Alabama Bass Frequently Asked Questions

Introduction

Alabama Bass pose a major threat to the bass fisheries in Kentucky. As more research comes out from other states, the significance of that threat is increasing. Kentucky Department of Fish and Wildlife Resources (KDFWR) is sometimes asked about Alabama Bass and whether they would be a good fit for stocking in Kentucky waters. KDFWR has determined that the introduction of Alabama Bass into Kentucky waters would be extremely detrimental and there are no plans to stock Alabama Bass. It is also illegal to stock Alabama Bass into Kentucky waters. This decision not to stock Alabama Bass is based on research in other states and is made with the best interests of future generations of Kentucky bass anglers in mind. KDFWR recognizes the importance of our native bass species and is dedicated to protecting and conserving that native diversity and its ecological and economical importance to the anglers of Kentucky.

In areas of North Carolina, Georgia, Tennessee, Virginia, and South Carolina where they have been illegally introduced, Alabama Bass have rapidly displaced and outcompeted the native Largemouth Bass populations. Additionally, Alabama Bass will readily hybridize with Smallmouth Bass and Spotted Bass and have nearly eliminated those species from invaded lakes through genetic mixing. An Alabama Bass introduction would mean a near total loss of Kentucky's official state fish, the "Kentucky" Spotted Bass. However, Alabama Bass are not only problematic for maintaining native bass diversity, but also for trophy bass anglers because Alabama Bass do not grow as big as Largemouth Bass and Smallmouth Bass.

As surrounding states continue to deal with this growing problem, KDFWR will continue to monitor for the presence of Alabama Bass in Kentucky waters. We have a team of biologists reviewing new research as it becomes available. Stocking of new or different bass genetics into Kentucky waters is a topic we take very seriously. Once non-native fish species are released that will hybridize with native species, the results are irreversible, and based on current research and data there are no benefits. Research in other states suggests that even introducing small numbers of Alabama Bass can lead to a collapse in the native bass numbers in less than 10 years. It is extremely important for anglers not to move bass between waterbodies to prevent the further spread of this and other invasive species.

KDFWR compiled the following answers to frequently asked questions about Alabama Bass to help better educate those interested in the subject. With each answer provided, there is a detailed evidence section that references peer-reviewed studies (research projects that followed standard scientific protocols and whose results were reviewed and approved by outside experts) that give reasoning behind KDFWR's stance on Alabama Bass. This information was researched and compiled by a <u>team of KDFWR fisheries biologists</u>. If you have further questions about Alabama Bass, please contact your <u>local district fisheries biologists</u>.

Thank you for your interest in bass fishing and conservation. We wish you great fishing!

- 1. What is an Alabama Bass? Is it a separate species of bass?
- 2. How do I tell Alabama Bass apart from other bass?

- 3. Do we have Alabama Bass in Kentucky?
- 4. Do Alabama Bass grow bigger than other bass species?
- 5. Is Kentucky stocking Alabama Bass into any of its lakes?
- 6. If they are introduced, could Alabama Bass outcompete our Largemouth Bass?
- 7. If they are introduced, could Alabama Bass eliminate our Spotted Bass and Smallmouth Bass populations in Kentucky?
- 8. Once introduced in a lake, how long does it take Alabama Bass to alter the fishery? Can the results be undone?
- 9. How can I prevent the spread of Alabama Bass into Kentucky?
- 10. Are there any other species of bass we can stock to improve our fishing in Kentucky?
- 11. How did Alabama Bass expand outside of their native range?
- 12. Once established, have there been any successful eradication or mitigation efforts in other states?
- 1. What is an Alabama Bass? Is it a separate species of bass?

Answer:

The Alabama Bass is native to the Mobile River basin and is very close in appearance to Kentucky's native Spotted Bass. Although originally thought to be a subspecies of Spotted Bass, they are now considered a distinct species.

Scientific Basis:

- The Alabama Bass, *Micropterus henshalli*, was originally thought to be a subspecies of a Spotted Bass (*Micropterus punctulatus*), however, Alabama Bass were found to be more closely related to a Largemouth Bass, *Micropterus salmoides* (Near et al. 2003; Near et al. 2004; Kassler et al 2002). Later research showed that they are even more closely related to Redeye Bass (*M. coosae*) and Shoal Bass (*M. cataractae*) (Bagley et al. 2011; Taylor et al. 2019).
- The Alabama Bass is native to the Mobile River Basin in Alabama, Georgia, and Mississippi. The species has been intentionally introduced in California and Texas and has been illegally introduced into several states (Baker et al. 2008; Dorsey and Abney 2016; Moyer et al. 2014; Rider and Maceina 2015; Sammons et al. 2023 in press).

