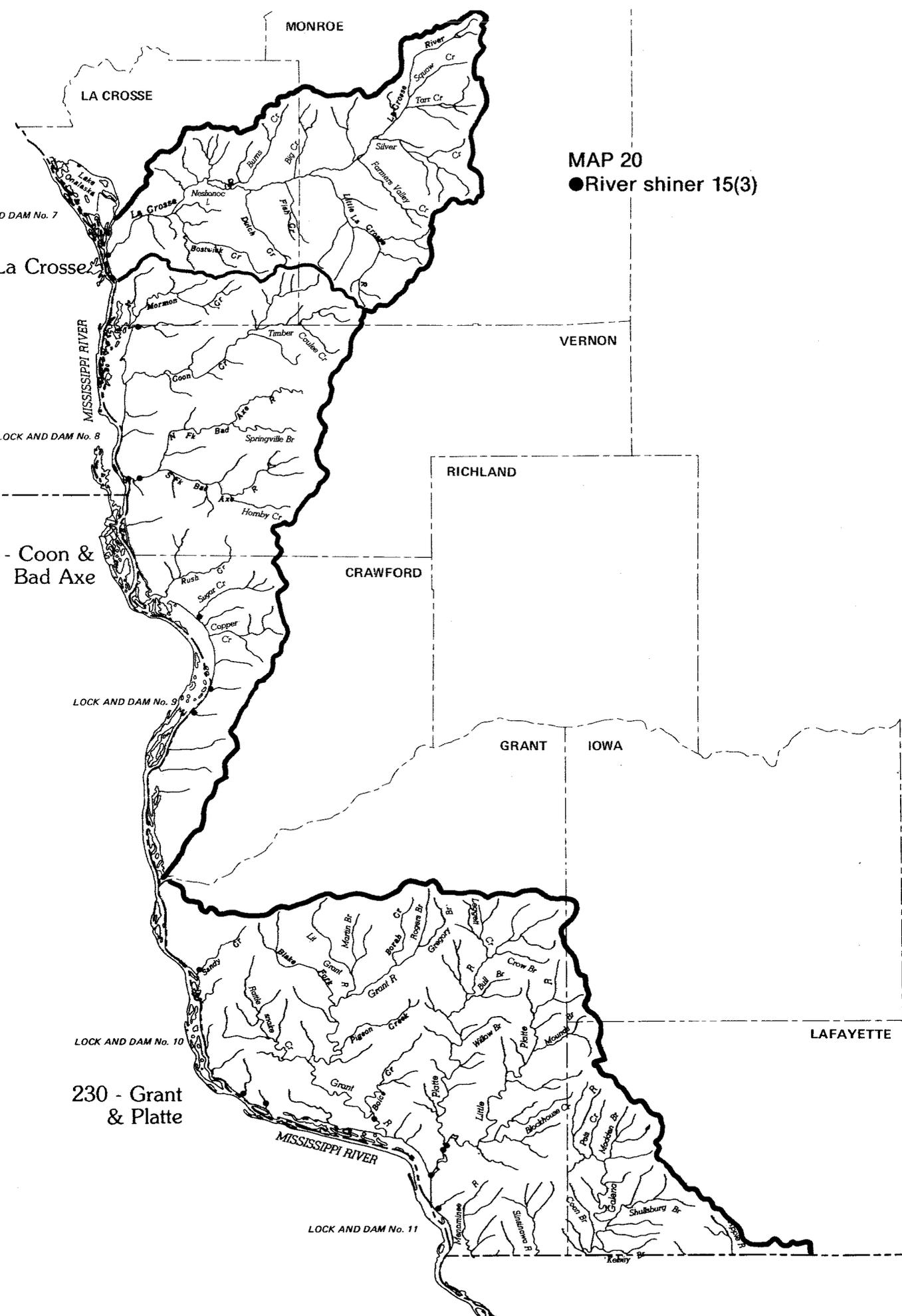
LOCK AND DAM No. 10

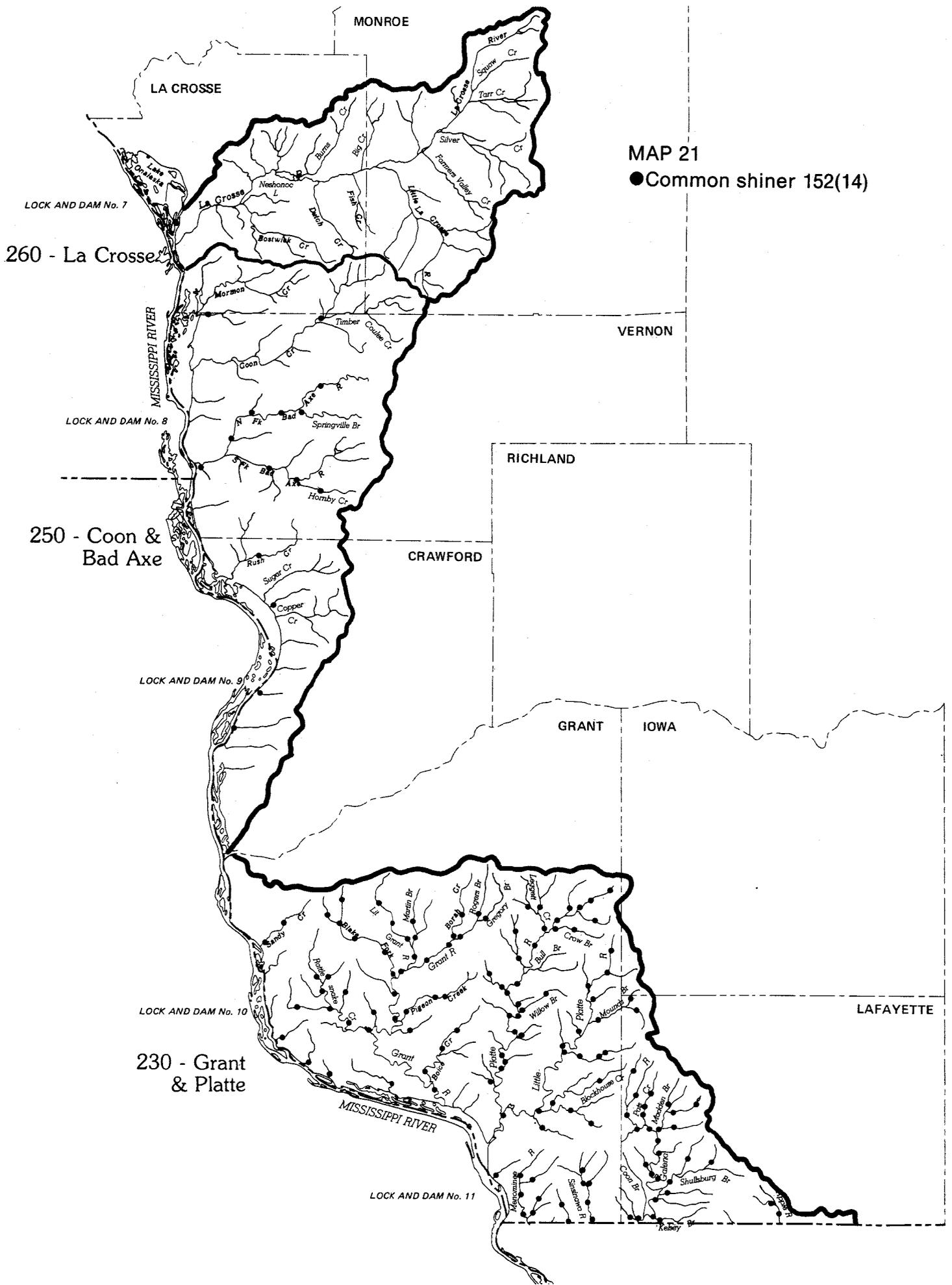
230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11





MAP 21

● Common shiner 152(14)

LOCK AND DAM No. 7

260 - La Crosse

LOCK AND DAM No. 8

250 - Coon & Bad Axe

LOCK AND DAM No. 9

LOCK AND DAM No. 10

230 - Grant & Platte

LOCK AND DAM No. 11

MONROE

LA CROSSE

VERNON

RICHLAND

CRAWFORD

GRANT

IOWA

LAFAYETTE

Neshonoc

Mormon

Coon

Bad Axe

Springville Br

Homby Cr

Rush Cr

Sugar Cr

Copper Cr

Sandy Cr

Little

Grant

Pigeon

Willow Br

Platte

Mounds

Little

Blochouse

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br

Mesquimie

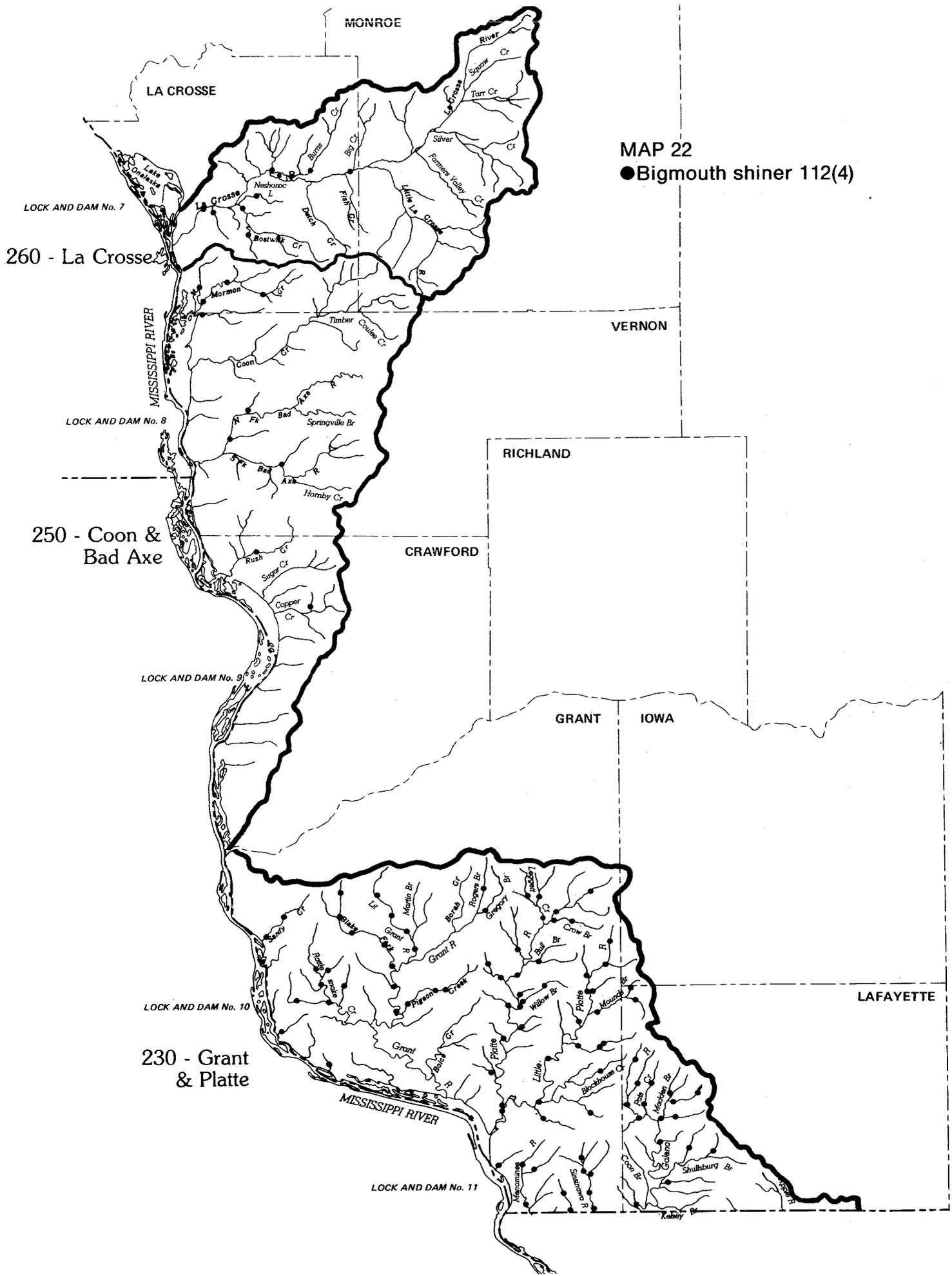
Swains

Coar Br

Crabara

Shullsburg Br

Kehey Br



MAP 22
●Bigmouth shiner 112(4)

