Hybrid Striped Bass in Urban Ponds: A Pilot Study on Angler Demographics, Attitudes, and Fishing Success

J. Wesley Neal,[1] *University of Arkansas at Pine Bluff, Aquaculture/ Fisheries Center, 1200 North University Drive, P.O. Box 4912, Pine Bluff, AR 71611*

Sanatan Shreay, *University of Arkansas at Pine Bluff, Aquaculture/ Fisheries Center, 1200 North University Drive, P.O. Box 4912, Pine Bluff, AR 71611*

N. Elizabeth Heitman, *University of Arkansas at Pine Bluff, Aquaculture/Fisheries Center, 1200 North University Drive, P.O. Box 4912, Pine Bluff, AR 71611*

Mark C. Leao, *University of Arkansas at Pine Bluff, Aquaculture/ Fisheries Center, 1200 North University Drive, P.O. Box 4912, Pine Bluff, AR 71611*

Kelly R. Winningham, *University of Arkansas at Pine Bluff, Aquaculture/Fisheries Center, 1200 North University Drive, P.O. Box 4912, Pine Bluff, AR 71611*

Regina E. Edziyie, *University of Arkansas at Pine Bluff, Aquaculture/Fisheries Center, 1200 North University Drive, P.O. Box 4912, Pine Bluff, AR 71611*

Clifton Jackson, *Arkansas Game and Fish Commission, No. 2 Natural Resources Drive, Little Rock, AR 72205*

Abstract: Urban fishing programs in Arkansas rely primarily on put-take stockings of channel catfish and rainbow trout. We evaluated hybrid striped bass as a potential addition to urban fisheries by stocking this fish at densities of 95 and 96 fish/ha in two urban fishing ponds. Angler surveys were conducted three times daily for five weeks following stocking to determine angler demographics, fishing success, and attitudes/preferences. We surveyed 320 anglers comprised primarily of local urban residents. They exerted 686 hours of fishing effort, catching 574 fish, including sunfish (38%), channel catfish (30%), and hybrid striped bass (22%). Of the anglers who caught hybrid striped bass, over 90% said that it added to their fishing experience and they were more likely to return to the lake to fish. Of all anglers surveyed, 90% said that the Arkansas Game and Fish Commission should begin stocking hybrid striped bass as part of urban fisheries management.

Key words: hybrid striped bass, urban, creel, put-take.

Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 58:130–138

---

1. Corresponding author.

Most fishing opportunities are located outside the boundaries of large towns and cities (Schramm and Edwards 1994), yet over 80% of the United States population lives in urban areas (U.S. Bureau of the Census 2000). Urban and community fishing programs have existed for more than 30 years, yet relatively little has been done to evaluate their success (Jackson et al. 2002). The Arkansas Game and Fish Commission (AGFC) measures the success of their Urban Fishing Program based on three overall goals: 1) to create and enhance urban fishing opportunities, 2) to recruit and retain new anglers in urban settings, and 3) to target potential anglers in youth and underrepresented racial, ethnic, demographic groups in urban settings. These goals are pursued through programs such as put-take stocking, fishing derbies, and the Hooked on Fishing—Not on Drugs (HOFNOD) program.

The Arkansas Urban Fishing Program (UFP) relies primarily on put-take stocking of channel catfish *(Ictalurus punctatus)* during warmer months and rainbow trout *(Oncorhynchus mykiss)* during colder months (Jackson et al. 2002). Rainbow trout are well received by some urban anglers, but a special trout permit is required to retain this species and many UFP anglers do not purchase this permit. Channel catfish are difficult to catch when water temperatures are low, making urban lakes essentially a single-species fishery with limited appeal and specialized permit requirements. For this reason, there is a need for alternative early and late season species in urban fisheries management for harvest-oriented anglers. Diversification of fishing opportunities in urban lakes would also allow resource managers to target a more diverse group of anglers, particularly specialized anglers preferring a more active fishing experience.

Hybrid striped bass *(Morone saxatilis* × *M. chrysops)* are popular sport fish that can survive and grow in small impoundments (Neal et al. 1999b), and these fish have been used successfully on a put-grow-take basis in urban fisheries (Morello 1984). Hybrid striped bass are especially suitable because they can be caught during all seasons, and may be harvested without a special license or permit apart from the basic fishing license. With the hybrid striped bass aquaculture industry in the southern United States continuing to grow, fry are readily available for grow out and stocking on a put-take basis. In this study, we evaluated a pilot hybrid striped bass stocking program in two UFP ponds in Arkansas. Our goal was to determine if these fish have potential as a put-take species, and whether or not a more intensive trial is warranted.