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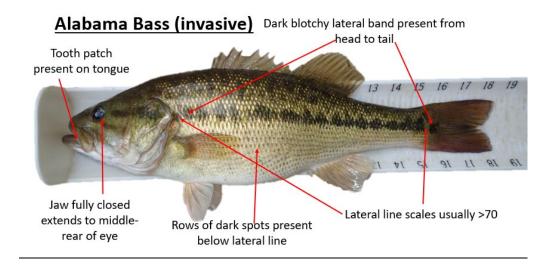
2. How do I tell Alabama Bass apart from other bass?

Answer:

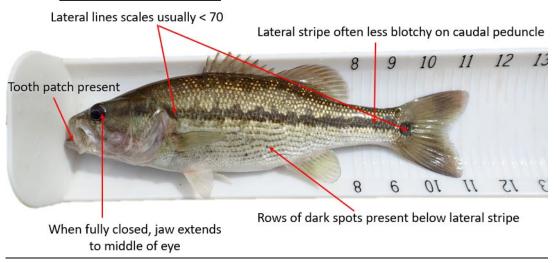
The Alabama Bass looks nearly identical to our native Kentucky Spotted Bass, which is why most biologists rely on genetic analysis to determine the difference. Visually differentiating Alabama Bass from pure Largemouth or pure Smallmouth Bass is possible, and the details are described below.

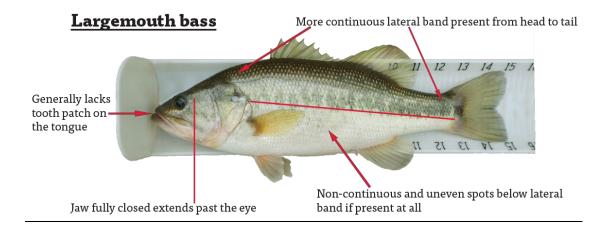
However, visually identifying hybrids has proven difficult even for trained fisheries biologists (<u>Sammons et al. 2023</u> *in press*). Many anglers rely on the presence of a tooth patch on the tongue, but it's important to note that both Spotted Bass and Alabama Bass have a tooth patch, and a small percentage of Largemouth Bass will also have a tooth patch.

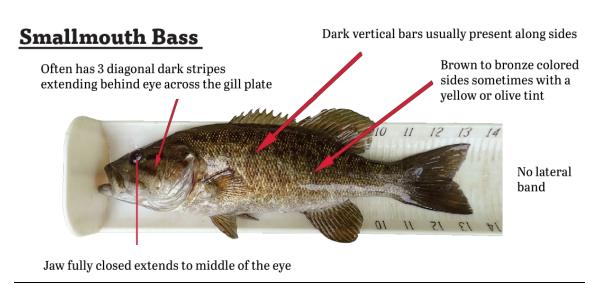
Identification Characteristics:



Spotted Bass (native)







Photos were provided by the iNaturalist angling for Black Bass Conservation Project.

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3. Do we have Alabama Bass in Kentucky?

Answer:

No, not to the best our knowledge. Spotted Bass look nearly identical and are widely distributed across the state, so it's impossible to say that illegal introductions of Alabama Bass have not occurred. KDFWR has not encountered any suspected Alabama Bass, but a forthcoming genetic analysis of Spotted Bass and Smallmouth Bass will reveal Alabama Bass genes if present in Kentucky waters. This analysis is part of a larger black bass genetics project currently being implemented across the state.

Scientific Basis:

• Because their appearance is so similar to Spotted Bass, the current extent of their non-native range is not precisely known. They have been documented in several states outside their native range.