MONROE

LA CROSSE

MAP 23

● Spottail shiner 13(7)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

250 - Coon & Bad Axe

LOCK AND DAM No. 9

CRAWFORD

RICHLAND

VERNON

GRANT

IOWA

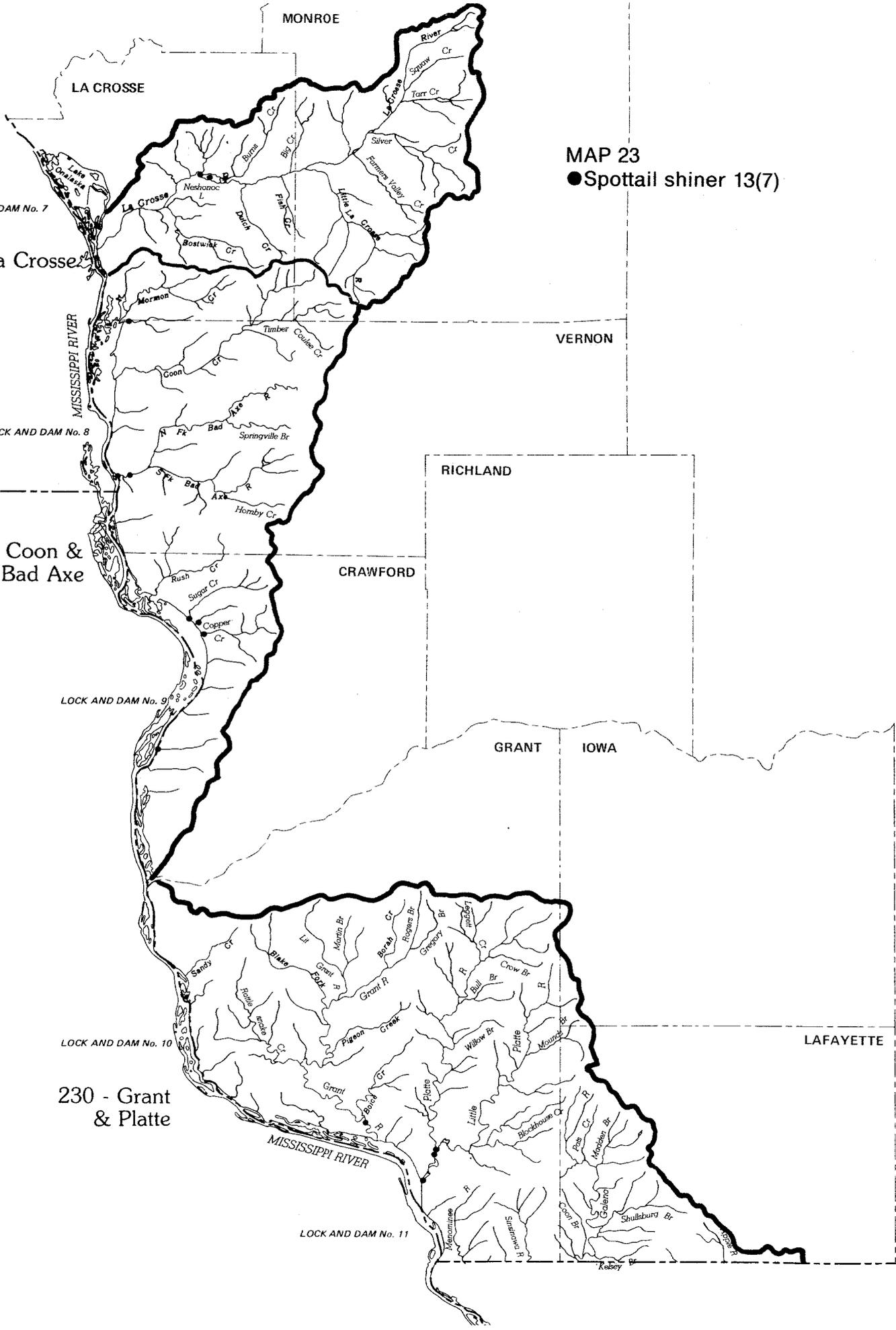
LOCK AND DAM No. 10

230 - Grant & Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

LAFAYETTE



MONROE

LA CROSSE

MAP 24

● Ozark minnow 26(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

VERNON

LOCK AND DAM No. 8

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

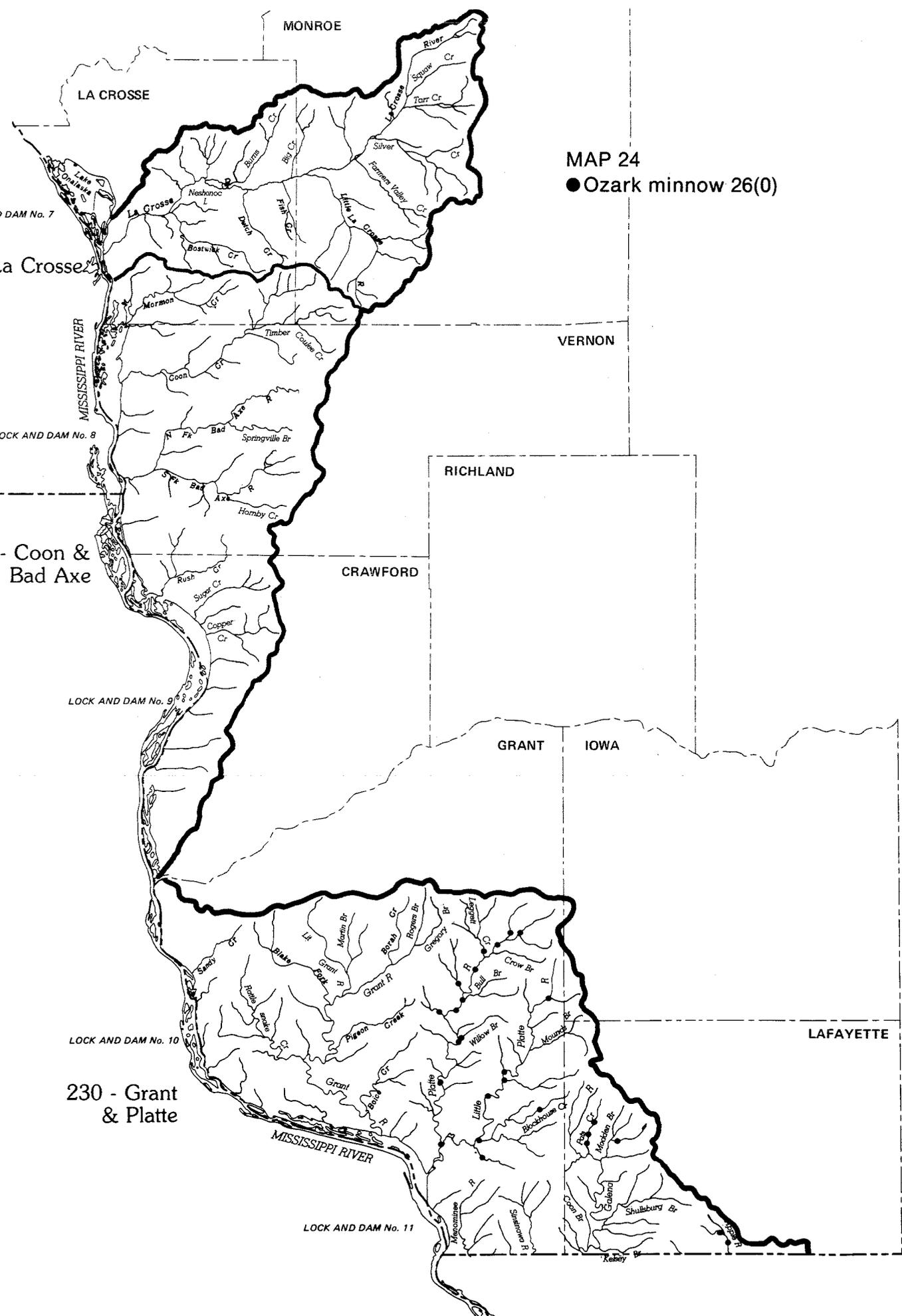
LOCK AND DAM No. 10

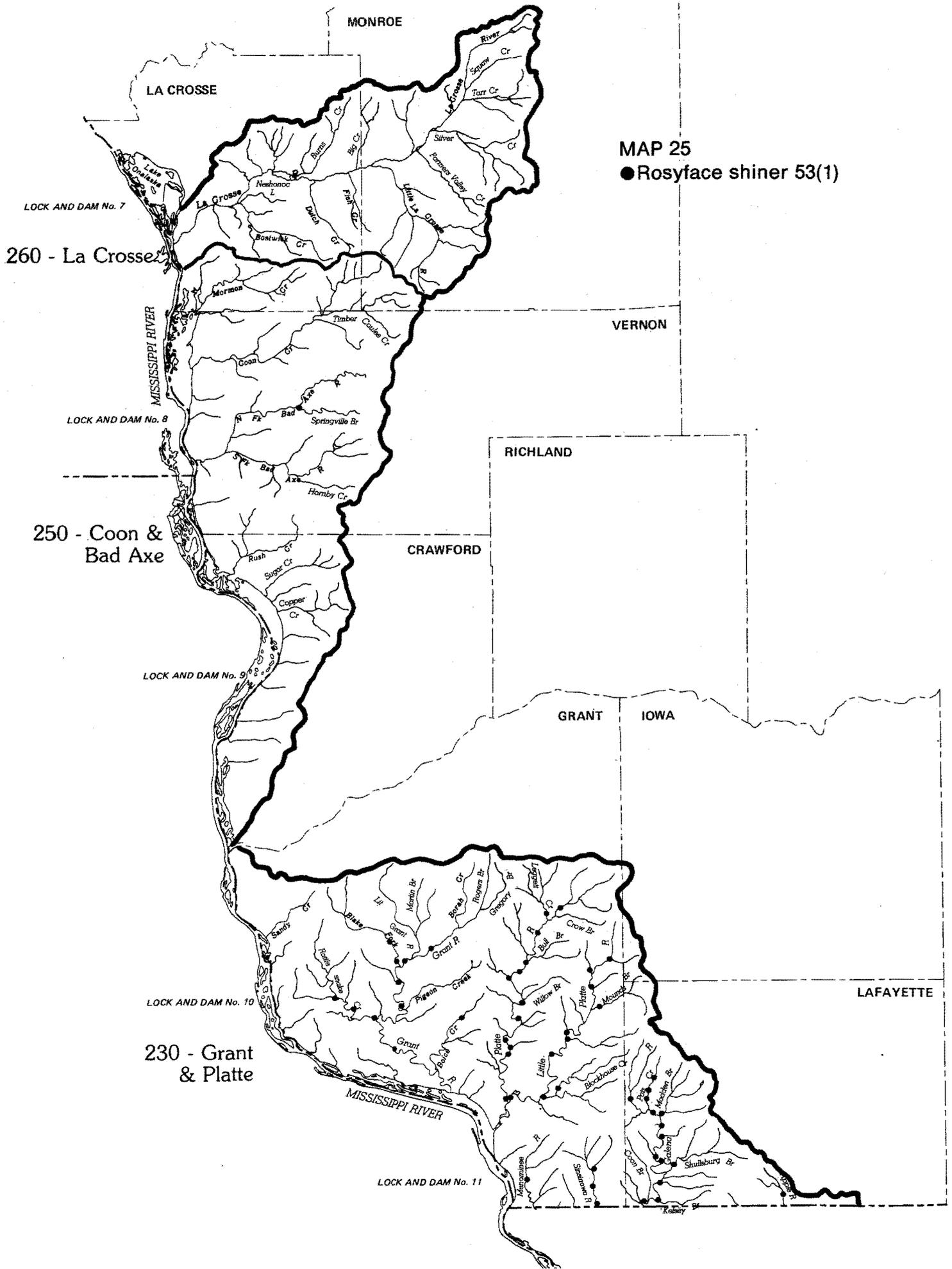
230 - Grant & Platte

LAFAYETTE

LOCK AND DAM No. 11

MISSISSIPPI RIVER





MONROE

LA CROSSE

MAP 26

● Spotfin shiner 60(17)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

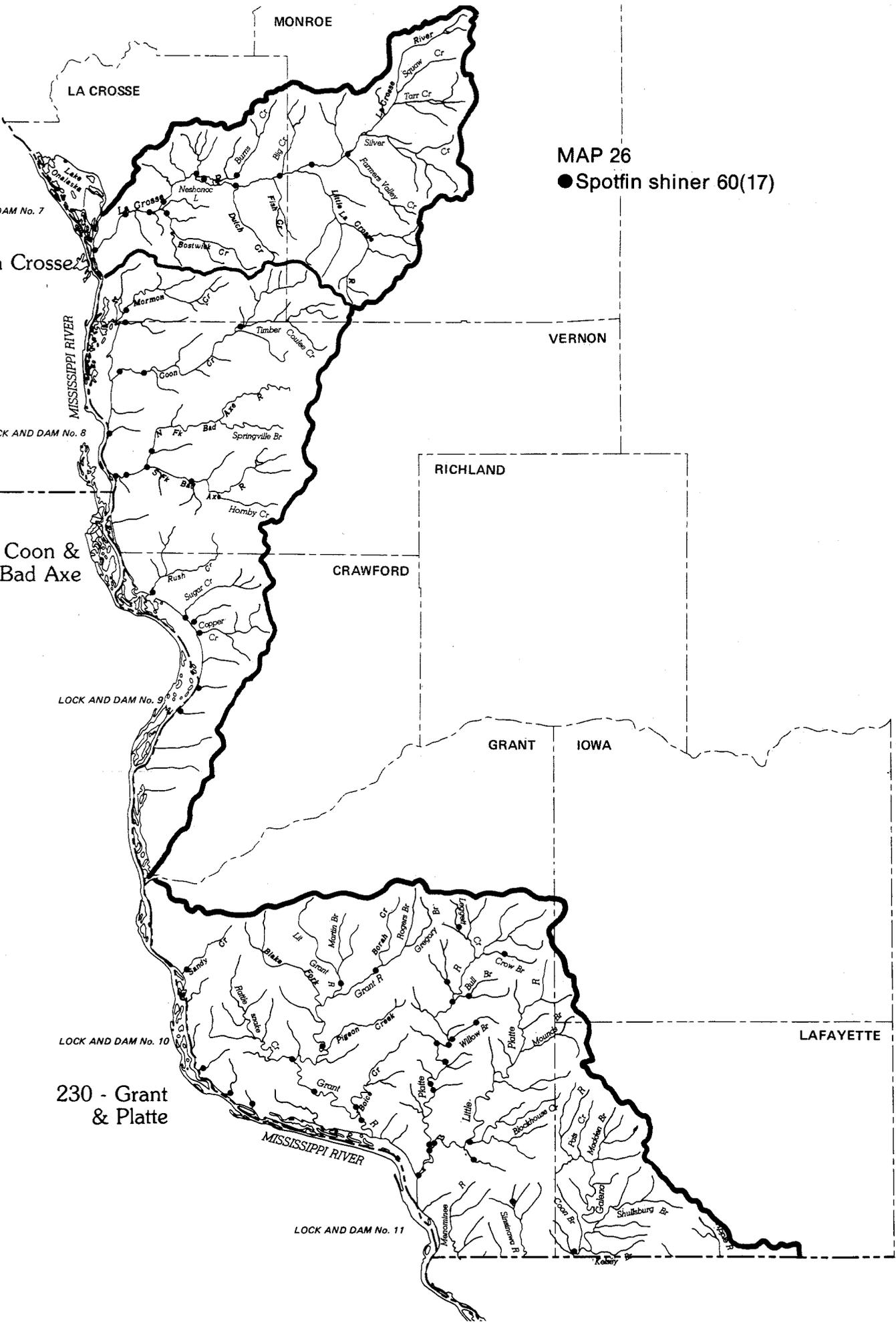
LOCK AND DAM No. 10

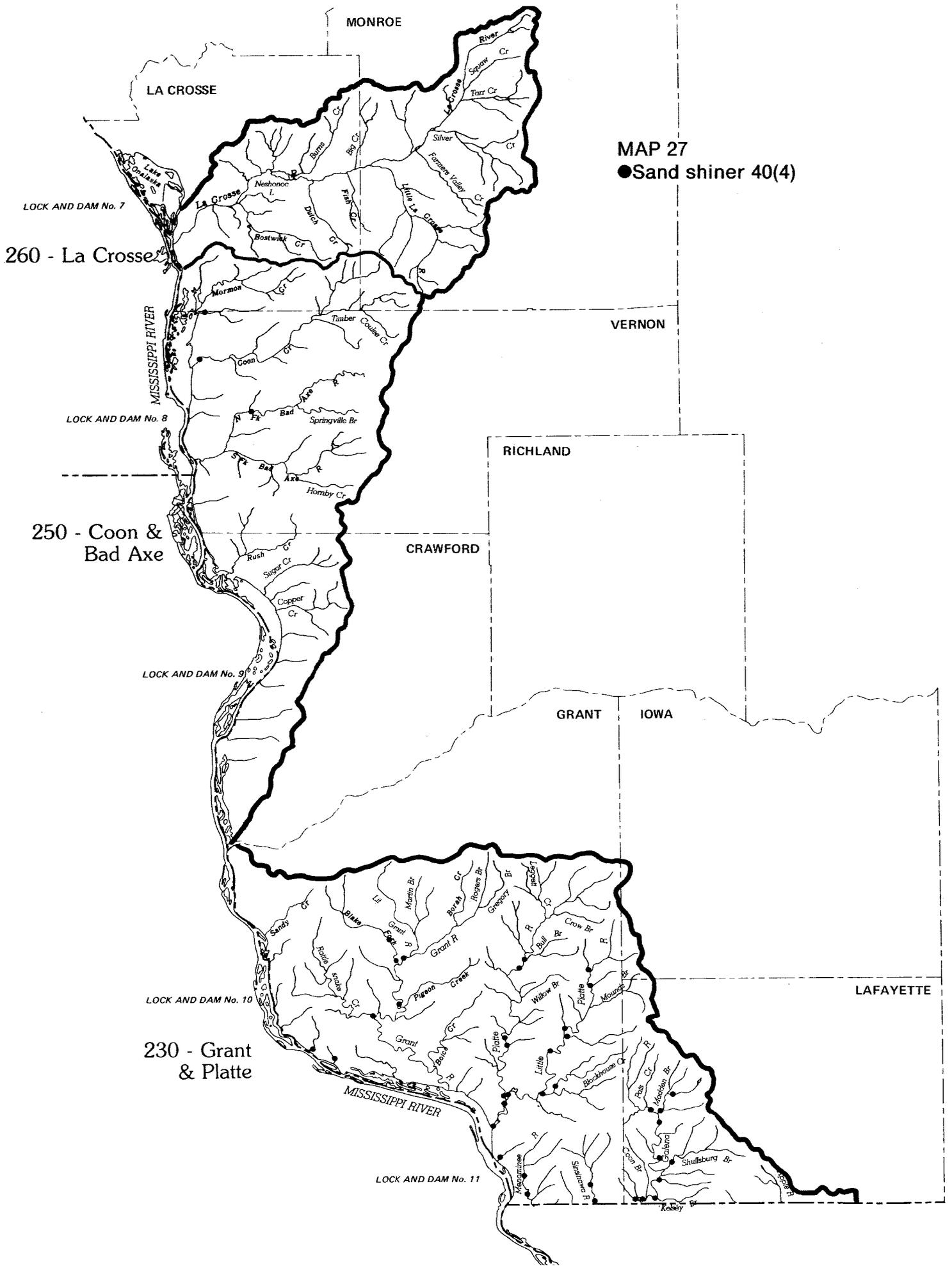
230 - Grant & Platte

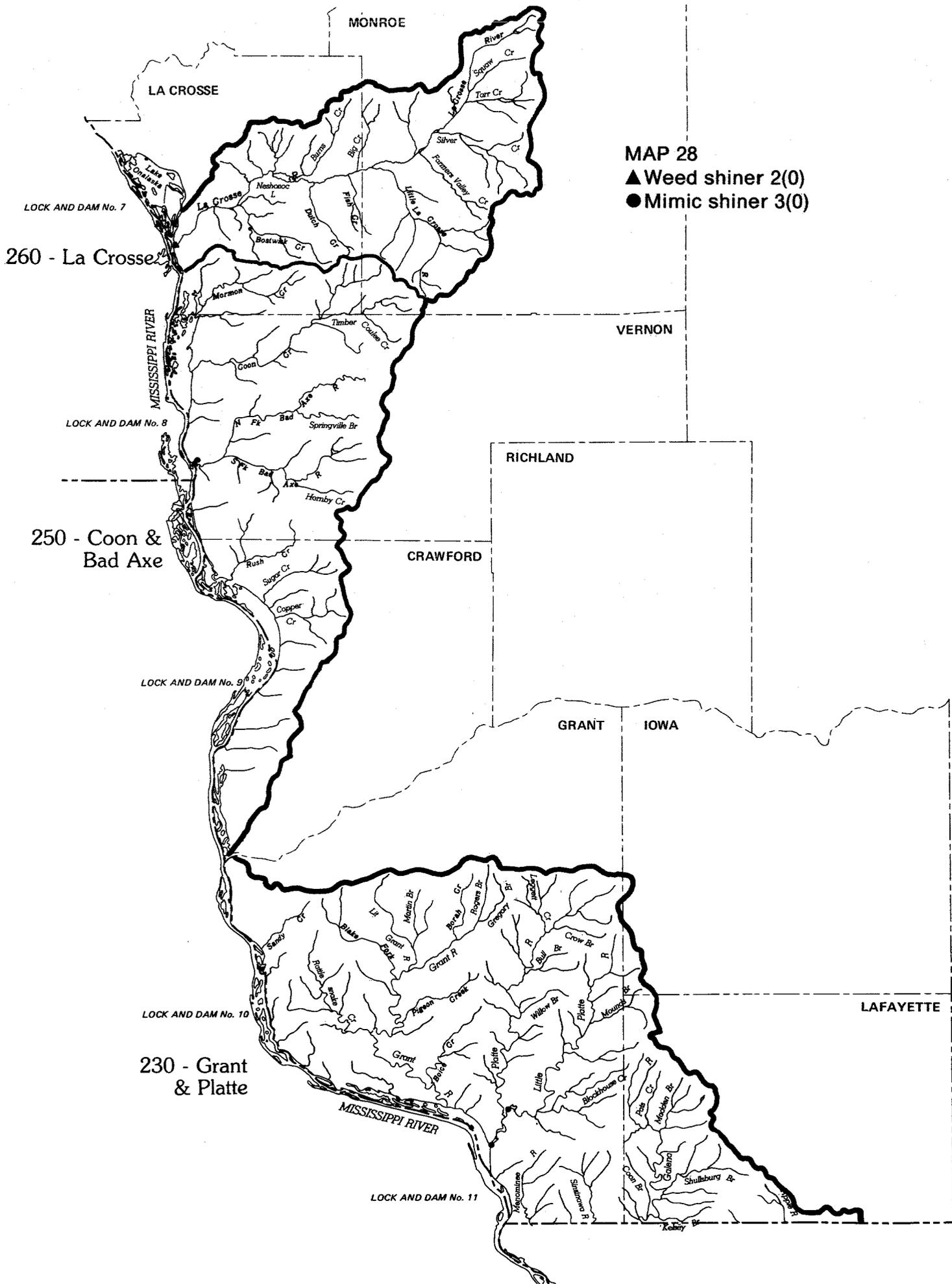
LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11







MAP 28
 ▲ Weed shiner 2(0)
 ● Mimic shiner 3(0)

260 - La Crosse

250 - Coon & Bad Axe

230 - Grant & Platte

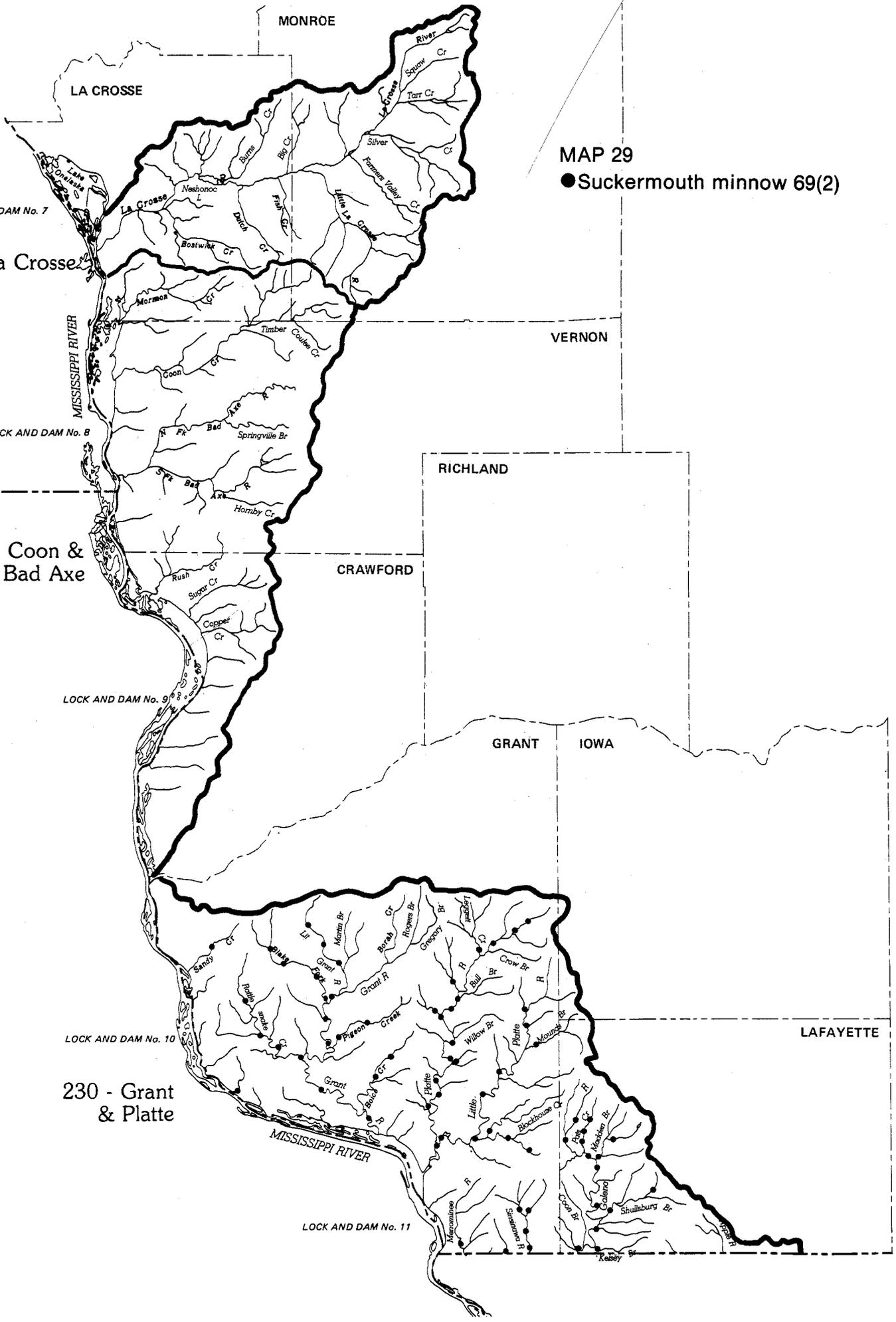
260 - La Crosse

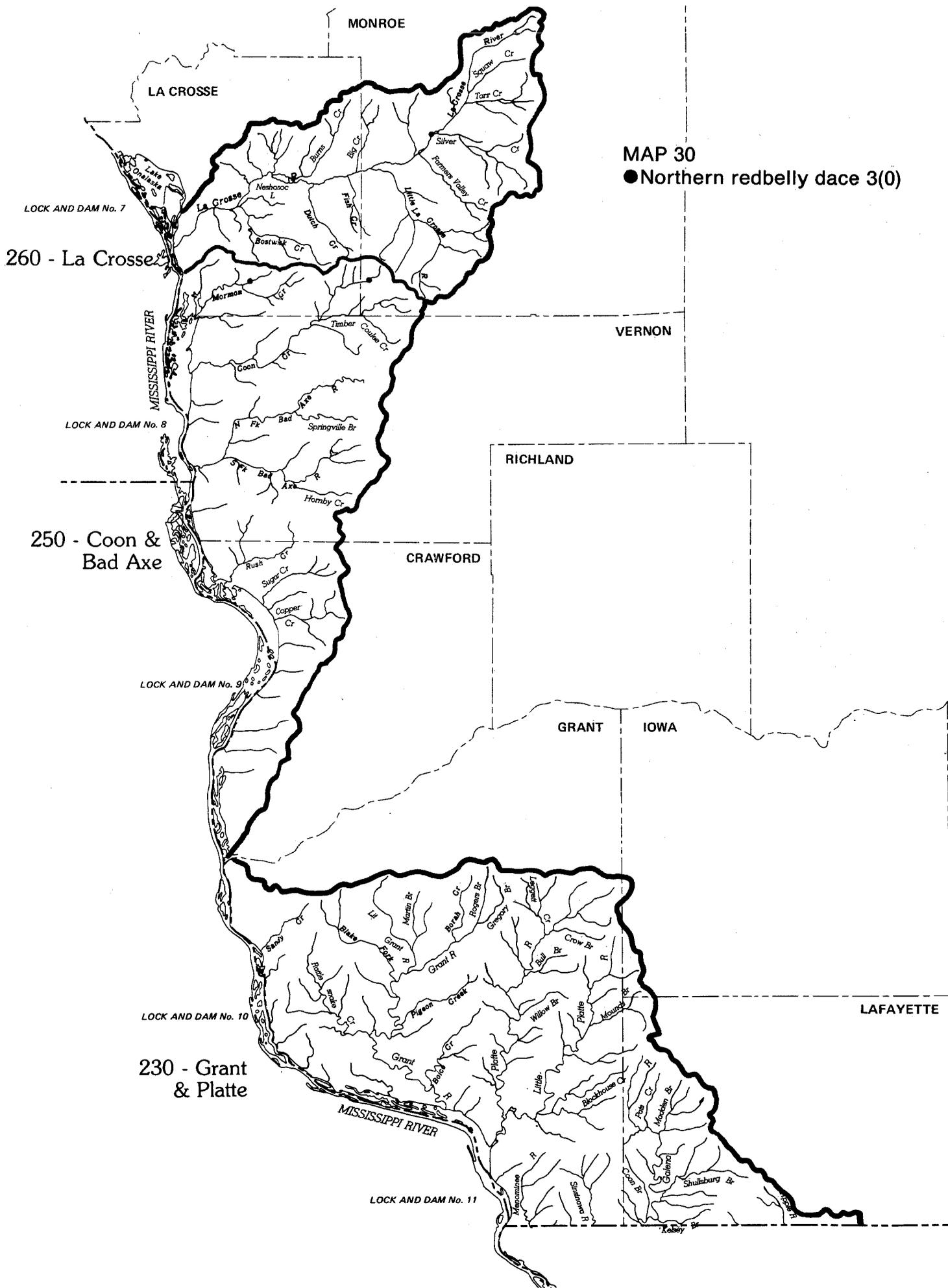
250 - Coon & Bad Axe

230 - Grant & Platte

MAP 29

● Suckermouth minnow 69(2)





MONROE

LA CROSSE

MAP 31

● Southern redbelly dace 132(7)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

250 - Coon & Bad Axe

LOCK AND DAM No. 9

CRAWFORD

RICHLAND

VERNON

GRANT

IOWA

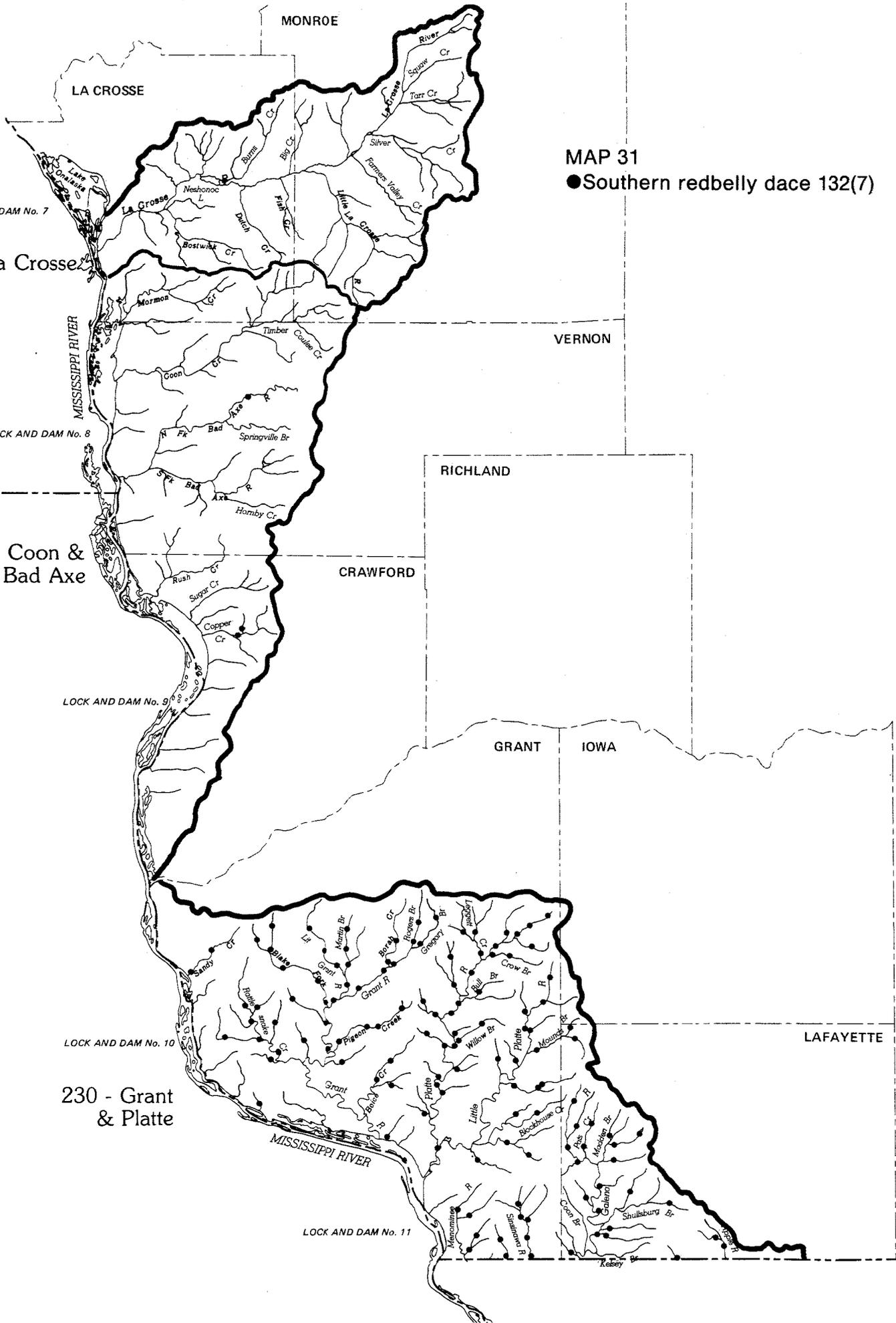
LOCK AND DAM No. 10

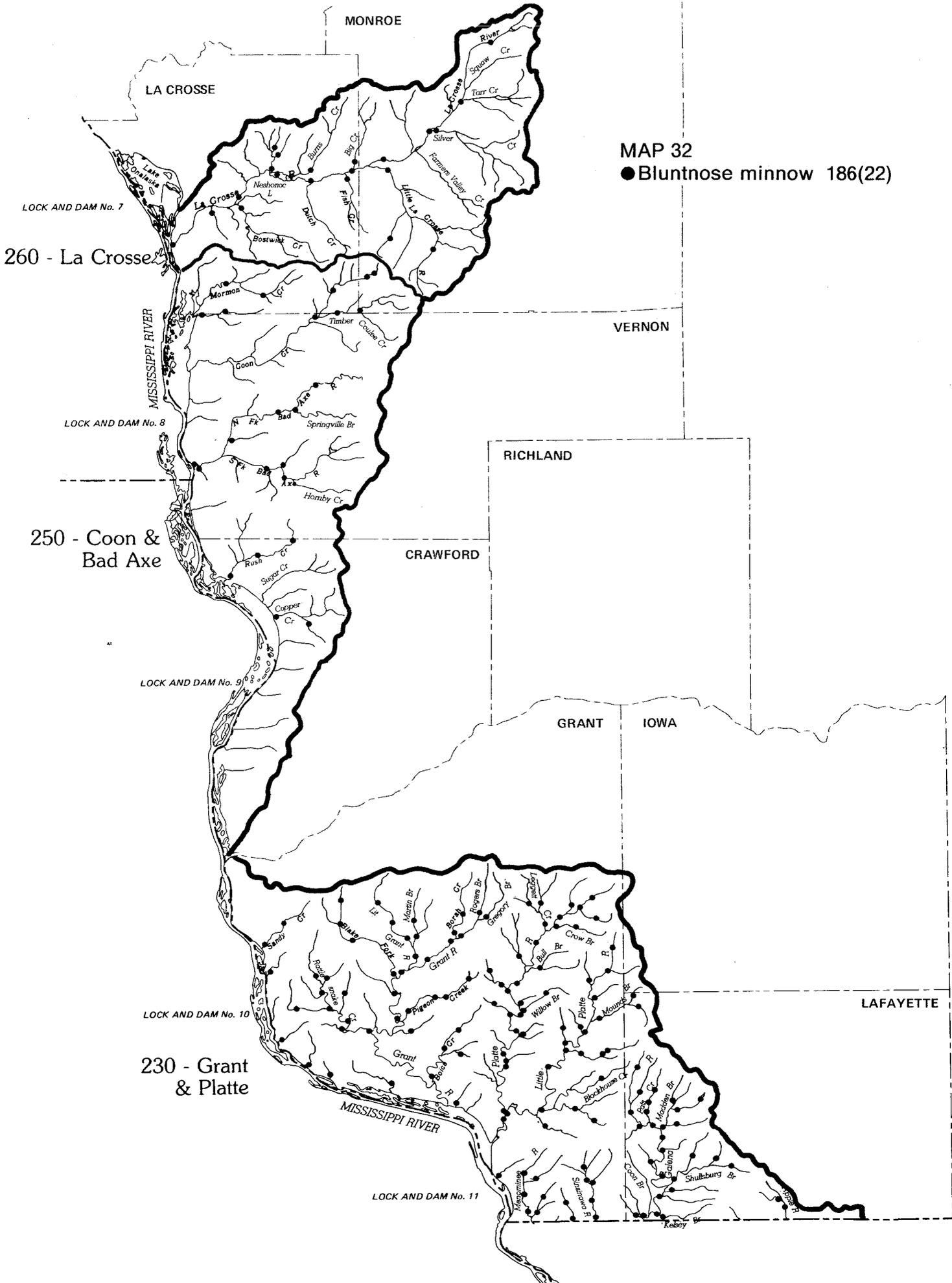
230 - Grant & Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

LAFAYETTE





MONROE

LA CROSSE

MAP 32
● Bluntnose minnow 186(22)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

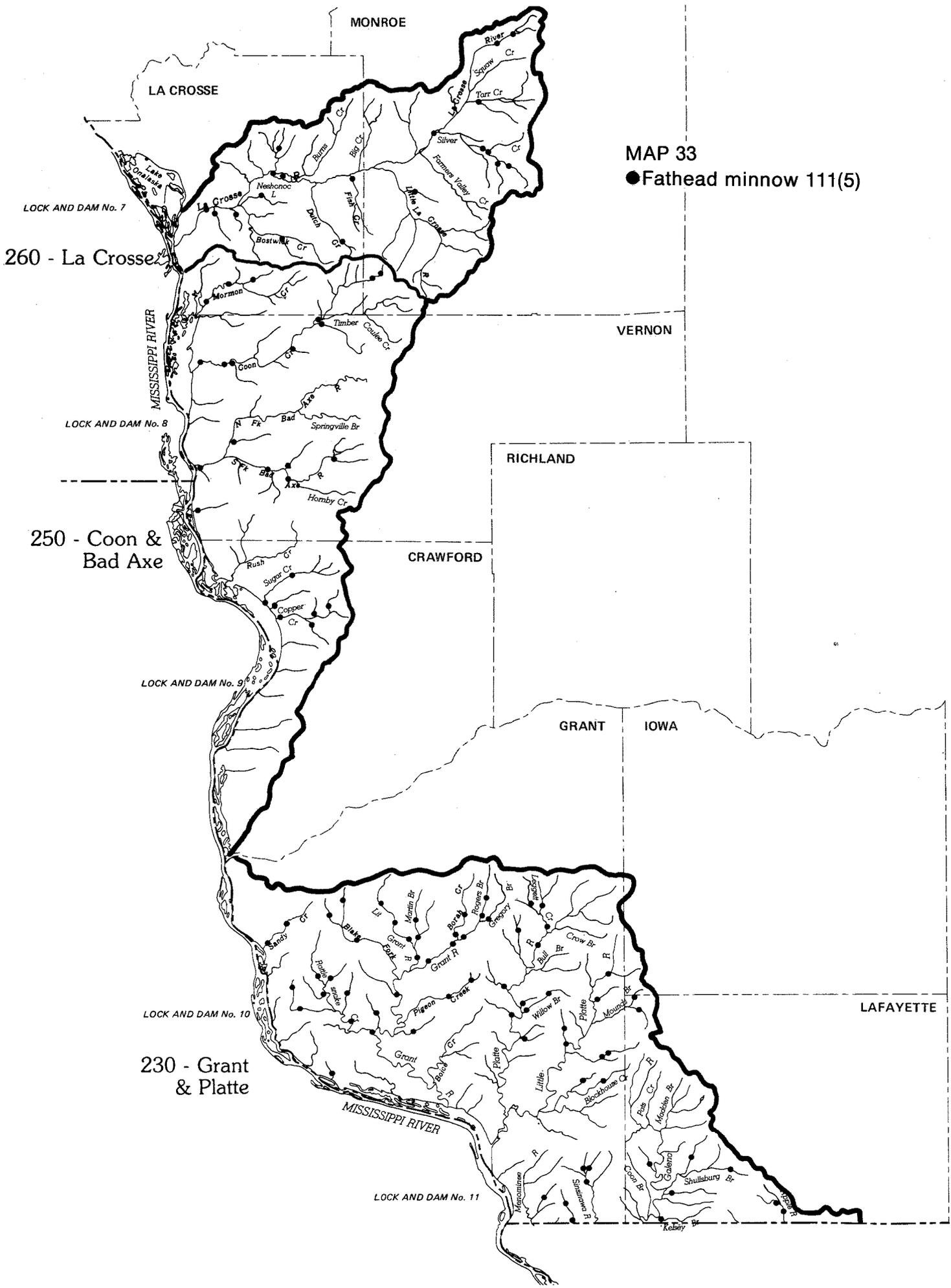
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MAP 33

● Fathead minnow 111(5)