Methods

Study Sites

We used two UFP ponds in Pine Bluff, Arkansas, as the study sites for this pilot study. Regional Park Youth and Seniors Pond (RP) was a 0.8-ha pond that was restricted to anglers <16 or >64 years of age except by special permit. This pond was stocked with channel catfish in late spring, summer, and early fall and with rainbow trout in the winter. Dr. Martin Luther King Jr. Park Pond (MLK) was a 2-ha pond open to all ages. This pond was stocked with channel catfish biweekly from late spring to early fall; trout were not stocked at the time of the study. Both study ponds contained other species including various sunfish (*Lepomis* spp.), crappie (*Pomoxis*

spp.), grass carp *(Ctenopharyngodon idella)*, and gizzard shad *(Dorosoma cepedianum)*. Largemouth bass *(Micropterus salmoides)* were in both ponds, but fishing for this species was limited and was restricted to catch and release.

Evaluation of Hybrid Striped Bass

We stocked hybrid striped bass at densities of 95/ha in the RP pond and 96/ha in the MLK pond. Mean total length of a sub-sample ($N = 41$) of hybrid striped bass was 301 mm total length (TL) at stocking, but fish ranged in size from 214 to 452 mm TL. Both stockings took place during the evening on 26 March 2004. Stocking densities above are compensated for observed post-stocking mortality (24 hours: 2 mortalities in RP, 10 mortalities in MLK). Water temperatures at the time of stocking were between 20 and 21 C at both ponds.

We conducted angler surveys from 27 March to 30 April 2004. Roving interviews were conducted three times daily on each pond: in the morning (0800–1200 hours), afternoon (1200–1600 hours), and evening (1600–1800 hours). Survey questions were designed to address angler demographics, fishing success, and attitudes/preferences, and were comprised of open-ended, categorical, and Likert scale questions. We did not attempt to correct for avidity bias resulting from multiple interviews of individual anglers and the implications of this are discussed. Furthermore, we estimated fishing effort only for the anglers interviewed, and did not attempt to extrapolate this to total fishing effort. Analyses were conducted using Survey Pro analysis software.

Results

We surveyed 239 anglers at MLK and 81 anglers at RP during the study period. Angler demographics were similar between ponds (Table 1) with African-Americans accounting for nearly three-quarters of the anglers utilizing these fisheries. Although there were more male anglers (208) during the study, female anglers were common at both lakes (34% and 41%). Age distributions did not vary as much as we expected between ponds, and this was due to significant non-compliance with the age restrictions at RP. Of the 62% of anglers that were in the restricted age range (16–64 years old) and fishing at RP, only 15 (29%) possessed a special permit that exempted the age requirement. Most anglers were local county residents (91%) and only two anglers (<1%) were from outside Arkansas.

Among the anglers interviewed, 8 were fishing for the first time, 55 said they fish every week, and 12 said they fish every day of the year. The mean number of days fished per year was 108 (to any location), and the median was 52 days of fishing per year. We talked with 29 people who were fishing at UFP lakes for the first time and four that said they fish UFP lakes every day of the year. The mean number of days per year spent fishing UFP lakes was 66, and the median was 30 days per year. We did not ask if this participation was directed only on the two study lakes or at UFP lakes statewide. Seasonal fishing preferences were highest in spring and summer and lowest in winter (Fig. 1). However, since this survey was conducted only during the

Table1. Demographic composition of anglers utilizing two Urban Fishing Program ponds during the hybrid striped bass pilot study 26 March–30 April 2004.