- They were intentionally introduced into California in 1974 and are now widespread in the Central Valley (Moyle 2002).
- The Texas Parks and Wildlife Department also introduced them in Alan Henry Reservoir (<u>Munger and Lutz-Carrillo 2012</u>).
- In recent years Alabama Bass have been detected in Claytor Lake, Lake Gaston, Diascund Reservoir, Philpott Lake, and Martinsville Reservoir in Virginia (<u>Love 2020</u>, <u>Sammons et al. 2023</u> in press)
- They have also been detected in South Carolina reservoirs (Leitner et al. 2015)
- Alabama bass were illegally introduced into Parksville Reservoir in Tennessee, and have been found in some Tennessee River impoundments (Moyer et al. 2014). Recent genetic testing has also revealed the presence of some Alabama Bass genetics in several Tennessee waterbodies including Tellico Reservoir, Calderwood Reservoir, Norris Reservoir, Cherokee Reservoir, Fort Loudon Reservoir, Watts Bar Reservoir, Chickamauga Reservoir, Nickajack Reservoir, Cheatham Reservoir, Pickwick Reservoir, the Emory River, the Ocoee River, and Kentucky Reservoir (John Hammonds, TWRA unpublished data). Although some Alabama Bass genetics have been found in the Tennessee portion of Kentucky reservoir, it is not yet known whether those genetics occur in the Kentucky portion.
- In North Carolina they have also been illegally introduced into several reservoirs (<u>Dorsey and Abney 2016</u>; <u>Sammons et al. 2023</u> in press)

4. Do Alabama Bass grow bigger than other bass species?

Answer:

The Alabama Bass does not grow as large as Largemouth Bass or Smallmouth Bass. However, the Alabama Bass does grow larger than Spotted Bass, and in some cases the first sign of their presence in a waterbody is the submission of a new "Spotted Bass" record. Unfortunately, due to a multitude of prior Alabama Bass introductions around the southeastern U. S., there is very solid information about how these introductions will ultimately affect native bass populations. In most cases, the increased growth outside of their native range diminishes as the population expands and overpopulates.

Scientific Basis:

- Spotted Bass in Kentucky typically grow to a maximum of 17.5 inches, whereas Alabama Bass can
 grow up to 23.5 inches in their native range (<u>Rider and Maciena 2015</u>). However, Alabama Bass are
 more elongated and tend to weigh less per inch than Kentucky Spotted Bass (<u>DiCenzo et al. 1995</u>).
- The state record Alabama Bass in Alabama is 8 lbs. 15 oz., which is larger than the state record spotted bass in Kentucky, which weighed in at 7 lbs. 10 oz. By comparison the weight of the state record Largemouth Bass in Kentucky is nearly double that at 14 lbs 9.5 oz. The Kentucky state record (and world record) Smallmouth Bass is also much larger at 11 pounds, 15 oz.
- The growth rates of Alabama Bass were examined at 10 reservoirs in their native range and were found to be similar to Largemouth Bass during the first 5 years of life in Alabama (<u>DiCenzo et al.</u> 1995). However, in places outside of their native range they have exhibited smaller size structures than the native Largemouth Bass (<u>Dorsey and Abney 2016</u>), resulting in high numbers of 1 pound Alabama Bass, but very few trophy fish. Growth rates of Alabama Bass in their native range were

- correlated with the productivity of the lake. Reservoirs that had a high alkalinity, conductivity, and chlorophyll-*a* concentrations, as well as low Secchi-depth (less clear) and stable water levels were associated with fast growth for Alabama Bass (DiCenzo et al. 1995).
- In California where they have a very long growing season, some very large individuals have been caught, including the world record (11.25 lbs.) (Love 2020). However, even in California, few Alabama Bass live longer than 4-5 years and fish over 16 inches are unusual (Moyle 2002).

5. Is Kentucky stocking Alabama Bass into any of its lakes?

Answer:

No, KDFWR has not stocked Alabama Bass nor does the department have plans to stock Alabama Bass (or any other non-native black bass species) into Kentucky waters.

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6. If they are introduced, could Alabama Bass outcompete our Largemouth Bass?

Answer:

Yes, it is very likely Alabama Bass would greatly reduce our populations of Largemouth Bass. Research in several invaded lakes has repeatedly shown that Alabama Bass quickly become the dominant black bass in the lake. The reason they so quickly outnumber Largemouth Bass is unknown, but researchers speculate that Alabama Bass can reproduce much more successfully than the Largemouth Bass in reservoir environments. They also have the ability to naturally hybridize with Largemouth Bass, which can result in mixed genetics, reduced reproductive ability, and increased susceptibility to disease. However, Alabama bass do not hybridize with Largemouth Bass as commonly as they hybridize with the other black bass species like Smallmouth Bass and Spotted Bass. Although the Alabama Bass might create some fishing opportunities, they have a much smaller maximum size than native bass with most adult populations consisting of one- and two-pound fish.