260 - La Crosse

250 - Coon & Bad Axe

230 - Grant & Platte

MONROE

LA CROSSE

VERNON

RICHLAND

CRAWFORD

GRANT

IOWA

LAFAYETTE

LOCK AND DAM No. 7

LOCK AND DAM No. 8

LOCK AND DAM No. 9

LOCK AND DAM No. 10

LOCK AND DAM No. 11

MISSISSIPPI RIVER

MISSISSIPPI RIVER

Lake Onalaska

La Crosse

Mormon

Coon

Bad

Hornby

Rush

Copper

Sugar

Copper

Grant

Pigeon

Grant

Little

Rockhouse

Pass

Meador

Shullsburg

Kobay

Shullsburg

La Crosse

Neshonoc

La Crosse

Mormon

Coon

Bad

Hornby

Rush

Copper

Sugar

Copper

Grant

Pigeon

Grant

Little

Rockhouse

Pass

Meador

Shullsburg

Kobay

Shullsburg

Kobay

Shullsburg

La Crosse

Neshonoc

La Crosse

Mormon

Coon

Bad

Hornby

Rush

Copper

Sugar

Copper

Grant

Pigeon

Grant

Little

Rockhouse

Pass

Meador

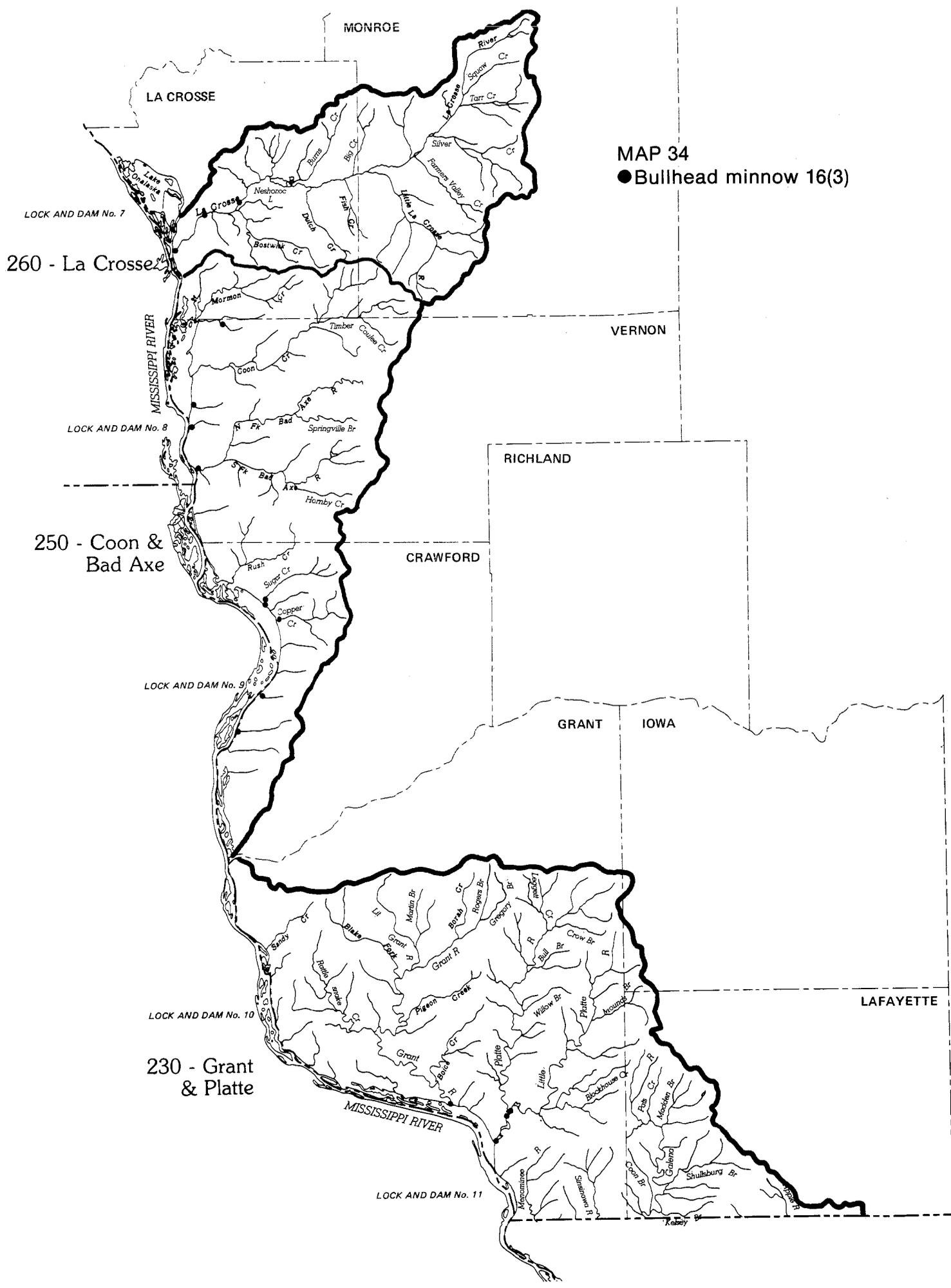
Shullsburg

Kobay

Shullsburg

Kobay

Shullsburg



MAP 34
 ● Bullhead minnow 16(3)

260 - La Crosse

250 - Coon & Bad Axe

230 - Grant & Platte

MONROE

LA CROSSE

MAP 35

● Blacknose dace 140(12)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

250 - Coon & Bad Axe

CRAWFORD

RICHLAND

VERNON

LOCK AND DAM No. 9

GRANT

IOWA

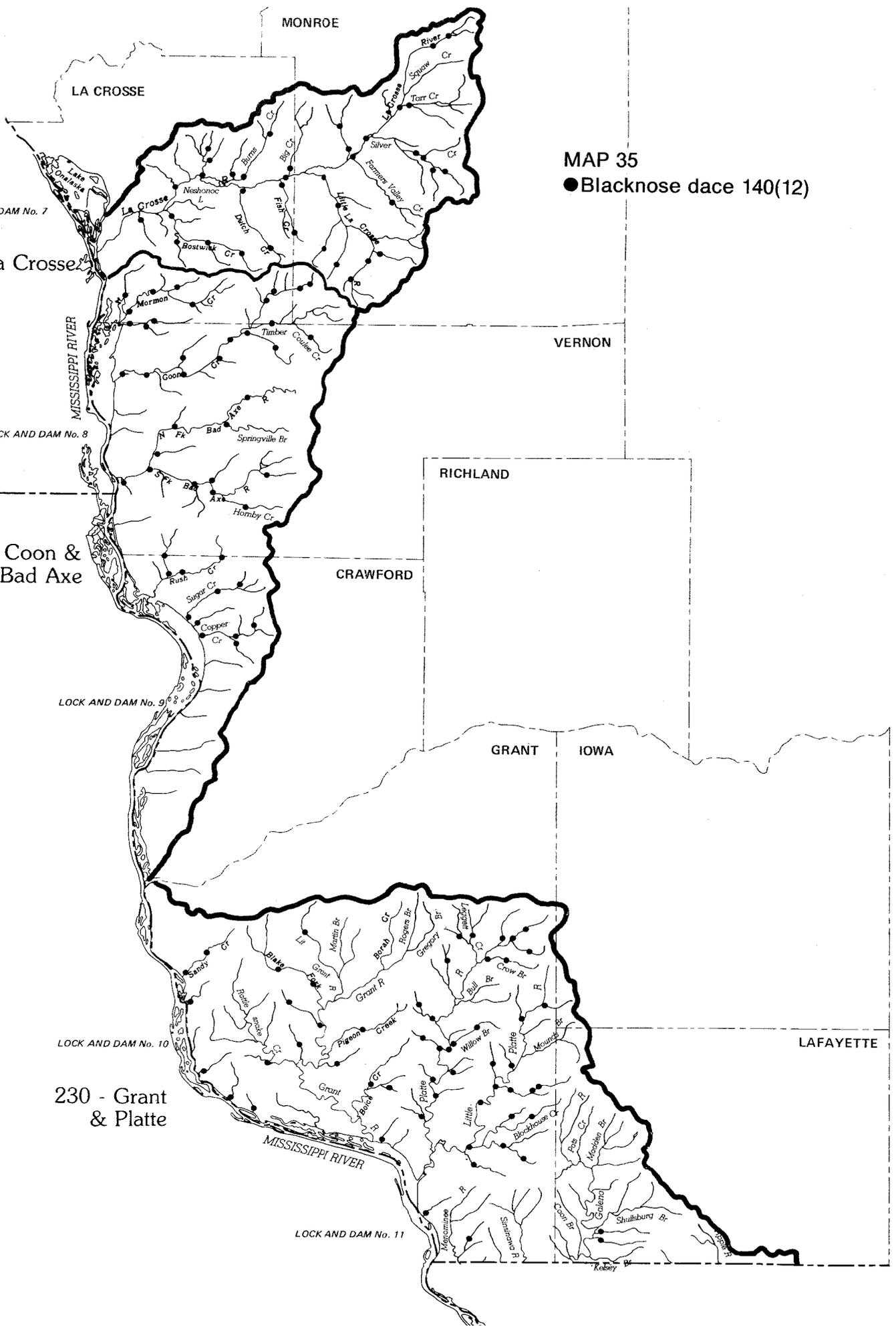
LOCK AND DAM No. 10

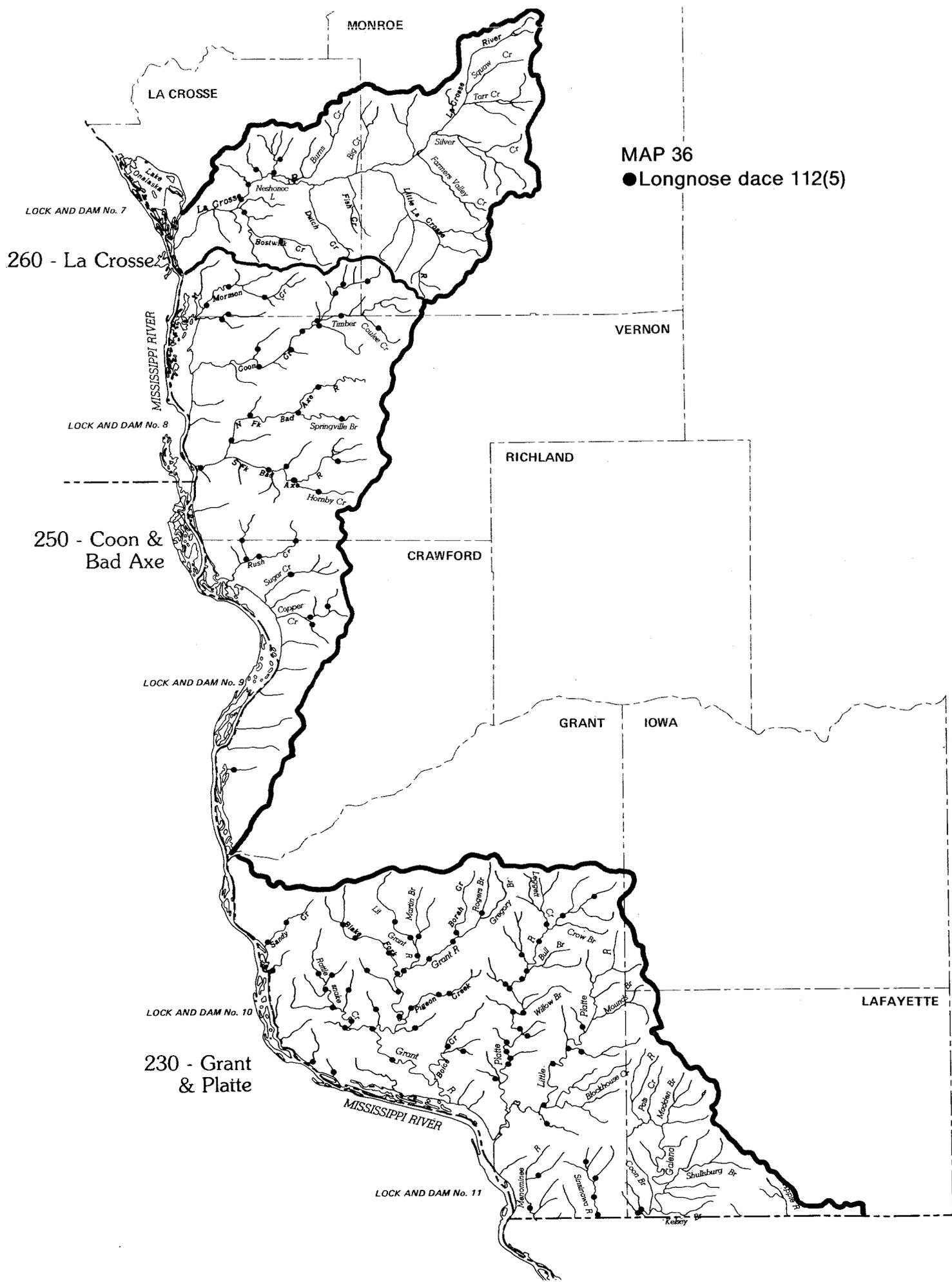
230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11





MAP 36

● Longnose dace 112(5)

260 - La Crosse

250 - Coon & Bad Axe

230 - Grant & Platte

LOCK AND DAM No. 7

LOCK AND DAM No. 8

LOCK AND DAM No. 9

LOCK AND DAM No. 10

LOCK AND DAM No. 11

LA CROSSE

MONROE

VERNON

RICHLAND

CRAWFORD

GRANT

IOWA

LAFAYETTE

La Crosse

Mormon

Coon

Bad Axe

Rush

Copper

Grant

Platte

MONROE

LA CROSSE

MAP 37

● Creek chub 217(14)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

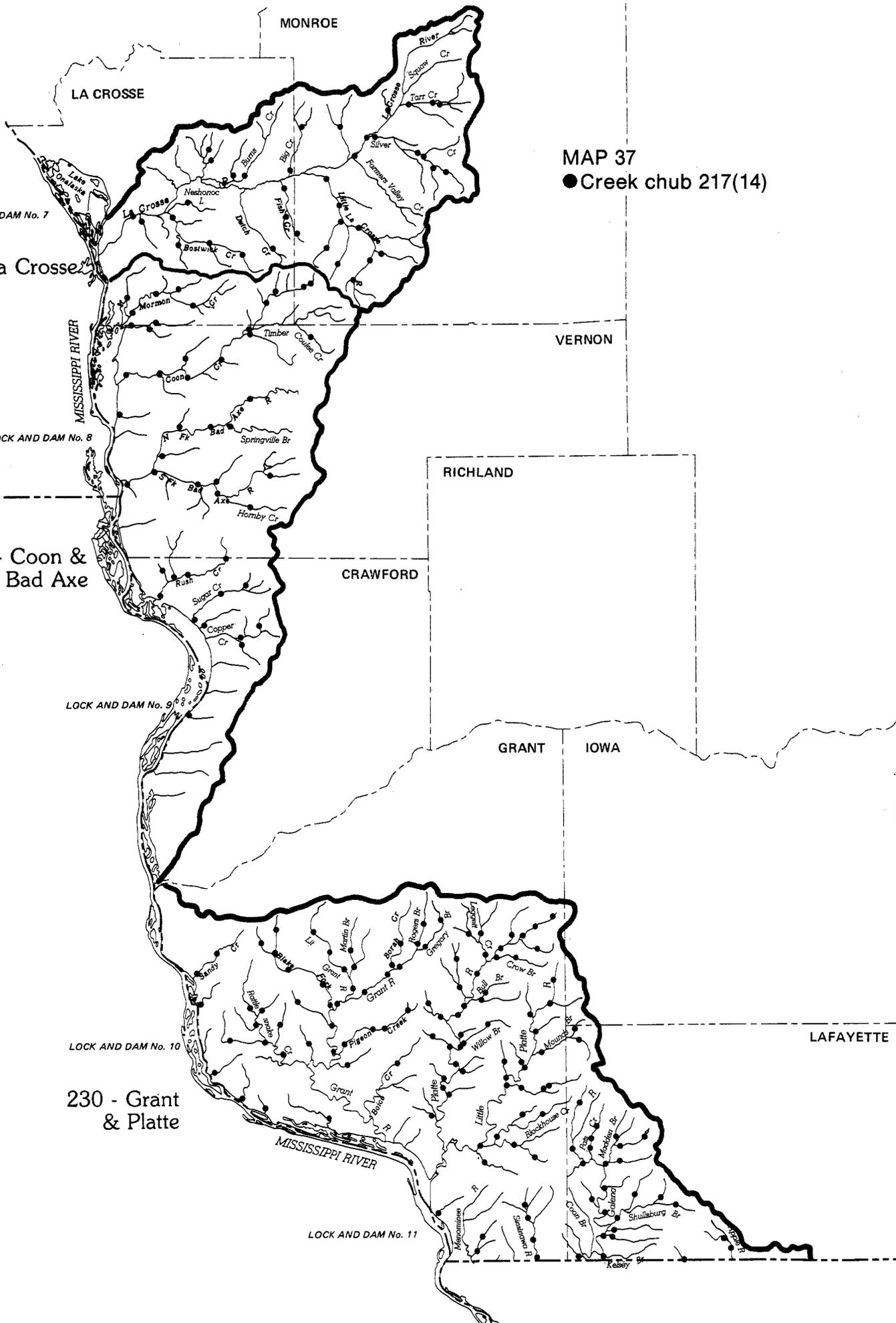
LOCK AND DAM No. 10

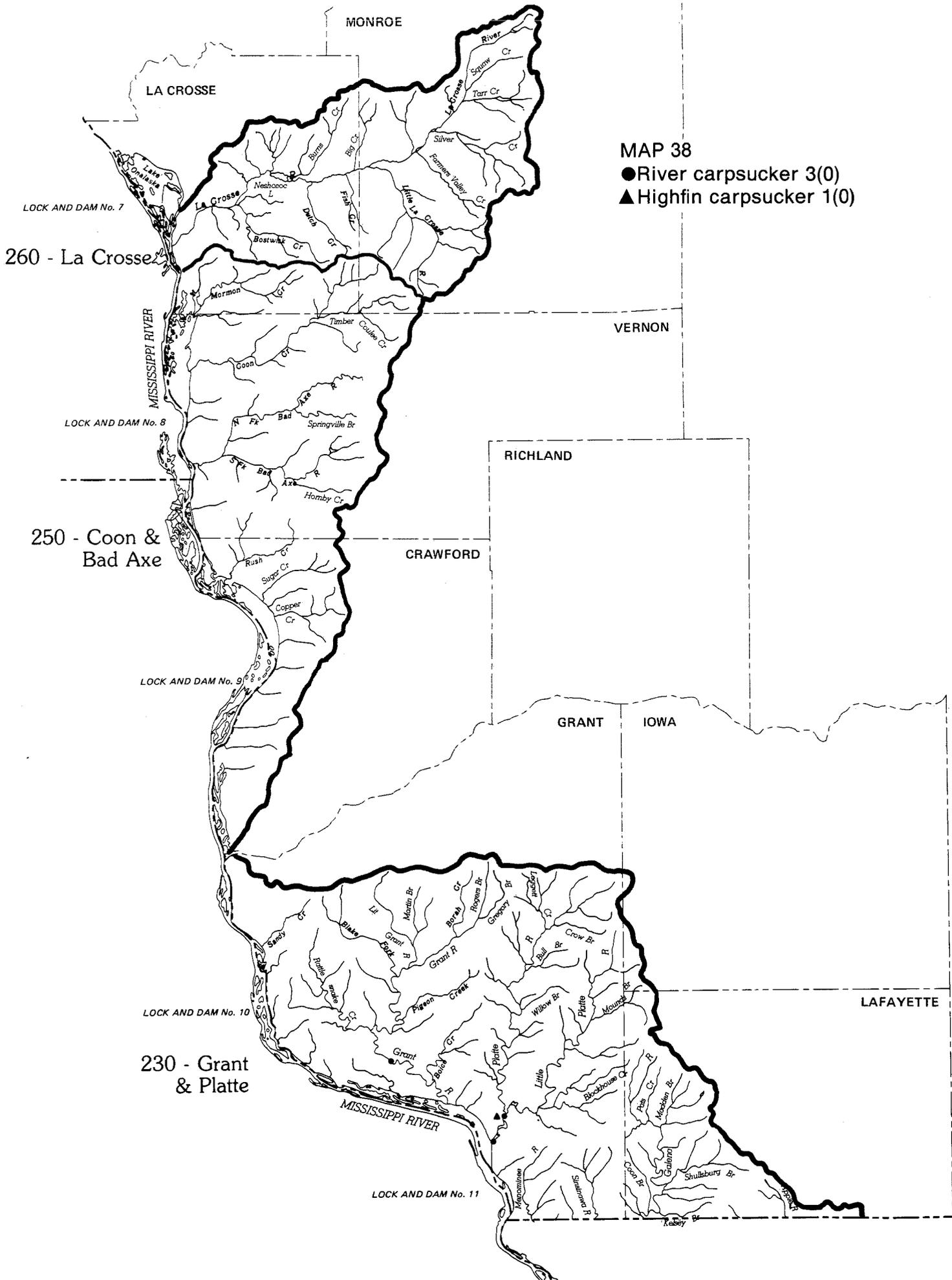
230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11





MAP 38

● River carpsucker 3(0)

▲ Highfin carpsucker 1(0)

260 - La Crosse

250 - Coon & Bad Axe

230 - Grant & Platte

MONROE

LA CROSSE

MAP 39

● Quillback 13(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

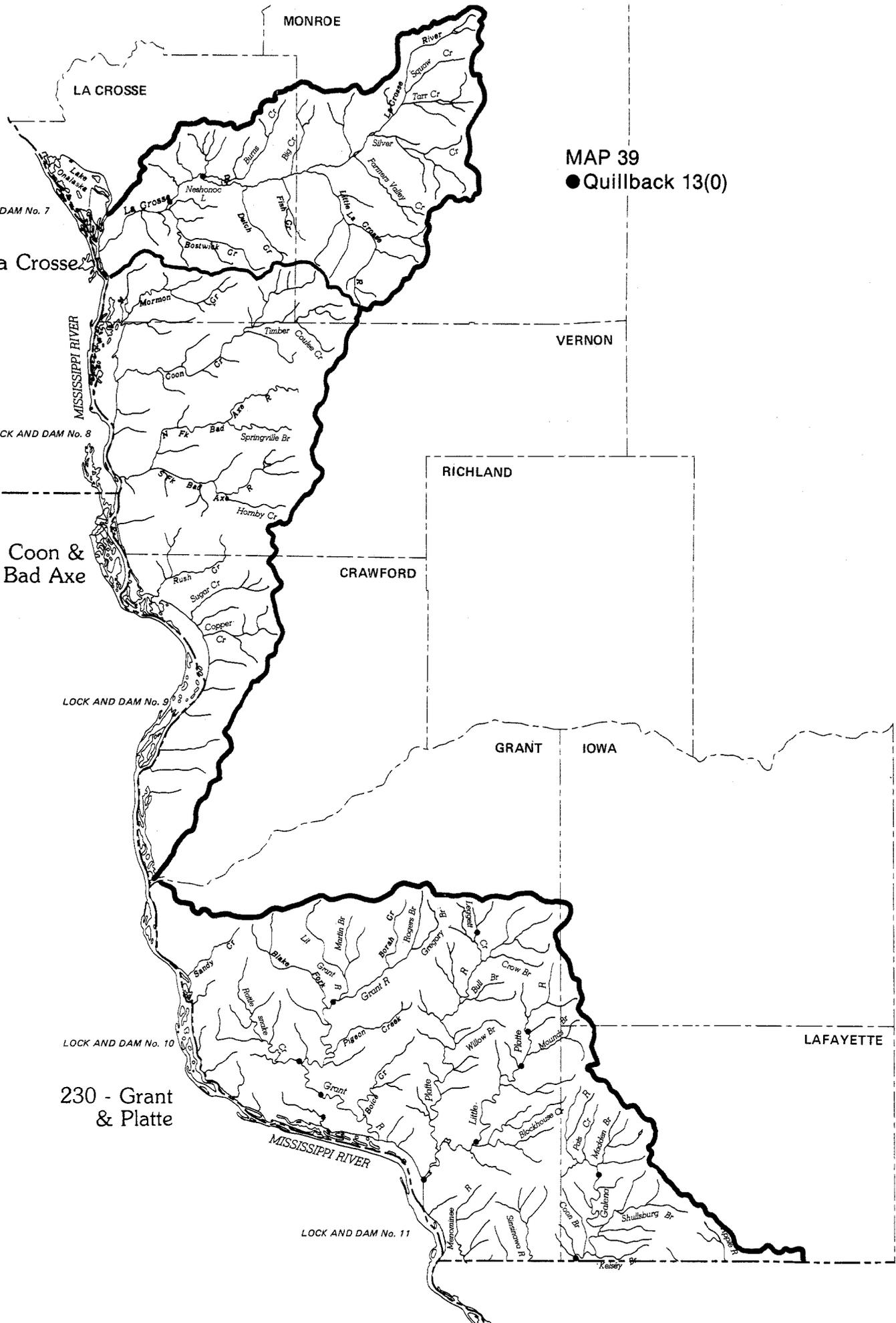
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 40

● White sucker 292(59)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

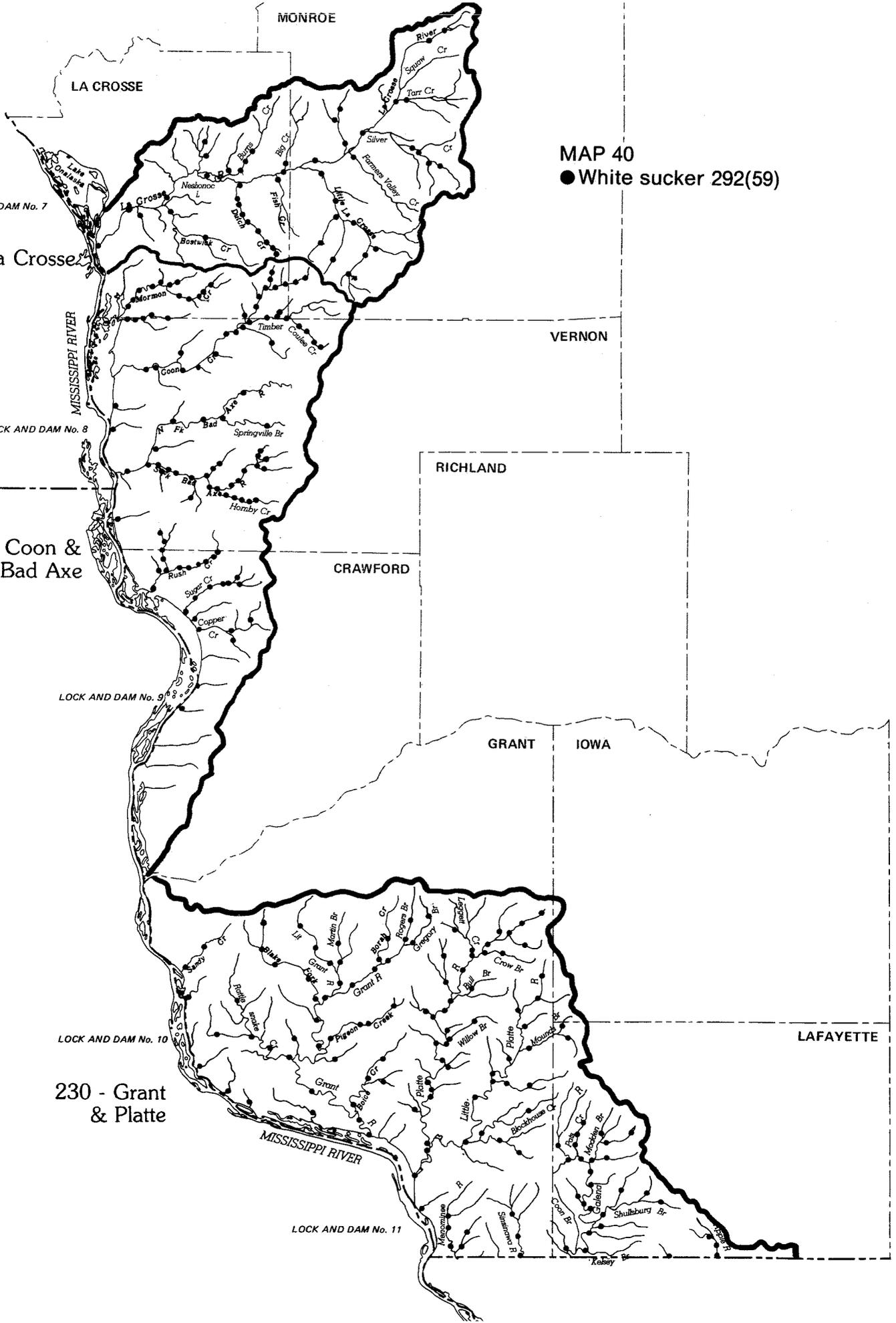
LOCK AND DAM No. 10

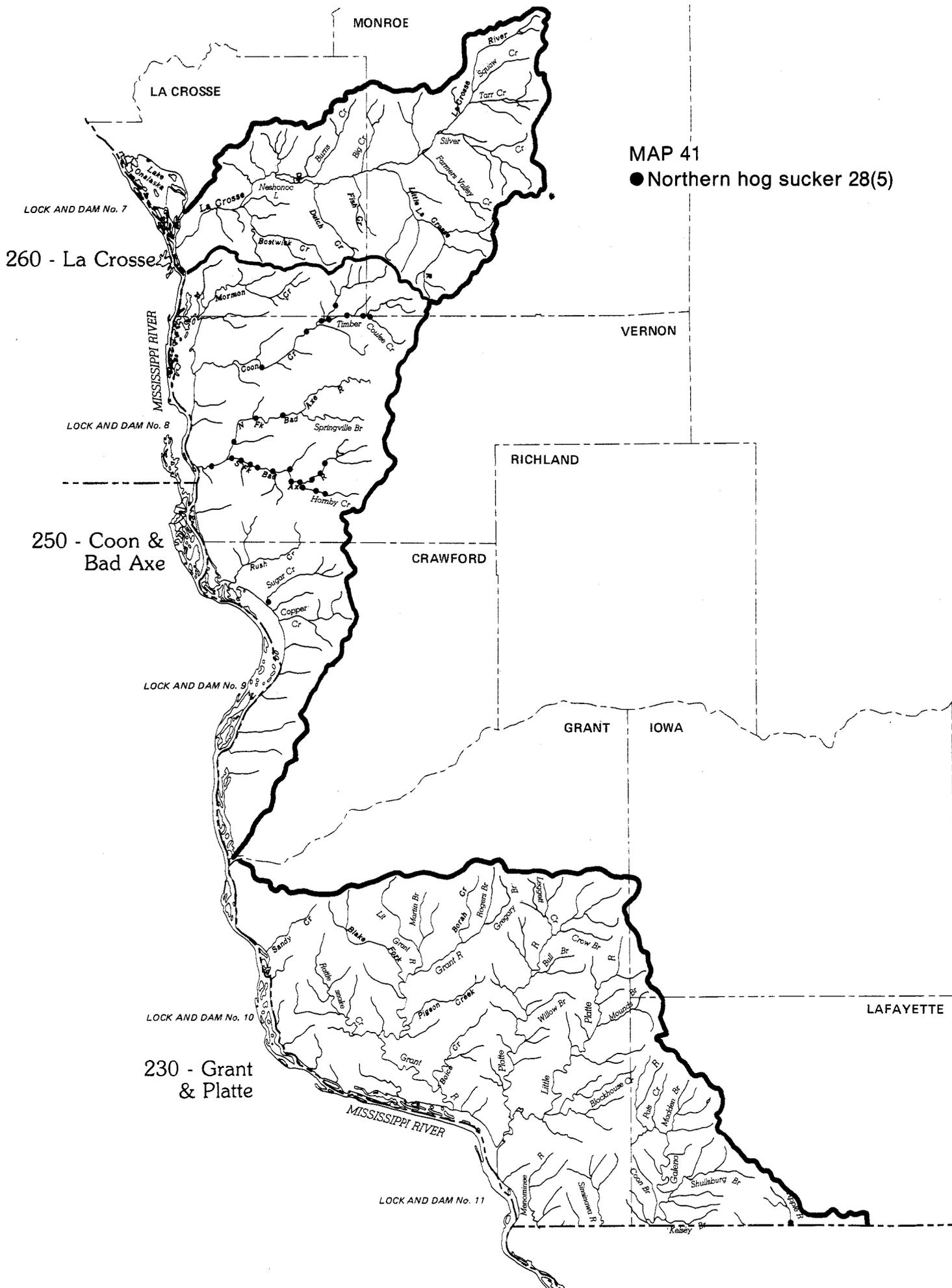
230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11