Category	MLK Park Pond	RP Pond	Both ponds
Total anglers	239	81	320
Ethnicity (%)			
African-American	73	72	73
Caucasian	25	18	23
Hispanic	<1	10	4
Other	<1	0	<1
Gender (%)			
Male	66	59	65
Female	34	41	35
Age (%)			
<16	7	12	8
16–18	3	5	3
19–45	45	49	46
46–64	31	9	25
>64	15	26	18
Residency (%)			
Jefferson County	92	88	91
Other AR county	8	12	9
Non-resident	<1	0	<1

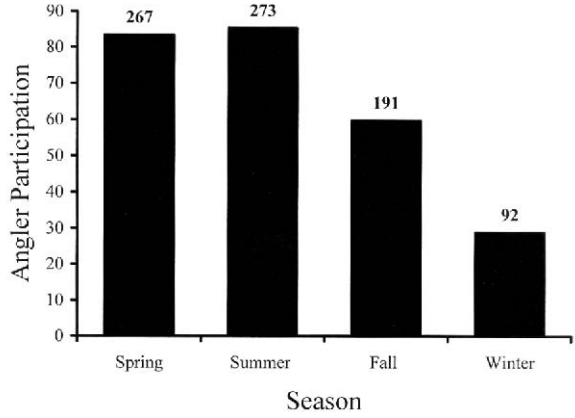

Figure 1. Preferred fishing season of anglers surveyed at Regional Park and Dr. Martin Luther King Jr. Park ponds following stocking of hybrid striped bass on 26 March 2004. Angler participation is the percentage of anglers that selected a given season, and the number of anglers responding selecting each season is given above bars.

spring, these preferences are likely biased since they do not represent all UFP participants.

Fishing effort of interviewed anglers was 686 hours during the 35-day study period (7.0 hrs/ha/day). We did not attempt to estimate total fishing effort. Anglers caught 574 fish (Fig. 2), yielding mean catch rates of 0.84 fish/hr (range 0–10.7 fish/hr). Sunfish were the most commonly caught species (37.8%), followed by channel catfish (29.8%) and hybrid striped bass (22.3%). Rainbow trout, which were stocked only in RP pond, accounted for 7.1% of the total catch (28.9% of catch in RP pond), and largemouth bass, crappie, and other species were much less common. There were 171 channel catfish and 122 hybrid striped bass caught by anglers surveyed, yielding catch rates of 0.25 and 0.18 fish/hr, respectively. The retention rate of fish caught was 91% of catfish, 85% of trout, 69% of hybrid striped bass, and 49% of sunfish during the survey. Natural baits such as worms, minnows, livers, and shrimp were most commonly used (85% of anglers).

Angler response to hybrid striped bass stocking was very positive. Over 90% of anglers that caught hybrid striped bass said that it added to their overall fishing experience, and <4% said that it did not. These anglers also stated that they were more likely to return to UFP lakes because of their experience catching hybrid striped bass. No anglers stated that they were less likely to return. Although we collected no data on target species of anglers surveyed, we encountered many anglers who explained that they were visiting the UFP ponds solely to fish for hybrid striped bass. This specialized angler group represented a diversification of UFP participants and likely resulted in a net increase in UFP participation and exposure.

When all anglers (regardless of whether or not they caught hybrid striped bass) were asked if they think AGFC should begin a stocking program with hybrid striped bass, 90% responded "yes," 1.6% responded "no," and 8.4% had no opinion. When asked what other species (not including hybrid striped bass) they would like to have stocked in UFP ponds, just over half (51.9%) of the respondents said "more catfish" and 38.8% responded "crappie." Other species indicated were sunfish, largemouth bass, rainbow trout, gar (*Lepisosteus* spp.), buffalo (*Ictiobus* spp.), freshwater drum *(Aplodinotus grunniens)*, and tilapia (*Tilapia orechromis* spp.; Fig. 3).

Discussion

Based on results from this pilot study, the Arkansas UFP may be achieving its desired goals. The majority of anglers that are using the UFP ponds are residents of the surrounding urban area. In fact, nearly 9 out of 10 anglers using the two UFP ponds in this study were residents of the county where the ponds were located. In 1999 and 2000, 66% of anglers fishing these two ponds traveled <5 miles from home, and only 16% traveled >10 miles (Jackson et al. 2002). The majority of anglers at these ponds were African-American, and about 3% were new to the sport of fishing. Women were well represented at about 35% of anglers surveyed, which is higher than the statewide percentage (27%) of women anglers, but lower than the statewide percentage of women in the population (54%; U.S. Department of the Inte-