Scientific Basis:

- In recent years, there is increasing evidence that Alabama Bass introduced into populations of Largemouth Bass will rapidly become the dominant black bass in the system. In most cases, the overall abundance of black bass remains the same, but there is a decrease in the abundance of Largemouth Bass and an increase in the abundance of Alabama Bass.
 - Lake Norman in North Carolina is a large 32,000 acre lake historically containing only Largemouth Bass. However, in 2000 researchers documented the first Alabama Bass and within 10 years Alabama Bass outnumbered the Largemouth Bass (<u>Dorsey and Abney 2016</u>). The same trend was observed at Moss Lake in North Carolina after Alabama Bass were discovered there in 2008, and at Belews Lake where Alabama Bass were discovered in 2011 (<u>Sammons et al. 2023</u> in press). Bill Frazier (North Carolina B.A.S.S. Nation) has commented "We had national-class fisheries rivaled only by Texas and Florida. Now they are ruined," (Alabama Bass Invasion 2019).

- In Tennessee, Alabama Bass were first discovered in Parksville Reservoir in 2001. Prior to that discovery, Largemouth Bass were the most abundant black bass. Alabama Bass rapidly became the dominant species (<u>Sammons et al. 2023</u> in press).
- In Georgia, Alabama Bass were first discovered in Blue Ridge Lake in 1999. The results in this system have been less damaging, so far. Alabama Bass did quickly outnumber the native Largemouth Bass, but over the past two decades the overall abundance of Largemouth bass also increased (Sammons et al. 2023 in press).
- In a study of Alabama reservoirs, <u>Green and Maceina (2000)</u> found that Alabama Bass spawned earlier and produced more young than Largemouth Bass in oligotrophic (infertile) and meso-oligotrophic (relatively infertile) reservoirs. This led <u>Maceina and Bayne (2001)</u> to postulate that Alabama Bass would become dominant over Largemouth Bass in these types of reservoirs.

7. If they are introduced, could Alabama Bass eliminate our Smallmouth Bass and Spotted Bass populations in Kentucky?

Answer:

Yes, the Alabama Bass can hybridize with Smallmouth Bass, Spotted Bass, and Largemouth Bass which are the only black bass species native to Kentucky. In our case, the hybridization with Smallmouth Bass and Spotted bass is the most concerning as Alabama Bass have been shown to virtually eliminate those species in invaded waterbodies through interbreeding. This would mean a complete loss of the Smallmouth and Spotted Bass if Alabama Bass became established. The natural hybridization with Largemouth Bass has been minimal in invaded waterbodies and within the native range of Alabama Bass.

Scientific Basis:

- Natural hybridization among several black bass species has been reported (<u>Avise et al. 1997</u>; <u>Barwick et al. 2006</u>; <u>Bangs et al. 2017</u>; <u>Lewis et al. 2021</u>; <u>Morizot et al. 1991</u>; <u>Peoples and Judson et al. 2021</u>; <u>Pierce and Van Den Ayle 1997</u>; <u>Pipas and Bulow 1998</u>).
- The high levels of natural hybridization with Alabama Bass can harm some endemic species of black bass (<u>Avise et al. 1997</u>; <u>Barwick et al. 2006</u>). This has been demonstrated for Redeye Bass (<u>Barwick et al. 2006</u>), Bartrams Bass (<u>Bangs et al. 2017</u>; <u>Peoples and Judson et al. 2021</u>), and Smallmouth Bass in invaded lakes in Georgia and Alabama (<u>Pierce and Van Den Avyle 1997</u>). Hybridization in these systems occurred to the point that there were few or no remaining non-hybridized fish.
- Hybridization with Largemouth Bass also occurs but seems to only occur at low rates in invaded waterbodies (<u>Bangs et al. 2017</u>; <u>Barwick et al. 2006</u>). The primary threat to Largemouth Bass is competition with Alabama Bass (<u>Dorsey and Abney 2016</u>).

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8. Once introduced in a lake, how long does it take Alabama Bass to alter the fishery? Can the results be undone?