MAP 41

● Northern hog sucker 28(5)

MONROE

LA CROSSE

MAP 42

● Spotted sucker 7(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

LOCK AND DAM No. 9

RICHLAND

CRAWFORD

GRANT

IOWA

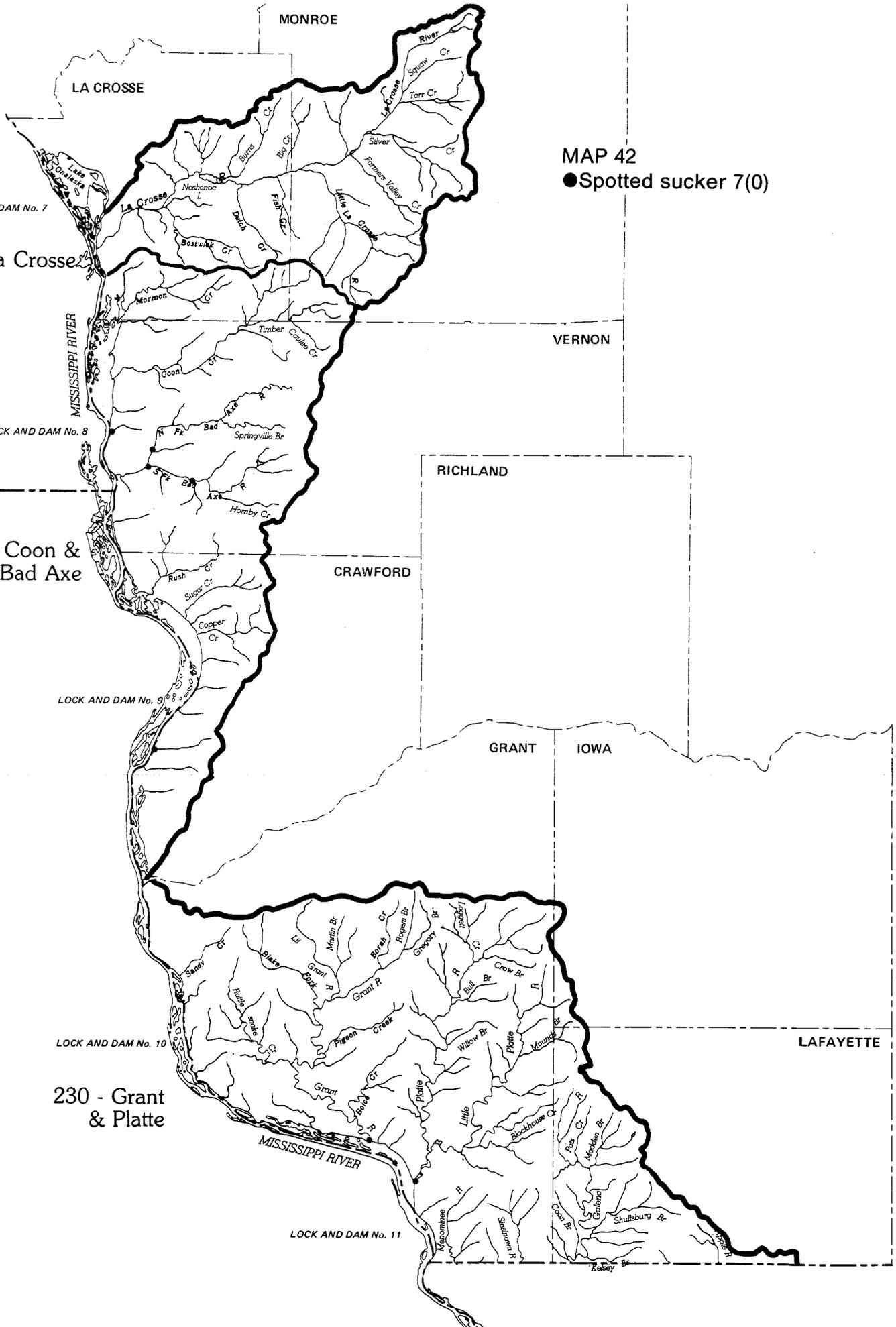
LOCK AND DAM No. 10

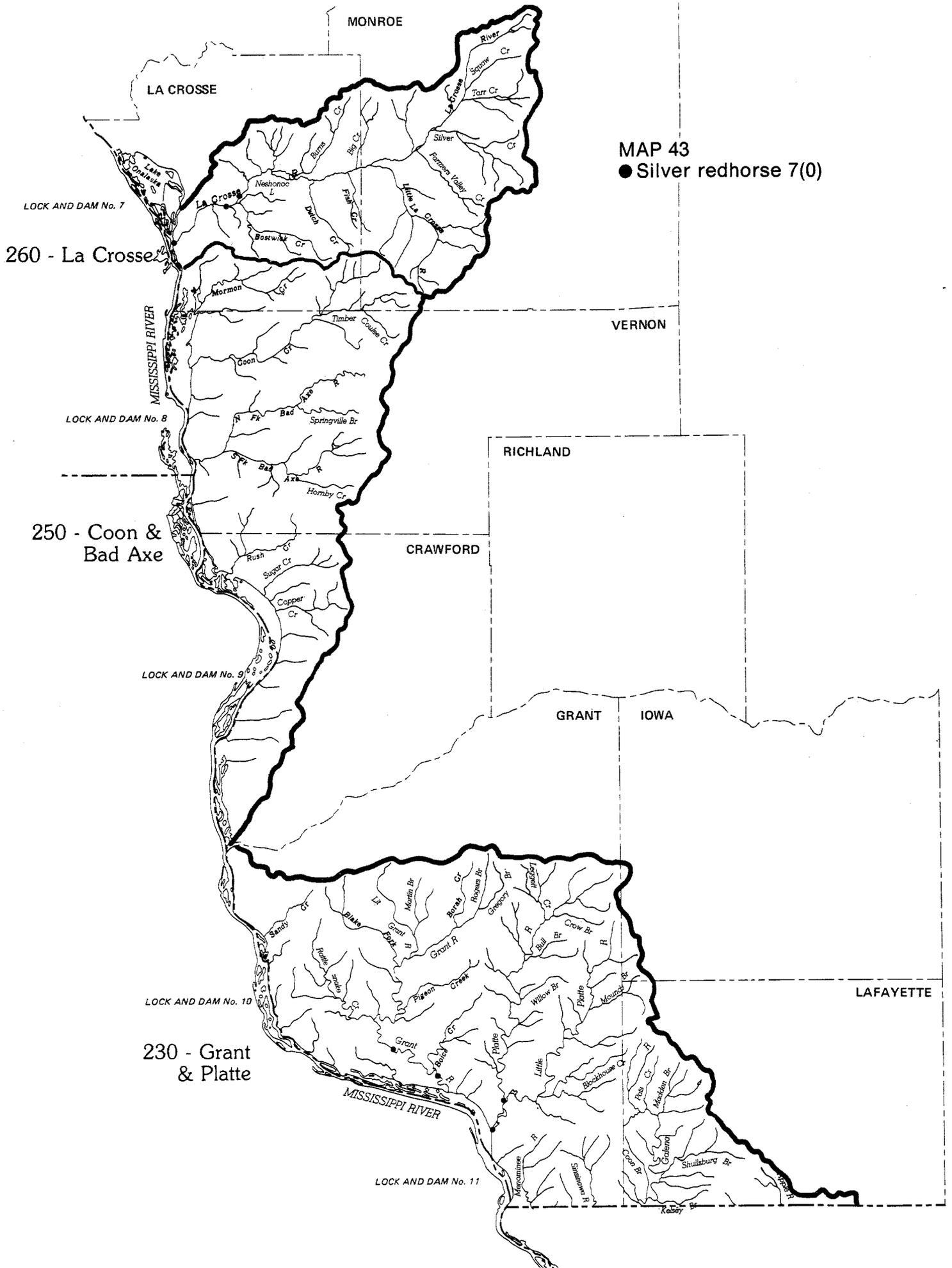
230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11





MONROE

LA CROSSE

MAP 44

● Golden redborse 23(1)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

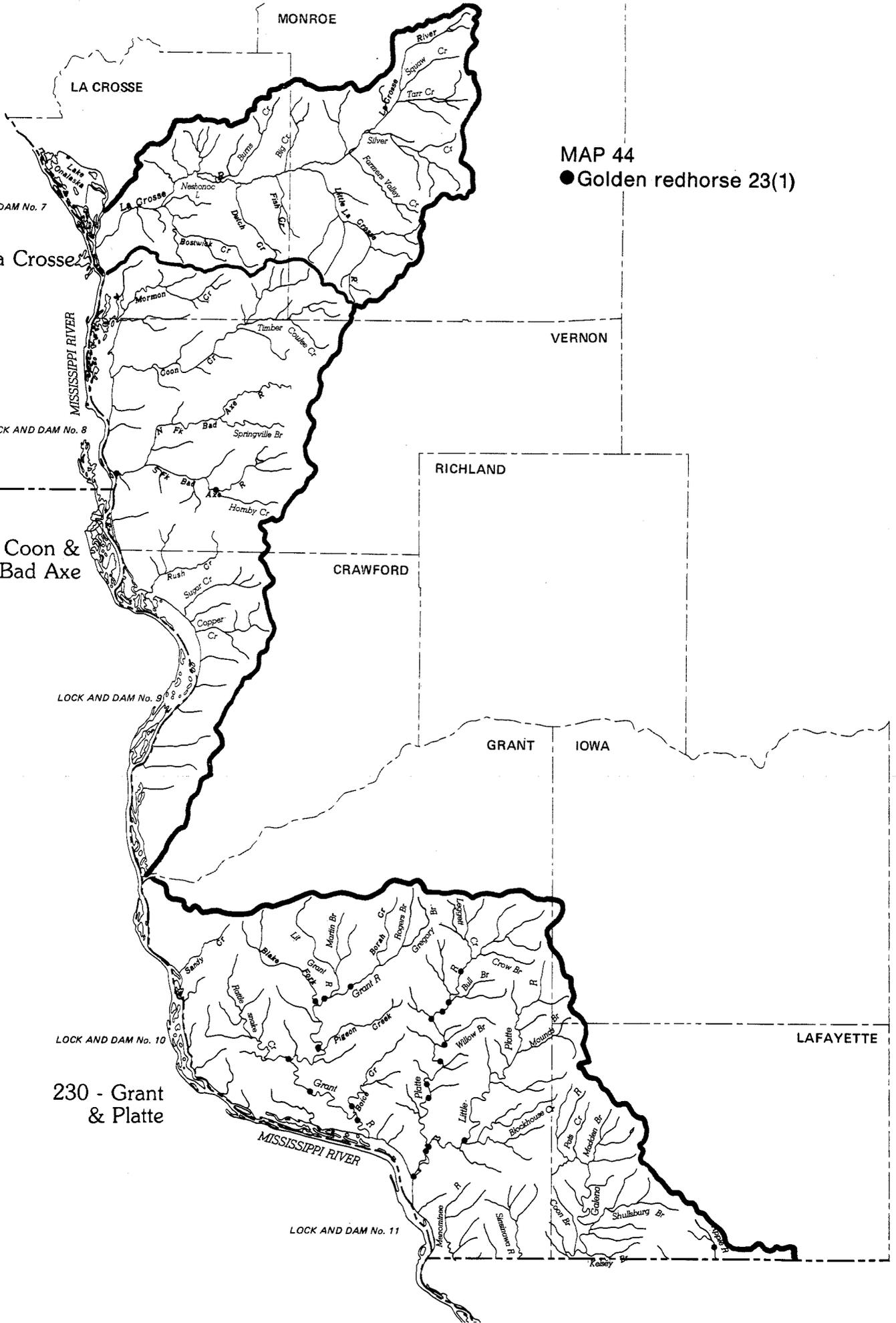
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 46

● Black bullhead (39)1

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

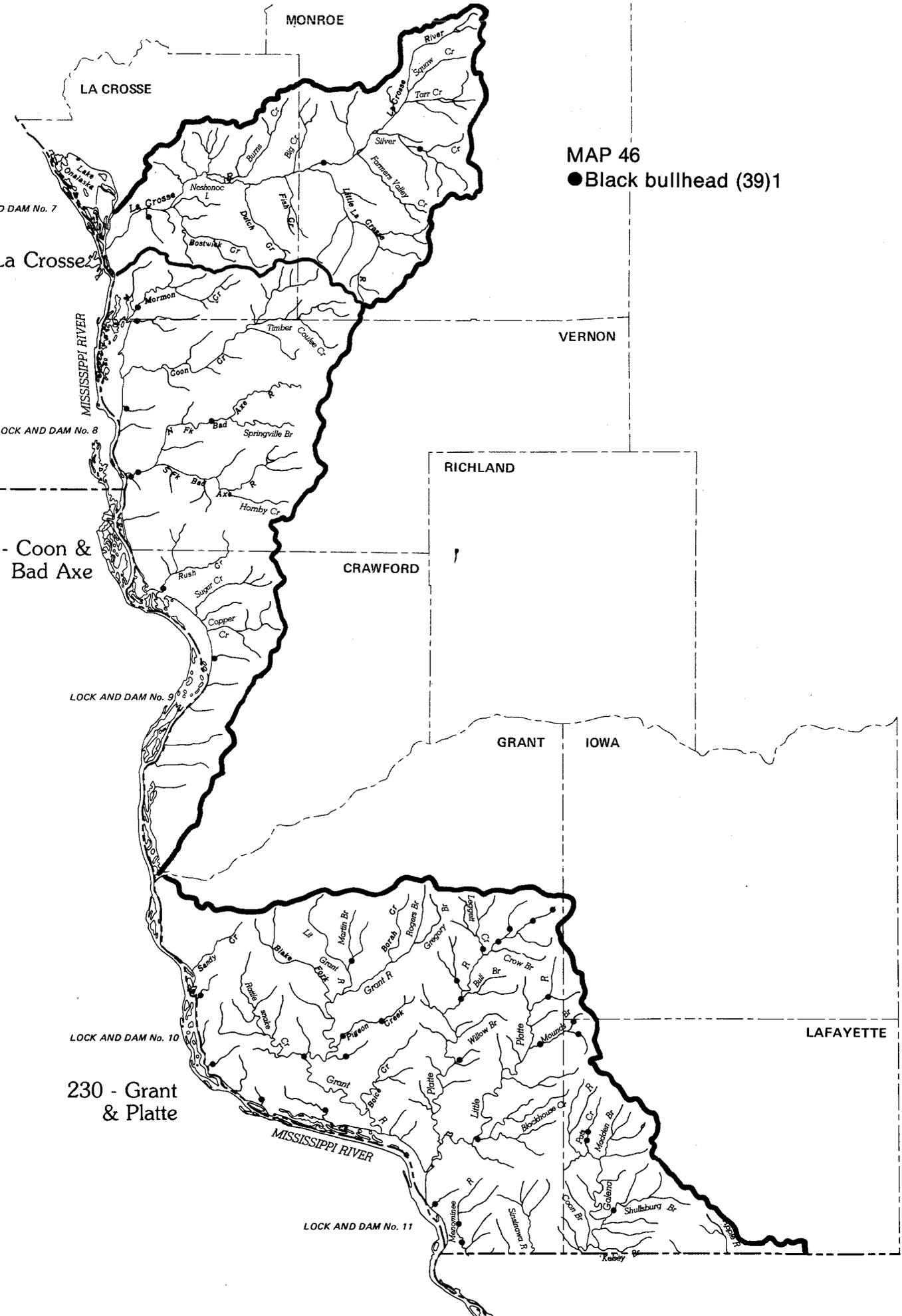
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 47

● Yellow bullhead 17(0)

▲ Brown bullhead 1(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

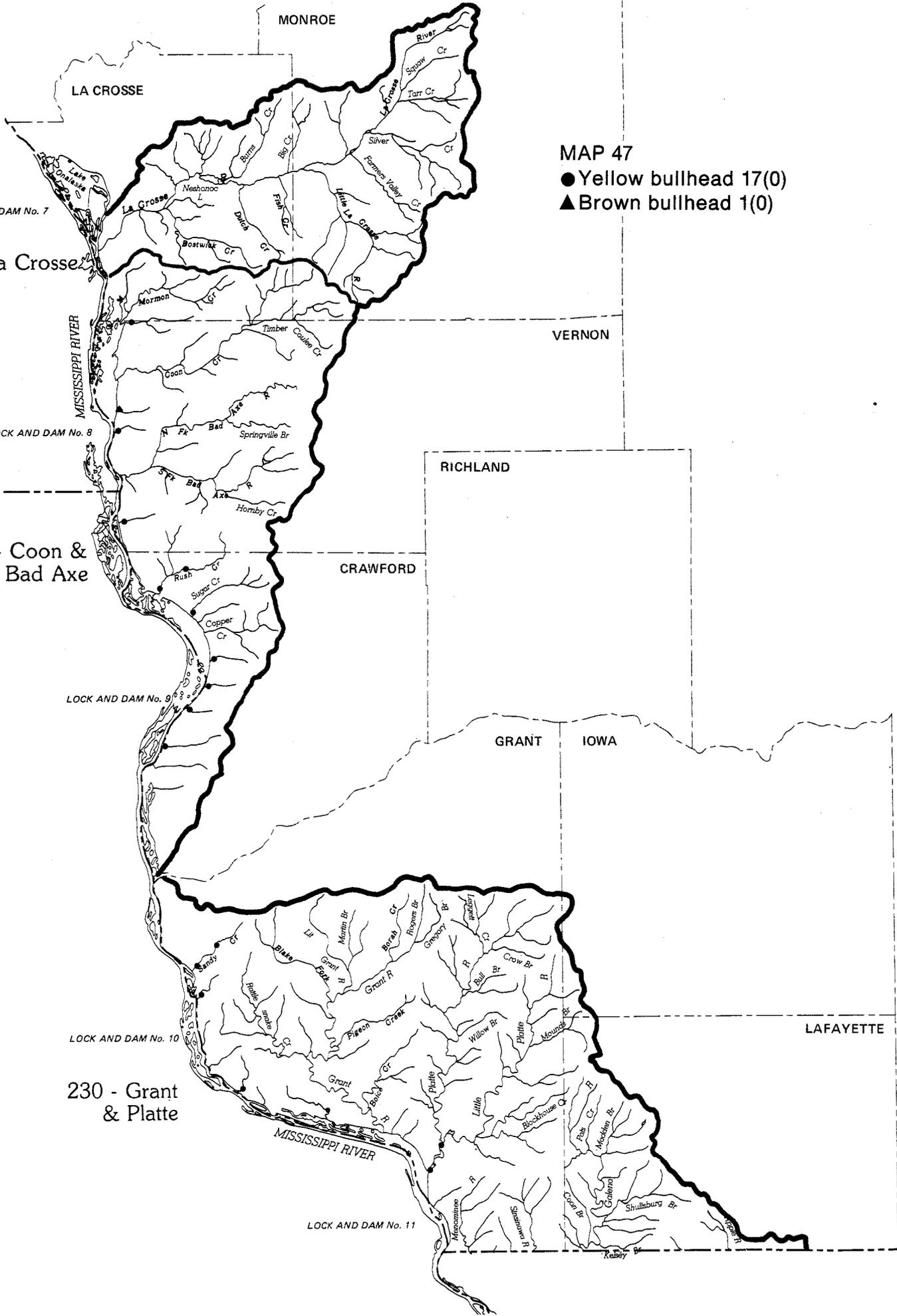
LOCK AND DAM No. 10

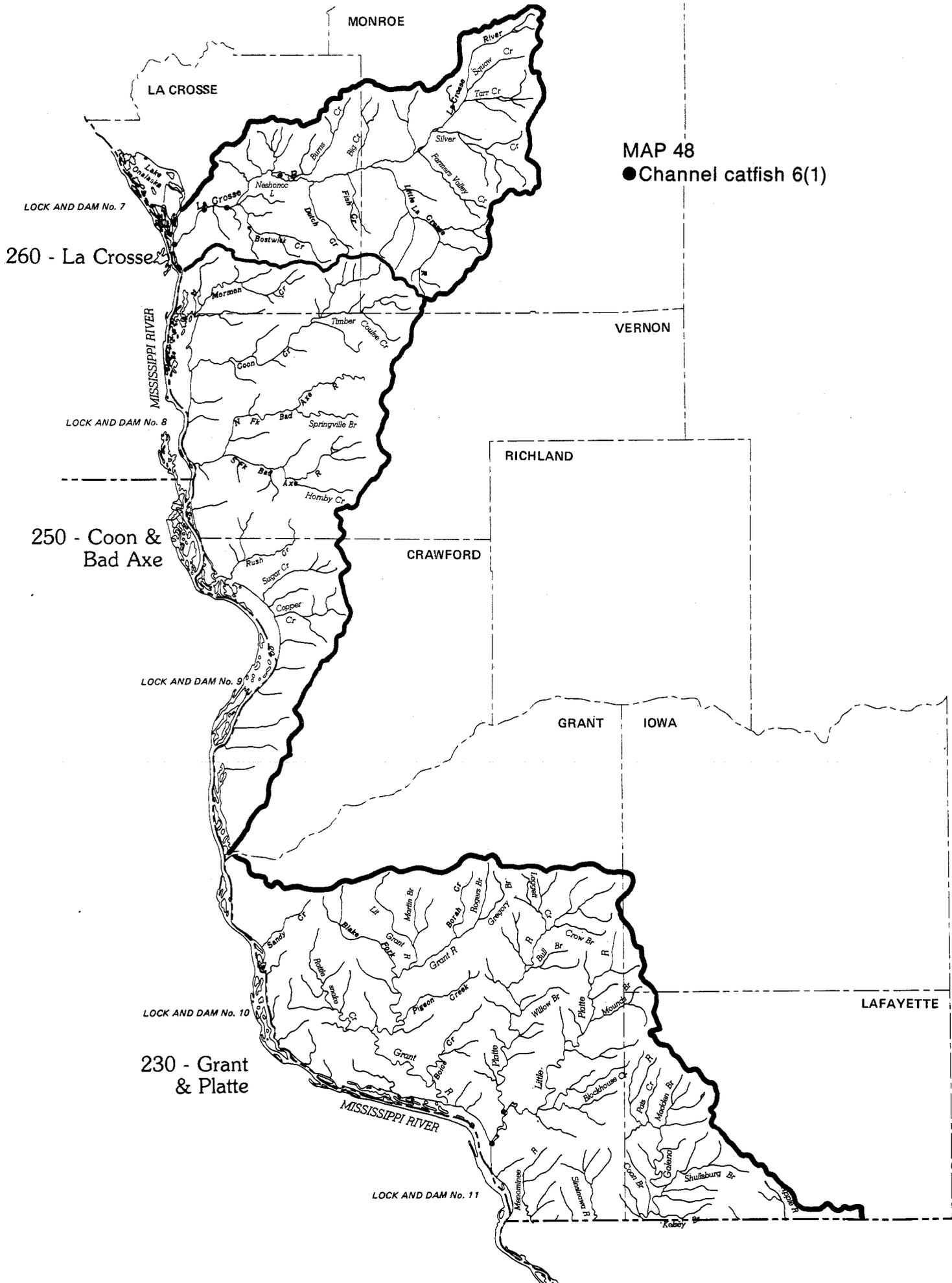
LAFAYETTE

230 - Grant & Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11





MAP 48
 ● Channel catfish 6(1)

260 - La Crosse

250 - Coon & Bad Axe

230 - Grant & Platte

MONROE

LA CROSSE

MAP 49

● Stonecat 55(1)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

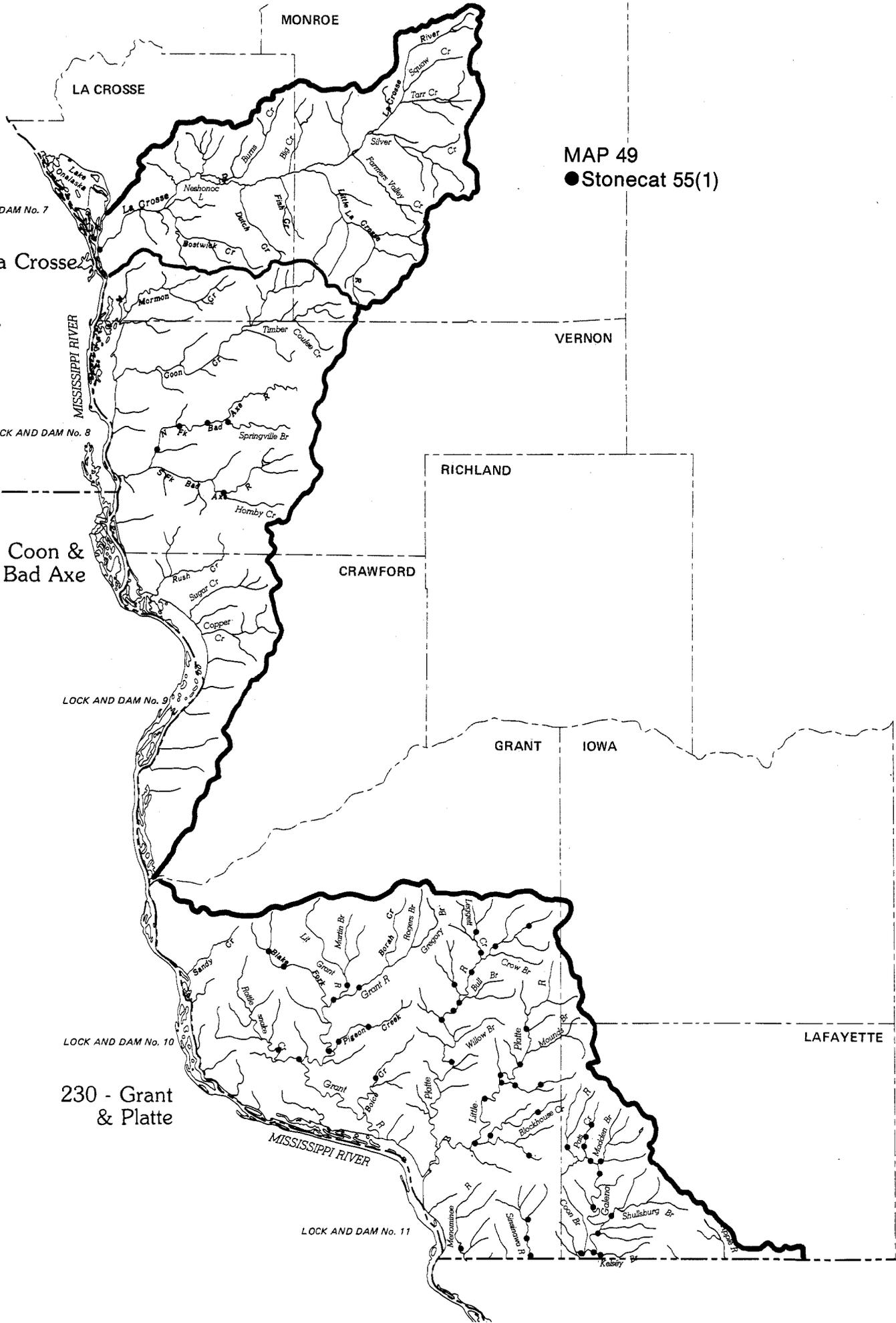
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 50

