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WATER INVESTIGATIONS PROGRAM

PADDLEFISH (*Polyodon spathula*) MOVEMENT IN THE ALABAMA RIVER, 2001-2005

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by

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CONTENTS

ILLUSTRATIONS

TABLES

APPENDICES

PADDLEFISH (*Polyodon spathula*) MOVEMENT IN THE ALABAMA RIVER, 2001-2005

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ABSTRACT

A total of 323 paddlefish have been anchor tagged since the study began in 2001. Ultrasonic tags were implanted in 103 anchor-tagged fish. Ninety-two sonic fish have been detected 460 times, from 1 to 677 days following release. One paddlefish released in 2004 moved upstream through Millers Ferry lock chamber and was detected in a 10 to 12 mile-long section of Dannelly Reservoir in 2004-05. Sixty-two sonic fish resided in one of four areas within Claiborne Reservoir. Fourteen resided in an area that extended from Claiborne tailwater downstream in the lower Alabama River to Marshall's Bluff. Several fish in both groups exhibited spawning site fidelity by returning to Millers Ferry tailwater one year after release. Some fish returned to the same habitat they occupied the previous year while others moved further downstream to the Tensaw River. Most of the 15 fish found in the Mobile-Tensaw River Delta resided in the Tensaw River and several of its major tributaries.

INTRODUCTION

The paddlefish (*Polyodon spathula*) originally inhabited many large river tributaries to the Mississippi and Mobile basins. Overfishing, dam construction, habitat modification, and pollution have dramatically reduced the distribution and abundance of this species (Burr, 1978; Robison and Buchanan, 1988; Williams and others, 1989; Etnier and Starnes,1993; Mettee and others, 1996; Ross, 2001). As a result, it has been extirpated from four states and is listed as endangered, threatened, or of special concern by 11 others (Graham, 1997). Fearing a similar downward trend in Alabama, the Wildlife and Freshwater Division (WFFD) of the Alabama Department of Conservation and Natural Resources (ADCNR) banned paddlefish harvest in all Alabama rivers in 1988. Recent increased paddlefish sightings have renewed public interest in re-opening the season. In response to these inquiries, the WFFD will soon initiate a multi-year study to determine the size of paddlefish populations inhabiting the Alabama and Tombigbee Rivers and Mobile-Tensaw River Delta. Paddlefish were very abundant in the Tennessee River from the later 1890s to the early 1900s, but populations were overfished and have not

recovered (Hoxmeier and DeVries, 1996). Due to continuing low numbers, the harvest ban on paddlefish will not be removed across northern Alabama for the foreseeable future.

Paddlefish life history and movements are well documented in the upper Mississippi River (Rosen and others, 1982; Southall and Hubert, 1984; Moen and others, 1992; Lyons, 1993; Zeigler and others, 1999, 2003; Runstron and others, 2001), but relatively little information has been published on populations inhabiting Alabama rivers. Hoxmeier and DeVries (1997) reported that juvenile Alabama River paddlefish used oxbow lakes as nursery areas until they reached sexual maturity at around 650 millimeters (mm) eye to fork length (EFL). Adults and juveniles remain in backwater habitats during the summer and fall and then move into main channel habitats in the winter and spring. Alabama River paddlefish had shorter life spans, higher fecundity rates, and the lengths for various age classes of Alabama River fish were generally shorter than those found in northern rivers. Lein and DeVries (1998) reported paddlefish populations in the Cahaba and Tallapoosa Rivers were functionally discrete units that resided in adjacent, non-connected reservoirs. Differences in population characteristics between these rivers were possibly influenced by a combination of factors, including flow, habitat size, and water temperature. The recapture of some anchor tagged individuals in the same spawning area in successive years suggested spawning site fidelity. Paddlefish growth was greatest during the first year of life, decreased with age, and was lowest in older, mature fish. The estimated ages of the oldest fish collected in the Tallapoosa and Cahaba Rivers were 11 years and 9 years, respectively. Alabama paddlefish matured quicker, grew faster, possibly spawned more frequently, and produced more eggs than individuals in Louisiana (Reed and others, 1992) and Missouri (Rosen and Hales, 1981).

In 2001, the WFFD contracted the Geological Survey of Alabama (GSA) to sonic tag and monitor paddlefish movements in the Alabama River. Although not included as part of the original scope of work, the GSA also implanted internal anchor tags into all paddlefish collected to assist the WFFD in their efforts to determine the size of the paddlefish populations inhabiting the Alabama River. This report summarizes information collected from 2001-05 for this project. It also includes paddlefish anchor and sonic tagging data collected during a fish bypass study completed by the GSA at Claiborne and Millers Ferry Locks and Dams in 2003-04 for the U.S. Fish and Wildlife Service (USFWS).

ACKNOWLEDGMENTS

Several agencies and individuals contributed to the success of this research. Section 6 funding was provided by the WFFD, USFWS, and GSA. The Mobile District Office of the U.S. Army Corps of Engineers (USCOE) altered the hydroelectric generation schedule at Millers Ferry Lock and Dam to accommodate netting operations for the study. Ed Tybergein (Alabama Power Company) and Greg Lein (ADCNR) shared information from their previous studies on paddlefish populations in the Tallapoosa and Cahaba Rivers. Dennis DeVries (Auburn University) supplied a thesis on paddlefish populations in the Alabama River by Hoxmeier (1996) and published papers by Hoxmeier and DeVries (1997) and Lein and DeVries (1998). We thank Dave Armstrong, Jerry Moss, Phillip Kilpatrick (retired), and Steve Rider from the WFFD for their field sampling assistance.

THE STUDY AREA

The Alabama River is formed by the junction of the Coosa and Tallapoosa Rivers. It drains approximately 22,617 square miles in eastern Alabama, northwestern Georgia, and a small section of southern Tennessee. The Alabama and Tombigbee Rivers join to form the Mobile-Tensaw River Delta, which extends about 30 miles (mi) before entering Mobile Bay.

The USCOE operates three locks and dams on the Alabama River, two of which have hydroelectric generating facilities. Robert F. Henry Lock and Dam at Alabama River mile (ARM) 236 and Millers Ferry Lock and Dam at ARM 133 each have a gated spillway, a lock chamber, and hydroelectric generating facilities. The powerhouse at Henry Lock and Dam is located on the west bank of the river; the lock chamber is on the east bank. The powerhouse at Millers Ferry was constructed as a separate facility on the east bank of the river about 0.5 mi downstream of the gated spillway and lock chamber. Claiborne Lock and Dam, located at ARM 73, has a combined crested and gated spillway and a lock chamber but no hydroelectric generating facility.

Forest production and agriculture are the dominant land uses throughout much of the Alabama River watershed. Montgomery and Selma are the largest municipal dischargers into the Alabama River although the Cahaba River, its largest tributary, receives substantial municipal discharge and nonpoint runoff from the Birmingham Metropolitan area and the town of Centreville. Other permitted dischargers in the area are paper mills near Montgomery, Selma, Camden, and Monroeville. Depth and flow in the Alabama River fluctuate daily due to

hydroelectric discharges at Henry and Millers Ferry Lock and Dams. Commercial barge traffic has declined significantly over the past 10 to 20 years, but the USCOE still maintains a 9-foot (ft) deep navigational channel throughout the entire 299 mi of the river. Most dredging activities are confined to the lower 73 mi of the river downstream of Claiborne Lock and Dam. Fishing and boating are popular recreational activities throughout the Alabama River system.

METHODS

Most paddlefish collected for this study were taken in the generator outflow area below Millers Ferry in March and April from 2001-05. On each sample day, the USCOE discontinued hydroelectric generation from 0900-1200 hours. Five 200-ft-long and 8-ft-deep (tied to 6-ft) multi-filament nylon gill nets, each having 2.0- to 2.5-inch- (in.) bar mesh, foamcore float lines, and leadcore bottom lines, were deployed in the outflow area (fig. 1), fished for approximately 60 minutes, and retrieved. All paddlefish collected were placed in large aerated tanks for processing. Other species were identified, tallied, and released.

Processing and tagging operations were completed on the west bank of the river. The EFL (mm) of each fish was measured and a Betadine-soaked Sonotronics sonic tag (Model CT-82-3) having a 48-month operating life was inserted into the abdominal cavity through a 2.0- to 2.5-in. long incision made near the ventral midline. The incision was sutured with non-absorbable nylon thread and the surgical area was treated with Betadine. A numbered internal anchor tag was inserted through a small vertical incision made on the lower left side of the body. Each fish was placed in a livewell and observed for several minutes before release.

Trips to detect sonic tagged fish were completed through the fall and summer using a Sonotronics DH-2 directional hydrophone and USR-5W sonic receiver. During each trip, the boat was stopped at about 0.3-mile intervals, the hydrophone was lowered into the water, and a minimum of two 360E sweeps were completed to detect tag signals in the 69-83 kilohertz (khz) range used during the study. Once detected, the location of each fish was georeferenced with a Lowrance LCX-15MT global positioning system (GPS) when the sonic signal was equally audible in all directions. Detection dates, locations, and depths were recorded on field sheets that are deposited in the GSA Ichthyological Collection in Tuscaloosa. Maps showing fish locations were generated with ArcView and Adobe Illustrator software.

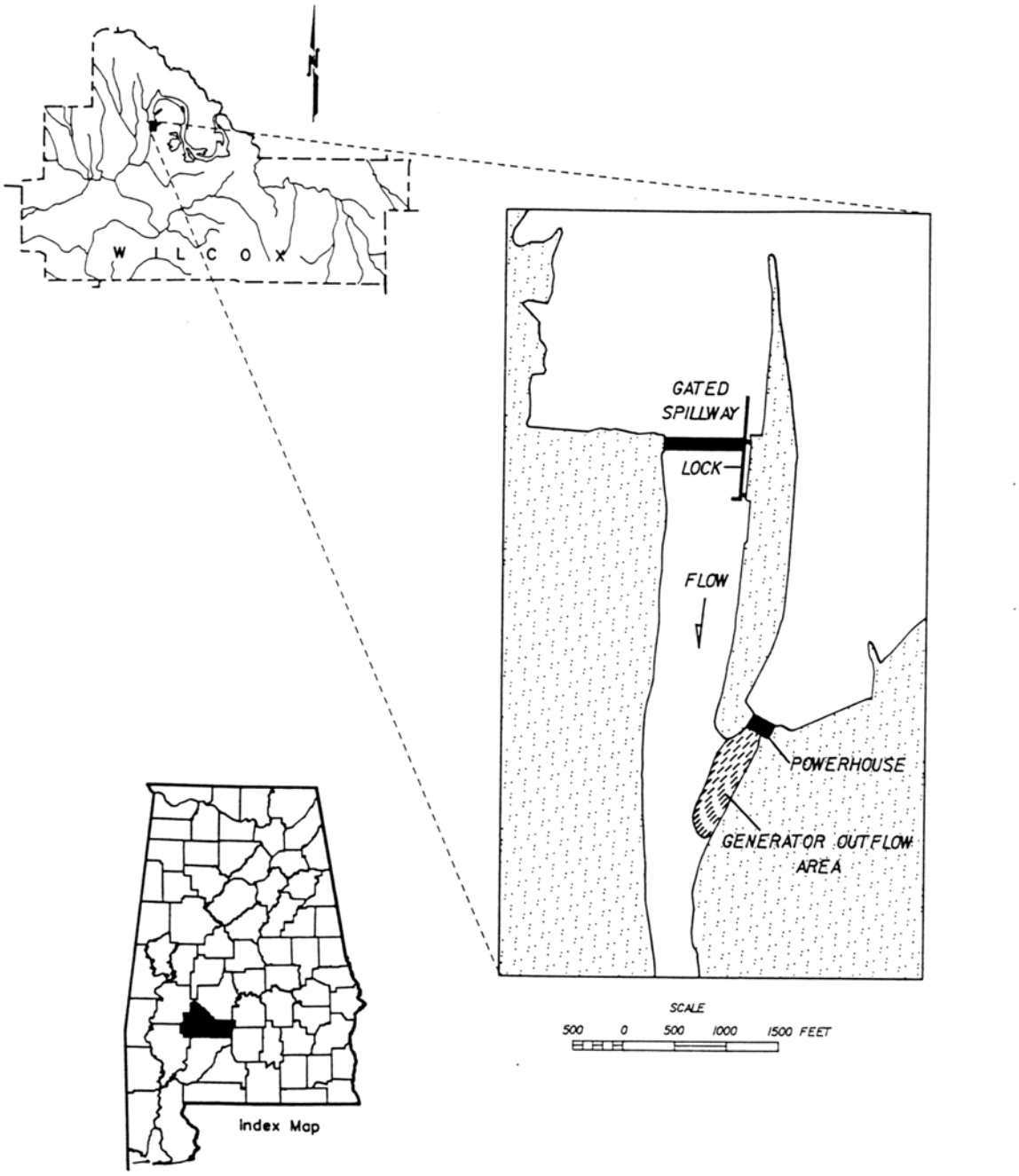

Figure 1. Sampling area for *Polyodon spathula* below Millers Ferry Lock and Dam.

