North American Journal of Fisheries Management 30:976–982, 2010
American Fisheries Society 2010
DOI: 10.1577/M10-033.1

[Management Brief]

Dispersal of Smallmouth Bass from a Simulated Tournament Weigh-In Site

Melissa A. Kaintz*[1] and Phillip W. Bettoli

Tennessee Cooperative Fishery Research Unit,[2] Tennessee Technological University, Cookeville, Tennessee 38505, USA

Abstract.—Simulated smallmouth bass *Micropterus dolomieu* fishing tournaments were staged in Dale Hollow Lake, a 12,400-ha reservoir in Tennessee, between March 2004 and February 2005 to investigate posttournament dispersal. Smallmouth bass ($n = 54$) were captured with conventional hook-and-line tackle and artificial lures, placed in live wells, and subjected to a weigh-in procedure before being externally tagged with an ultrasonic transmitter and released. Water temperatures ranged from 7.4°C to 29.3°C (mean [SE] = 17.6°C [2.5]), fish ranged in total length from 330 to 572 mm (mean = 452 [8.3]), and no fish were dead at the weigh-ins. Smallmouth bass dispersed rapidly away from the release site, which was located at the head of a 68-ha embayment. After 3–5 d, survivors ($n = 44$) traversed an average distance of 1,475 m [213]. Most (72%) fish swam uplake and out of the 385-ha study area after 6 d. The rapid dispersal of smallmouth bass may be relevant in systems that experience heavy tournament activity. The smallmouth bass caught and subjected to simulated tournament conditions on Dale Hollow Lake did not stockpile near the release site.

The movements of fish that have been translocated have long interested fisheries biologists. Shoemaker (1952) studied this phenomenon to address the assumption of random mixing of marked individuals when estimating population sizes. In that early work, pumpkinseeds *Lepomis gibbosus* and yellow bullheads *Ameiurus natalis* displayed homing behavior after translocation, whereas walleye *Sander vitreus* did not. Other early studies examined the dispersal and homing behavior of translocated fish to understand their basic ecology and how they perceive their environment (e.g., Hasler and Wisby 1958). In succeeding decades, applied research has increasingly been directed at understanding the movements, dispersal, and homing behavior of sport fish caught during competitive fishing tournaments and released at a central weigh-in site.

Tournament activity that displaces significant numbers of smallmouth bass *Micropterus dolomieu* and largemouth bass *M. salmoides* could have ecological effects and management implications for reservoir populations (Schramm et al. 1991; Stang et al. 1996; Wilde 2003). Some researchers have noted that smallmouth bass disperse more rapidly and at greater distances than largemouth bass (Wilde 2003). However, Bunt et al. (2002) noted that smallmouth bass released at a tournament tended to stay near the release site in the Grand River, Ontario, for extended periods, thereby artificially increasing smallmouth bass density and possibly increasing the exploitation of released fish. Ridgway and Shuter (1996) noted that displaced smallmouth bass with internally implanted sonic tags remained within the general area of release sites for about 1 week in Lake Opeongo, Ontario. Although there is abundant published information on posttournament dispersal for largemouth bass (e.g., Ricks and Maceina 2008), there is little information on the postrelease dispersal of smallmouth bass in lakes or reservoirs outside of early work by Healey (1990), who reported that tournament-caught smallmouth bass dispersed more rapidly, and farther, than largemouth bass. The objective of our study was to measure postsimulated tournament dispersal of externally tagged smallmouth bass from a tournament release site in a large Tennessee reservoir.

Study Area

Dale Hollow Lake is a storage impoundment on the Obey and Wolf rivers that was constructed in 1943. It has a surface area of 12,400 ha at full pool, is approximately 92 km long, and has 1,000 km of shoreline. The reservoir is deep ($Z_{mean} = 15$ m) and oligo-mesotrophic (FTN Associates, Ltd. 2001); chlorophyll *a* concentrations during summer averaged 2 μg/L between 1971 and 1999 and Secchi disk transparencies averaged 3.1 m. Dale Hollow Lake is managed by the Tennessee Wildlife Resources Agency as a two-story fishery that supports popular fisheries for smallmouth bass, walleyes, and rainbow trout *Oncorhynchus*

* Corresponding author: makaintz@gmail.com
[1] Present address: Louisiana Department of Wildlife and Fisheries, Office of Fisheries, Inland Fisheries Division, Post Office Box 1190, 61384 Fish Hatchery Road, Lacombe, Louisiana 70445, USA.
[2] The unit is jointly sponsored by the Tennessee Wildlife Resources Agency, Tennessee Technological University, and the U.S. Geological Survey.