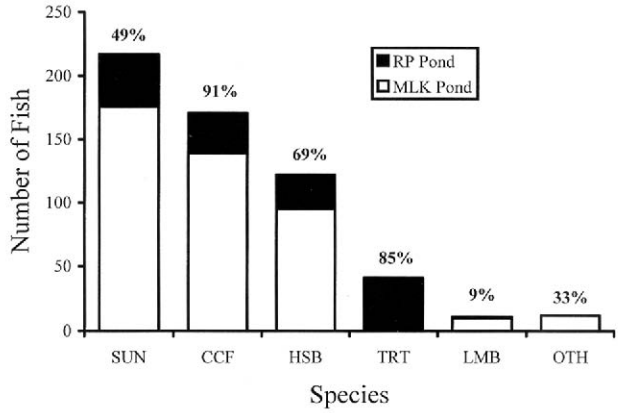

Figure 2. Angler catch by species in Martin Luther King Jr. and Regional Park ponds. Species abbreviations are as follows: sunfish (SUN), channel catfish (CCF), hybrid striped bass (HSB), rainbow trout (TRT), largemouth bass (LMB), and other (OTH). The percent of catch that was harvested (from both ponds combined) is given above each species bar.

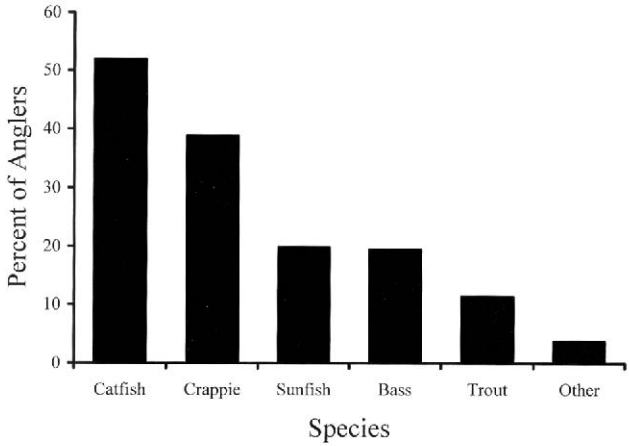

Figure 3. Angler suggestions for additional species to be stocked in the AGFC Urban Fishing Program. Other includes gar, buffalo, drum, and tilapia. There were 341 responses to this question from 237 anglers.

rior 2003). Hence, these fisheries are attracting traditionally underrepresented user groups.

Hybrid striped bass catch rates in this study were high despite apparently limited directed fishing effort. Most anglers interviewed were unaware that hybrid striped bass had been stocked, and many used natural bait designed to target catfish. However, hybrid striped bass catch rates were only 28% lower than channel catfish. The similarities in catch rates between channel catfish and hybrid striped bass were important because channel catfish were stocked at much higher densities in these UFP lakes. Channel catfish were stocked in both ponds at 300/ha on 15 April and in MLK Pond at 420/ha on 28 April, while hybrid striped bass were stocked at rates of 95 and 96/ha. Although no estimate was available for channel catfish density prior to the onset of stocking in April, it is likely that catfish were still present in abundance in both lakes from the previous season's many stocking events.

The high catch rates of hybrid striped bass were partly due to the effectiveness of the few anglers who targeted hybrid striped bass. Conversely, the low channel catfish catch rates were likely due to the cool water temperatures (20–21 C at stocking). Hybrid striped bass were quick to take shrimp, minnows, chicken livers, and other "catfish" baits, suggesting that hybrid striped bass are more appropriate than channel catfish for use in put-take fisheries during cool water periods. Morello (1984) noted a similar natural bait-based urban fishery for hybrid striped bass, with most hybrids caught using bottom rigs of fresh or frozen shrimp. Several anglers interviewed at MLK and RP effectively targeted hybrid striped bass using small artificial baits. Unlike catfish and trout anglers, these artificial bait anglers mostly practiced catch and release, and contributed to a lower harvest rate for hybrid striped bass than for catfish or trout. Several of these anglers indicated that they came to the UFP ponds specifically to catch hybrid striped bass.

The fisheries created in MLK and RP ponds attracted high fishing effort (7.0 hrs/ha/day). This measure of effort is not total fishing effort since we may have missed anglers between sampling periods and many anglers had not completed their fishing trip at the time of the interview. However, it is considerably higher than reported angling effort of 0.15 hrs/ha/day on Lake Osborne, a 144-ha urban lake in Florida and site of earlier introductions of hybrid striped bass in an urban fishery (Morello 1984). Edwards and Okamoto (1980) reported that in a put-take urban fishery, angling pressure is directly influenced by stocking and harvest; the more fish people catch, the more frequently they go fishing. Mean total catch rate (all species combined) was only 0.84 fish/hr in this study, although many anglers were much more successful (up to 10.7 fish/hr). Stocked channel catfish, hybrid striped bass, and trout accounted for 58% of the catch, demonstrating the importance of hatchery support in these fisheries.