RESULTS AND DISCUSSION

Anchor tags were implanted in 323 paddlefish to assist the WFFD in their efforts to estimate paddlefish population size in the lower Alabama River. Eye-to-fork lengths for anchor tagged fish ranged from 321-1080 mm (fig. 2). Hoxmeier and DeVries (1996) indicated that lower Alabama River paddlefish reached sexual maturity at around 650 mm EFL. Using their estimate, 27 of the individuals tagged were immature and 296 were mature.

Our efforts to distinguish male and female paddlefish using rostral tubercles and body girth, respectively (Hoxmeier and DeVries 1996; Lein and DeVries 1998), were usually unsuccessful. To help resolve this problem, we consulted several paddlefish publications and state fish books, none of which included reliable characteristics to distinguish male from female paddlefish. We also discussed gender determination with several biologists currently involved in paddlefish studies in the Mississippi River. Most responded that external characteristics were unreliable because they were only visible for a short time period on some but not all individuals. Internal examination was the only reliable way to distinguish paddlefish sexes. Based on these findings, we did not record paddlefish gender unless eggs were observed inside the abdominal cavity or milt was extruded during the tagging process.

Ultrasonic tags were implanted in 103 anchor tagged fish (Table 1). Ninety-seven fish were tagged below Millers Ferry, five below Claiborne, and one below Henry. Ninety-two fish have been detected 460 times, from 1 to 677 days following release. The detection area covered about 200 miles, from 12 miles upstream of Millers Ferry to the lower Apalachee River.

One paddlefish tagged downstream of Millers Ferry in March 2004 moved upstream through Millers Ferry lock chamber and was detected in a 10 to 12- mile-long reach of Dannelly Reservoir in 2004-05. To our knowledge, this is the first record of a sonic tagged fish moving through a USCOE lock and dam in Alabama.

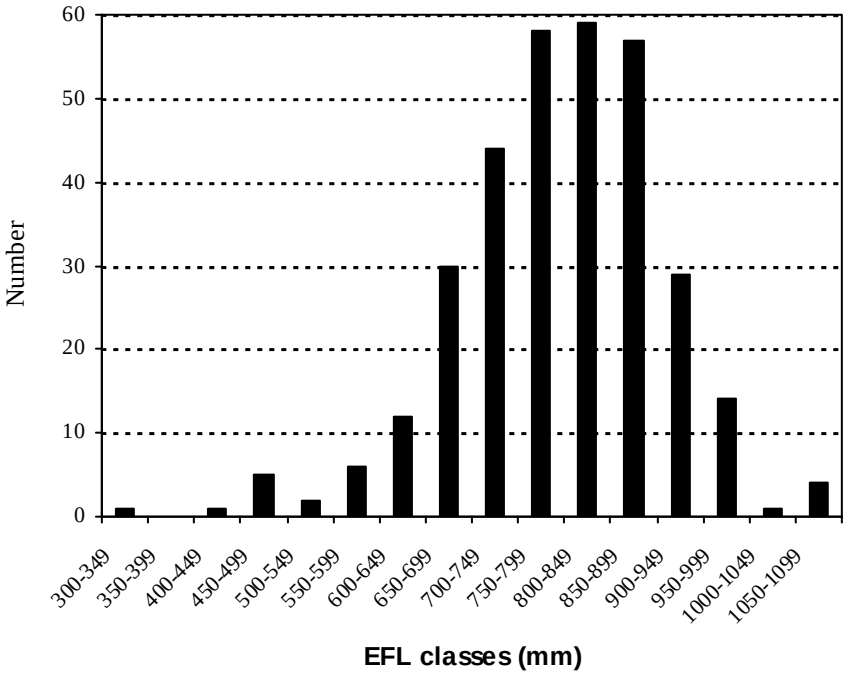

Figure 2. Eye to fork (EFL) length classes for 323 paddlefish anchor tagged in the Alabama River, 2002-05.

Table 1.—Summary statistics on 103 paddlefish sonic tagged in the Alabama River, 2001-05.

Tag Year	Fish Tagged	Detection Year					Tag Year	
		2001	2002	2003	2004	2005	Detected	Not Detected
2001	5	2					2	3
2002	17		15	8	1*		15	2
2003	24			17	13**		21	3
2004	38				36	14	36	2
2005	19					18	18	1
Total	103	2	15	25	40	32	92	11

* one 2002 fish found in 2004 but not 2003; ** two 2003 fish found in 2004 but not 2003

Sixty-two sonic fish spent their summers between Millers Ferry and Claiborne Locks and Dams (ARM 73-133) (Table 2). Many of these individuals congregated in four or five distinct areas, including the locally known Mermaid Hole (ARM 126-129), Walnut Bluff (ARM 120-122), Lower Peachtree Landing to Stein Island (ARM 94-98), and near Bates Bar (ARM 86-88). Very few fish resided in the area from Claiborne Lock and Dam upstream to Bates Bar (ARM 73-86), even though this region appeared to provide excellent paddlefish habitat. Most individuals initially found in this section usually continued downstream and were subsequently detected in either the lower Alabama River or Mobile-Tensaw River Delta.

Table 2. Major detection areas for 92 sonic tagged paddlefish detected in the Alabama River and Mobile-Tensaw River Delta, 2001-05.

Tag Year	Above Millers Ferry	Millers Ferry To Claiborne	Claiborne to Marshall Bluff	Mobile-Tensaw River Delta
2001		2		
2002		13	1	1
2003		12	5	4
2004	1	23	7	5
2005		12	1	5
Total	1	62	14	15

Most of the 29 fish that moved downstream past Claiborne Lock and Dam (ARM 73) were found in one of two widely separated areas. Fourteen were detected from Claiborne tailwater (ARM 73) downstream to Marshall's Bluff (ARM 54). The remaining 15 fish continued an additional 80-90 miles downstream to the Mobile-Tensaw River Delta. Fourteen inhabited the Tensaw River and several of its major tributaries including Briar and Mifflin Lakes, The Basin, and Raft River. One fish was discovered in the Mobile River near Mt. Vernon, but it was never found again. Tagging and detection data for all sonic fish are included in Appendix 2.

Lein and DeVries (1998) suggested spawning site fidelity in paddlefish populations they studied in the Cahaba and Tallapoosa Rivers. We observed similar behavior in several Alabama River paddlefish. In addition, several fish that moved upstream to Millers Ferry one year after release returned to the same habitats they occupied the previous summer. Examples of Claiborne Reservoir fish that utilize the same area as summer habitat in two consecutive years include 3-3-

6-4 (71 khz) from Bells Landing to Millers Ferry and back to Bells Landing in 2003-04, 4-5-7-8 (78 khz) and 4-6-7-5 (74 khz) (fig. 3) from Bates Bar to Millers Ferry and back to Bates Bar in 2004-05, and 5-6-6-6 (72 khz) Mermaid Hole to Millers Ferry and back to Mermaid Hole in 2004-05. Sonic fish 3-3-3-6 (69 khz) is an example of a fish that moved from Claiborne tailwater to Millers Ferry tailwater and then back to Claiborne tailwater (fig. 4). Spawning site fidelity and the ability to return to the same summer habitat in two consecutive years has also been documented for southeastern blue suckers, *Cycleptus meridionalis*, that inhabit the Alabama River and Mobile-Tensaw River Delta (Mettee and others, 2003).

Not all fishes returned to the same summer habitat in two consecutive summers. Sonic fish 4-5-6-7 (77 khz) spent the summer of 2004 near Bates Bar and returned to the Millers Ferry tailwater in March 2005 (fig. 5). Instead of returning to Bates Bar in its second year, it moved approximately 130 miles downstream into the Mobile-Tensaw River Delta where it was detected in The Basin, a western tributary to the Tensaw River, on July 8. Sonic fish 4-4-5-8 (74 khz) was detected in the Claiborne tailwater on July 29, 2004, and at the Alabama State Dock grain elevator, about five miles downstream, on August 17 (fig. 6). Sometime in late 2004 or early 2005, this fish moved back upstream to Millers Ferry tailwater where it was detected on March 7. After the spawning season concluded, it moved approximately 185 miles downstream to the Raft River, a western tributary to the Tensaw River, in the Mobile-Tensaw River Delta.

Sonic fish 4-6-8-8 (74 khz) did not return to Millers Ferry tailwater after its release in March 2004. It moved through Claiborne Reservoir and into the lower Alabama River (fig. 7). We found this fish in the Tensaw River in November 2004 and the Apalachee River, about a half mile upstream of the Mobile Bay Causeway, on June 23, 2005.

Two paddlefish released at Millers Ferry in 2005 illustrate long distance movements within the Tensaw River system. Sonic fish 3-4-4 (71 khz), a 760-mm EFL fish tagged on March 14, moved downstream to the lower junction of the Middle and Tensaw Rivers where it was detected on May 9 (fig. 8). When detected on May 11, this fish was several miles in the channel that leads into The Basin. This fish was discovered in Briar Lake on September 14. This position is about 12-13 miles upstream past its original detection location and I-65. Sonic fish 5-5-5 (70 khz), an 850-mm EFL fish also tagged on March 14, was detected one week after its release at ARM 121. When next detected on June 23, it had moved approximately 170 miles