Received February 17, 2010; accepted May 31, 2010
Published online August 9, 2010

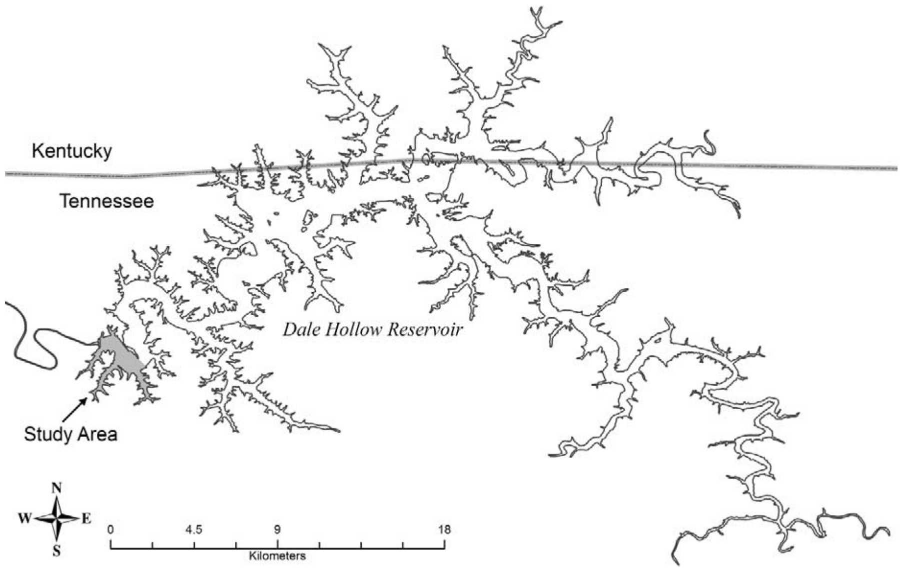

FIGURE 1.—Map of Dale Hollow Lake, Tennessee–Kentucky; the 385-ha study area where smallmouth bass tagged with ultrasonic transmitters were released and tracked is shaded.

mykiss. The tournament weigh-in site where fish were processed and released was located at the end of a narrow, 68-ha embayment in close proximity to the dam (Figure 1). Steep rocky walls lined the main channel of the embayment, with smaller coves ranging from 1 to 3 m in depth. Water quality in the release area was presumed to be representative of embayments throughout the reservoir.

Methods

Simulated fishing tournaments ($n = 13$) were held from March 2004 through February 2005 at water temperatures ranging from 8°C to 27°C. Local anglers and fishing guides suggested that summer was the least successful time to catch smallmouth bass on Dale Hollow Lake (i.e., tournament fishing pressure increases in winter months); therefore, most (62%) simulated tournaments were held from September to March. Resistance from anglers to removing smallmouth bass from spawning beds during spring months resulted in fewer experimental tournaments during this time period.

With the assistance of experienced anglers and guides familiar with the reservoir, fish were caught using artificial lures. An observer was present on each boat to record data. Captured fish were marked by tagging them with a T-bar numbered Floy tag or a hole punch in a specific fin to identify the order in which they were caught. Geographic location (when allowed by the anglers) and fish length (TL) were recorded, as well as the time that each fish was caught. After several hours (depending on how many fish were caught), boats returned to the weigh-in site at a commercial dock. Fish were carried from live wells to a processing table in plastic bags commonly used to transfer fish during tournament weigh-ins (Meals and Miranda 1994; Suski et al. 2004; Schramm and Davis 2006). In lieu of being weighed, fish were placed into a foam-lined cooler filled with lake water for tag attachment. No control fish were used in this study because smallmouth bass often inhabit deep water and electrofishing was not an effective collection method throughout much of the year in Dale Hollow Lake.