● Tadpole madtom 11(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

CRAWFORD

LOCK AND DAM No. 9

RICHLAND

GRANT

IOWA

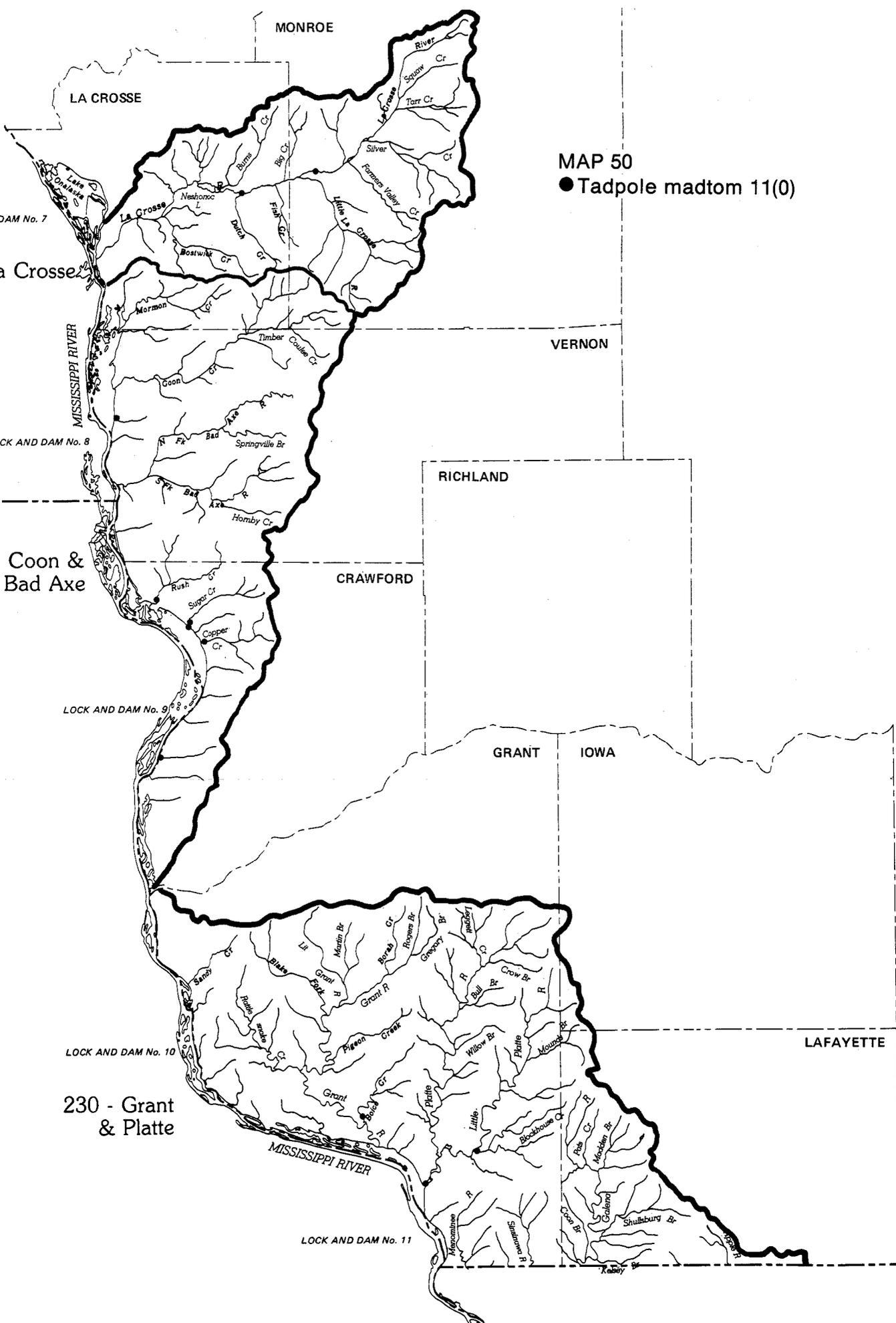
LOCK AND DAM No. 10

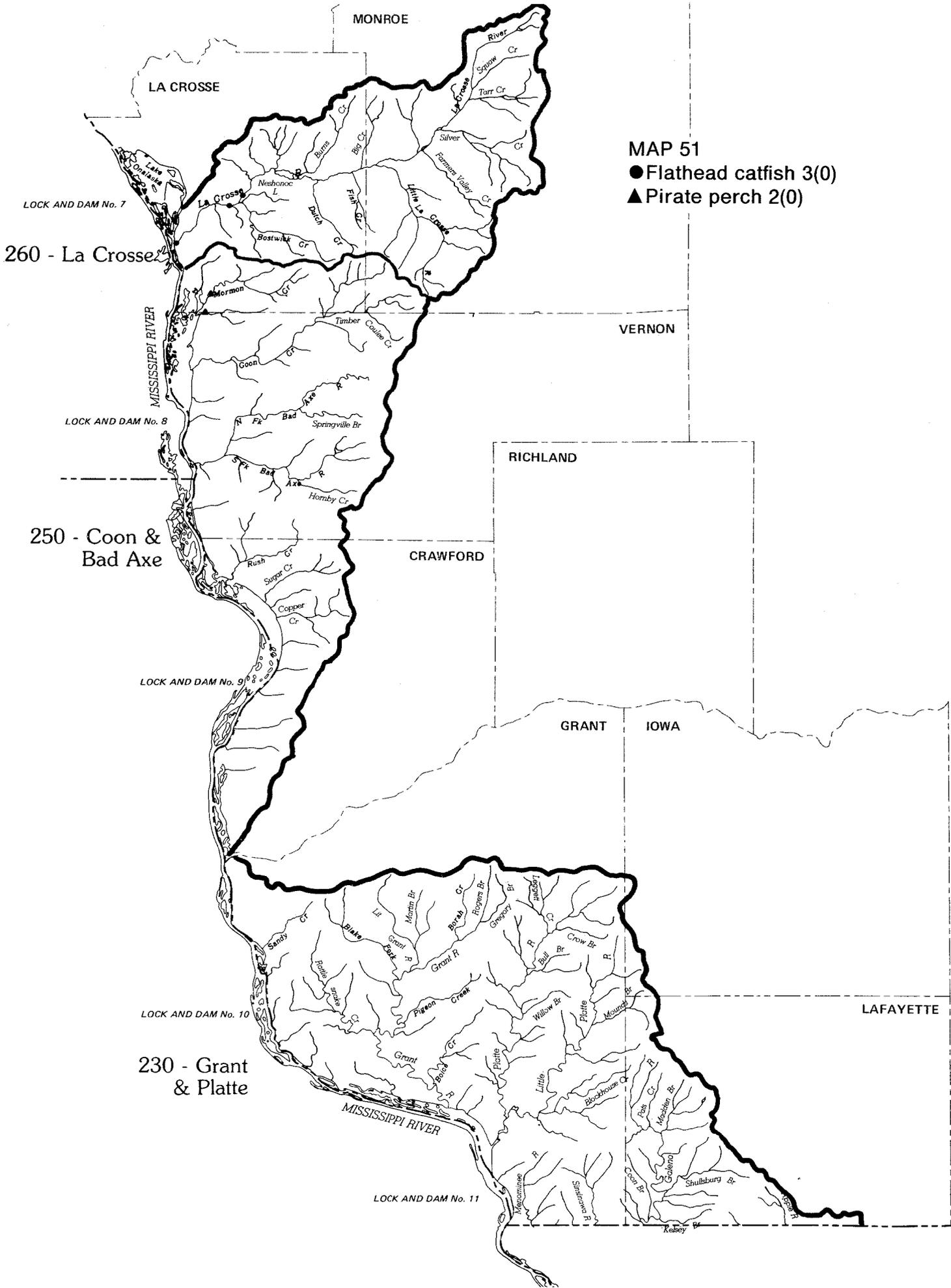
230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11





MAP 51

- Flathead catfish 3(0)
- ▲ Pirate perch 2(0)

260 - La Crosse

250 - Coon & Bad Axe

230 - Grant & Platte

MONROE

LA CROSSE

VERNON

RICHLAND

CRAWFORD

GRANT

IOWA

LAFAYETTE

LOCK AND DAM No. 7

LOCK AND DAM No. 8

LOCK AND DAM No. 9

LOCK AND DAM No. 10

LOCK AND DAM No. 11

MISSISSIPPI RIVER

MISSISSIPPI RIVER

Shullsburg Br

Galena

Mooshen Br

Post Cr

Blackhouse Cr

Little

Willow Br

Platte

Mounds Br

Crow Br

Hull Br

R

Crescent Br

Rogers Br

Boyer Cr

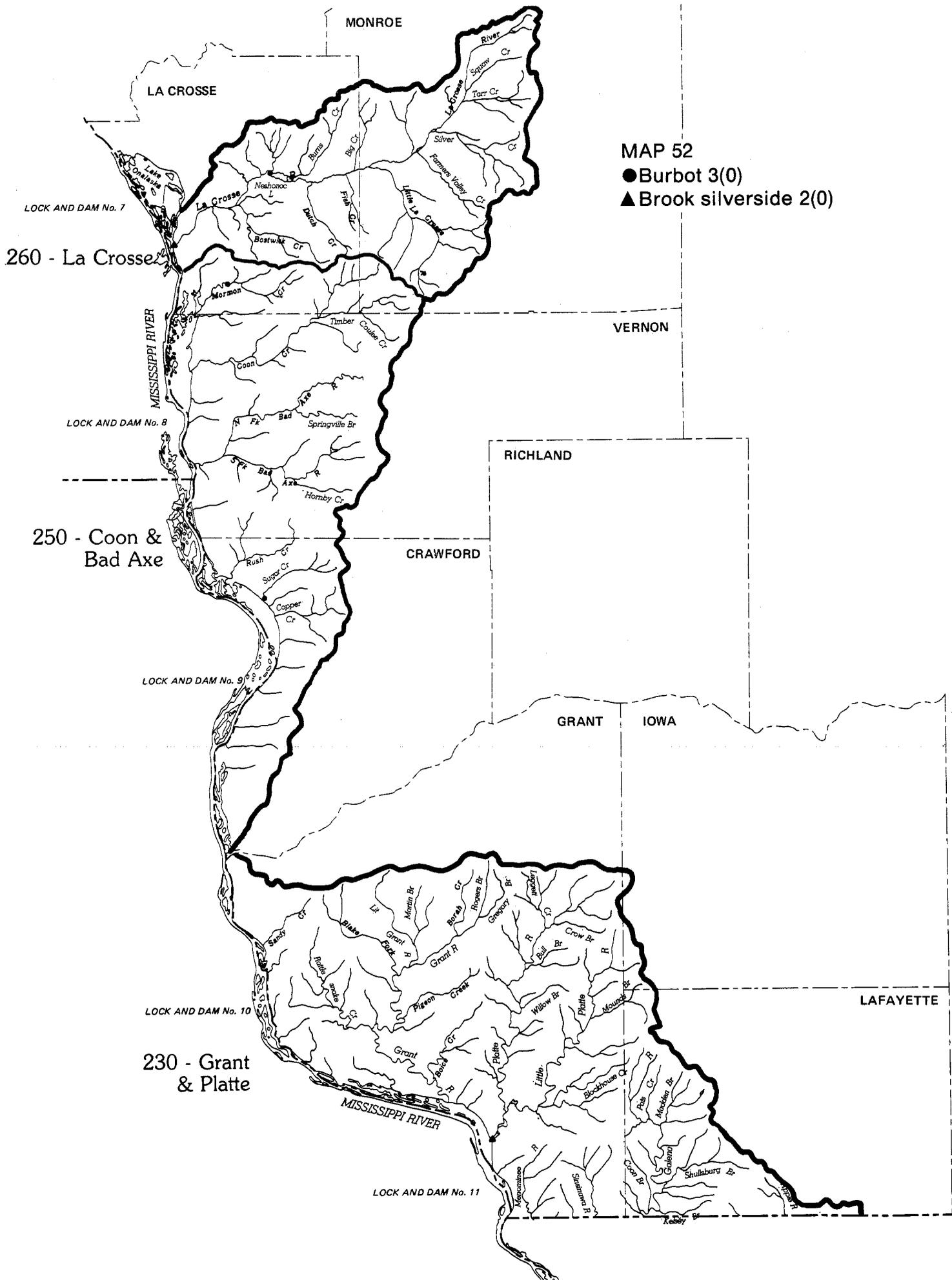
Grant Cr

Mormon Br

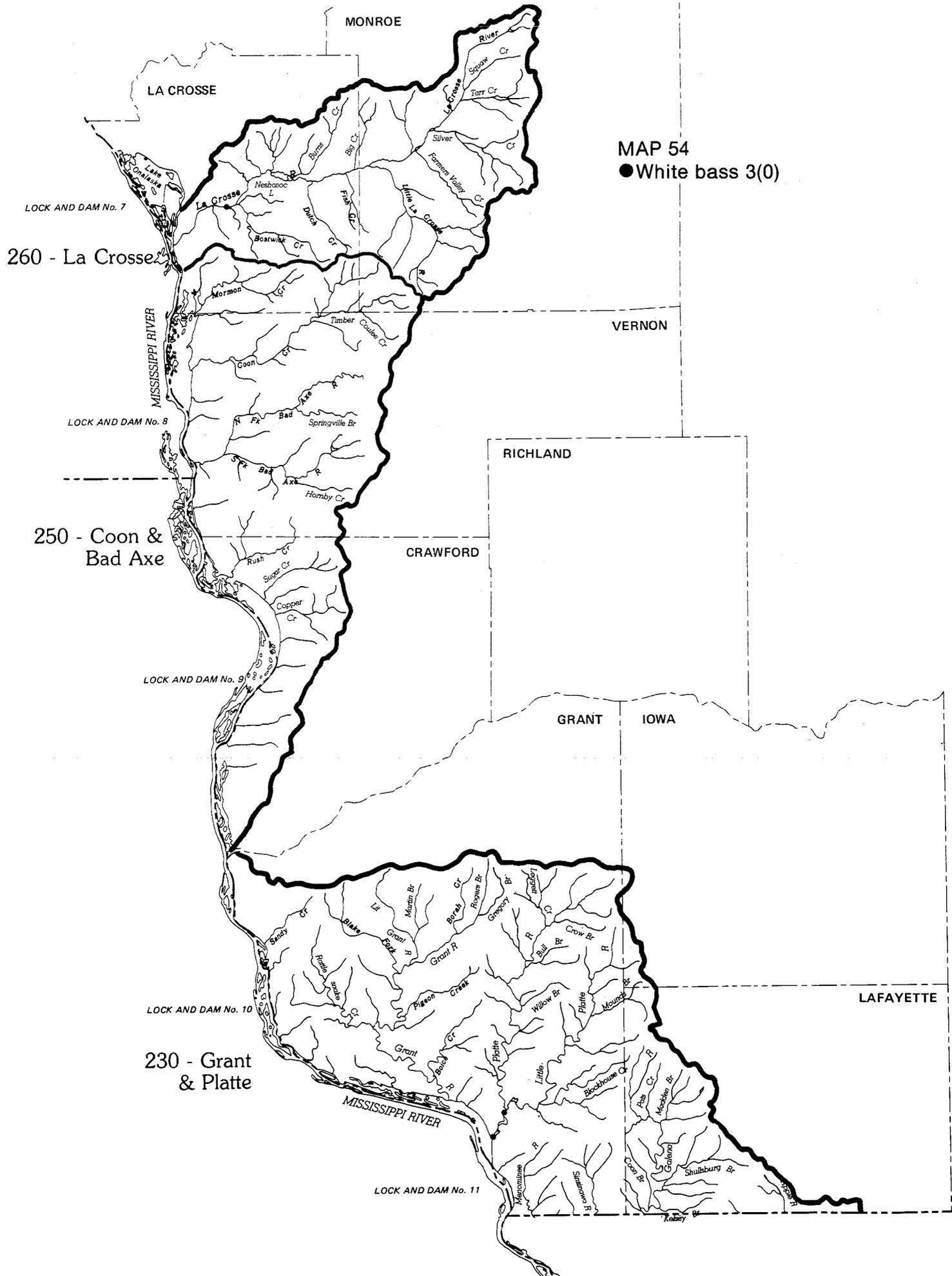
Grant Cr

Platte

Grant Cr







MAP 54
● White bass 3(0)

260 - La Crosse

250 - Coon & Bad Axe

230 - Grant & Platte

MONROE

LA CROSSE

VERNON

RICHLAND

CRAWFORD

GRANT

IOWA

LAFAYETTE

LOCK AND DAM No. 11

LOCK AND DAM No. 10

LOCK AND DAM No. 9

LOCK AND DAM No. 8

LOCK AND DAM No. 7

La Crosse

MISSISSIPPI RIVER

MISSISSIPPI RIVER

Neshatoc

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

Bad Axe

Lock and Dam No. 9

Lock and Dam No. 10

Grant

& Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

La Crosse

Mormon

Coon Cr.

MONROE

LA CROSSE

MAP 55

● Rock bass 14(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

250 - Coon & Bad Axe

LOCK AND DAM No. 9

CRAWFORD

RICHLAND

VERNON

GRANT

IOWA

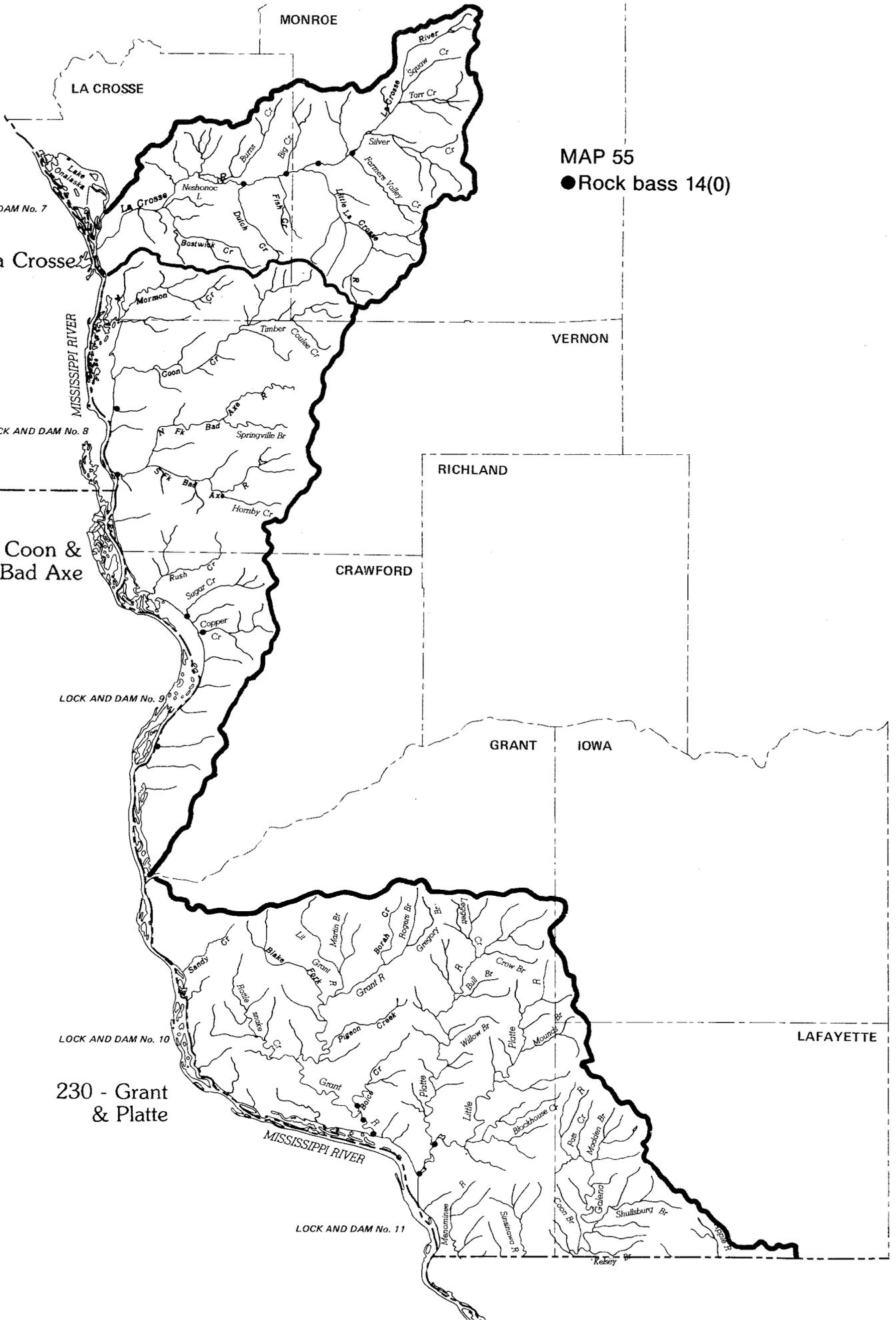
LOCK AND DAM No. 10

230 - Grant & Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

LAFAYETTE



MONROE

LA CROSSE

MAP 56

● Green sunfish 49(5)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

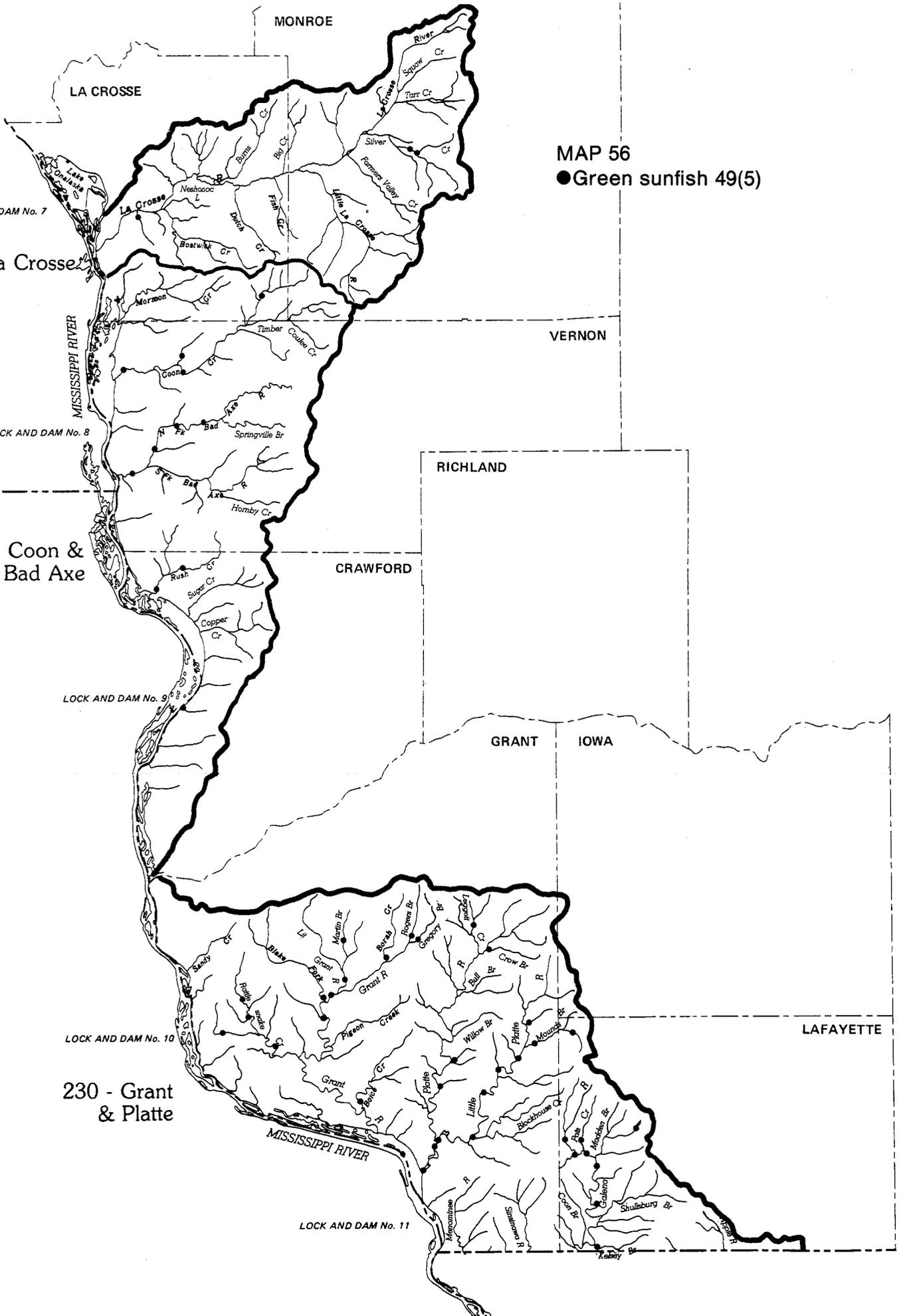
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 57

●Pumpkinseed 11(2)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

250 - Coon & Bad Axe

VERNON

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

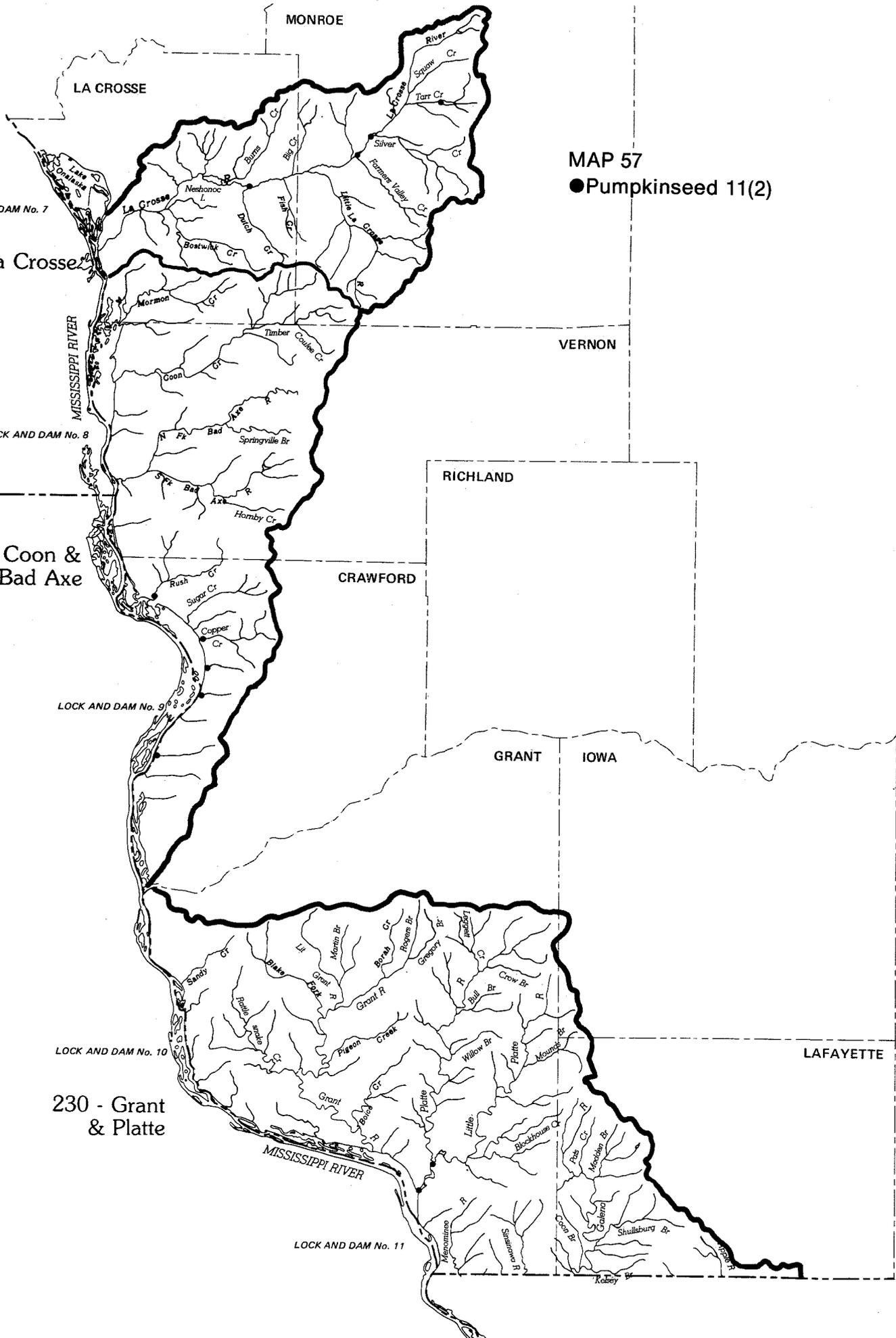
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

LOCK AND DAM No. 11

MISSISSIPPI RIVER



MONROE

LA CROSSE

MAP 58

● Orangespotted sunfish 8(7)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