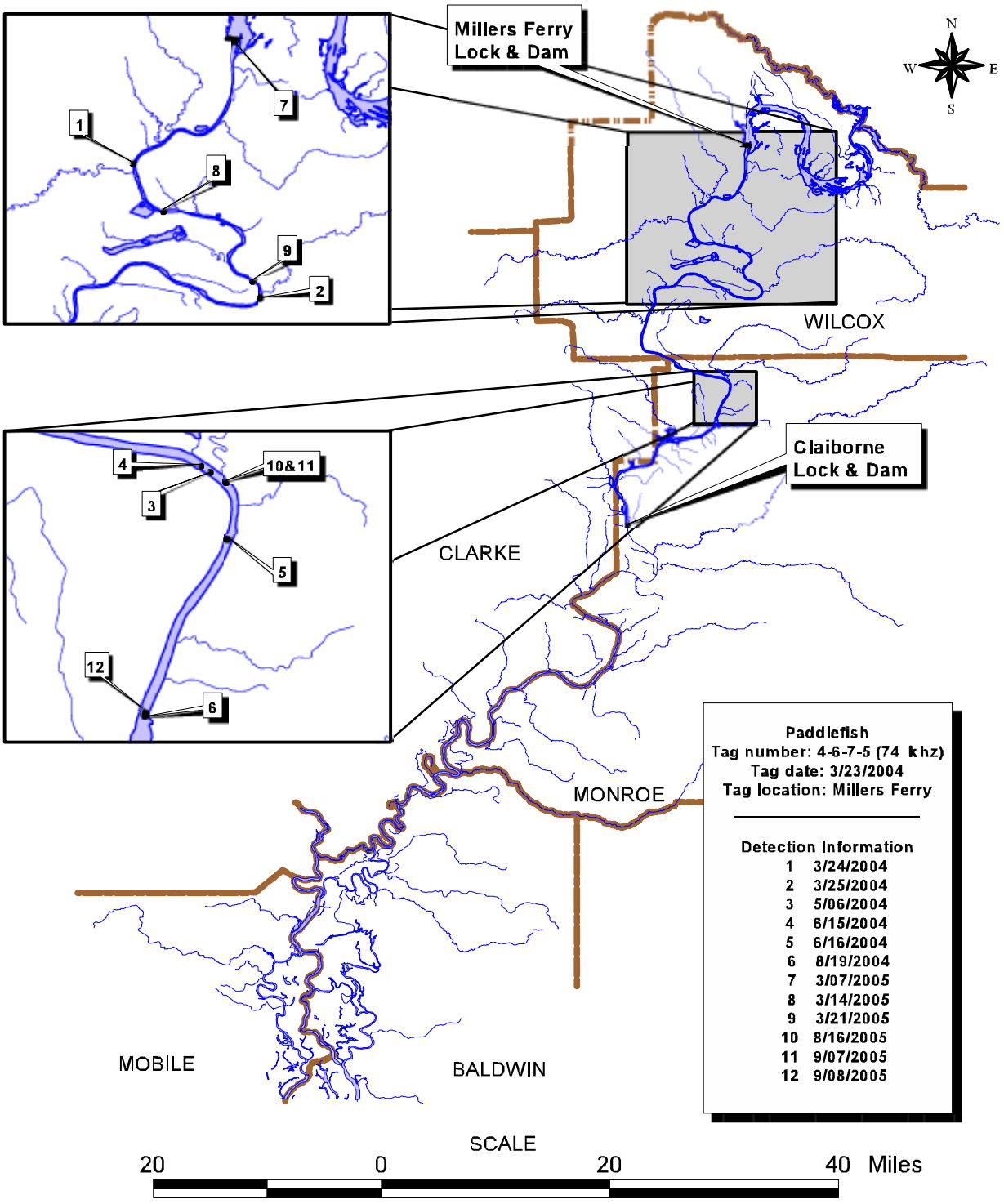

Figure 3. Detection locations for sonic fish 4-6-7-5 (74 khz), 2004-05.

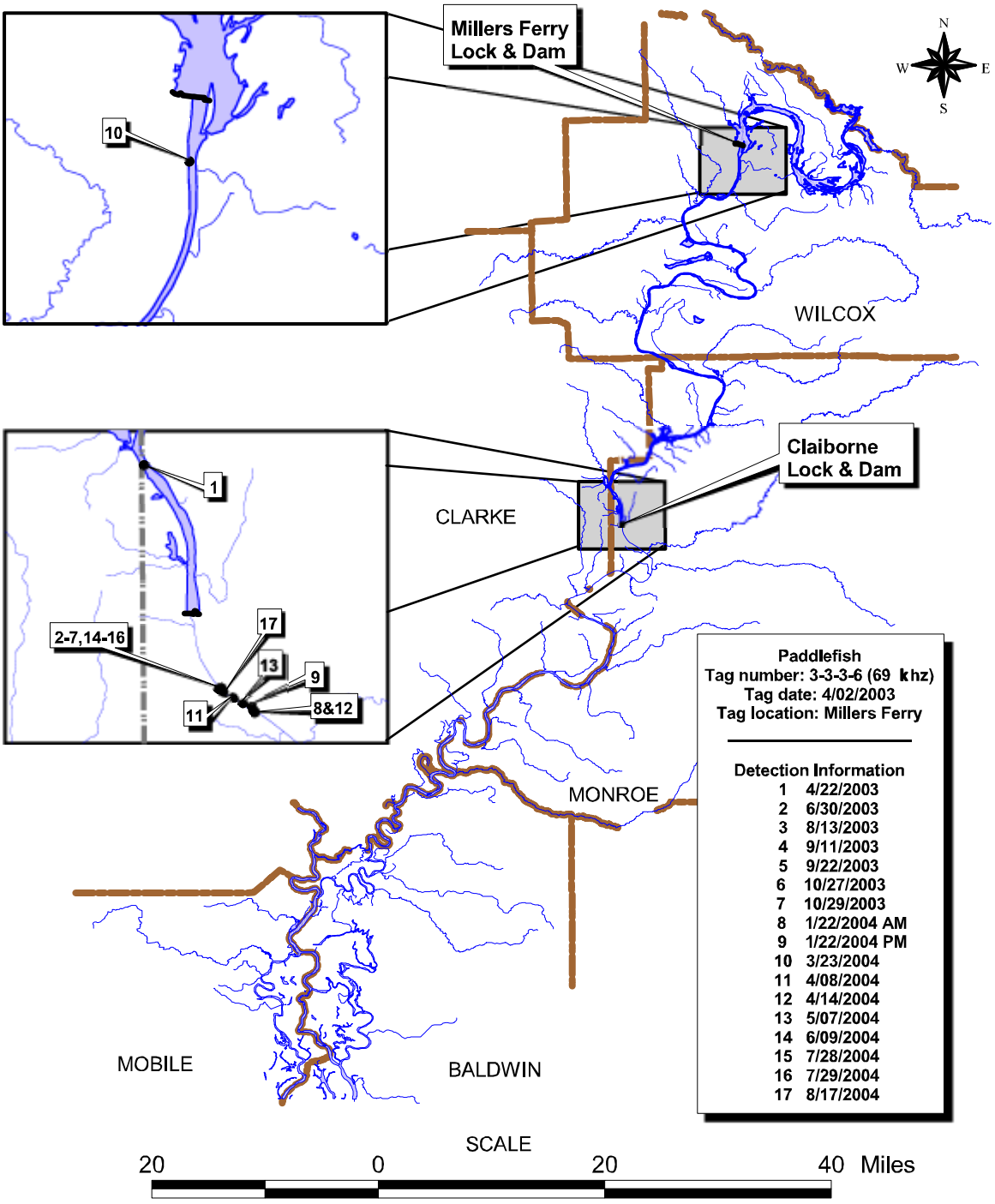

Figure 4. Detection locations for sonic fish 3-3-3-6 (69 khz), 2003-04.

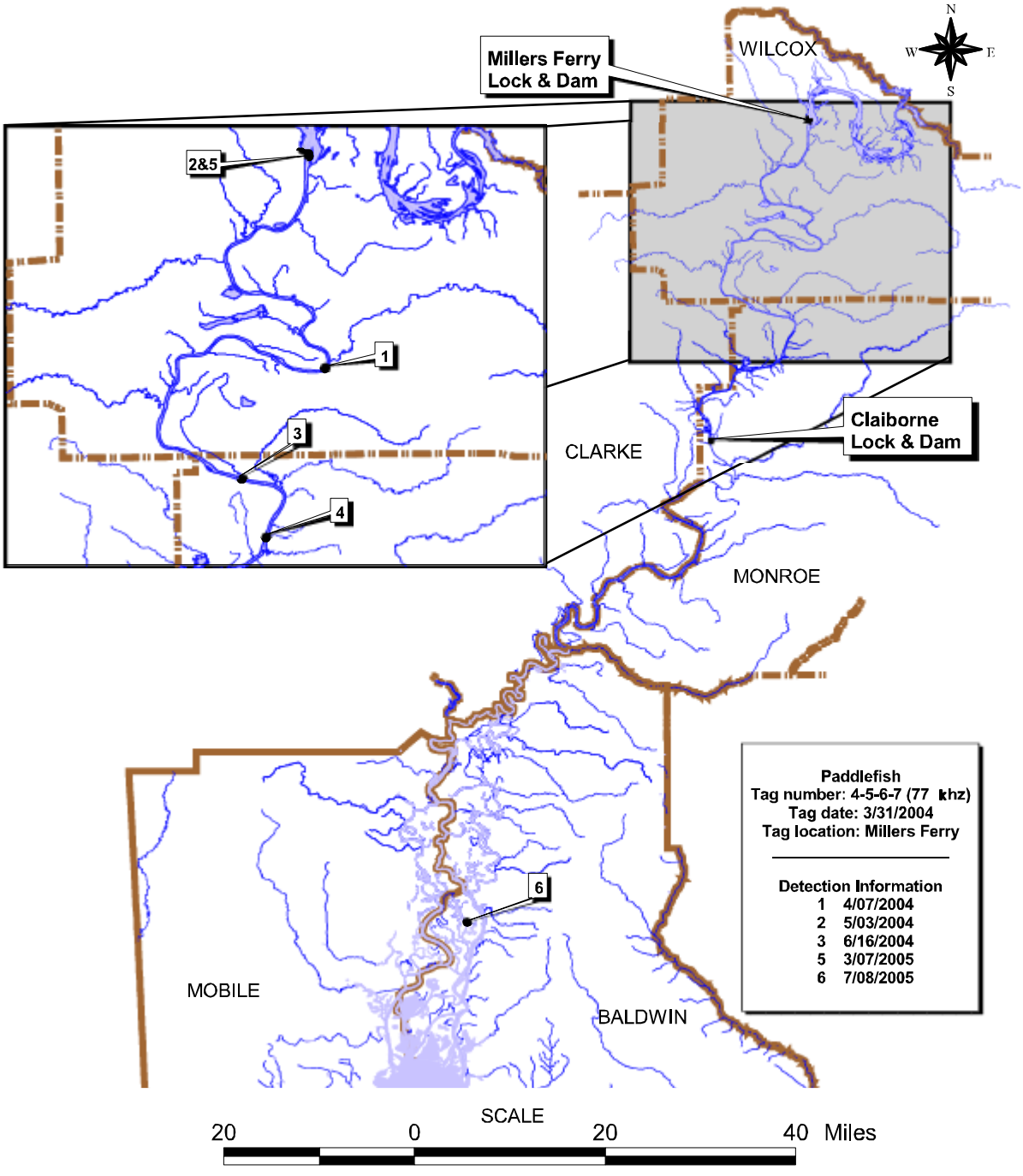

Figure 6. Detection locations for sonic fish 4-5-6-7 (77 khz), 2004-05.