Sonotronics IBT-96–5 ultrasonic transmitters (tags) that were 36 mm long and 13 mm in diameter, weighed 9.2 g in air, and had a maximum range of 500 m were externally attached to each fish brought to the weigh-in site. Each tag had a unique code consisting of a series of pulses, allowing the identification of each fish. Tags were equipped with a small float that was approximately 80 mm long and 13 mm in diameter that was made from acrylic tubing with end caps. Each float was labeled with contact information and the words “$25 Reward.” Tags were attached in front of the dorsal fin using suture thread inserted into the musculature (MacLean et al. 1982). Chromic gut suture (VetCassette II C, size 1) was used to attach the tags to each fish, and the time to attach tags was recorded for four fish during the first simulated tournament. This suture would eventually decompose and allow the tag and float assembly to detach from the fish and float to the surface, where the tag could theoretically be recovered and attached to another fish (Sutton et al. 2004). A similar float-and-tag system was used successfully to assess catch-and-release mortality of free-ranging striped bass *Morone saxatilis* (Osborne and Bettoli 1995) in a sport fishery and paddlefish *Polyodon spathula* (Kerns et al. 2009) in a commercial fishery.

Smallmouth bass were tracked using a Sonotronics directional hydrophone and wideband receiver. Tracking was limited to the embayment where fish were released and adjacent reaches of the main channel of the reservoir basin, which covered an area of about 385 ha (Figure 1). On each tracking day, the entire 385-ha study area was searched. We attempted to locate tagged fish once a day for the first 3 d, then on days 10 and 14. Tracking was repeated on days 4 or 5 if a fish could not be located on days 1–3. When fish were released in groups ranging from 5 to 12, tracking on the first and second days postrelease was difficult. Fixes were not recorded unless the tag signal could be positively identified. The wideband receiver could not easily distinguish among overlapping sonic tag signals of those fish that had died or that had not yet moved away from the release site in the narrow embayment. Heavy boat traffic (i.e., acoustic interference) and weather conditions occasionally delayed tracking during the scheduled intervals. When only one fish was caught in a tournament (and no fish were thought to be in the study area) the tracking schedule was delayed because of the costs associated with tracking a single fish in the 1–2 d immediately following release.

Once a fish was located, the geographic location was recorded (error, <15 m) using a Global Positioning System receiver (GPSMAP 188; Garmin International Inc.). Fish that moved out of the immediate area of the marina from which they were released (i.e., swam >200 m) were judged to have dispersed from the release site. Fish that could not be located were assumed to have left the 385-ha study area in the lower reservoir and to have survived. Tagged fish that moved continuously within the study area were also deemed to have survived, whereas a fish that remained in the same location for three consecutive fixes was considered dead.

ArcView GIS 3.2 was used to measure minimum distances traversed by smallmouth bass away from the release site. The movement data were pooled by three intervals to represent immediate (1–2 d), delayed (3–5 d), and extended ($\geq$6 d) periods of dispersal. When a fish was located more than once in any interval, its last-known location in that interval was used to calculate the mean distances moved in each interval. Tagged smallmouth bass that died postrelease were not included in movement calculations.

Results and Discussion

All of the smallmouth bass that were caught, subjected to a simulated tournament weigh-in, and tagged with an ultrasonic tag were alive when released, although 10 of 54 tagged fish (19%) died postrelease. Average time to attach ultrasonic tags to fish was 73 s (SE = 7). Fish ranged in total length from 330 to 572 mm (mean [SE] = 452 [8.3]). The number of times tagged fish were located ranged from 0 to 7 (mean = 3 [0.26]; Table 1). Although fish were presumed dead after 3 fixes in the same location, dead fish were located an average of 5 [0.6] times and in most (63%) cases the last fix was recorded more than a month postrelease. One dead (bloated) fish surfaced and was recovered after only 2 fixes. Eight tag and float assemblies were found floating in the water or along the shoreline and returned for rewards; these returns ranged from 1 month to 5 months postrelease. In addition, six floats were found and returned without tags; these returns ranged from 3 months to 5 years postrelease. Two anglers reported catching the same fish on two separate occasions. On each occasion, the Floy tag number was reported and the fish was released with the tag assembly attached.

Tagged fish had to swim at least 1.9 km from where they were weighed and released to reach the main channel of the reservoir. Minimum movements of tagged smallmouth bass that survived the simulated tournaments ranged from 0.2 to 5.17 km (mean [SE] = 1.78 [0.21] km; Table 1). Tagged fish moved an average of 623 [93] m within 2 d ($n = 20$) and 1,475 [213] m in 3–5 d ($n = 33$; Figure 2). Most (72%) fish were not located in the study area after 5 d at large and were presumed to have moved uplake and out of the study area, or at least 5.5 km from the release site. Fifteen fish that were located in the study area 6 or more days postrelease moved an average of 2,241 m [375]. Minimum distances traversed by tagged fish were not correlated with surface water temperature, air temperature, live-well confinement time, total length, handling time, or tournament duration ($|r| \leq 0.154$; $P > 0.3280$) The lack of significant correlations persisted ($|r| \leq 0.2514$; $P \geq 0.1226$) when the response variable (minimum distance traversed) was $\log_{10}$ transformed.