VERNON

LOCK AND DAM No. 8

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

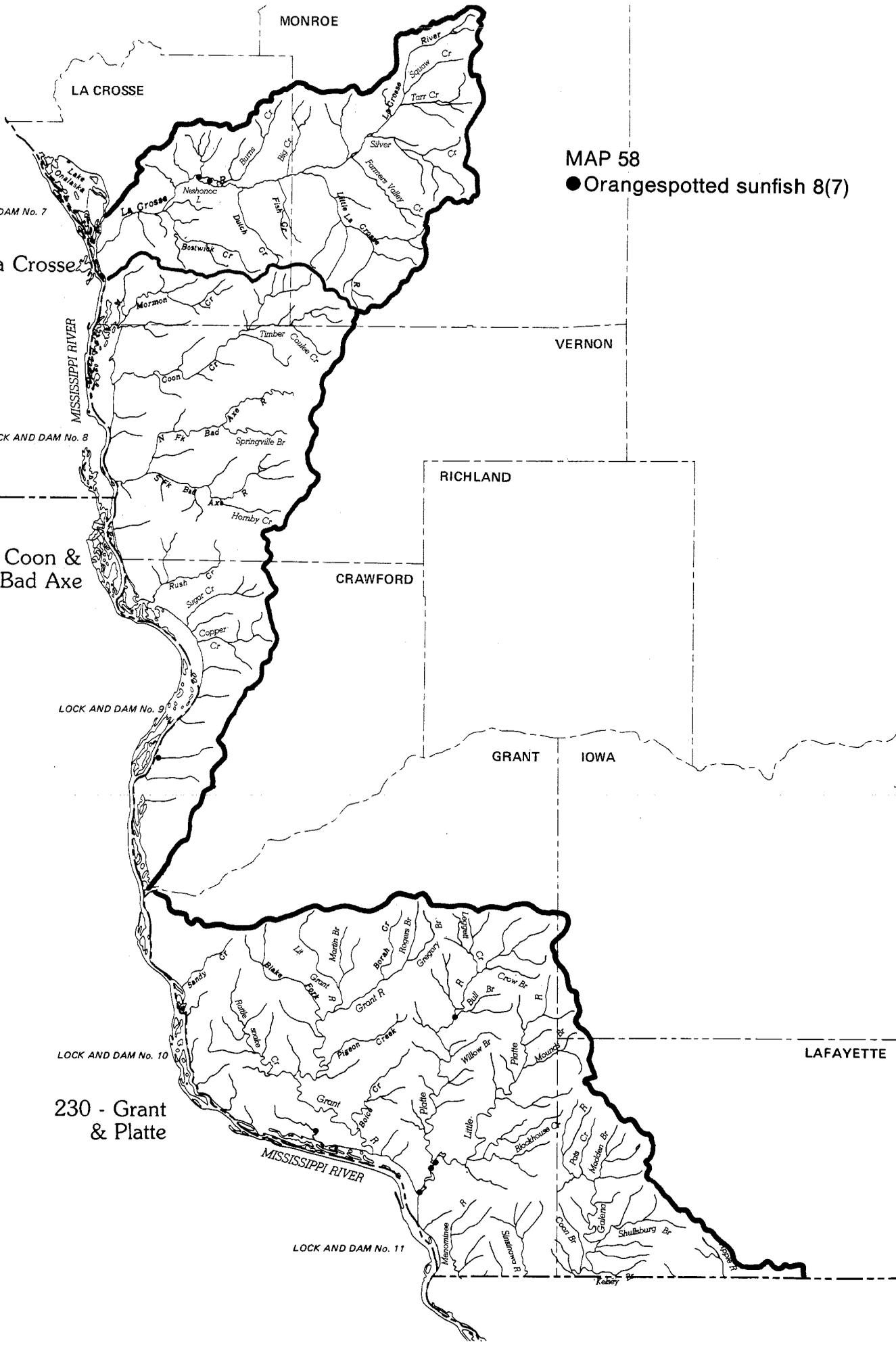
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 59

●Bluegill 19(5)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

VERNON

LOCK AND DAM No. 8

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

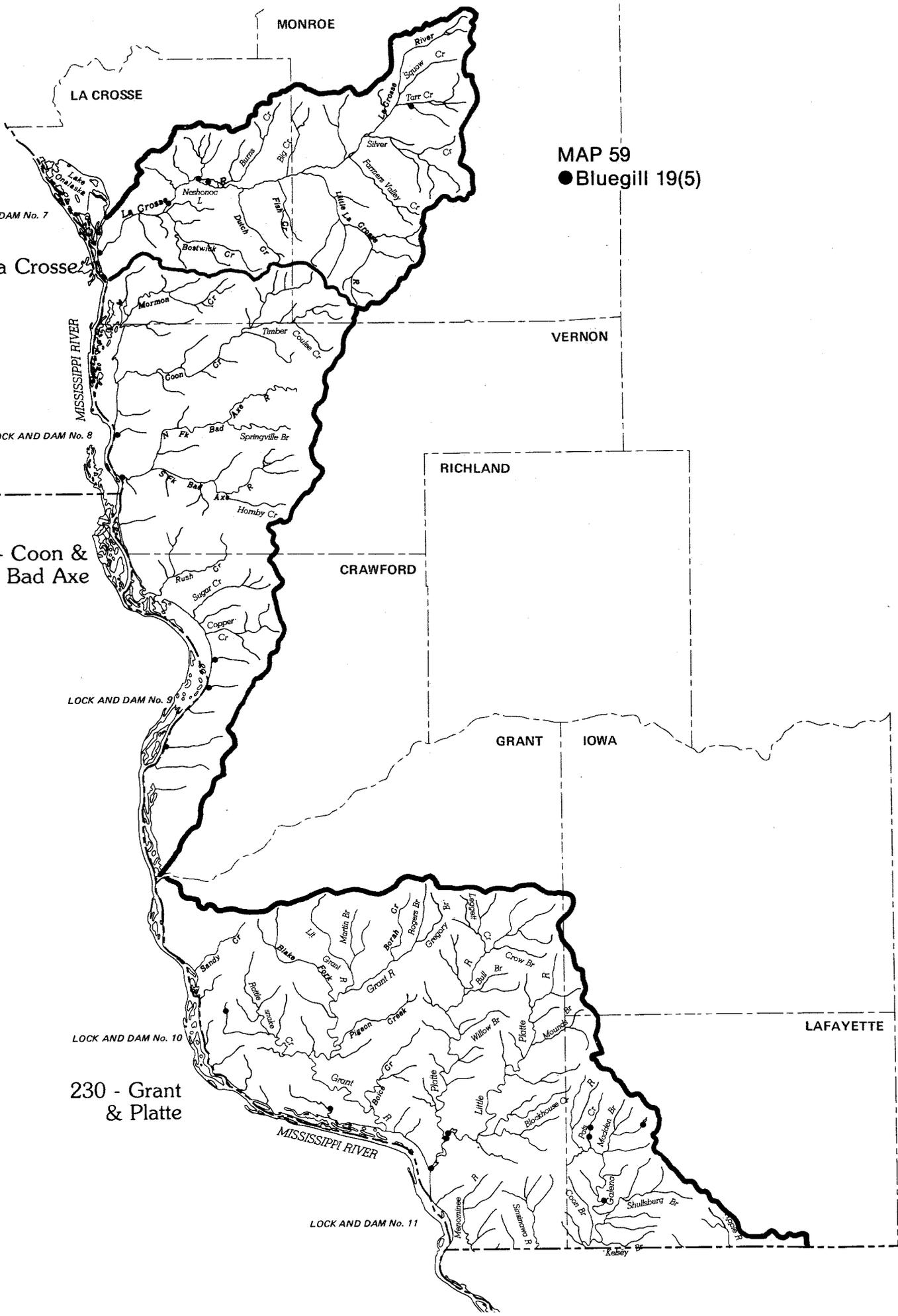
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 60

● Smallmouth bass 74(4)

LOCK AND DAM No. 7

260 - La Crosse

VERNON

LOCK AND DAM No. 8

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

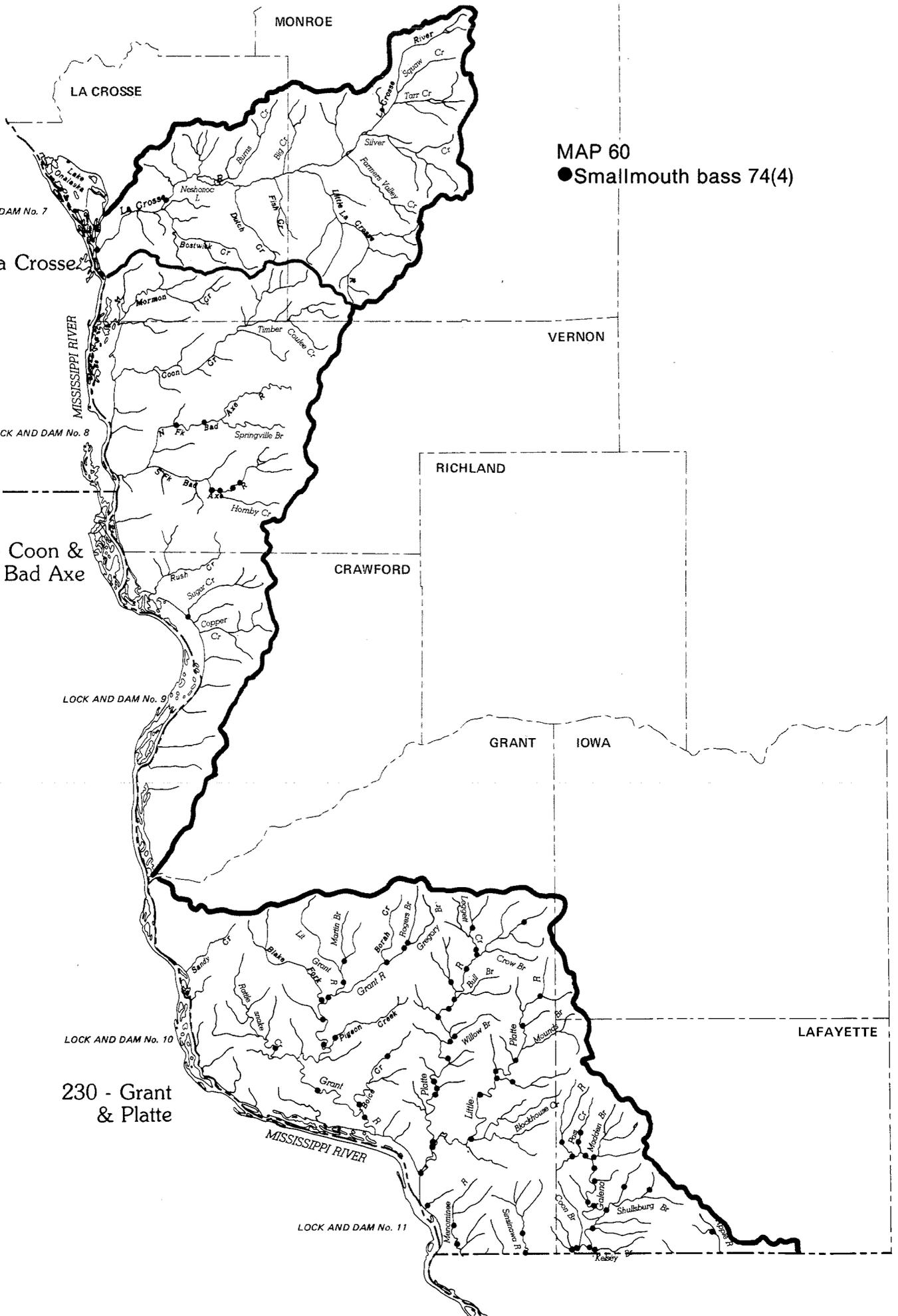
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 61

● Largemouth bass 25(10)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

LOCK AND DAM No. 9

RICHLAND

CRAWFORD

GRANT

IOWA

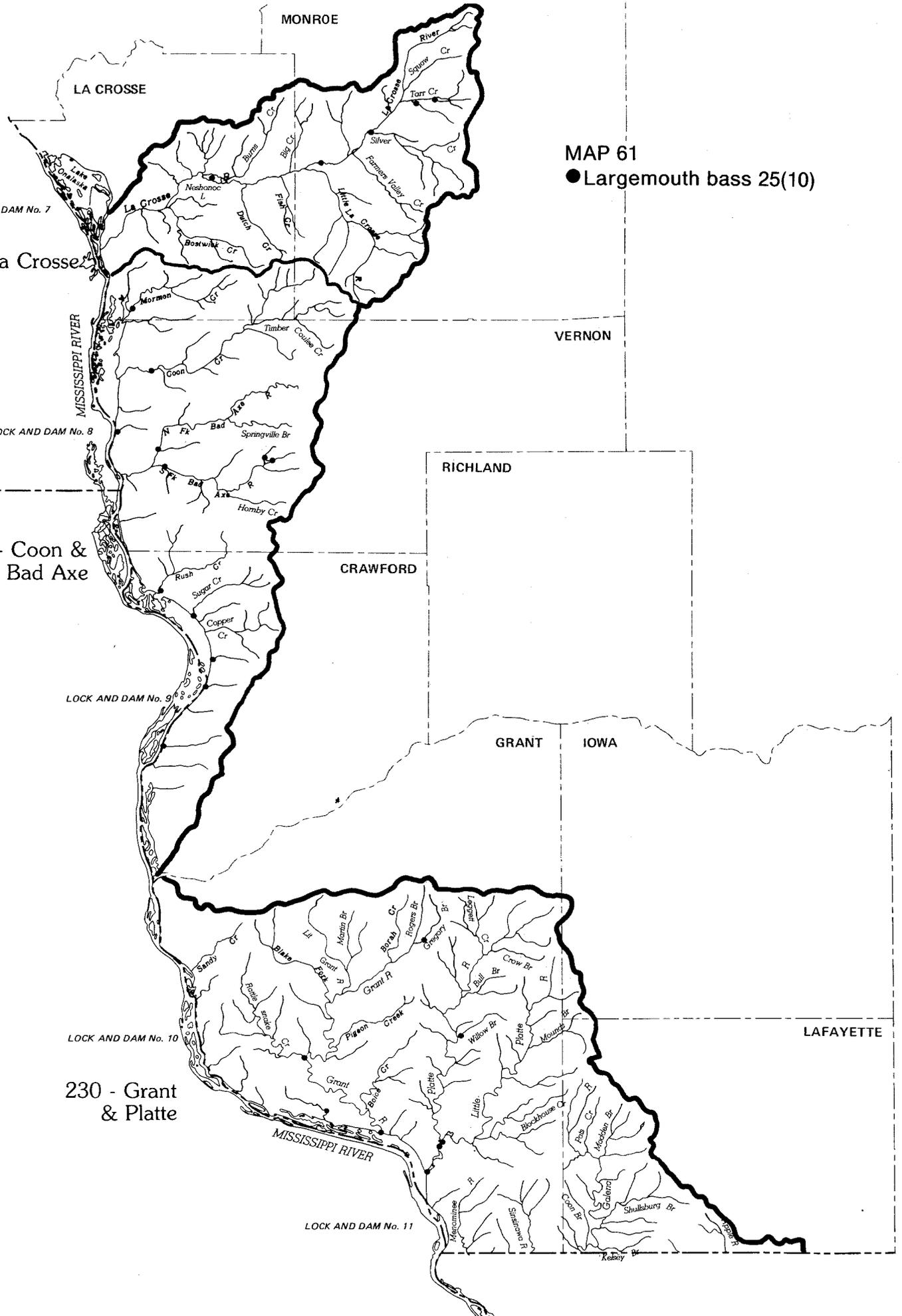
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 62

● White crappie 4(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

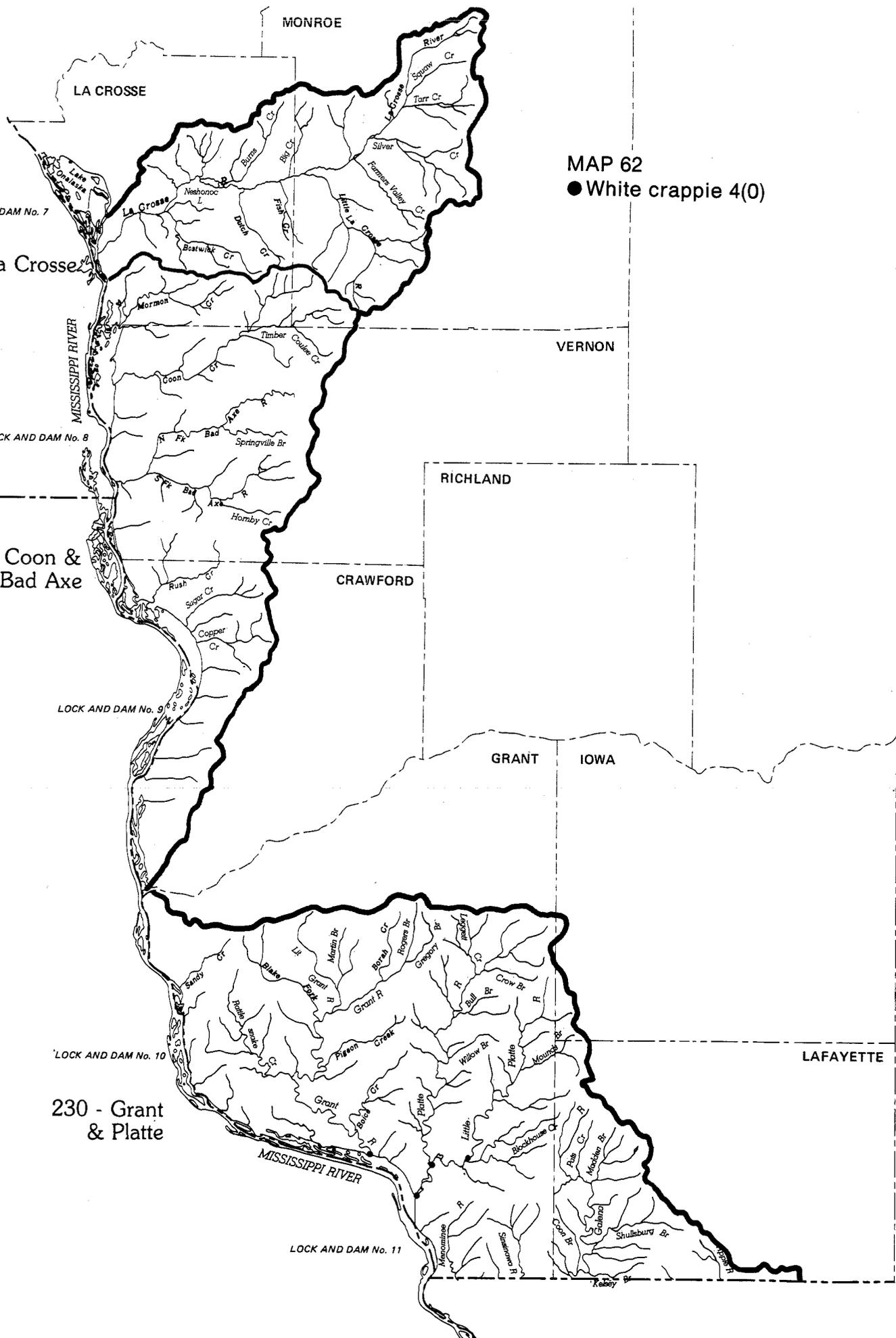
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 63

● Black crappie 7(4)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

250 - Coon & Bad Axe

VERNON

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

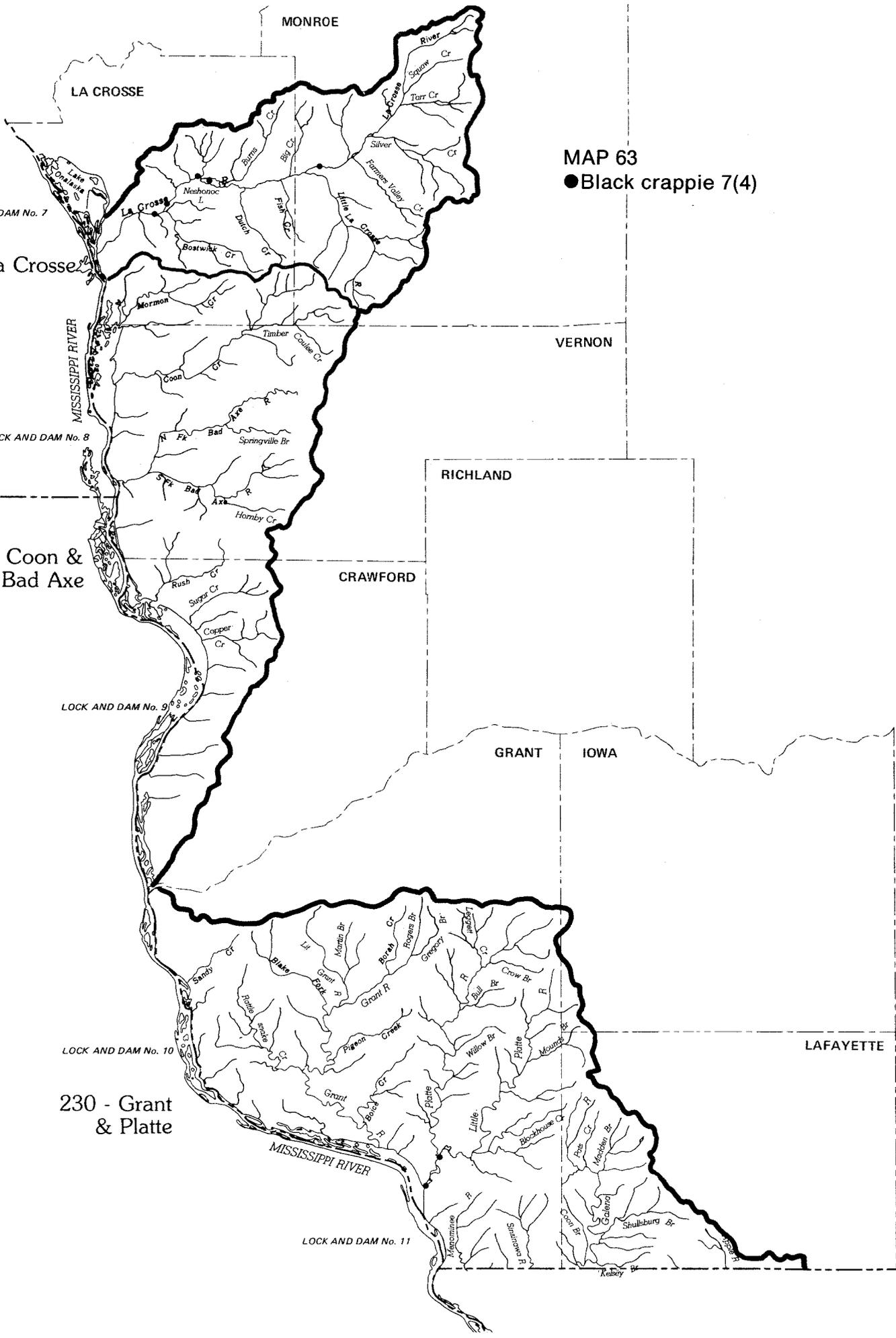
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 64

● Mud darter 13(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

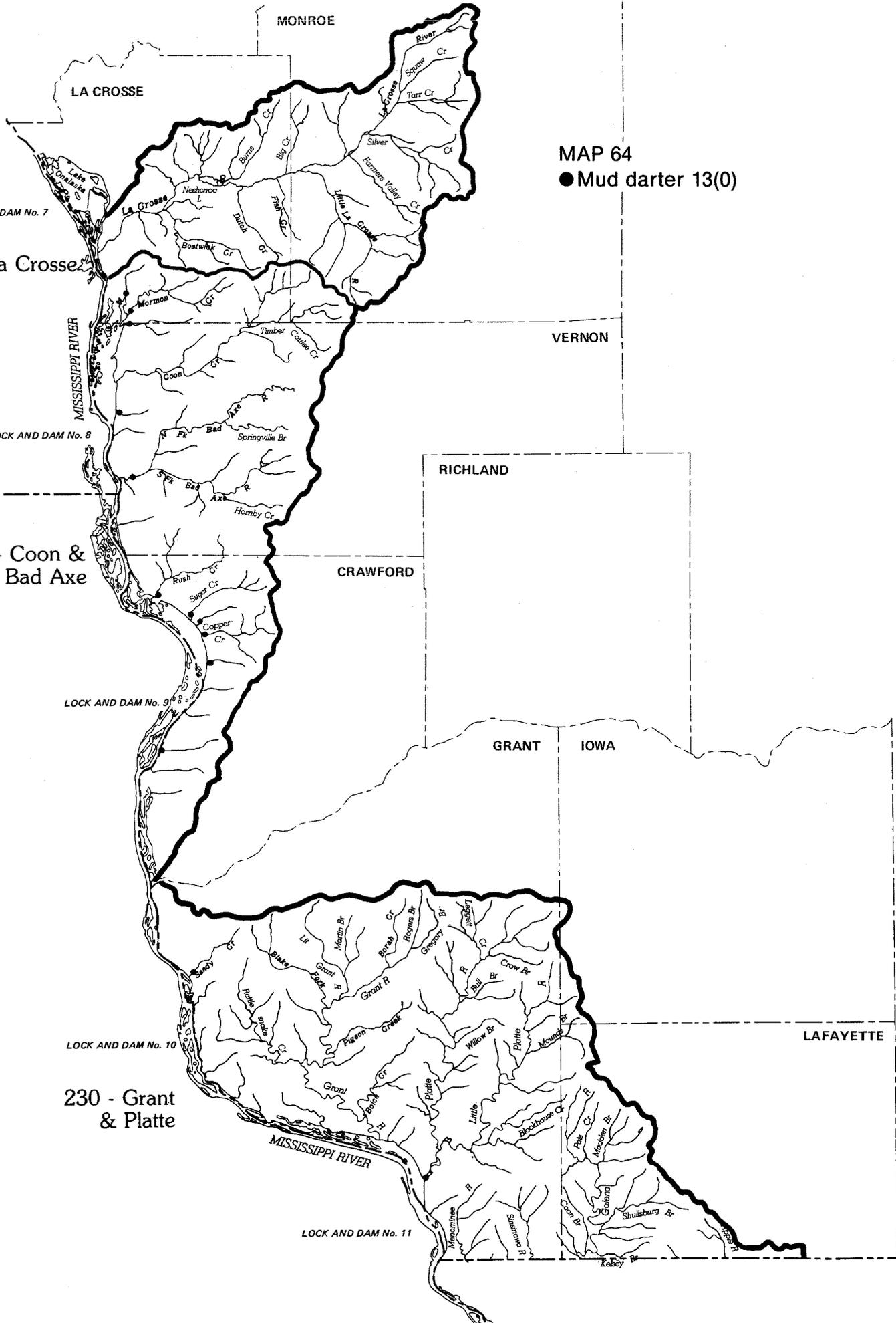
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 65

● Rainbow darter 1(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

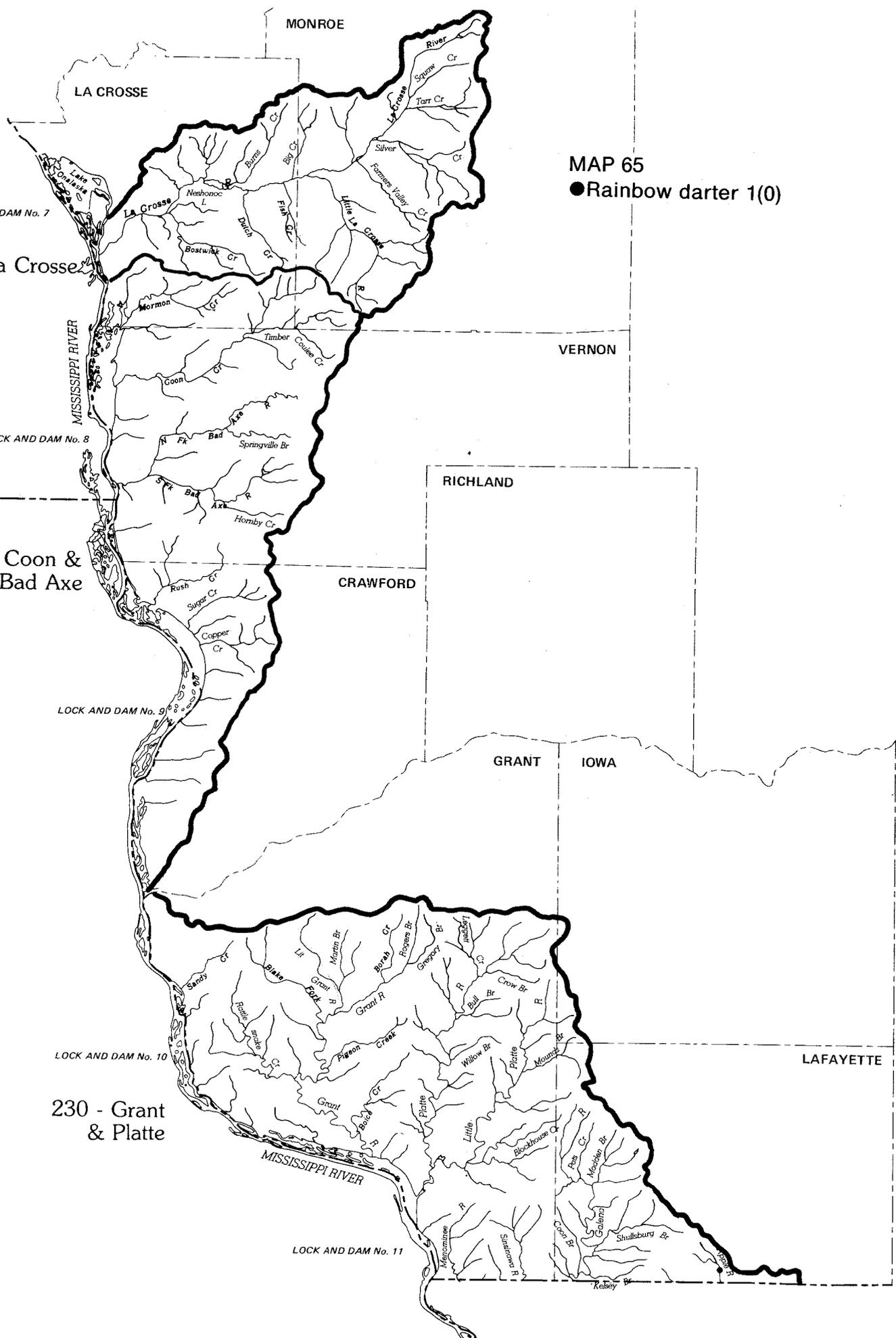
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 66