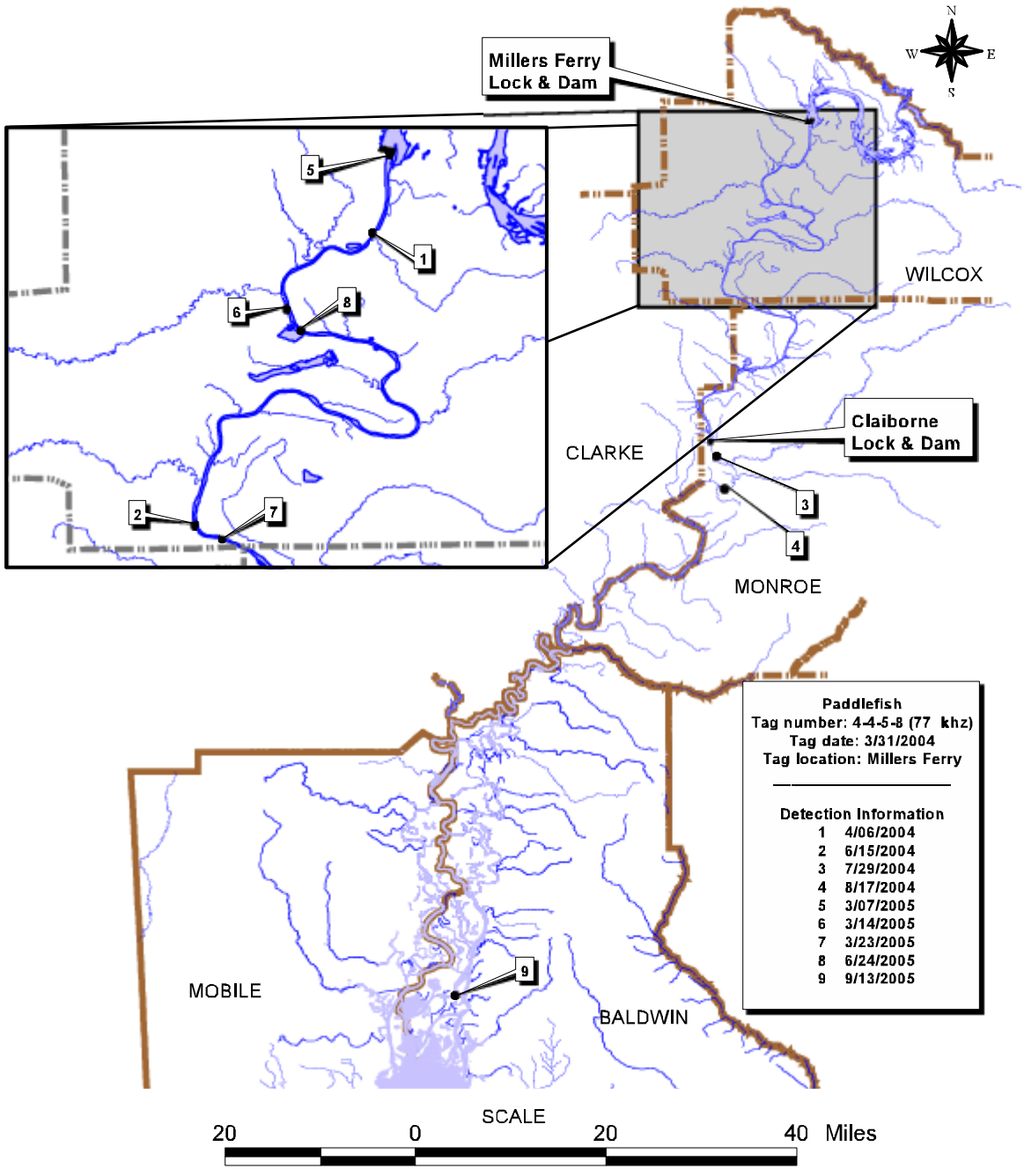

Figure 6. Detection locations for sonic fish 4-4-8-8 (74 khz), 2004-05.

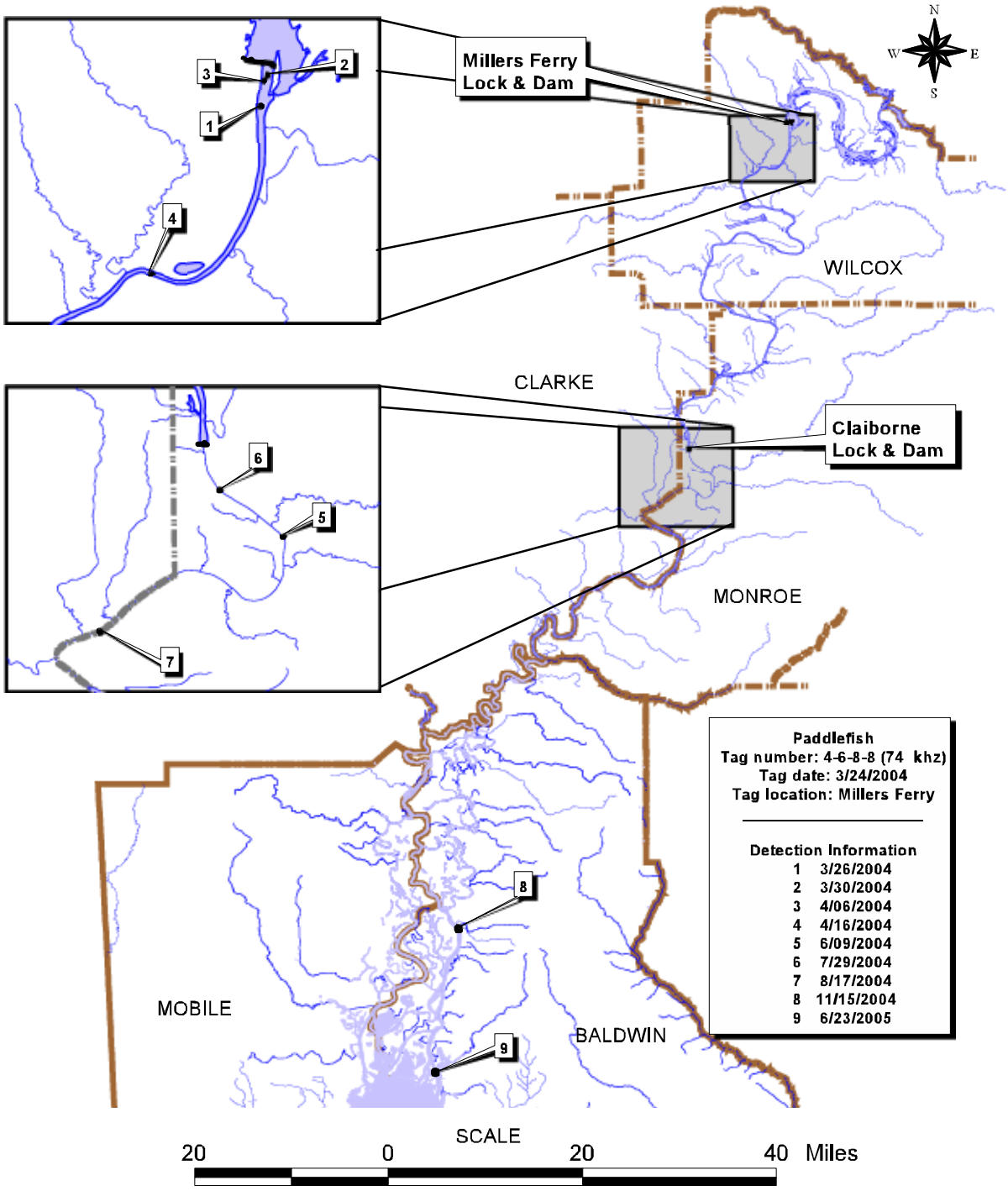

Figure 7. Detection locations for sonic fish 4-6-8-8 (74 khz), 2004-05.

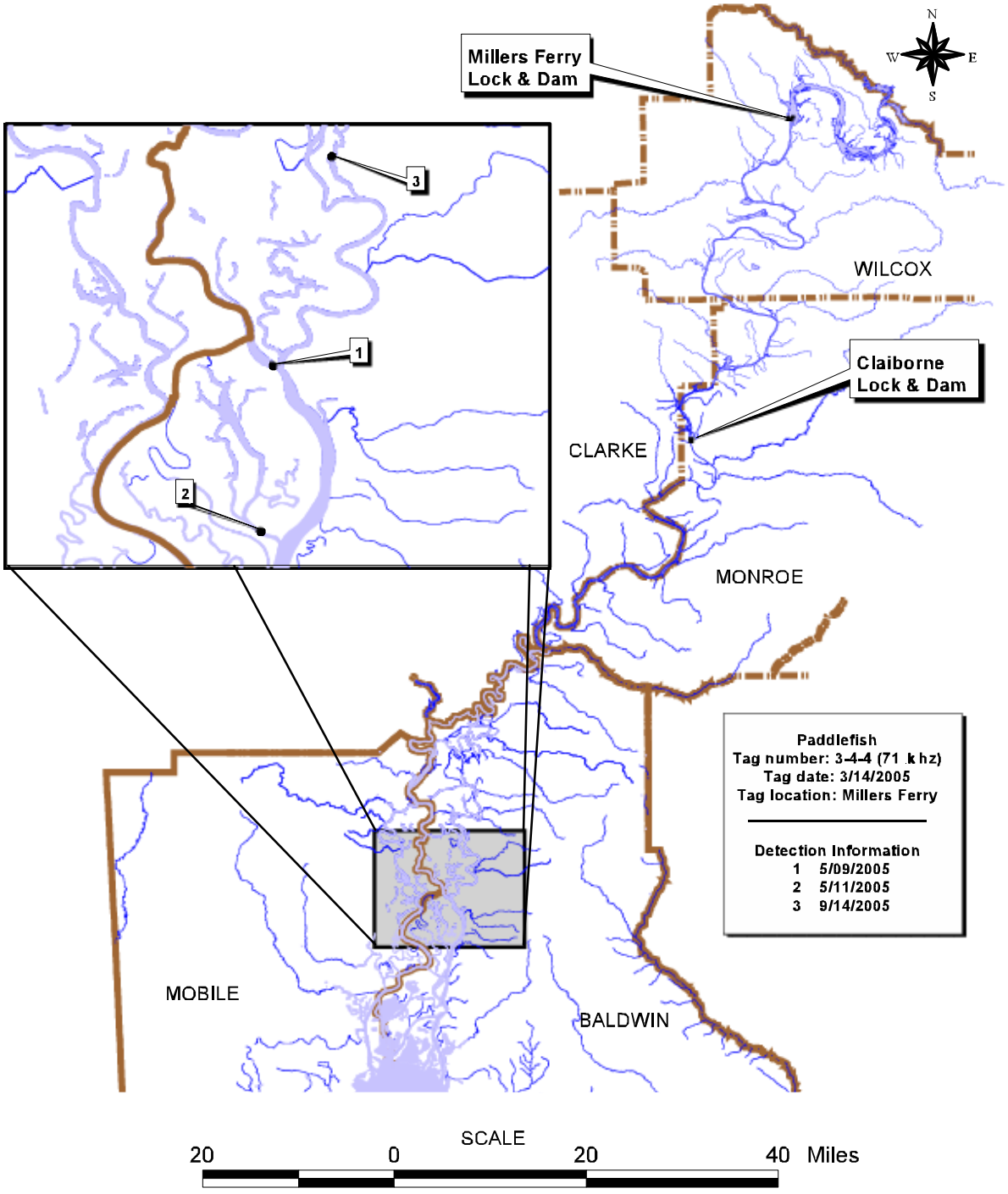

Figure 8. Detection locations for sonic fish 3-4-4 (71 khz), 2005.

downstream into the Tensaw River, about half the distance between Cloverleaf Landing and the south end of Gravine Island (fig. 9). When located on July 8, this fish was still in the Tensaw River, but it had moved about five miles upstream near Cliff's Landing. When last detected on September 13, it had moved back down to the south end of Gravine Island. Although maps are not included herein, two other 2005 tagged paddlefish, 5-5-6-7 (74 khz) and 5-5-6-8 (75 khz), exhibited similar movement patterns within the Tensaw River system.

Paddlefish movements through lock chambers have not been well studied in the Mississippi River (Zigler and others, 2004) or in Alabama. The upstream movement of a paddlefish tagged in March 2004 through the Millers Ferry lock chamber represents the first documentation of this behavior in Alabama. Sonic fish 4-4-7-5 (74 khz), a 1,045-mm EFL fish tagged below Millers Ferry on March 23, was detected near the closed gated spillway below the dam on March 26 and March 30 (fig. 10). When rediscovered on June 14, this fish was moving upstream about 3 mi above Millers Ferry Lock and Dam. On June 30, we located this fish in the immediate reservoir area upstream of the Millers Ferry powerhouse. Within a few minutes, it moved upstream, proceeded around the peninsula that separates the powerhouse and navigation channel, and began moving downstream along the rip-rap wall toward the upper lock approach. On reaching the lock approach, it moved across the navigation channel and then across the pool created by the gated spillway.