We saw no evidence that two or more fish congregated after dispersing from the release site; however, some fish followed similar dispersal patterns. Similar to observations made by Hubert and Lackey (1980), tagged smallmouth bass in Dale Hollow Lake

TABLE 1.—Total length (TL), water temperature, live-well confinement time, fate, number of fixes, and minimum distances traversed by 54 tournament-caught smallmouth bass in Dale Hollow Lake.

Tag number	Date tagged	TL (mm)	Water temperature (°C)	Live-well time (h)	Fate	Number of fixes	Minimum distance traversed (km)
3-3-4-6	Mar 17, 2004	448	9.2	6.42	Live	7	3.35
3-3-5-5	Mar 17, 2004	472	9.2	7.38	Live	4	0.32
3-4-4-4	Mar 17, 2004	433	9.2	7.32	Live	7	0.80
4-4-4-4	Mar 17, 2004	498	9.2	2.37	Live	5	1.95
7-7-7-7	May 6, 2004	508	18	4.92	Live	4	4.25
3-3-7-5	Aug 13, 2004	508	26.2	4.05	Live	2	0.45
3-4-6-6	Aug 13, 2004	381	26.2	2.30	Dead	2	0.43
3-4-4-6	Aug 13, 2004	356	26.2	2.17	Live	1	1.38
3-3-5-7	Aug 13, 2004	483	26.2	1.28	Live	1	3.50
3-4-5-5	Aug 13, 2004	337	26.2	4.62	Live	0	[a]
3-3-6-6	Aug 13, 2004	330	26.2	0.30	Dead	4	0.43
6-6-6-6	Aug 13, 2004	495	26.2	4.33	Live	1	0.39
3-3-3-7	Aug 13, 2004	330	26.2	4.00	Dead	4	0.13
3-4-5-7	Sep 14, 2004	483	26.7	2.88	Live	2	1.21
3-3-4-6	Sep 14, 2004	483	26.7	1.50	Live	2	1.42
3-3-6-4	Sep 14, 2004	483	26.7	0.33	Dead	3	0.56
3-4-7-5	Sep 14, 2004	521	26.9	2.17	Live	1	[b]
6-6-6-6	Sep 14, 2004	426	26.9	1.67	Dead	3	0.39
3-3-3-3	Sep 14, 2004	394	27	0.75	Live	1	0.84
3-3-4-4	Sep 14, 2004	406	27	0.05	Live	2	0.56
4-4-7	Oct 7, 2004	508	23.1	2.33	Live	2	0.84
3-3-5	Oct 7, 2004	432	23.1	1.17	Dead	7	0.48
4-4-5	Oct 7, 2004	407	23.1	0.42	Live	5	1.75
3-4-6-6	Oct 7, 2004	343	23.1	3.17	Live	3	5.13
4-4-6	Oct 7, 2004	419	23.1	2.08	Live	2	5.17
3-3-3	Oct 30, 2004	400	20.7	3.08	Live	1	3.98
4-5-5	Oct 30, 2004	406	20.7	1.47	Live	3	1.67
3-3-6	Oct 30, 2004	415	20.7	6.83	Live	4	0.25
3-3-7	Oct 30, 2004	357	20.7	4.28	Dead	7	0.28
3-3-4	Oct 30, 2004	432	20.7	2.80	Live	5	3.14
2-3-3	Jan 14, 2005	381	9.9	4.12	Live	4	3.70
3-4-4	Jan 28, 2005	483	7.6	2.83	Live	2	3.74
3-4-5	Jan 28, 2005	533	7.6	2.78	Live	3	1.66
4-4-4	Jan 28, 2005	508	7.6	2.58	Live	1	2.53
4-4-7	Jan 28, 2005	470	7.6	2.17	Live	2	4.02
4-4-5	Jan 28, 2005	432	7.6		Live	7	2.22
5-5-6	Jan 28, 2005	533	7.6	1.42	Live	3	3.04
2-2-5	Jan 28, 2005	483	7.6	0.33	Live	3	1.06
5-5-5	Jan 28, 2005	521	7.6	0.17	Live	4	3.00
2-3-4	Jan 28, 2005	470	7.6	2.42	Live	3	0.79
2-4-4	Jan 28, 2005	495	7.6		Dead	7	0.03
3-3-4-4	Jan 28, 2005	483	7.6		Live	5	2.98
2-2-2	Jan 28, 2005	495	7.6		Live	1	1.26
2-3-5	Feb 5, 2005	445	7.4	7.25	Live	2	2.35
2-4-5	Feb 5, 2005	381	7.4	7.15	Dead	5	0.77
3-3-3	Feb 5, 2005	419	7.4	0.53	Live	2	3.49
3-3-5	Feb 5, 2005	508	7.4	5.65	Dead	4	0.72
2-2-4	Feb 19, 2005	457	8	4.08	Live	1	3.31
4-5-5	Feb 19, 2005	533	8	4.00	Live	0	[c]
3-5-5	Feb 19, 2005	572	8	3.98	Live	2	0.95
3-3-4	Feb 19, 2005	508	8	3.00	Live	1	2.51
3-3-3	Feb 19, 2005	533	8	1.92	Live	2	3.48
2-2-3	Feb 19, 2005	483	8	1.50	Live	2	1.90
4-4-4	Feb 19, 2005	381	8	1.75	Live	1	0.70