● Iowa darter 6(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

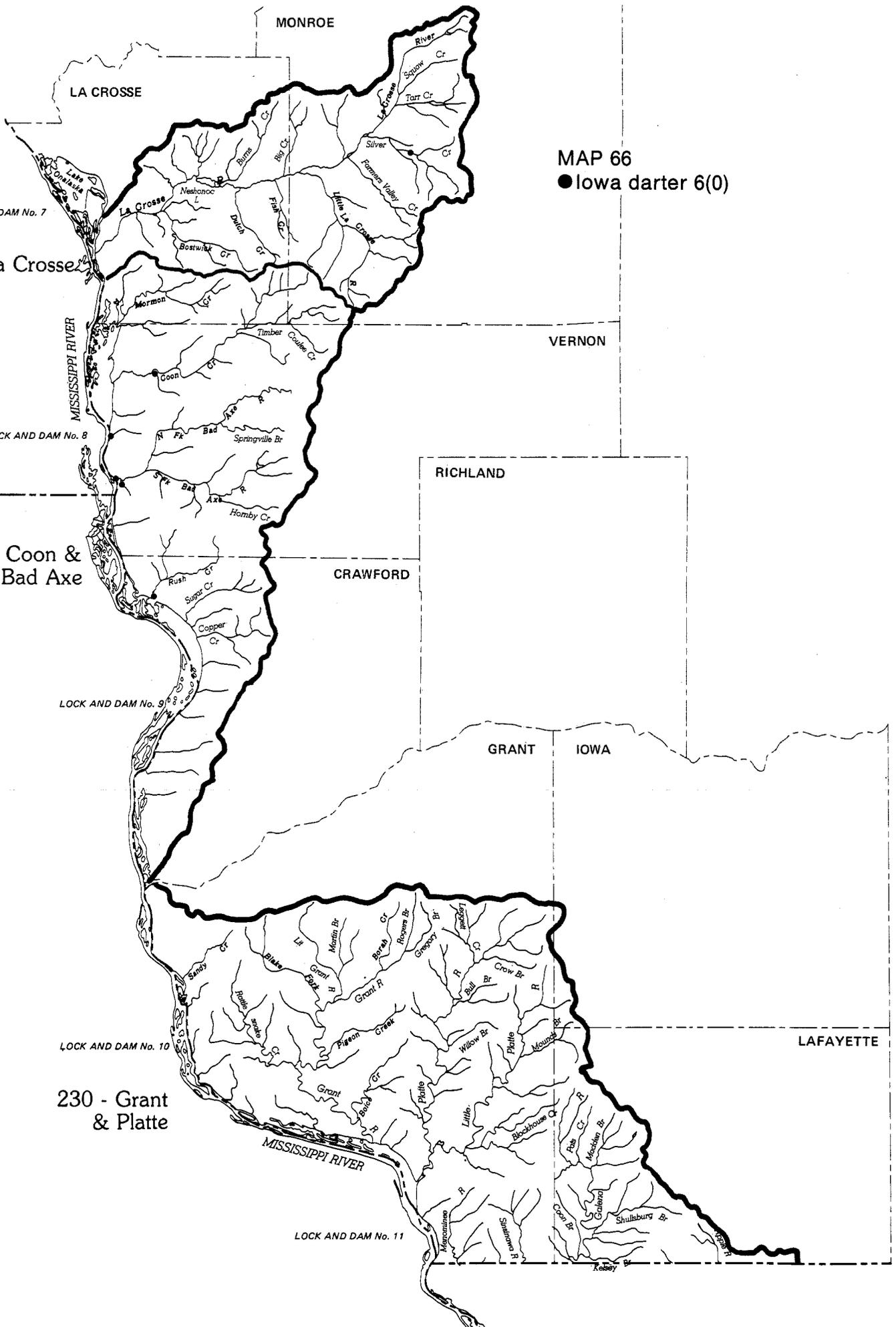
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 67

● Fantail darter 145(9)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

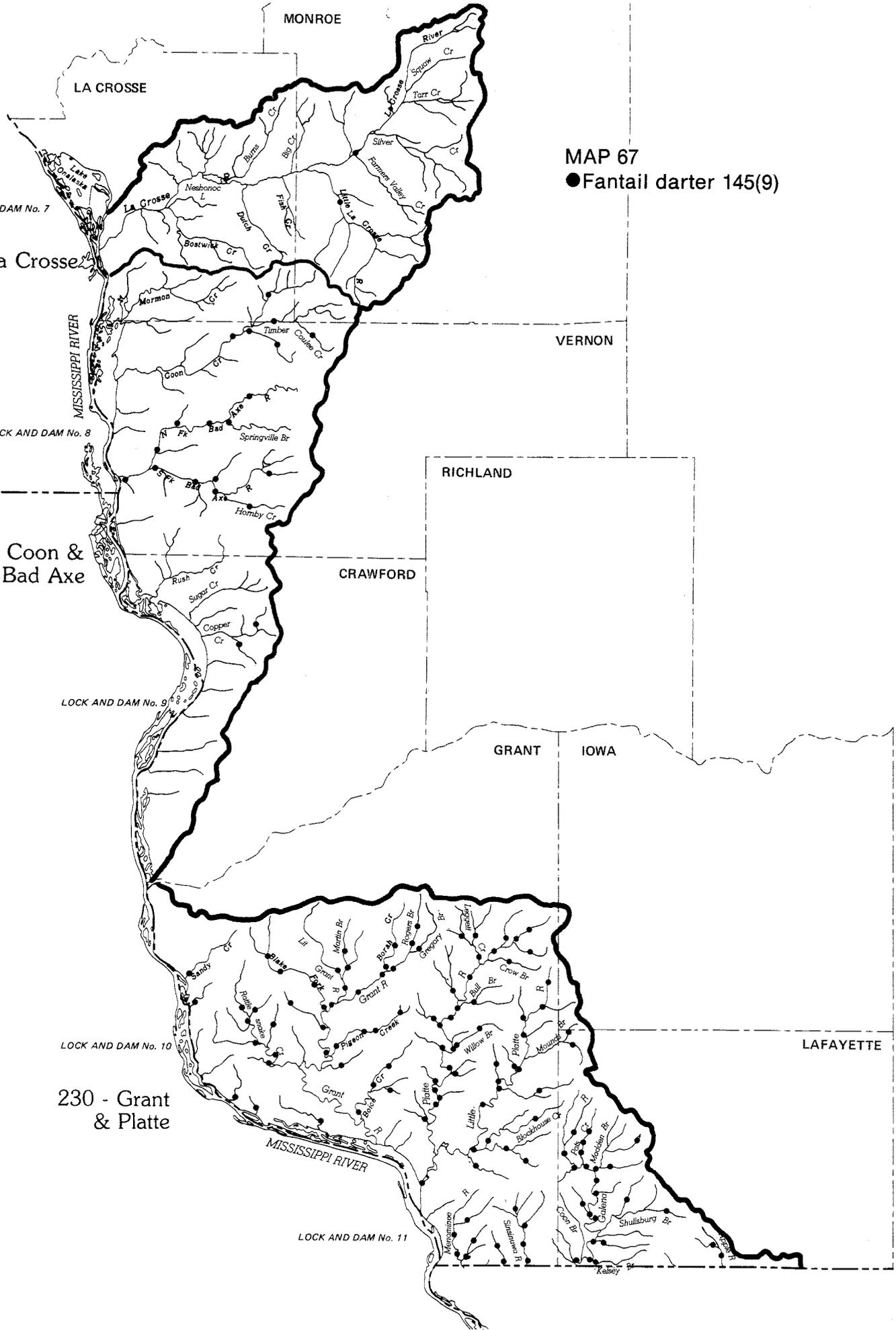
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 68

● Johnny darter 200(21)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

250 - Coon & Bad Axe

VERNON

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

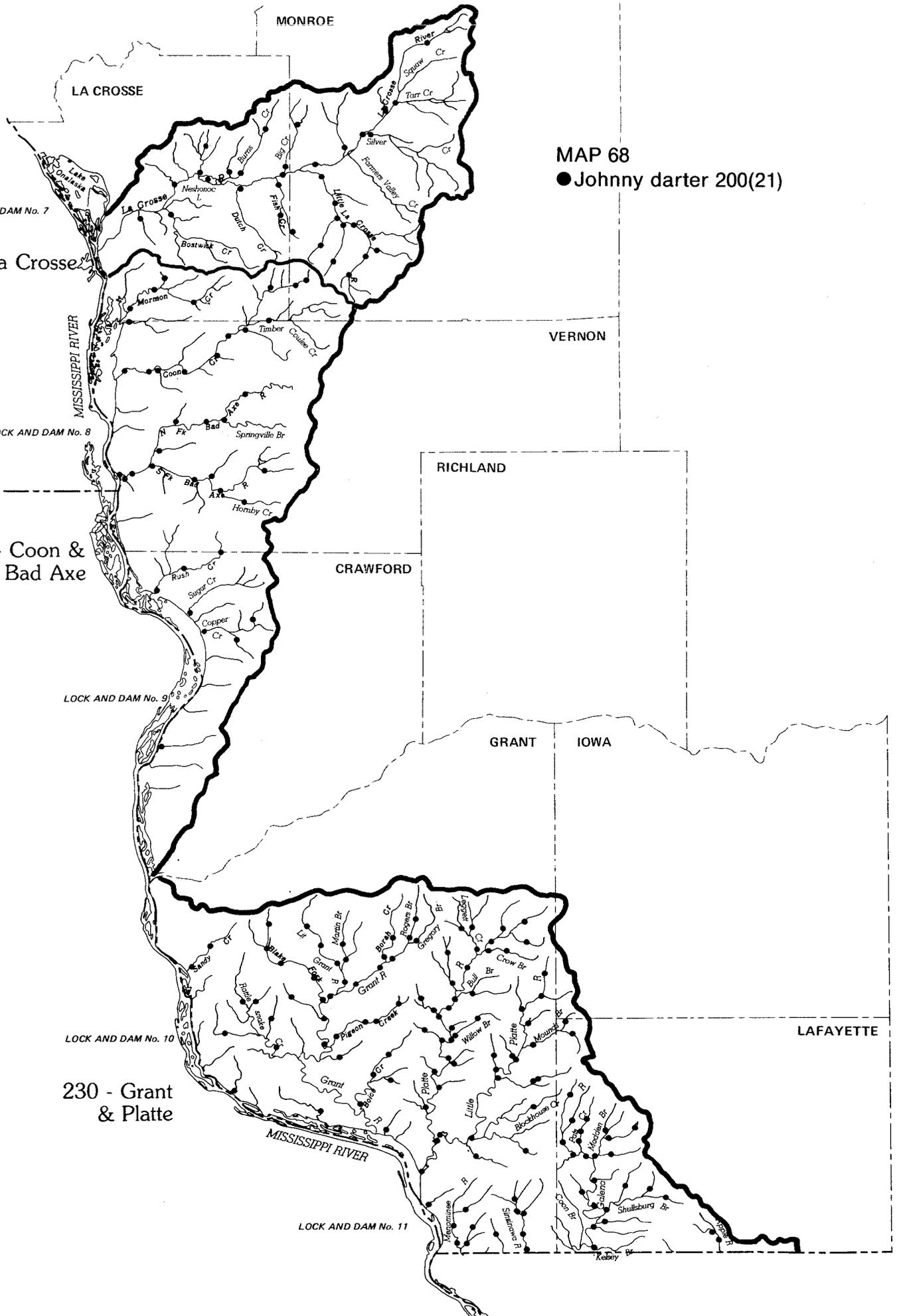
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 69

● Banded darter 4(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

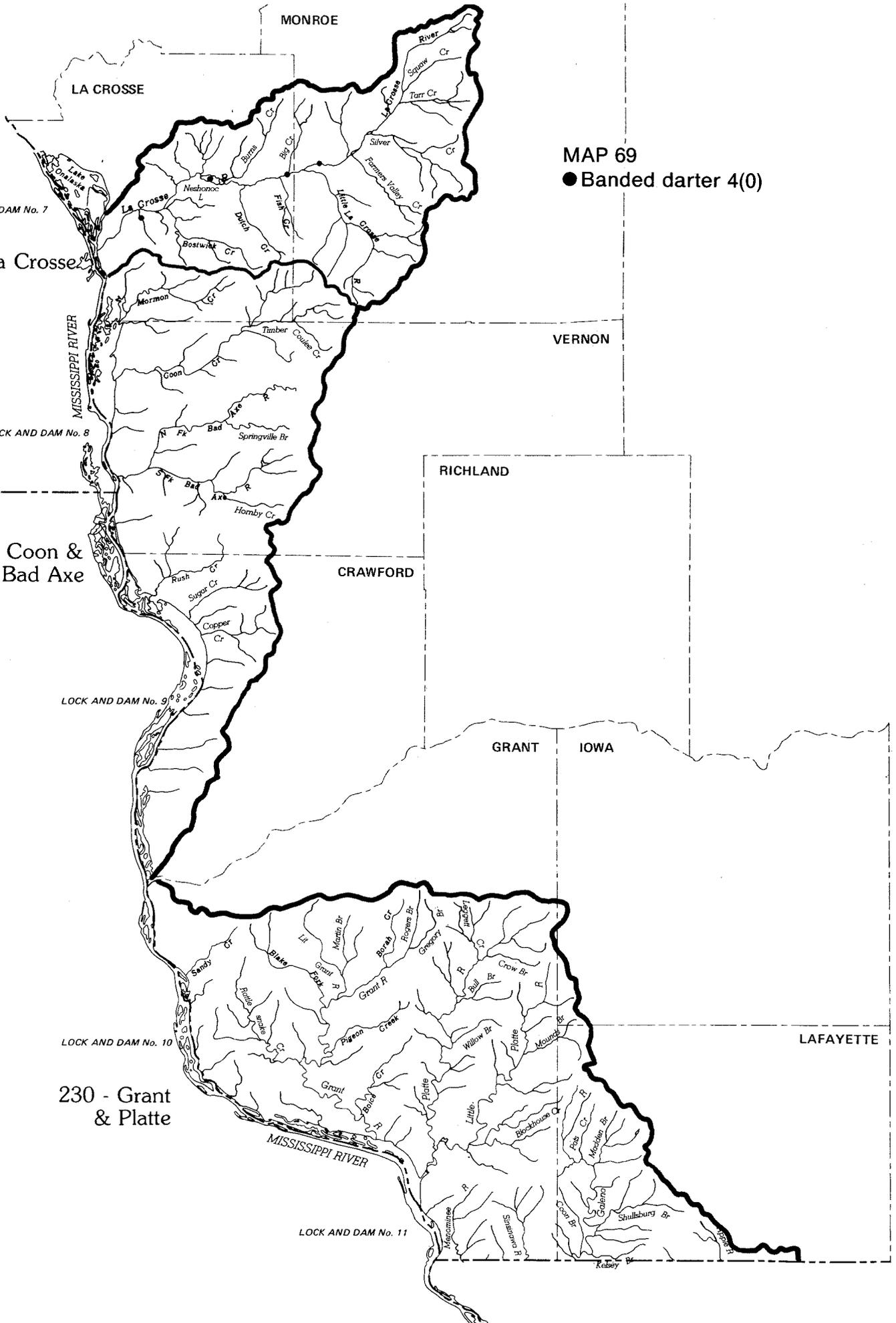
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 70

● Yellow perch 4(2)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

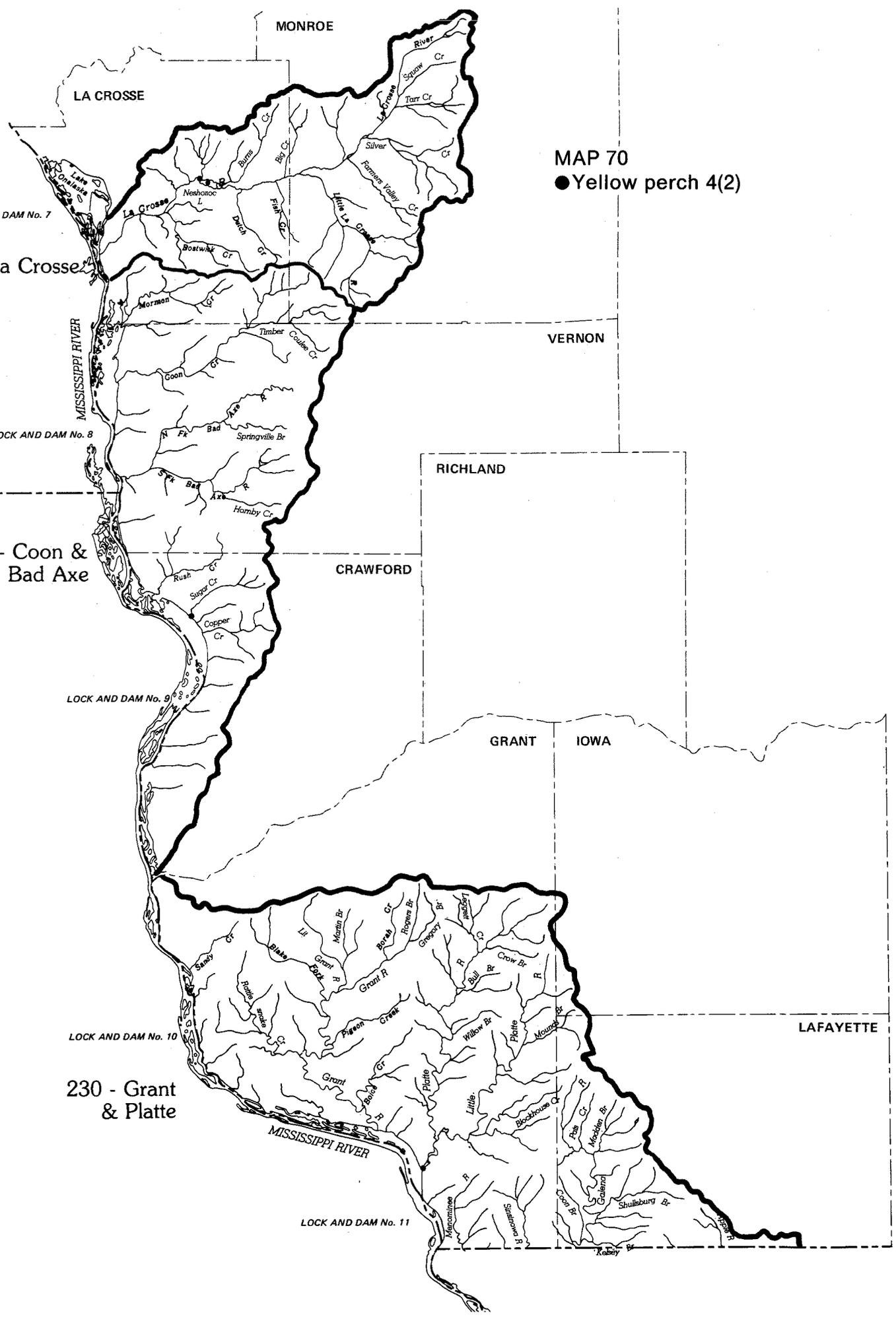
LOCK AND DAM No. 10

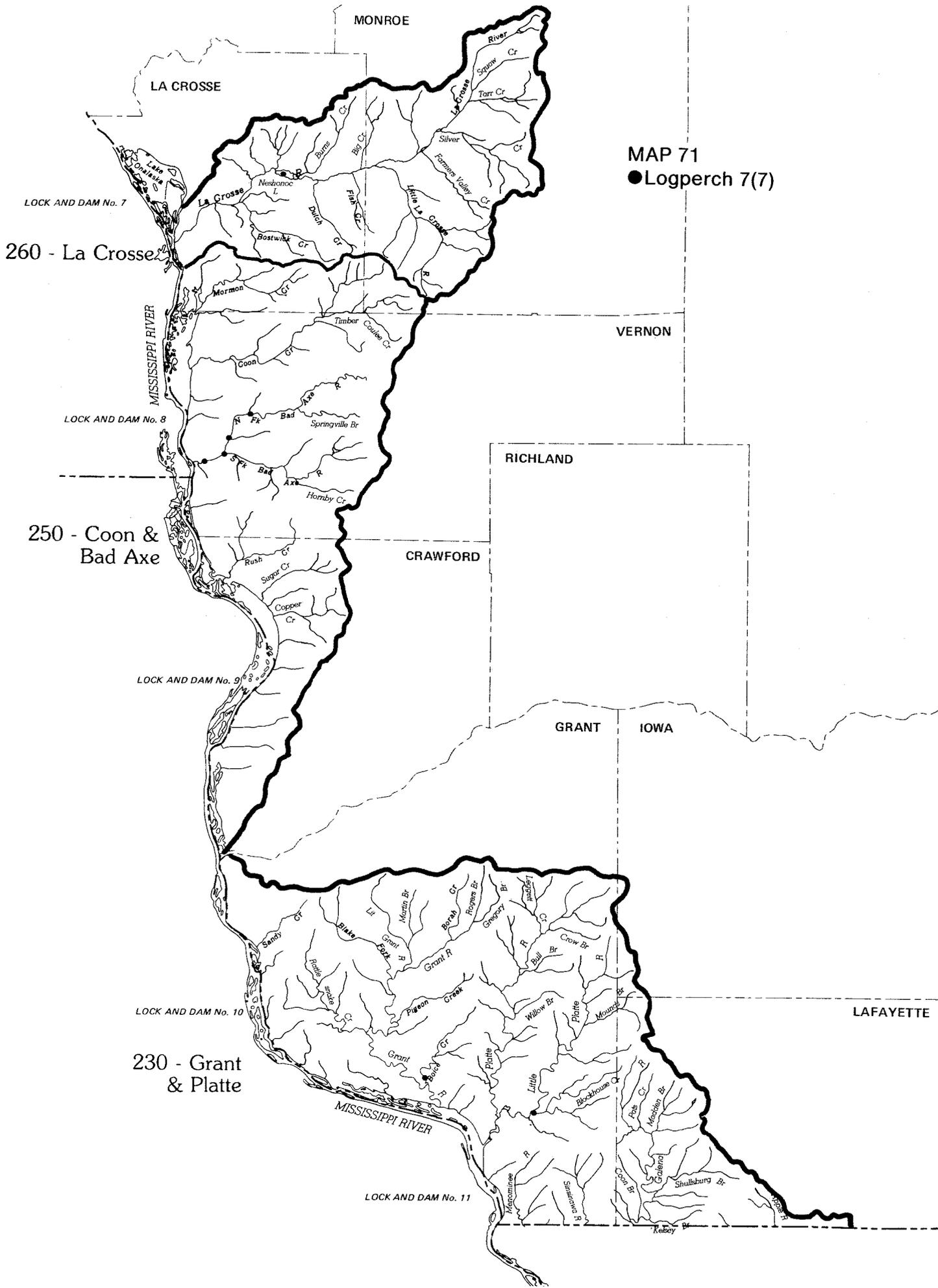
230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11





MONROE

LA CROSSE

MAP 72

● Blackside darter 7(0)

▲ Slenderhead darter 3(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

VERNON

LOCK AND DAM No. 8

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

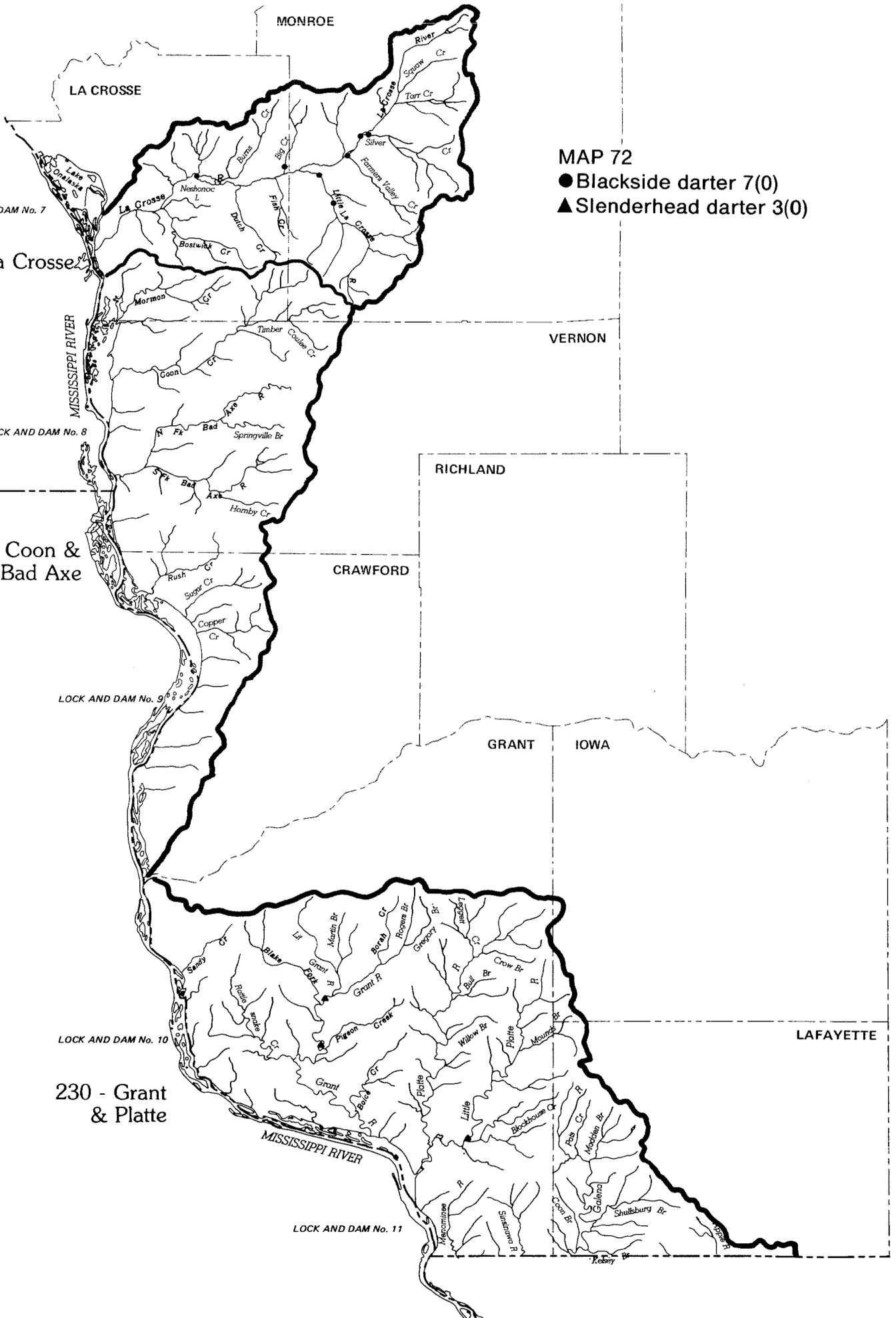
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 73
● Sauger 11(2)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