Tracking operations were suspended due to an impending lightning storm. When we located this fish on the following morning (July 1), it was swimming upstream about 4 miles above Miller Ferry Lock and Dam. A simple time and travel study determined its swimming speed was about 1 mile per hour. This fish was only detected once in 2005, near the mouth of Mill Creek at ARM 135.

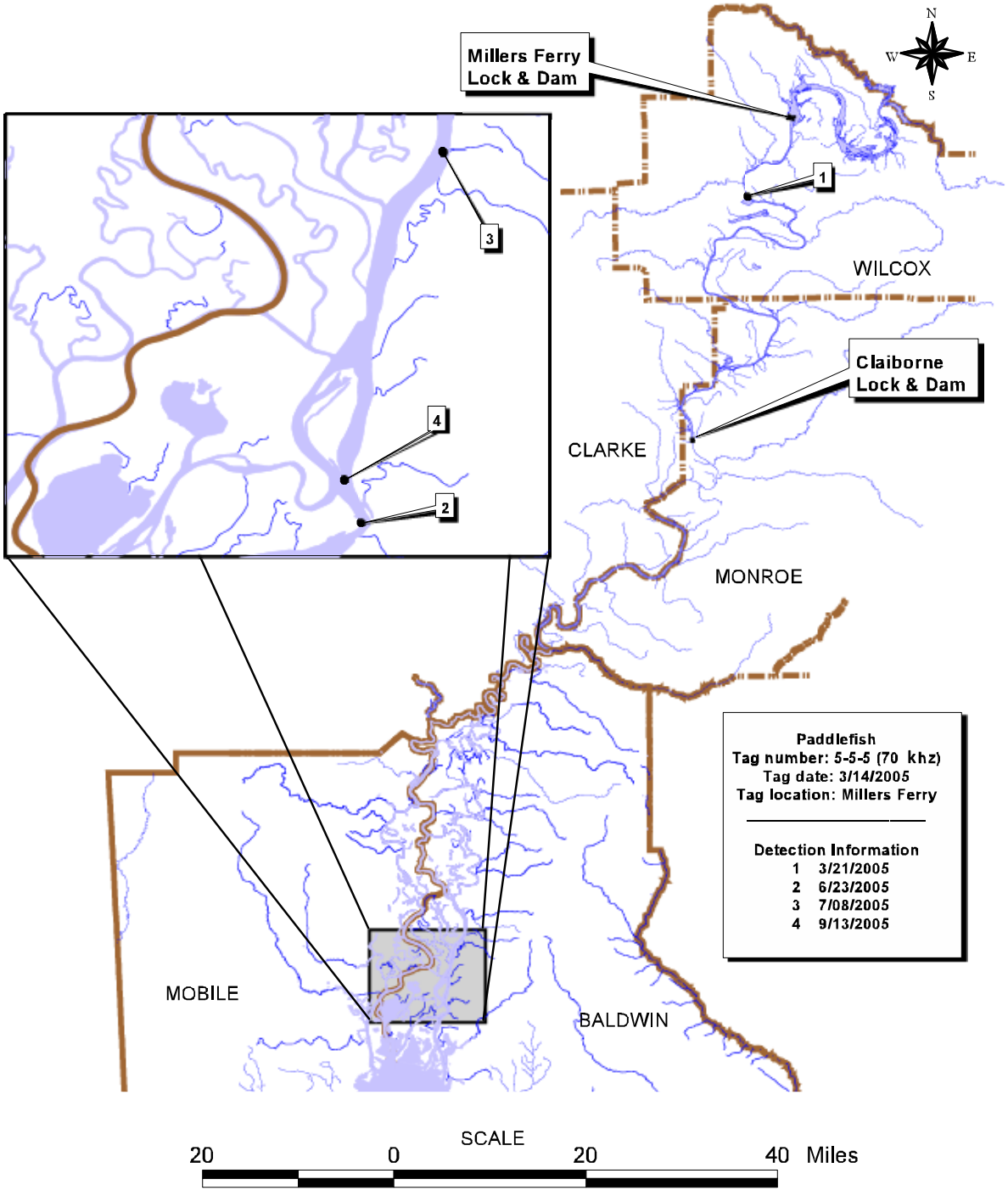

Figure 9. Detection locations for sonic fish 5-5-5 (70 khz), 2005.

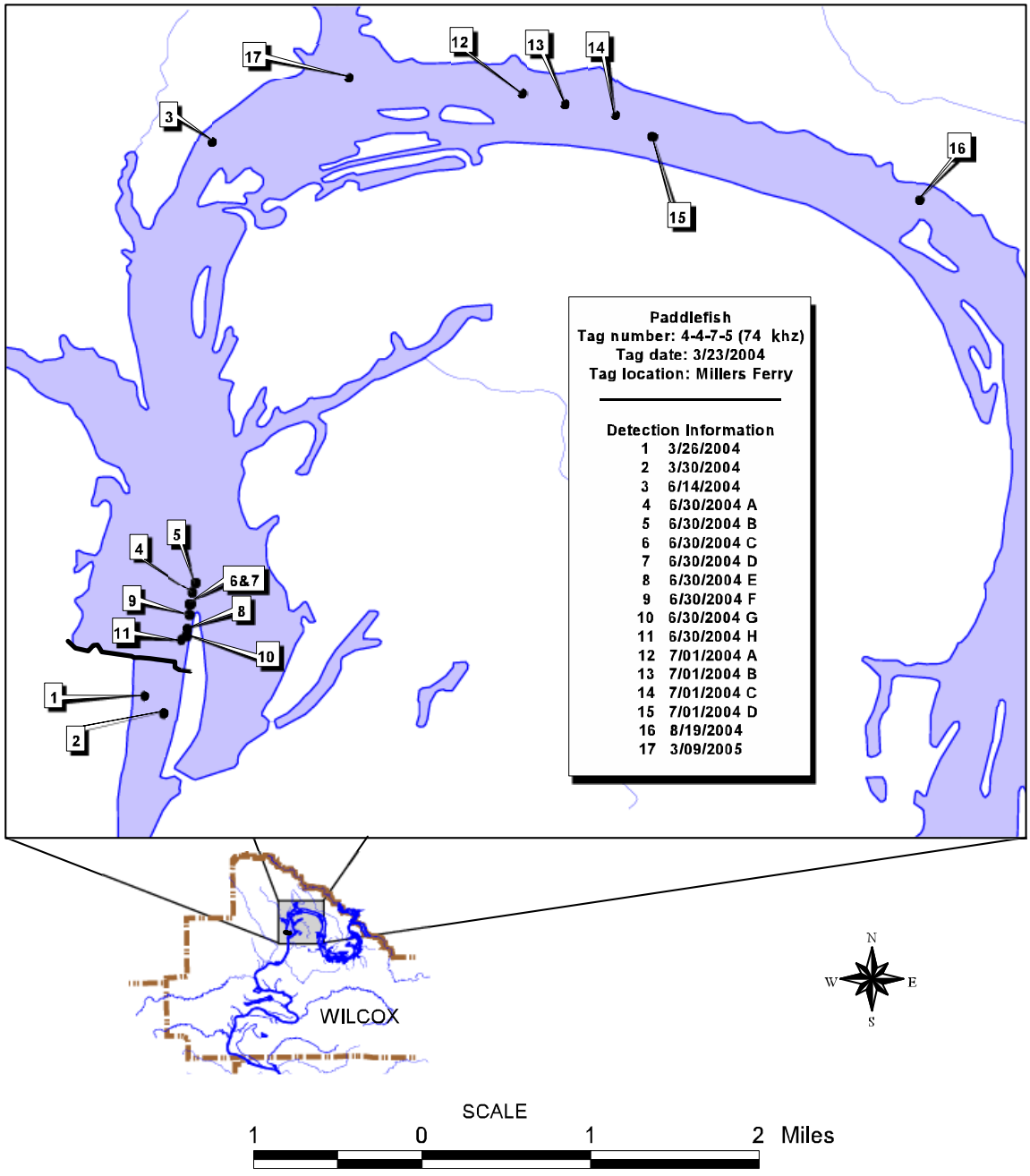

Figure 10. Detection locations for sonic fish 4-4-7-5 (74 khz), 2004-05.

CONCLUSIONS

Alabama River paddlefish can be segregated into two distinct groups: reservoir populations that are isolated by high-lift locks and dams and free ranging populations that use the lower sections of the Alabama and Tombigbee Rivers and the Mobile-Tensaw River Delta as summer habitat and the Alabama and probably the Tombigbee River as spawning habitat. Lein and DeVries (1998) determined that paddlefish populations inhabiting the Cahaba and Tallapoosa Rivers never mixed and were functionally distinct. Their observation was probably influenced by the fact that paddlefish movements between the upper Alabama and lower Coosa and Tallapoosa Rivers are restricted by Henry Lock and Dam.

About two-thirds of the paddlefish monitored during this study remained in Claiborne Reservoir, but one-third moved downstream past Claiborne Lock and Dam to inhabit the lower Alabama and Tensaw Rivers. Several Claiborne Reservoir and lower Alabama River fish demonstrated spawning site fidelity by returning to the Millers Ferry tailwater one year after their release. Some of these fish returned to the same summer habitat in two consecutive years while others moved downstream into the Mobile-Tensaw River Delta. We are not aware of any other studies that document paddlefish using the same summer habitat in two consecutive years.

Our tracking data, observations of large numbers of jumping paddlefish of all sizes, and the recapture of a paddlefish in Mifflin Lake that was originally anchor tagged below Claiborne Lock and Dam (Hoxmeier and DeVries (1997) suggest that the Mobile-Tensaw River Delta is an important summer refuge for large numbers of paddlefish. No one knows the spawning locations for these fish, but we suspect large numbers utilize the lower sections to the Alabama and Tombigbee Rivers. Additional data on movement patterns of Mobile-Tensaw River Delta paddlefish would be helpful to WFFD in their efforts to estimate permanent paddlefish numbers in the Alabama and Tombigbee Rivers.

Mettee, O'Neil, and others (2005) documented that moderate to large numbers of paddlefish could be moved upstream in the Alabama River if the USCOE would consider implementing daily fish passage operations at Claiborne and Millers Ferry Locks and Dams from January through April, the period when many Alabama fish species are involved in upstream spawning migrations. Fish passage could be easily accomplished using the following procedure. The lower lock gates at each facility would be opened around dusk and a small, siphon-operated attraction flow would be passed through the lock chamber throughout the night. On the following

morning, the siphon pump would be stopped and the lower lock gates would be closed. The lock chamber would be filled to upper pool level and the upper lock gates would be opened to allow captured fishes to continue moving upstream during the daylight hours. Operations could be temporarily suspended and then restarted if unexpected low river flows persist for several days.

The primary benefit of this method is that it would not require significant additional funds because it will utilize existing staff and facilities. Fish bypass may not be needed in the Tombigbee River since unknown numbers of fishes of various species probably move upstream through Coffeeville Lock and Dam as commercial vessels are passed along the Black Warrior-Tombigbee Waterway.

Numerous commercial fishermen have indicated that paddlefish and blue catfish routinely inhabit the upper section of Mobile Bay when salinity is reduced by winter flooding. As flooding recedes and salinity gradually increases in the upper bay, both species transition into the Mobile-Tensaw River Delta and eventually into the lower Alabama and Tombigbee Rivers. More work is needed to define the precise movements of these important commercial species.

STUDY PLAN FOR 2005-06

Most of the funds allocated to this project in 2005-06 will be used to continue tracking efforts of already tagged fish. A final report summarizing the results of all previous study years will be submitted to the WFFD in November 2006.

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Appendix 1. Eye to fork lengths (ELF) (mm) and anchor tag numbers (ATN) of 323 paddlefish tagged in the Alabama River, 2002-05. NT= not tagged; NM = not measured.