[a] This fish was located once away from the release site, but a GPS coordinate was not recorded. It was never located again in the study area; thus, it was assumed to have moved uplake and out of the study area or to have been caught and not reported.

[b] This fish was located once under the boat dock where it was released and was never located again; it was assumed to have swum uplake and out of the study area or to have been caught and not reported.

[c] This fish was never located after it was released. All tags were tested immediately prior to attachment to ensure that they were functioning; thus, this fish was assumed to have survived and swum uplake and out of the study area.

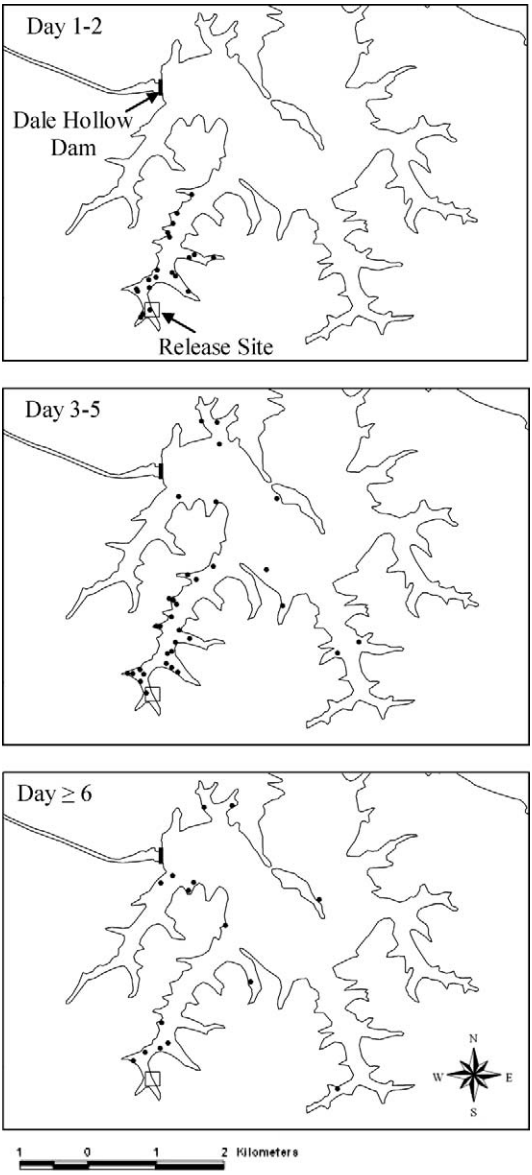

FIGURE 2.—Dispersal of smallmouth bass from the tournament weigh-in release site at Dale Hollow Lake at three different intervals postrelease. All locations are for live fish.

generally moved along steep rocky shorelines as they left the release site. Fish were usually located on points near the shore or along rocky cliffs and were rarely found offshore in open water.

A key assumption in our study was that externally attaching telemetry tags did not unduly influence fish behavior, which other authors have successfully argued (e.g., Osborne and Bettoli 1995; Cooke 2003). Telemetry tags have been externally attached to fish for decades to study movements and behavior (Donaldson et al. 2008). However, we do not discount the possibility that the movements of our tagged smallmouth bass were influenced in unknown ways by the lightweight tag assemblies we attached to their dorsal musculature.