In general, anglers were very receptive of hybrid striped bass in the UFP. Most people who caught these fish said that it improved their fishing experience and they were more likely to return to the lake because of it. Most (90%) said they would like AGFC to begin a stocking program using hybrid striped bass, and <2% said they do not want this fish stocked. While it is likely that many anglers would have said "yes"

to any new stocking effort regardless of species, there were a significant number of anglers who came to fish for hybrid striped bass where otherwise they were unlikely to visit UFP fisheries. Hence, hybrid striped bass could be used to diversify urban fisheries and provide new opportunities to urban anglers. Whereas trout can only survive winter months in Arkansas urban ponds and catfish angling is most effective during summer months, hybrid striped bass may provide angling opportunities for a greater portion of the year.

The biggest complaint voiced by anglers in this study was the small size of sunfish in both ponds, and the small size of crappie in MLK pond. Hybrid striped bass have been shown to eat large numbers of sunfish and crappie fry in ponds, thus reducing their abundance and increasing available resources for growth (Neal et al. 1999a). This can result in increased growth and improvement in condition of sunfish and crappie. Hybrid striped bass stocking in UFP fisheries may exert significant predatory pressure on prey populations, and could yield better wild sunfish and crappie fishing in addition to a hatchery-supported hybrid striped bass fishery. The degree of predatory pressure will depend on stocking densities and harvest regulations of hybrid striped bass, and warrants further study.

This research was conducted as a student class project at UAPB and only examined two UFP ponds during the spring of a single year. As such, management recommendations and conclusions are not justifiable beyond stating that hybrid striped bass show potential as a new species in the UFP. Also, we did not attempt to correct for the bias associated with multiple surveys by the same angler. A handful of UFP regulars were interviewed two or more times, which likely biased our results on demographics and attitude. A more intensive examination of hybrid striped bass will follow as part of collaborative effort between researches at UAPB and AGFC personnel. This research will examine UFP lakes statewide, and will focus on stocking rates, harvest regulations, angler response, angler motivations, and economic feasibility.

Acknowledgments

We thank P. Perschbacher of UAPB, and K. Davis, S. Rawles, and G. Ludwig of the H. K. Dupree Stuttgart National Aquaculture Research Center for providing hybrid striped bass for use in this study. We also acknowledge the cooperation of the Arkansas Game and Fish Commission, especially the Urban Fishing Program. Appreciation is expressed to M. Eggleton, S. Lochmann, and P. Perschbacher for providing manuscript advice during preparation.

Literature Cited

Edwards, G., and G. Okamoto. 1980. Fishing in the city. Arizona Game and Fish Department. Project F-14-R.

Jackson, J. R., C. Long, and H. D. Symens. 2002. A pilot urban and community fishing program for central and southeast Arkansas. Final Report. Arkansas Game and Fish Commission, Little Rock.

Morello, F. A. 1984. Development and management of an urban fishery with hybrid striped

bass. Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies 38:436–445.

Neal, J. W., R. L. Noble, and J. A. Rice. 1999a. Fish community response to hybrid striped bass introduction in small warmwater impoundments. North American Journal of Fisheries Management 19:1044–1053.

_____, J. A. Rice, and R. L. Noble. 1999b. Evaluation of two sizes of hybrid striped bass for introduction into farm ponds. North American Journal of Aquaculture 61:74–78.

Schramm, H. L. and G. B. Edwards. 1994. The perspectives on urban fisheries management: results of a workshop. Fisheries 19(10):9–15.

U.S. Bureau of the Census. 2000. Statistical abstracts of the United States: 2000. U. S. Office, Washington, D.C.

U.S. Department of the Interior (USDI). 2003. 2001 national survey of fishing, hunting, and wildlife-associated recreation: Arkansas. USDI Fish and Wildlife Service and U.S. Department of Commerce Bureau of the Census. U.S. Government Printing Office, Washington, D.C.