Date	EFL (mm)	ATN	Date	EFL (mm)	ATN	Date	EFL (mm)	ATN
3/12/02	900	618	**4/1/03**	735	956	**3/30/04**	830	2556
3/19/02	835	689	**4/1/03**	815	981	**3/30/04**	860	2465
3/19/02	610	654	**4/1/03**	740	982	**3/30/04**	860	2638
3/19/02	840	691	**4/1/03**	710	984	**3/30/04**	800	2601
3/19/02	603	675	**4/1/03**	850	989	**3/31/04**	725	2612
3/19/02	865	570	**4/1/03**	770	979	**3/31/04**	475	2623
3/19/02	890	668	**4/1/03**	755	978	**3/31/04**	950	2630
3/19/02	655	686	**4/2/03**	752	2003	**3/3104**	475	2625
3/20/02	950	712	**4/2/03**	754	2022	**3/31/04**	820	2632
3/27/02	805	738	**4/2/03**	683	2024	**3/31/04**	735	2639
3/27/05	728	737	**4/2/03**	1080	2040	**3/31/04**	735	2953
4/9/02	920	719	**4/16/03**	900	2013	**3/31/04**	710	2954
4/9/02	890	699	**3/15/04**	947	2541	**3/31/04**	810	2567
4/9/02	740	725	**3/15/04**	882	2540	**4/6/04**	812	2658
4/10/02	735	757	**3/16/04**	742	2559	**4/6/04**	981	2659
4/10/02	639	754	**3/16/04**	949	2565	**4/6/04**	637	2664
4/10/02	640	756	**3/16/04**	862	2568	**4/6/04**	749	2665
4/10/02	560	763	**3/16/04**	730	2590	**4/6/04**	838	2666
3/26/03	940	869	**3/23/04**	760	2650	**4/6/04**	926	2667
3/26/05	760	864	**3/23/04**	1045	2636	**4/6/04**	742	2669
3/26/05	706	868	**3/23/04**	943	2637	**4/6/04**	832	2670
3/28/03	930	967	**3/23/04**	839	2645	**4/6/04**	837	2674
3/28/03	890	970	**3/23/04**	862	2647	**4/6/04**	744	2675
3/28/03	840	971	**3/23/04**	865	2459	**4/6/04**	789	2652
3/28/03	845	975	**3/24/04**	488	2552	**4/7/04**	931	2686
3/28/03	845	964/966	**3/24/04**	800	2554	**4/7/04**	623	2688
4/1/03	855	900	**3/24/04**	720	2644	**4/7/04**	698	2700
4/1/03	603	957	**3/24/04**	748	2560	**4/7/04**	916	2690
4/1/03	845	914	**3/24/04**	935	2479	**4/8/04**	750	2735
4/1/03	655	927	**3/24/04**	860	2465	**4/8/04**	856	2712
4/1/03	830	954	**3/24/04**	865	2459	**4/8/04**	719	2726
4/8/04	553	2727	**3/30/04**	820	2684	**4/15/04**	690	2756
4/8/03	757	2725	**3/30/04**	775	2687	**4/15/04**	868	2757

Appendix 1. Eye to fork lengths (ELF) (mm) and anchor tag numbers (ATN) of 323 paddlefish tagged in the Alabama River, 2002-05. NT= not tagged; NM = not measured.

Date	EFL (mm)	ATN	Date	EFL (mm)	ATN	Date	EFL (mm)	ATN
4/8/03	760	2731	**4/14/04**	836	2693	**4/15/04**	855	2758
4/8/03	932	2733	**4/14/04**	852	2703	**4/15/04**	955	2759
4/8/04	620	2736	**4/14/04**	778	2704	**4/15/04**	758	2760
4/8/04	523	2737	**4/14/04**	810	2707	**4/15/04**	756	2761
4/8/04	630	2740	**4/14/04**	826	2713	**4/15/04**	880	2762
4/8/04	702	2744	**4/14/04**	855	2714	**4/15/04**	765	2763
4/8/04	491	2747	**4/14/04**	974	2697	**4/15/04**	991	2764
4/8/04	609	2749	**4/14/04**	857	2720	**4/15/04**	772	2765
4/8/04	560	2750	**4/14/04**	964	2721	**4/15/04**	732	2766
4/8/04	656	2724	**4/14/04**	857	2722	**4/15/04**	728	2767
4/8/04	1068	2734	**4/14/04**	792	2723	**4/15/04**	738	2768
4/14/04	997	2678	**4/14/04**	898	2728	**4/15/04**	583	2769
4/14/04	686	2679	**4/14/04**	746	2729	**4/15/04**	834	2770
4/14/04	887	2680	**4/14/04**	847	2730	**4/15/04**	782	2771
4/14/04	855	2682	**4/14/04**	898	2732	**4/15/04**	690	2772
4/14/04	651	2891	**4/14/04**	845	2738	**4/15/04**	840	2773
4/14/04	897	2695	**4/14/04**	910	2739	**4/15/04**	936	2774
4/14/04	690	2698	**4/14/04**	940	2741	**4/15/04**	859	2775
4/14/04	663	2699	**4/14/04**	738	2745	**4/15/04**	715	2776
4/14/04	804	2701	**4/14/04**	871	2746	**4/15/04**	713	2777
4/14/04	903	2702	**4/14/04**	904	2709	**4/15/04**	858	2778
4/14/04	670	2706	**4/15/04**	787	2657	**4/15/04**	727	2779
4/14/04	812	2710	**4/15/04**	816	2692	**4/15/04**	861	2780
4/14/04	872	2715	**4/15/04**	787	2697	**4/15/04**	1078	2782
4/14/04	450	2716	**4/15/04**	700	2705	**4/15/04**	613	2784
4/14/04	798	2717	**4/15/04**	745	2708	**4/15/04**	868	2785
4/14/04	824	2718	**4/15/04**	895	2711	**4/15/04**	894	2787
4/14/04	694	2673	**4/15/04**	986	2751	**4/15/04**	964	2788
4/14/04	915	2676	**4/15/04**	751	2753	**4/15/04**	816	2789
4/14/04	888	2677	**4/15/04**	672	2754	**4/15/04**	893	2790
4/14/04	674	2683	**4/15/04**	865	2755	**4/15/04**	758	2791
4/15/04	810	2792	**4/15/04**	885	2831	**5/4/04**	915	2874
4/15/04	870	2793	**4/15/04**	791	2832	**5/4/04**	915	2875
4/15/04	805	2794	**4/15/04**	840	2781	**5/4/04**	656	2877

Appendix 1. Eye to fork lengths (ELF) (mm) and anchor tag numbers (ATN) of 323 paddlefish tagged in the Alabama River, 2002-05. NT= not tagged; NM = not measured.

Date	EFL (mm)	ATN	Date	EFL (mm)	ATN	Date	EFL (mm)	ATN
4/15/04	738	2795	**4/15/04**	770	2804	**5/4/04**	752	2878
4/15/04	762	2797	**4/15/04**	735	2834	**5/4/04**	321	2879
4/15/04	802	2798	**4/15/04**	725	2837	**5/4/04**	690	2880
4/15/04	694	2799	**4/15/04**	1065	2838	**5/4/04**	698	2883
4/15/04	903	2800	**4/15/04**	775	2842	**5/4/04**	816	2885
4/15/04	782	2801	**4/15/04**	745	2844	**5/4/04**	803	2886
4/15/04	710	2802	**4/15/04**	825	2845	**5/4/04**	881	2803
4/15/04	855	2807	**4/15/04**	965	2846	**5/4/04**	827	2876
4/15/04	665	2808	**4/15/04**	720	2847	**5/4/04**	704	2884
4/15/04	775	2809	**4/15/04**	965	2850	**5/4/04**	820	2887
4/15/04	867	2810	**4/15/04**	772	2783	**5/4/04**	762	2890
4/15/04	680	2811	**4/15/04**	760	2833	**5/4/04**	807	2891
4/15/04	700	2812	**4/15/04**	810	2849	**5/4/04**	713	2892
4/15/04	862	2813	**4/15/04**	830	2836	**5/4/04**	824	2893
4/15/04	790	2814	**4/15/04**	921	2839	**5/4/04**	680	2895
4/15/04	900	2815	**4/15/04**	708	2840	**5/4/04**	829	2898
4/15/04	798	2816	**4/15/04**	868	2841	**5/4/04**	687	2742
4/15/04	740	2817	**4/15/04**	640	2843	**5/4/04**	758	2806
4/15/04	740	2818	**4/15/04**	685	2835	**5/4/04**	652	2854
4/15/04	796	2819	**4/15/04**	880	2899	**5/4/04**	743	2871
4/15/04	743	2820	**4/15/04**	768	2824	**5/4/04**	707	2873
4/15/04	755	2821	**5/4/04**	663	2855	**5/4/04**	670	2888
4/15/04	845	2822	**5/4/04**	904	2858	**5/4/04**	912	2896
4/15/04	860	2823	**5/4/04**	740	2859	**3/7/05**	765	2862
4/15/04	865	2825	**5/4/04**	553	2865	**3/7/05**	804	2866
4/15/04	987	2826	**5/4/04**	754	2867	**3/7/05**	828	3851
4/15/04	770	2827	**5/4/04**	751	2868	**3/7/05**	921	2857
4/15/04	1066	2828	**5/4/04**	903	2869	**3/7/05**	872	2860
4/15/04	732	2829	**5/4/04**	660	2870	**3/7/05**	933	2861
4/15/04	755	2830	**5/4/04**	689	2872	**3/8/05**	823	2685
3/8/05	907	2856	**3/15/05**	882	2981	**3/21/05**	845	2989
3/14/05	845	2966	**3/15/05**	798	2985	**3/21/05**	815	2978
3/14/05	835	2967	**3/15/05**	820	2992	**3/21/05**	400	3903
3/14/05	824	2970	**3/15/05**	785	2988	**3/24/05**	748	2560

Appendix 1. Eye to fork lengths (ELF) (mm) and anchor tag numbers (ATN) of 323 paddlefish tagged in the Alabama River, 2002-05. NT= not tagged; NM = not measured.								
Date	EFL (mm)	ATN	Date	EFL (mm)	ATN	Date	EFL (mm)	ATN
3/14/05	750	2944	**3/15/05**	785	2991	**3/24/05**	935	2479
3/14/05	725	2940	**3/15/05**	750	2987	**5/9/05**	775	2999
3/21/05	715	2921	**3/21/05**	875	3947	**5/15/05**	775	2999
3/14/05	850	2939	**3/21/05**	775	2986	**5/19/05**	830	3917
3/14/05	845	2941	**3/21/05**	898	2996	**5/19/05**	865	3926
3/14/05	760	2920	**3/21/05**	775	2998	**5/19/05**	769	2962
3/14/05	890	2922	**3/21/05**	865	3919			

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
2001	1	4/25/01	H	ND		
	2	4/24/01	MF	ND		
	3	4/16/01	MF	ND		
	4	4/16/01	MF	4/24/01	32.03921307	87.41374876
	5	4/24/01	MF	5/30/01	31.64763043	87.55753009
				7/25/01	31.64847440	87.55733179
				8/15/01	31.65208834	87.56068477
				9/26/01	31.65208834	87.55989159
				11/15/01	31.66225714	87.56108136
				3/7/02	31.64802176	87.55772838
2002	6	3/12/02	MF	ND		
	7	4/9/02	MF	5/9/02	31.76047774	87.43474992
				7/17/02	31.74416800	87.44164515
				8/7/02	31.75690640	87.43685905
				8/21/02	31.75290572	87.43829217
				9/19/02	31.74297992	87.44030216
				4/22/03	31.74755465	87.43876988
				8/13/03	31.74618388	87.43952701
				9/11/03	31.7583373	87.43566027
	8	4/10/02	MF	5/9/02	31.73608871	87.44807168
				7/16/02	31.97435281	87.45457934
				8/8/02	32.03269549	87.43380351
				8/22/02	32.03081577	87.43004494
				9/20/02	32.03092275	87.43019816
				1/22/03	32.03451404	87.44077085
				3/6/03	32.03329913	87.43636331
				4/22/03	31.80339202	87.43281204
				8/14/03	31.90693701	87.51772703
	9	4/9/02	MF	ND		
	10	4/9/02	MF	4/10/02	32.08483842	87.40247303
				4/26/02	32.08625120	87.40190519
				7/16/02	31.97429929	87.45315528