250 - Coon & Bad Axe

LOCK AND DAM No. 9

CRAWFORD

RICHLAND

VERNON

GRANT

IOWA

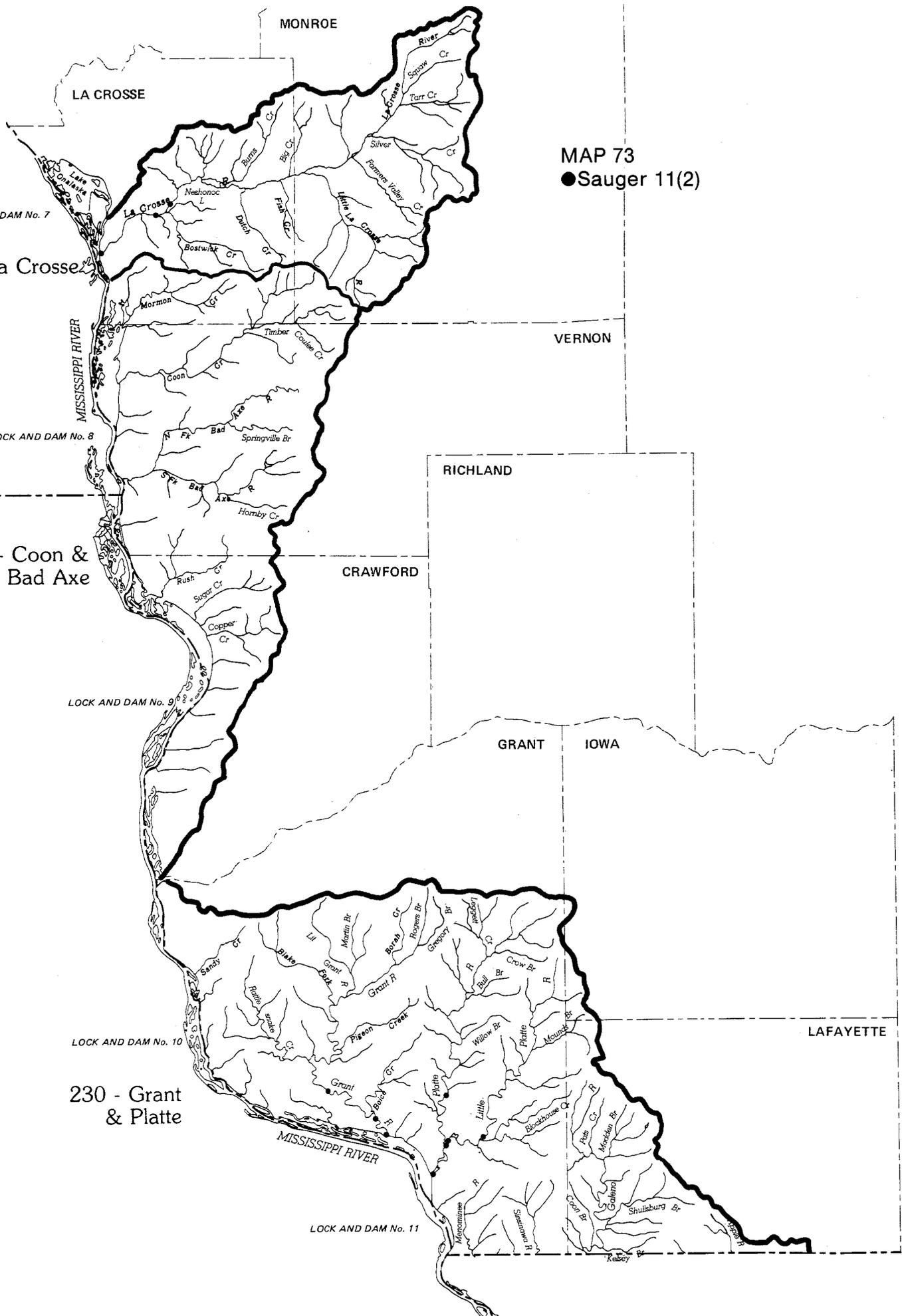
LOCK AND DAM No. 10

230 - Grant & Platte

MISSISSIPPI RIVER

LOCK AND DAM No. 11

LAFAYETTE



MONROE

LA CROSSE

MAP 74

●Walleye 12(1)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

VERNON

LOCK AND DAM No. 8

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

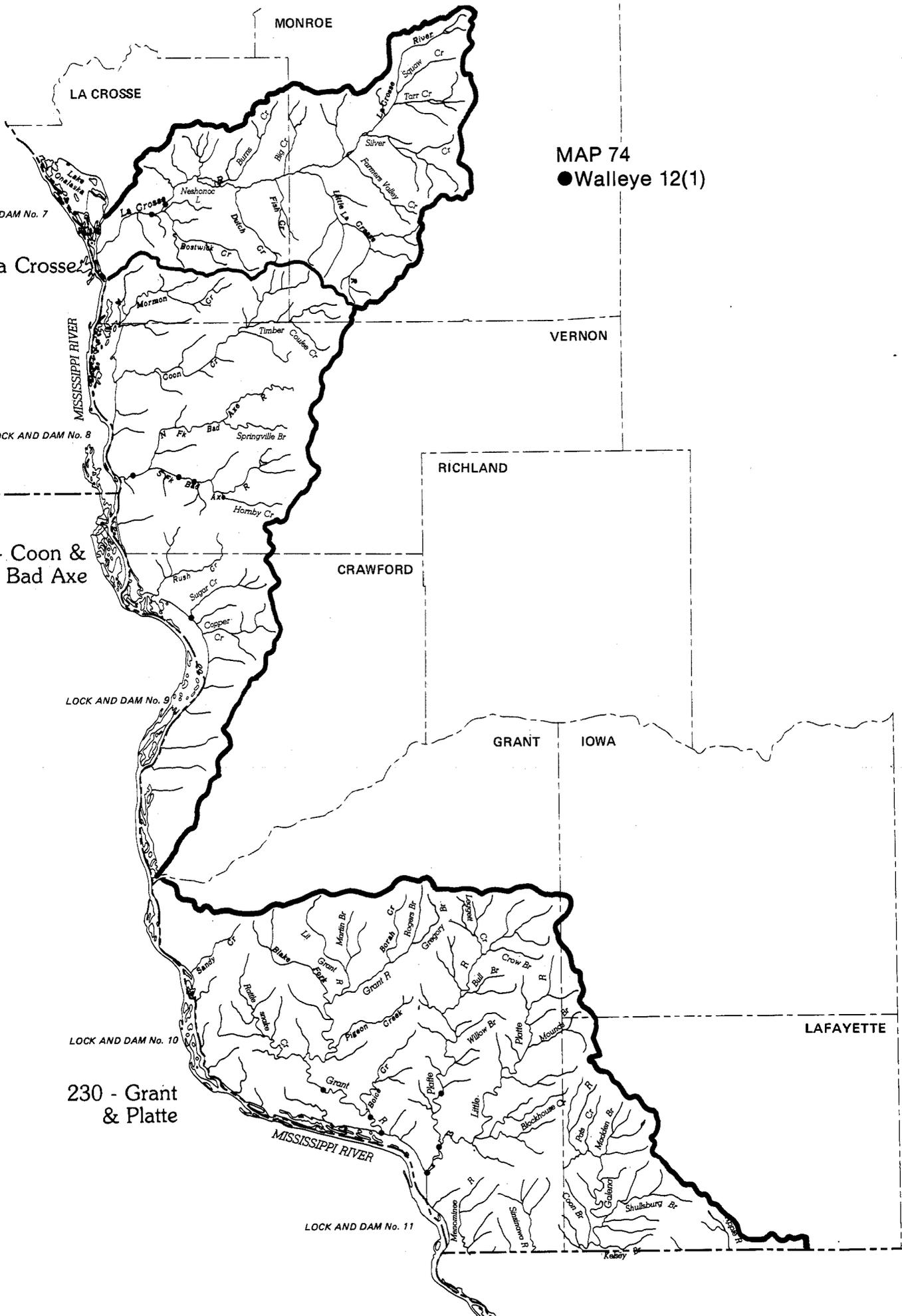
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 75

● Freshwater drum 2(0)

LOCK AND DAM No. 7

260 - La Crosse

MISSISSIPPI RIVER

LOCK AND DAM No. 8

VERNON

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

IOWA

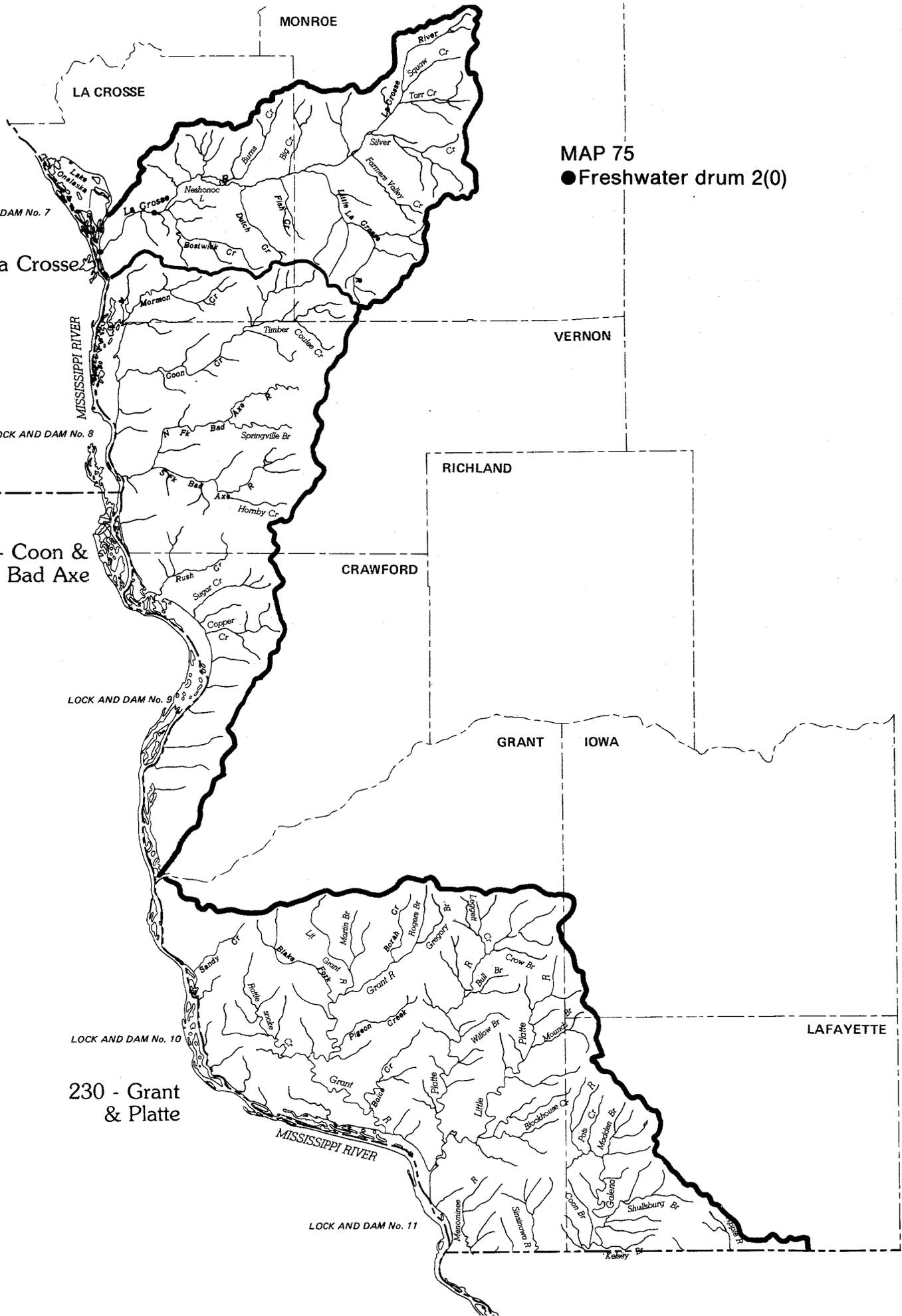
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

MISSISSIPPI RIVER

LOCK AND DAM No. 11



MONROE

LA CROSSE

MAP 76

● Mottled sculpin 20(0)

LOCK AND DAM No. 7

260 - La Crosse

VERNON

LOCK AND DAM No. 8

250 - Coon & Bad Axe

RICHLAND

CRAWFORD

LOCK AND DAM No. 9

GRANT

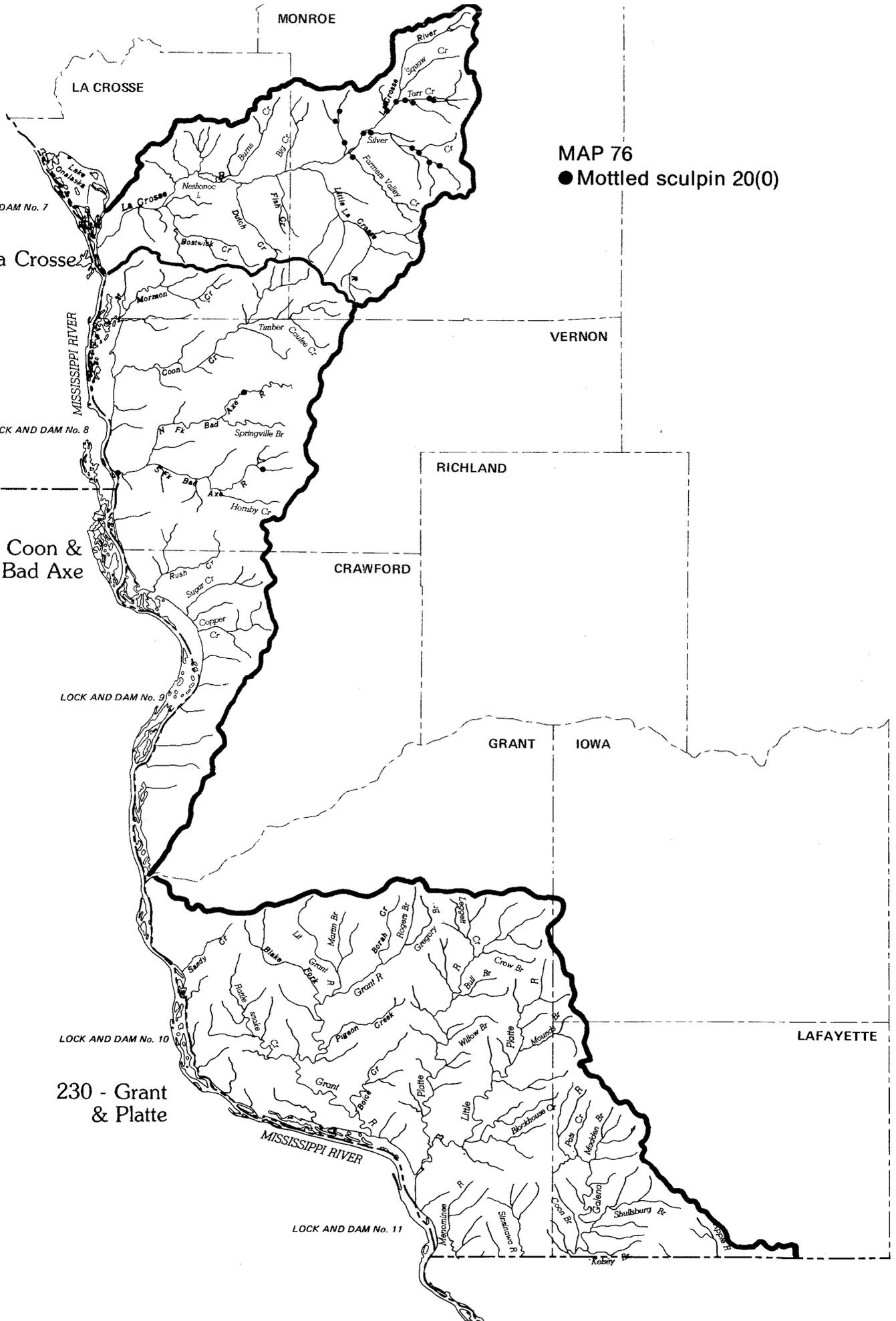
IOWA

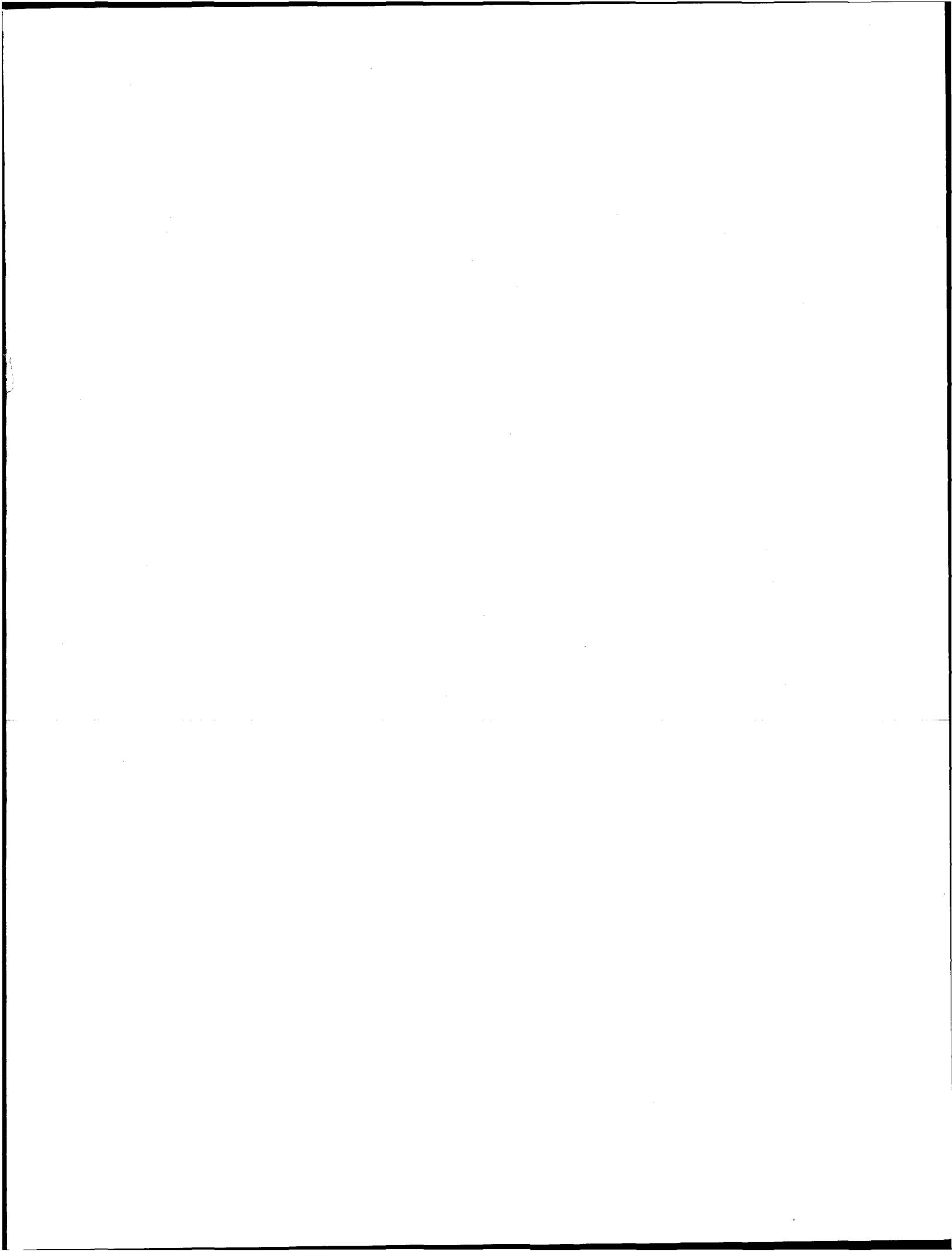
LOCK AND DAM No. 10

230 - Grant & Platte

LAFAYETTE

LOCK AND DAM No. 11





INDEX TO MAPS

	Map No.		Map No.		Map No.
Bass		Johnny	68	Shorthead	45
Largemouth	61	Mud	64	Silver	43
Rock	55	Rainbow	65	Sauger	73
Smallmouth	60	Slenderhead	72	Shad, Gizzard	4
White	54	Drum,		Sculpin	
Bluegill	59	Freshwater	75	Mottled	76
Bowfin	4	Gar		Slimy	77
Bullhead		Longnose	3	Shiner	
Black	46	Shortnose	3	Bigmouth	22
Brown	47	Goldeye	5	Common	21
Yellow	47	Lamprey		Emerald	19
Burbot	52	American		Golden	18
Carp, Common	14	brook	2	Mimic	28
Carp sucker		Chestnut	1	River	20
Highfin	38	Silver	1	Rosyface	25
River	38	Logperch	71	Sand	27
Catfish		Madtom,		Spotfin	26
Channel	48	Tadpole	50	Spottail	23
Flathead	51	Minnow		Weed	28
Chub		Bluntnose	32	Silverside, Brook	52
Creek	37	Brassy	13	Stickleback,	
Hornyhead	17	Bullhead	34	Brook	53
Silver	16	Fathead	33	Stonecat	49
Crappie		Ozark	24	Stoneroller	
Black	63	Miss. silvery	15	Central	12
White	62	Suckermouth	29	Largescale	13
Dace		Mooneye	5	Sucker	
Blacknose	35	Mudminnow,		Northern hog	41
Longnose	36	Central	9	Spotted	42
Northern		Perch		White	40
redbelly	30	Pirate	51	Sunfish	
Southern		Yellow	70	Green	56
redbelly	31	Pickrel, Grass	10	Orangespotted	58
Darter		Pike, Northern	11	Trout	
Banded	69	Pumpkinseed	57	Brook	8
Blackside	72	Quillback	39	Brown	7
Fantail	67	Redhorse		Rainbow	6
Iowa	66	Golden	44	Walleye	74

METRIC-ENGLISH AND ENGLISH-METRIC CONVERSIONS

1 km = 0.6214 mile
1 km² = 0.3861 miles²
1 ha = 2.47 acres
1 cm = 0.3937 inches (0.328 ft)
1 m³ = 35.21³

1 ft = 30.48 cm
1 mile = 1.609 km
1 acre = 0.4047 ha

ACKNOWLEDGMENTS

The study of the distribution of fish in the Grant & Platte, Coon & Bad Axe, and La Crosse river basins spans 5 years and represents the efforts and co-operation of a number of people.

One requiring special thanks is David Siegler for his work throughout the study, particularly in heading a field sampling crew, in coding the raw data for entry into the computer, in drafting the base maps, in preparing the 77 species maps, and in preparing and proofing many of the tables and figures. Another is Dale Becker for his work as principal fish taxonomist and a member of the sampling crew until July 1978.

Another member of the crew was Keith Otis who was our principal taxonomist from July 1978 to September 1980.

Three other individuals, Fred Hagstrom, Ken Kahler, and Jim Kreitlow are recognized for their work in the field as crew leaders and in the laboratory.

Summer employes who helped with the strenuous field work were Roger Cohn, Paul Johnson, Al Kaas, Douglas Leschisin, Mike Meyers, Tom Meyer, John Nichols, Kurt Osterby, Eric Polzin, Tom Rosin, Don Samuelson, Peter Segerson, Paul Sims, Richard Tollefson, and Kurt Welke.

I am particularly indebted to Dr. George Becker who shared not only his skills in fish taxonomy with members of this study, but also data from fish collections that he and his students had made.

Credit is given to District Fish Management personnel who assisted by sending us fish from their stream and lake surveys and copies of their reports.

The following persons critically reviewed this manuscript: Lyle Christenson and Anne Forbes.

Photographs were taken by the author except where listed.

Permission to use several fish photographs and drawings from "Fishes of Illinois" by Philip Smith was kindly

granted by the University of Illinois Press (©1979 by the Board of Trustees of the University of Illinois).

This investigation was financed in part by the Wisconsin Department of Natural Resources, Federal Aid in Fish Restoration under Dingell-Johnson project F-83-R, and Federal Endangered Species Act of 1973 under Wisconsin Project E-1.

About the Author

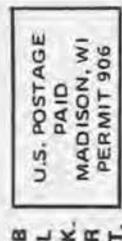
Don Fago is a fisheries biologist with the Bureau of Research who has been in charge of the statewide fish distribution study since its inception in 1974 (DNR, 3911 Fish Hatchery Road, Madison, Wisconsin 53711).

Production Credits

Ruth L. Hine, Editor
Donna Mears, Copy Editor
Richard Burton, Graphic Artist
Sheila Mittelstaedt, Christine Trevorrow
and Susan J. Hoffman, Word Processors

TECHNICAL BULLETINS (1981-84)

- No. 120 Forest opening construction and impacts in northern Wisconsin. (1981) Keith R. McCaffery, James E. Ashbrenner, and John C. Moulton
- No. 121 Population dynamics of wild brown trout and associated sport fisheries in four central Wisconsin streams. (1981) Ed L. Avery and Robert L. Hunt
- No. 122 Leopard frog populations and mortality in Wisconsin, 1974-76. (1981) Ruth L. Hine, Betty L. Les, and Bruce F. Hellmich
- No. 123 An evaluation of Wisconsin ruffed grouse surveys. (1981) Donald R. Thompson and John C. Moulton
- No. 124 A survey of Unionid mussels in the Upper Mississippi River (Pools 3 through 11). (1981) Pamela A. Thiel
- No. 125 Harvest, age structure, survivorship, and productivity of red foxes in Wisconsin, 1975-78. (1981) Charles M. Pils, Mark A. Martin, and Eugene L. Lange
- No. 126 Artificial nesting structures for the double-crested cormorant. (1981) Thomas I. Meier
- No. 127 Population dynamics of young-of-the-year bluegill. (1982) Thomas D. Beard
- No. 128 Habitat development for bobwhite quail on private lands in Wisconsin. (1982) Robert T. Dumke
- No. 129 Status and management of black bears in Wisconsin. (1982) Bruce E. Kohn
- No. 130 Spawning and early life history of yellow perch in the Lake Winnebago system. (1982) John J. Weber and Betty L. Les
- No. 131 Hypothetical effects of fishing regulations in Murphy Flowage, Wisconsin. (1982) Howard E. Snow
- No. 132 Using a biotic index to evaluate water quality in streams. (1982) William L. Hilsenhoff
- No. 133 Alternative methods of estimating pollutant loads in flowing water. (1982) Ken Baun
- No. 134 Movement of carp in the Lake Winnebago system determined by radio telemetry. (1982) Keith J. Otis and John J. Weber
- No. 135 Evaluation of waterfowl production areas in Wisconsin. (1982) LeRoy R. Petersen, Mark A. Martin, John M. Cole, James R. March, and Charles M. Pils
- No. 136 Distribution and relative abundance of fishes in Wisconsin. I. Greater Rock river basin. (1982) Don Fago
- No. 137 A bibliography of beaver, trout, wildlife, and forest relationships with special reference to beaver and trout. (1983) Ed Avery
- No. 138 Limnological characteristics of Wisconsin lakes. (1983) Richard A. Lillie and John W. Mason
- No. 139 A survey of the mussel densities in Pool 10 of the Upper Mississippi River (1982). Randall E. Duncan and Pamela A. Thiel
- No. 140 Distribution and relative abundance of fishes in Wisconsin. II. Black, Trempealeau, and Buffalo river basins. (1983) Don Fago
- No. 141 Population dynamics of wild trout and associated sport fisheries in two northern Wisconsin streams. (1983) Ed L. Avery
- No. 142 Assessment of a daily limit of two trout on the sport fishery at McGee Lake, Wisconsin. (1984) Robert L. Hunt
- No. 143 Distribution and relative abundance of fishes in Wisconsin. III. Red Cedar river basin. (1984) Don Fago
- No. 144 Population ecology of woodcock in Wisconsin. (1984) Larry Gregg
- No. 145 Duck breeding ecology and harvest characteristics on Grand River Marsh Wildlife Area. (1984) William E. Wheeler, Ronald C. Gatti, and Gerald A. Bartelt
- No. 146 Impacts of a floodwater-retarding structure on year class strength and production by wild brown trout in a Wisconsin coulee stream. (1984) Oscar M. Brynildson and Clifford L. Brynildson
- No. 147 Distribution and relative abundance of fishes in Wisconsin. IV. Root, Milwaukee, Des Plaines, and Fox River basins. (1984) Don Fago
- No. 148 An 8-inch length limit on smallmouth bass: effects on the sport fishery and population of smallmouth bass and yellow perch in Nebish Lake, Wisconsin. (1984) Steven L. Serns
- No. 149 Food habits of adult yellow perch and smallmouth bass in Nebish Lake, Wisconsin. (1984) Steven L. Serns and Michael Hoff
- No. 150 Aquatic organisms in acidic environments: a literature review. (1984) Joseph M. Eilers, Gregory J. Lien, and Richard G. Berg
- No. 151 Ruffed grouse habitat relationships in aspen and oak forest of central Wisconsin. (1984) John F. Kubisiak



B L K R T

Department of Natural Resources
 Box 7921
 Madison, Wisconsin 53707

Address Correction Requested
 DO NOT FORWARD