Answer:

One of the biggest concerns with illegal stocking of Alabama Bass into existing black bass populations is how quickly they can alter the native black bass fishery. There are many examples where a significant change has occurred within 10 years. Many times, it is so fast that eradication or mitigation efforts cannot be put into place in time. These quick and disastrous changes are not specific only to Largemouth Bass. They have occurred with Smallmouth Bass and other black bass species in their native ranges. Once these changes begin taking place, there is no way to reverse them. This is especially true when interspecific hybridization is occurring.

Scientific Basis:

- Unauthorized introduction of Alabama Bass into Lake Norman, NC, was first discovered in 2000.
 Before introduction of Alabama Bass, the Largemouth Bass catch rates were variable, but never declined more than two years in a row. After the introduction, Largemouth Bass catch rates declined for ten years in a row and never recovered. In this case, it only took 10 years for Alabama Bass to dominate the native Largemouth Bass fishery (Dorsey and Abney 2016).
- Sammons et al. (2023 in press) reviewed population and genetics data from several lakes in the
 Southeastern U.S. where Alabama Bass had been illegally stocked. In each case, there were
 sweeping changes to the black bass composition in these reservoirs and the changes occurred
 rapidly. Many of these changes occurred within ten years following detection of Alabama Bass in
 the reservoir. Changes included 42-72% declines in the Largemouth Bass abundance in four of five
 reservoirs and almost complete extirpation of Smallmouth Bass in two reservoirs.
- Alabama Bass were introduced into Keowee Reservoir in South Carolina, where a native Redeye Bass population existed. In ten years after introduction, Alabama Bass were the most frequently caught sport fish in the reservoir. At the same time, Redeye Bass numbers declined by 83%. Hybridization was likely the cause for the shift, with no options to undo the damage (Barwick et al. 2006). In another example with Redeye Bass, unauthorized introduction of Alabama Bass into Lake Chatuge, Georgia, led to a reversal in black bass species abundance with 99% of the population being Alabama Bass or hybrids thereof. This occurred within 10-15 years of the initial introduction (Avise et al. 1997).

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9. How can I prevent the spread of Alabama Bass into Kentucky?

Answer:

Do Not Move Bass Between Waterbodies! In order to prevent the spread of Alabama Bass, movement of any black bass species between waterbodies should not occur and is illegal. It may be difficult to tell the difference between Alabama Bass and other black bass species, and visually identifying hybrids is virtually impossible without genetic testing. Many of the problematic introductions of this species in other states are believed to be the result of well-intentioned anglers illegally moving fish between lakes (Sammons et al. 2023 in press).

If, you believe that you have caught an Alabama Bass in Kentucky waters, please take several photographs or keep the fish and report it to your <u>local fisheries biologist</u> or the Kentucky Department of Fish and Wildlife Resources information line at 1-800-858-1549.

Kentucky Laws:

- Pursuant to KRS 150.180 (Section 7) "No person may at any time stock any species of fish secured from any source into the public waters of the Commonwealth without first securing a permit from the commissioner."
- Pursuant to 301 KAR 1:122 Section 1 "A person shall not buy, sell, possess, import, or release any aquatic species not native or established in Kentucky waters...".

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10. Are there any other species of bass that can be stocked to improve our fishing in Kentucky?

Answer:

No. The current evidence suggests that stocking non-native bass of any species would be a bad idea.

Scientific Basis:

Depending upon who you ask, there are between 12 and 19 species of black bass (<u>Kim et al. 2022</u>;
 <u>Taylor et al. 2019</u>), each with its own home range and unique characteristics. There are great risks of irreversible damage involved anytime you stock a non-native species or even the same species from different geographical areas (<u>Philipp et al. 2002</u>). The greatest risk is that the negative effects can be irreversible.

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11. How did Alabama Bass expand outside of their native range?

Answer:

The natural native ranges of many species of black bass are highly stable and are often defined by the boundaries of their individual watersheds. However, government agencies and private citizens have been moving black bass between waterbodies for at least 150 years. In some cases, Alabama Bass were moved outside of their range by state agencies who thought they were moving Spotted Bass. However, many of the recent introductions are thought to be the result of bass anglers illegally transporting fish to new lakes. This transport of bass by anglers is often done with good intentions, but the results of the introductions have been devastating to some waterbodies.