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
				8/8/02	31.97462041	87.45681466
				8/22/02	31.97517092	87.45809455
				9/20/02	31.97474275	87.45629188
				1/22/03	31.97439104	87.45150578
				4/21/03	31.97098090	87.42669196
				8/19/03	31.94134712	87.40401431
	11	4/10/02	MF	8/28/02	31.07823112	87.97384878
	12	4/10/02	MF	4/26/02	32.03328385	87.43487610
				5/20/02	32.03342902	87.43530875
				7/16/02	32.03371174	87.43505637
				8/8/02	32.03358949	87.43531776
				8/22/02	32.03367354	87.43668779
				1/22/03	32.03412435	87.43733676
				3/6/03	32.01880301	87.46804532
				4/21/03	32.00577977	87.47376881
	13	3/27/02	MF	4/9/02	32.08080615	87.40241895
	14	3/19/02	MF	3/26/02	32.01204705	87.47369670
				4/26/02	32.03074700	87.42536700
				5/8/02	31.69047428	87.53893550
				8/1/02	31.55575459	87.56063970
				8/7/02	31.55565474	87.56072984
				8/20/02	31.61412406	87.55156323
				9/18/02	31.61408549	87.55214910
	15	3/19/02	MF	3/28/02	31.83519902	87.52015163
				7/16/02	31.90998227	87.51797039
				8/7/02	31.90938547	87.51733946
				8/21/02	31.90841374	87.51730340
				9/19/02	31.91891852	87.50131368
				4/22/03	31.88736999	87.52412653
				8/14/03	31.91129828	87.51806053
				9/10/03	31.91130593	87.51799743
	16	3/19/02	MF	3/26/02	32.09441433	87.39908400
				3/27/02	32.09147446	87.40117510

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
				4/9/02	31.98861897	87.46942436
				5/20/02	31.98892476	87.46786505
				7/16/02	31.98935286	87.46822559
				8/8/02	31.98917703	87.46823460
				8/22/02	31.98971216	87.46829769
				9/20/02	31.99011732	87.46855908
				1/22/03	31.98791565	87.46741438
	17	3/19/02	MF	3/26/02	31.93450897	87.40445597
				7/17/02	31.81346453	87.47796003
				8/7/02	31.81292072	87.47718488
				8/21/02	31.81335730	87.47721192
				9/19/02	31.81421514	87.47904163
				3/25/03	31.81272924	87.47788792
				8/14/03	31.81102119	87.47019050
				9/11/03	31.81112076	87.47056906
	18	3/19/02	MF	3/26/02	32.00354790	87.47549938
				5/8/02	31.92006609	87.49263380
				7/16/02	31.91976007	87.49580651
				8/7/02	31.92008139	87.49587861
				8/21/02	31.91979067	87.49587861
				9/19/02	31.89891852	87.50131368
	19	3/19/02	MF	5/8/02	31.83581162	87.52024176
				7/17/02	31.83576567	87.52019670
				8/7/02	31.83562018	87.52168390
				8/21/02	31.83572738	87.51985419
				9/19/02	31.83472425	87.51261645
				3/25/03	31.83472425	87.51261645
				9/10/03	31.82603256	87.49566229
	20	3/20/02	MF	3/26/02	31.91213990	87.38036322
	21	3/19/02	MF	7/16/02	32.03282538	87.44529556
				7/17/02	31.79295069	87.42104959
				8/7/02	31.75443857	87.43815697
				9/19/02	31.81537933	87.48328693

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
				8/21/02	31.72625311	87.49038947
				8/13/03	31.72522579	87.47801411
				9/11/03	31.79522598	87.42161743
	22	3/27/02	MF	5/8/02	31.83555892	87.51970096
				7/17/02	31.83606431	87.52345052
				8/7/02	31.83607963	87.52412653
				8/21/02	31.83421120	87.51283277
				9/19/02	31,83342247	87.51176919
				2/3/04	31.82108520	87.48841554
2003	23	4/3/03	MF	4/22/03	31.65808048	87.56567818
				6/30/03	31.39363518	87.54308165
				8/13/03	31.59361215	87.54431648
				9/11/03	31.59274459	87.54332501
				9/22/03	31.59323596	87.54386581
				10/28/03	31.59340486	87.54380272
				1/22/04am	31.58705537	87.53405025
				1/22/04pm	31.58843740	87.53467217
				3/23/04	32.08292922	87.40267132
				4/8/04	31.59083287	87.53978276
				4/14/04	31.58687110	87.53368070
				5/7/04	31.58918983	87.53715986
				6/9/04	31.59371196	87.54354133
				7/28/04	31.59317454	87.54337008
				7/29/04	31.59376570	87.54411819
				8/17/04	31.59252962	87.54253183
	24	4/2/03	MF	4/21/03	32.03343667	87.44497108
				7/30/03	31.97443691	87.45652623
	25	4/2/03	MF	ND		
	26	4/2/03	MF	4/22/03	31.74874391	87.43887804
	27	4/16/03	MF	4/21/03	31.92200163	87.49116462
				4/22/03	31.90837549	87.51684421
				8/13/03	31.78358849	87.42235653
				9/11/03	31.78191822	87.42326688

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
				2/3/04	31.90924009	87.51772703
				3/23/04	32.08836650	87.40188716
				3/24/04	31.98618791	87.46734228
				3/25/04	31.92039506	87.49460773
				4/7/04	31.96589604	87.40832271
				4/16/04	32.03180912	87.44573722
				6/16/04	31.78332033	87.42304155
	28	3/28/03	MF	4/22/03	31.86371107	87.53107469
				8/17/03	31.60746894	87.47403921
	29	4/1/03	MF	4/22/03	31.83530622	87.52093579
				5/13/03	30.79641417	87.91911958
				5/19/03	30.79583123	87.91891227
				6/11/03	30.79499504	87.91918268
				6/23/04	30.79655127	87.91873201
	30	3/28/03	MF	5/13/04	30.77599299	87.93576728
				5/19/04am	30.82685801	87.91831739
				5/19/04pm	30.81802630	87.91799291
				5/20/04	30.88127772	87.89490065
				6/11/04	30.76308278	87.92426622
				6/23/04	30.75418325	87.91902945
	31	4/1/03	MF	4/22/03	31.87975479	87.52698377
				6/4/03	31.83539046	87.52130534
				8/14/03	31.91128297	87.51806954
				2/3/04	31.91139009	87.51762788
				3/25/04	31.91058672	87.51703300
				4/7/04	31.86152168	87.53146341
				5/6/04	31.72911267	87.46018566
				6/15/04	31.87426687	87.52881348
				8/17/04	31.52654078	87.60158746
	32	4/1/03	MF	ND		
	33	4/1/03	MF	5/20/04	30.92280100	87.91342313
				6/9/04	30.92080607	87.91202606
				6/23/04	30.87777344	87.89337739

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
	34	3/28/03	MF	4/22/03	31.73665597	87.44803563
				8/13/03	31.69450833	87.52011558
				9/11/03	31.79092051	87.42082426
				2/3/04	31.83535983	87.51944859
				3/25/04	31.94432240	87.40391517
				4/7/04	31.91508552	87.38169720
				5/6/04	31.66632766	87.56654346
				6/16/04	31.71473730	87.51388733
	35	4/1/03	MF	4/16/03	32.03331441	87.41954436
				5/13/03	30.77140066	87.92517657
				5/19/03am	30.87816797	87.92022823
				5/19/03pm	30.82185786	87.91745211
				6/9/04	30.87170061	87.92179655
				6/23/04	30.76000018	87.92055271
	36	3/28/03	MF	4/1/03	32.08822141	87.40133734
				4/16/03	32.03417020	87.43859863
	37	4/1/03	MF	4/22/03	31.84259585	87.53278838
				10/28/03	31.61298037	87.55067992
				4/15/04	32.03817395	87.41567762
	38	3/26/03	MF	4/22/03	31.73705459	87.44760299
	39	4/1/03	MF	4/21/03	32.01620462	87.47069525
	40	3/26/03	MF	2/3/04	31.87064634	87.52924612
				3/25/04	31.81204755	87.47469719
				4/8/04	31.61229721	87.55142803
	41	4/1/03	MF	4/16/03	32.09305513	87.40153564
				4/21/03	32.09319258	87.39985014
				3/25/04	31.97088150	87.42723276
	42	3/26/03	MF	3/27/03	32.03466686	87.44184344
				4/21/03	31.92725721	87.48690130
				8/14/03	31.92673702	87.48717170
				9/10/03	31.92712716	87.48721676
				2/3/04	31.92726486	87.48713564
				3/25/04	31.92682647	87.48745111

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
				4/7/04	31.92685942	87.48722578
				5/5/04	31.92648457	87.48765842
				6/16/04	31.92677527	87.48741506
	43	4/1/03	MF	4/21/03	32.02527573	87.45296594
	44	4/1/03	MF	4/21/03	32.09349038	87.40180604
				8/12/03	32.03375759	87.43695819
				8/21/03	32.03329913	87.43688609
				3/15/04	32.09200136	87.40043601
				3/16/04	32.09753736	87.39893979
				3/24/04	31.98097393	87.46555763
				3/30/04	31.97556850	87.45827482
				4/6/04	32.03080813	87.44739568
				4/16/04	32.10027851	87.40085062
				5/7/04	31.58478266	87.53079642
	45	3/28/03	MF	4/1/03	32.09761371	87.39874149
	46	4/1/03	MF	ND		
2004	47	3/16/04	MF	3/23/04	32.09717085	87.40056219
				3/26/04	32.08997013	87.40061627
				3/30/04	32.07727778	87.40179702
				4/6/04	32.08472387	87.40231980
				4/7/04	32.09117665	87.40068838
				5/13/04	30.76542952	87.92610495
	48	3/30/04	MF	4/6/04	32.07540662	87.40165281
				5/7/04	31.54772804	87.57551177
				6/9/04	31.57088410	87.51282376
				7/29/04	31.74092250	87.56255955
				8/17/04	31.46812419	87.56334371
	49	3/16/04	MF	3/25/04	31.83607197	87.52458621
				5/6/04	31.80672412	87.45349773
				6/16/04	31.74155419	87.44150093
				9/7/04	31.83599539	87.52761470
	50	3/15/04	MF	3/24/04	32.08315069	87.40146353
				2/26/04	32.08315069	87.40146353

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
				4/9/04	31.65701404	87.56505625
				5/6/04	31.65769687	87.56461460
				6/16/04	31.65652302	87.56392958
	51	3/31/04	MF	4/6/04	32.04148227	87.41207227
				4/16/04	32.03172504	87.42143717
				5/5/04	32.01591421	87.46998319
				6/14/04	32.03100680	87.43072995
				7/30/04	32.07021298	87.40135537
	52	3/16/04	MF	3/23/04	32.09786569	87.40122918
				3/26/04	32.09795732	87.40168886
				3/30/04	32.10023269	87.39866938
				4/9/04	31.82138389	87.49018216
	53	3/23/04	MF	3/26/04	32.07920236	87.40240092
				3/31/04	32.08786250	87.40155366
				4/6/04	32.09744573	87.40139142
				5/3/04	32.08657193	87.40248204
	54	3/16/04	MF	3/16/04	32.09762135	87.39882261
				4/6/04	32.08854214	87.40198631
				4/7/04	32.07883578	87.40186012
				6/15/04	31.79261361	87.42095044
				6/16/04	31.80554449	87.45024391
				8/19/04	31.76883077	87.43278500
	55	3/30/04	MF	4/16/04	32.05750261	87.40428472
				5/6/04	31.71915365	87.50904715
				6/16/04	31.71057377	87.51500499
				7/29/04	31.61261960	87.55146409
				8/17/04	31.59170044	87.54159444
				9/8/05	31.51151166	87.61960519
	56	4/6/04	MF	4/9/04	31.83578864	87.52067440
				6/15/04	31.83557424	87.52232385
				8/19/05	31.83523731	87.51858330
	57	4/6/04	MF	5/6/04	31.77892236	87.42501547
				6/15/04	31.81355644	87.47891545