The dispersal behavior displayed by the smallmouth bass that we caught, transported, weighed, tagged, and released contrasted with the more sedentary behavior and stockpiling of largemouth bass commonly observed near tournament release sites (e.g., Gilliland 2001; Ridgway 2002; Wilde 2003; Wilde and Paulson 2003; Ricks and Maceina 2008). Our results contrast with the findings of Ridgway and Shuter (1996), who found that internally tagged smallmouth bass remained at a release site for about 1 week, but their movements may have been influenced by the surgical procedures they endured. Our results support those of previous studies that suggest clear differences in the movements of displaced largemouth bass and smallmouth bass (Ridgway 2002; Wilde 2003), with smallmouth bass moving more than largemouth bass. In an early study, Healey (1990) went so far as to state that fishing tournament sponsors should consider transporting largemouth bass away from weigh-in sites to avoid stockpiling, but smallmouth bass could be expected to disperse naturally. Arlinghaus et al. (2009) reported rapid dispersal and physiological recovery of northern pike *Esox lucius* from stressors associated with catch-and-release practices. It is possible that smallmouth bass also experience rapid recovery which results in rapid dispersal from a release site. Although smallmouth bass are generally more susceptible to unfavorable conditions, perhaps the recovery rate of smallmouth bass that survive tournaments is higher than that of largemouth bass. However, the propensity of smallmouth bass to display strong homing behavior after being displaced may be a more likely explanation for their rapid dispersal in our study and others (e.g., Pflug and Pauley 1983).

Additional research on smallmouth bass dispersal from a centralized weigh-in location could use readily available technologies (e.g., submersible ultrasonic receivers and underwater video cameras) to verify our assumptions regarding the mortality of tagged fish and long-range dispersal. Information on specific environmental factors that might influence movements and activity postrelease should also be collected. It would also be interesting to compare delayed mortality and postrelease behavior (e.g., stockpiling) of largemouth bass and smallmouth bass as it relates to tournament stress (e.g., live-well confinement times, handling). This additional information could help managers and tournament organizers more fully understand the dispersal and mortality of smallmouth bass following tournaments and how they differ from those of other black bass species.

Acknowledgments

Primary funding for this project was provided by the Tennessee Wildlife Resources Agency. Additional funding was provided by the Tennessee Cooperative Fishery Research Unit and the Center for the Management, Utilization, and Protection of Water Resources at Tennessee Technological University. We are indebted to members of the Sparta (Tennessee) Bass Club, S. Arms, and numerous Tennessee Tech students for the time they spent helping us catch and process fish. Special thanks go to J. Huddleston, who granted us full use of the facilities at Horse Creek Marina. We thank R. Bisch for his assistance with GIS modeling. Helpful presubmission comments on this manuscript were provided by G. Gilliland and H. Schramm. The use of trade, product, industry, firm names is for information purposes only and does not constitute an endorsement by the U.S. Government or the U.S. Geological Survey.

References

Arlinghaus, R., T. Klefoth, S. J. Cooke, A. Gingerich, and C. Suski. 2009. Physiological and behavioural consequences of catch-and-release angling on northern pike (*Esox lucius* L.). Fisheries Research 97:223–233.

Bunt, C. M., S. J. Cooke, and D. P. Philipp. 2002. Mobility of riverine smallmouth bass related to tournament displacement and seasonal habitat use. Pages 545–552 *in* D. P. Philipp and M. S. Ridgway, editors. Black bass: ecology, conservation, and management. American Fisheries Society, Symposium 31, Bethesda, Maryland.

Cooke, S. J. 2003. External attachment radio transmitters do not affect the parental care behaviour of rock bass. Journal of Fish Biology 62:965–970.

Donaldson, M. R., R. Arlinghaus, K. C. Hanson, and S. J. Cooke. 2008. Enhancing catch-and-release science with biotelemetry. Fish and Fisheries 9:79–105.

FTN Associates, Ltd. 2001. Dale Hollow Lake CE-QUAL-W2 water quality model. Final report to the U.S. Army Corps of Engineers, Nashville, Tennessee.

Gilliland, E. R. 2001. Dispersal of black bass following tournament release in an Oklahoma reservoir. Proceedings of the Annual Conference Southeastern Association of Fish and Wildlife Agencies 53(1999):144–149.