Scientific Basis:

• The diverse number of species of black bass is thought to be the result of large sea level fluctuations which resulted in the separation of gulf coast watersheds (Near et al 2003). Many of the land and saltwater barriers to natural migration still exist today, but black bass species including Alabama Bass have been moved over those barriers by humans. Unfortunately, most black bass species have weak reproductive barriers, so these unnatural introductions have resulted in widespread hybridization and threaten many of North America's unique black bass species (Taylor et al. 2019).

- Alabama Bass were intentionally introduced into California in 1974 and are now widespread in the Central Valley (Moyle 2002).
- The Texas Parks and Wildlife Department also introduced Alabama Bass in Alan Henry Reservoir (Munger and Lutz-Carrillo 2012).
- In recent years Alabama Bass have been detected in Claytor Lake, Lake Gaston, Diascund
 Reservoir, Philpott Lake, and Martinsville Reservoir in Virginia (Love 2020, Sammons et al. 2023
 in press) It is speculated that these introductions were the result of anglers moving fish between
 waterbodies
- They have also been detected in South Carolina reservoirs (<u>Leitner et al. 2015</u>)
- Alabama bass were illegally introduced into Parksville Reservoir in Tennessee, and have been found in some Tennessee River impoundments (<u>Moyer et al. 2014</u>)
- In North Carolina they have also been illegally introduced into several reservoirs (<u>Dorsey and Abney 2016</u>; <u>Sammons et al. 2023</u> in press)

12. Once established, have there been any successful eradication or mitigation efforts in other states?

Answer:

No. Once established, no state has successfully been able to reduce their numbers or their negative effects on native black bass.

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References

Avise J. C., P. C. Pierce, M. J. Van Den Avyle, M. H. Smith, W. S. Nelson, and M. A. Asmussen. 1997 Cytonuclear introgressive swamping and species turnover of bass following an introduction. Journal of Heredity 88: 14-20.

Bagley J. C., R. L. Mayden K. J. Roe, W. Holznagel, and R. M. Harris. 2011. Congeneric phylogeographical sampling revels polyphyly and novel biodiversity with black basses (Centrarchidae: Micropterus). Biological Journal of the Linnean Society 104:346-363.

Baker, W. H., C. E. Johnston, G. W. Folkerts. 2008. The Alabama Bass, *Micropterus henshalli* (Teleostei: Centrarchidae), from the Mobile River basin. Zootaxa 1861:57-67.

Bangs, M. R., K. J. Oswald, T. W. Greig, J. K. Leitner, D. M. Rankin, J. M. Quattro. 2017. Introgressive hybridization and species turnover in reservoirs: a case study involving endemic and invasive basses (Centrarchidae: *Micropterus*) in southeastern North America. Conservation Genetics 19: 57-69.

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Barwick D. H., K. J. Oswald, J. M. Quattro, R. D. Barwick. 2006. Redeye Bass (*Micropterus coosae*) and Alabama Spotted Bass (*M. punctulatus henshalli*) hybridization in Keowee Reservoir. Southeastern Naturalist 5(4):661-668.

DiCenzo, V. J., M. J. Maceina, W. C. Reeves. 1995. Factors related to growth and condition of the Alabama subspecies of Spotted Bass in reservoirs. North American Journal of Fisheries Management 15:794-798.

Dorsey, L. G., and M. A. Abney. 2016. Changes in black bass population characteristics after the introduction of Alabama Bass in Lake Norman, North Carolina. Journal of the Southeastern Association of Fish and Wildlife Agencies 3:161-166.

Greene, J. C. and M. J. Maceina. 2000. Influence of trophic state on Spotted Bass and Largemouth Bass spawning time and age-0 characteristics in Alabama reservoirs. North American Journal of Fisheries Management 20:100-108.

Kassler, T. W., J. B. Koppelman, T. J. Near, C. B. Dillman, J. Levengood, D. L. Swofford, J. L. Vanorman, J. E. Claussen, and D. P. Philipp. 2002. Molecular and morphological analyses of the black basses: implications for taxonomy and conservation. Black Bass: Ecology, Conservation and Management, Symposium 21:291-332.

Kim, D., A. T. Taylor, T. J. Near. 2022 Phylogenomics and species delimitation of the economically important Black Basses (Micropterus). Scientific Reports 12: 9113

Lewis, M. R., P. Ekema, M. Holley, and E. J. Peatman. 2021. Genetic evidence of introduced Redeye bass and Alabama Bass hybridization with native *Micropterus spp*. In Town Creek, Alabama, USA. North American Journal of Fisheries Management 41:78-85.