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
				8/19/04	31.80431889	87.44182542
				3/23/05	31.83468597	87.51788927
	58	3/30/04	MF	4/6/04	32.03455224	87.44171726
	59	3/23/04	MF	3/24/04	31.99413829	87.47084848
				3/25/04	31.97228074	87.43278500
				4/7/04	31.92194807	87.49107449
	60	3/31/04	MF	4/6/04	32.04440846	87.41078336
				6/15/04	31.84362186	87.53341030
				7/29/04	31.59104785	87.54055791
				8/17/04	31.54165198	87.53067024
				3/7/05	32.09780460	87.39944453
				3/14/05	31.99156976	87.47018149
				3/23/05	31.83374409	87.51422083
				6/24/05	31.97686828	87.46027579
				9/13/05	30.77291080	87.94517724
	61	3/23/04	MF	3/30/04	32.09652945	87.39918315
				6/14/04	32.14552996	87.39503699
				6/30/04	32.10589799	87.39698388
				7/1/04a	32.10771509	87.39646111
				7/1/04b	32.10689816	87.39675855
				7/1/04c	32.10586745	87.39684868
				7/1/04d	32.10498943	87.39698388
				7/1/04e	32.10380600	87.39717316
				7/1/04f	32.10318755	87.39725428
				7/1/04g	32.10288214	87.39775002
				7/1/04h	32.14968909	87.36839346
				7/1/04i	32.14877334	87.36471601
				7/1/04j	32.14598022	87.35718984
				8/19/04	32.14054637	87.33425081
				3/9/05	32.15107034	87.38329257
	62	3/24/04	MF	4/7/04	31.91852968	87.43131582
				4/16/04	32.08776322	87.40216657
				6/14/04	31.97449043	87.45140663

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
				6/15/04	31.97427635	87.45078471
				7/1/04	31.97426870	87.45488579
				7/30/04	31.97605018	87.45949163
	63	3/31/04	MF	4/6/04	32.08917596	87.40070641
	64	3/31/05	MF	4/6/04	32.03233636	87.43285711
				4/16/04	32.09808712	87.39915611
				5/2/04	32.09157373	87.40090470
				6/14/04	32.01199355	87.47308379
				7/1/04	32.07476506	87.40195025
				7/30/04	32.01365202	87.47187600
	65	3/31/04	MF	4/6/04	32.03106029	87.42455579
				4/16/04	32.03064766	87.42808002
				5/5/04	32.03696673	87.41545229
				6/14/04	32.03197723	87.42236554
				7/1/04	32.03047956	87.42586273
				7/30/04	32.03371938	87.44423199
	66	3/31/04	MF	5/6/04	31.83549766	87.52226076
				6/16/04	31.76014054	87.43538005
	67	3/31/04	MF	4/7/04	31.90691406	87.38422996
				5/3/04	32.09786569	87.40030080
				6/16/04	31.80781181	87.45909504
				8/19/04	31.75513600	87.43727366
				3/7/05	32.09727011	87.39908400
				7/8/05	30.88366798	87.91956124
	68	3/24/04	MF	3/26/04	32.03198487	87.43283908
				3/30/04	32.07656750	87.40172492
				3/31/04	32.08984795	87.40098582
				4/6/04	32.05861025	87.40423965
				4/16/04	32.09349038	87.40103990
				5/19/04	30.90905986	87.93596558
				11/17/04	30.90700278	87.93385645
				5/11/05	30.91073798	87.93418093
	69	3/23/04	MF	3/26/04	32.03459809	87.43939180

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Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
				3/30/04	31.97472746	87.45676959
				4/7/04	31.90488638	87.39537950
				5/5/04	31.97520914	87.45876154
				6/15/04	31.91526914	87.38139976
				7/1/04	31.97457454	87.45616559
	70	3/24/04	MF	3/26/04	32.03031145	87.42708855
				3/30/04	32.08510406	87.40283356
				4/6/04	32.09901866	87.40002139
				4/16/04	32.08903087	87.40003040
				5/3/04	32.08874068	87.39956171
				6/16/04	31.69128724	87.52982298
				8/19/04	31.73158118	87.45497593
				3/14/05	32.09035958	87.40079654
				9/7/05	31.76813343	87.43308244
				9/8/05	31.75082100	87.43884199
	71	3/31/04	MF	4/6/04	32.03191610	87.42232048
				4/16/04	32.09817875	87.39921019
				5/2/04	32.08978686	87.40163478
				6/14/04	32.09798022	87.39942651
				7/1/04	32.09558261	87.39883163
				7/30/04	32.09740755	87.39937243
				3/14/05	32.09345220	87.40140044
				3/21/05	32.09161955	87.40116609
				6/24/05	32.09740212	87.40034587
	72	3/15/04	MF	3/16/04	32.09991964	87.40011152
				3/23/04	32.08977923	87.40078753
				3/26/04	32.08977159	87.40008448
				3/30/04	32.08795414	87.40058923
				4/6/04	32.09923245	87.39955269
				4/16/04	32.09915610	87.39961579
	73	3/24/04	MF	3/26/04	32.06168867	87.40391517
				3/30/04	32.04935909	87.40719604
				4/9/04	31.70048239	87.51864640

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
				5/6/04	31.63062550	87.55190574
				6/16/04	31.67649179	87.56416393
				7/28/04	31.59841812	87.54775959
				7/29/04	31.54634541	87.51781717
	74	3/31/04	MF	4/6/04	32.03093803	87.42571852
				7/1/04	32.03070115	87.42570049
				7/30/04	32.03412435	87.44317742
				3/7/05	32.09843072	87.39860629
				3/14/05	32.09663635	87.40124721
				3/21/05	32.09704870	87.39929131
				6/24/05	32.09142101	87.40060165
				8/15/05	32.09609421	87.39996731
	75	3/30/04	MF	4/6/04	31.97462806	87.44086098
				3/22/05	31.60985624	87.55002195
	76	3/23/04	MF	3/24/04	32.00948669	87.47374177
				3/25/04	31.91026536	87.38117443
				5/6/04	31.79933207	87.42562838
				6/15/04	31.80061902	87.42747613
				6/16/04	31.78580272	8742231146
				8/19/04	31.75036880	87.43894114
				3/7/05	32.09965240	87.39975099
				3/14/05	31.97422283	87.45139762
				3/21/05	31.92275900	87.38650133
				8/16/05	31.79724840	87.42240160
				9/7/05	31.79744758	87.52257285
				9/8/05	31.75100495	87.43886903
	77	3/24/04	MF	3/26/04	32.08742722	87.40161676
				3/30/04	32.09736937	87.39974198
				4/6/04	32.09582696	87.40072443
				4/16/04	32.03360477	87.43714747
				6/9/04	31.57172882	87.51366200
				7/29/04	31.59357376	87.54379627
				8/17/04	31.52684042	87.60031657

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
				11/15/04	30.89659293	87.89358470
				6/23/05	30.68825157	87.92860165
	78	4/14/04	CL	5/7/04	31.59895551	87.54780466
				7/28/04	31.59359680	87.54327093
				7/29/04	31.59301331	87.54324389
				8/17/04	31.55636903	87.55919756
	79	4/14/04	CL	5/7/04	31.61284988	87.55119369
				6/9/04	31.59265247	87.54272112
				7/29/04	31.47450483	87.56201875
				8/17/04	31.47447408	87.56201875
	80	4/14/04	CL	ND		
	81	5/4/04	MF	6/15/04	31.83337652	87.51236407
	82	4/14/04	CL	ND		
	83	4/14/04	CL	4/14/04	31.59044131	87.53885438
				8/17/04	31.61343324	87.55206798
	84	5/2/04	MF	6/14/04	31.97444456	87.45213671
				6/15/04	31.97471981	87.45595838
				7/1/04	32.03060946	87.42596188
				7/30/04	31.97438339	87.45664340
				3/8/05	32.09631565	87.39932736
				3/14/05am	32.09885068	87.39964283
				3/14/05b	32.05422543	87.40565476
				3/21/05	32.03336790	87.43575942
2005	85	3/15/05	MF	3/21/05	31.97057565	87.42067103
				8/16/05	31.76486126	87.43342495
				9/7/05	31.76828669	87.43276698
				9/8/05	31.75287506	87.43809388
	86	3/15/05	MF	3/23/05	31.89152556	87.52001643
				8/16/05	31.75982632	87.43494821
				9/8/05	31.64413915	87.55493424
	87	3/14/05	MF	3/21/05	32.03459045	87.43881495
	88	3/14/05	MF	6/24/05	32.06119216	87.40274343
				8/15/05	32.09709449	87.40148156

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
				9/7/05	32.07455885	87.40127425
	89	3/14/05	MF	3/21/05	32.09996546	87.39998534
	90	3/14/05	MF	5/9/05	30.92344277	87.91537002
				5/11/05	30.85658260	87.92036343
				9/14/05	31.00772484	87.89172794
	91	3/15/05	MF	6/24/05	32.03034960	87.44766608
				8/16/05	31.72560912	87.47720291
				9/8/05	31.75459951	87.43768828
	92	3/14/05	MF	3/21/05	32.06253655	87.40231079
				9/7/05	31.80821777	87.45777909
	93	3/14/05	MF	3/21/05	31.98108861	87.46520611
				6/23/05	30.75585633	87.91981361
				7/8/05	30.87012238	87.89465729
				9/13/05	30.76897662	87.92503236
	94	3/8/05	MF	3/14/05	30.05422543	87.40565475
	95	3/14/05	MF	3/21/05am	32.07617936	87.40173393
				3/21/05pm	31.98166965	87.46567480
				6/24/05	32.08934396	87.40112102
				9/7/05	32.09289477	87.40031822
	96	3/14/05	MF	ND		
	97	3/14/05	MF	3/21/05	32.08580064	87.40247303
				9/8/05	31.47010761	87.56298318
	98	3/14/05	MF	8/16/05	31.74733360	87.44050946
				9/7/05	31.83576567	87.52127830
	99	3/7/05	MF	3/21/05	32.09953023	87.39914709
				6/23/05	30.75576338	87.91920972
				7/8/05	30.75310658	87.91966038
	100	3/7/05	MF	3/14/05	32.00136184	87.47390401
				6/23/05	30.76599489	87.92617705
				7/8/05	30.86704321	87.89572087
	101	3/7/05	MF	3/21/05	31.91858954	87.43250559
				9/13/05	30.95153733	87.91208915
	102	3/7/05	MF	3/14/05	32.03077756	87.42772850

Appendix 2.Tagging and tracking data for 103 paddlefish collected below Henry (H), Millers Ferry (MF), and Claiborne (CL) Locks and Dams in the Alabama River, 2001-05. ND = not detected.

Tag Year	Fish	Tag Date	Tag Location	Detection Date	Detection Locations	
					Longitude N	Latitude W
				3/21/05	31.97151613	87.42904445
				6/23/05	32.03455988	87.44070776
				8/15/05	32.09873614	87.40017462
				9/7/05	31.90612595	87.38493300
	103	3/7/05	MF	3/14/05	32.08659484	87.40150860
				3/15/05	32.08971050	87.39909301
				3/21/05	32.08920650	87.40195025
				8/16/05	31.71832560	87.51045324
				9/8/05	31.72599245	87.48484539

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