Hasler, A. D., and W. J. Wisby. 1958. The return of displaced largemouth bass and green sunfish to a "home" area. Ecology 39:289–293.

Healey, T. P. 1990. Movement and survival of tournament-caught black bass at Shasta Lake. California Fish and Game 76:36–42.

Hubert, W. A., and R. T. Lackey. 1980. Habitat of adult smallmouth bass in a Tennessee River reservoir. Transactions of the American Fisheries Society 109:364–370.

Kerns, J. A., P. W. Bettoli, and G. D. Scholten. 2009. Mortality and movements of paddlefish released as bycatch in a commercial fishery in Kentucky Lake, Tennessee. Pages 329–343 *in* C. P. Paukert and G. D. Scholten, editors. Paddlefish management, propagation, and conservation in the 21st century: building from 20 years of research and management. American Fisheries Society, Symposium 66, Bethesda, Maryland.

MacLean, N. G., G. C. Teleki, and J. Polak. 1982. Ultrasonic telemetry studies of fish activity near the Nanticoke Thermal Generating Station. Journal of Great Lakes Research 8:495–594.

Meals, K. O., and L. E. Miranda. 1994. Size-related mortality of tournament-caught largemouth bass. North American Journal of Fisheries Management 14:460–463.

Osborne, R., and P. W. Bettoli. 1995. A reusable ultrasonic tag and float assembly for use with large pelagic fish. North American Journal of Fisheries Management 15:512–514.

Pflug, D. E., and G. P. Pauley. 1983. The movement and homing of smallmouth bass *Micropterus dolomieui* in Lake Sammamish, Washington. California Fish and Game 69:207–216.

Ricks, B. R. Jr., and M. J. Maceina. 2008. Effects of catch-and-release tournament fishing on dispersal and population metrics of black bass in Lake Martin, Alabama. Pages 293–308 *in* M. S. Allen, S. M. Sammons, and M. J. Maceina, editors. Balancing fisheries management and water uses for impounded river systems. American Fisheries Society, Symposium 62, Bethesda, Maryland.

Ridgway, M. S., and B. J. Shuter. 1996. Effects of displacement on the seasonal movements and home range characteristics of smallmouth bass in Lake Opeongo. North American Journal of Fisheries Management 16:371–377.

Ridgway, M. S. 2002. Movements, home range, and survival estimation of largemouth bass following displacement. Pages 525–533 *in* D. P. Philipp and M. S. Ridgway, editors. Black bass: ecology, conservation, and management. American Fisheries Society, Symposium 31, Bethesda, Maryland.

Schramm, H. L. Jr., M. L. Armstrong, N. A. Funicelli, D. M. Green, D. P. Lee, R. E. Manns Jr., B. D. Taubert, and S. J. Waters. 1991. The status of competitive fishing in North America. Fisheries 16(3):4–12.

Schramm, H. L. Jr., and J. G. Davis. 2006. Survival of largemouth bass from populations infected with largemouth bass virus and subjected to simulated tournament conditions. North American Journal of Fisheries Management 26:826–832.

Shoemaker, H. H. 1952. Fish home areas of Lake Myosotis, New York. Copeia 1952:83087.

Stang, D. L., D. M. Green, R. M. Klindt, T. L. Chiotti, and W. W. Miller. 1996. Black bass movements after release from fishing tournaments in four New York waters. Pages 163–171 *in* L. E. Miranda and D. R. DeVries, editors. Multidimensional approaches to reservoir fisheries management. American Fisheries Society, Symposium 16, Bethesda, Maryland.

Suski, C. D., S. S. Killen, S. J. Cooke, J. D. Kieffer, D. P. Philipp, and B. L. Tufts. 2004. Physiological significance of the weigh-in during live-release angling tournaments for largemouth bass. Transactions of the American Fisheries Society 133:1291–1303.

Sutton, T. M., E. T. Volkman, K. L. Pangle, D. A. Rajchel, and J. P. Duehr. 2004. Effects of absorbable suture strand diameter on retention of external radio transmitters by juvenile lake sturgeon. North American Journal of Fisheries Management 24:1404–1408.

Wilde, G. R. 2003. Dispersal of tournament-caught black bass. Fisheries 28(7):10–17.

Wilde, G. R., and L. J. Paulson. 2003. Movement and dispersal of tournament-caught largemouth bass in Lake Mead, Arizona–Nevada. Journal of Freshwater Ecology 18:339–342.