Leitner, J. K., K. J. Oswald, M. Bangs, D. Rankin, and J. M. Quattro. 2015. Hybridization between native Bartram's Bass and two introduced species in Savannah drainage streams. Pages 481-490 in M.D. Tringali, J. M. Long, T.W. Birdsong, and M.S. Allen, editors. Black bass diversity: multidisciplinary science for conservation. American Fisheries Society. Symposium 82, Bethesda, Maryland.

Love, J. W. 2020. Alabama Bass (*Micropterus henshalli*) Ecological Risk Screening Summary. Maryland Department of Natural Resources. October 2020.

Maceina, M. J. and D.R. Bayne. 2001. Changes in the black bass community and fishery with oligotrophication in West Point Lake, Georgia. North American Journal of Fisheries Management 21:745-755.

Montgomery, R. 2019. Alabama Bass Invasion. B.A.S.S. Master Conservation News [Online]. https://www.bassmaster.com/conservation-news/alabama-bass-invasion/.

Morizot D. C., S. W. Calhoun, L. L. Clepper, M. E. Schmidt, J. H. Williamson, and G. J. Carmichael. 1991. Multispecies hybridization among native and introduced Centrarchid basses in central Texas. Transactions of the American Fisheries Society 120: 283-289

Moyer, G. R., A. S. Williams, M. L. Jolley, B. J. Ragland, and T. N. Churchill. 2014. Genetic confirmation and assessment of an unauthorized fish introduction in Parksville Reservoir, Tennessee. Journal of the Southeastern Association of Fish and Wildlife Agencies 1:64-69.

Moyle, P. B. 2002. Inland fishes of California. University of California Press, Berkeley

Munger, C., and D. J. Lutz-Carrillo. 2012. Investigations of potential hybridization among black bass species in Alan Henry reservoir, Texas. Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies. 66:37-41

Near, T. J., Kassler, T. W., Koppelman, J. B., Dillman, C.B. and Philipp, D.P. 2003. Speciation in North American basses, Micropterus (Actinopterygii: Centrarchidae). Evolution 57: 1610-1621

Near, T. J., Bolnick, D. I. and Wainwright, P. C. 2004. Investigating phylogenetic relationships of sunfishes and black basses (Actinopterygii: Centrarchidae) using DNA sequences from mitochondrial and nuclear genes. Molecular Phylogenetics and Evolution 32:344-357

Peoples B. K. and Judson E., T. L. Darden and D. J. Farrae, K. Kubach, J. Leitner, and M. C. Scott. 2021. Modeling distribution of endemic Bartram's Bass *Micropterus* sp. Cf. *coosae*: Disturbance and proximity to invasion source increase hybridization with invasive Alabama Bass. North American Journal of Fisheries Management 41: 1309-1321.

Philipp D. P., J. E. Claussen, T. W. Kassler and J. M. Epifanio. 2002. Mixing stocks of largemouth bass reduces fitness through outbreeding depression. Black Bass: Ecology, Conservation and Management. Symposium 21:349-363.

Pierce P. C. and M. J. Van Den Ayle. 1997. Hybridization between introduced Spotted Bass and Smallmouth Bass in reservoirs. Transactions of the American Fisheries Society 126: 939-947

Pipas J. C., and F. J. Bulow. 1998 Hybridization between Redeye Bass and Smallmouth Bass in Tennessee streams. Transactions of the American Fisheries Society. 127(1):141-146

Rider, S. J., and M. J. Maceina. 2015. Alabama Bass *Micropterus henshalli* Hubbs and Bailey, 1940. American Fisheries Society Symposium 82: 83-91.

Sammons, S. M., L. G. Dorsey and C. S. Loftis, P. Chrisman, M. Scott, J. Hammonds, M. Jolley, H. Hatcher, J. Odenkirk, J. Damer, M. R. Lewis, and E. J. Peatman. 2023. North American Journal of Fisheries Management. In press.

Taylor, T. T., J. M. Long, M. D. Tringali, B. L. Barthel. 2019. Conservation of black bass diversity: an emerging management paradigm. American Fisheries Society 44(1):21-36.

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