Massachusetts Wildlife

No. 2, 2015

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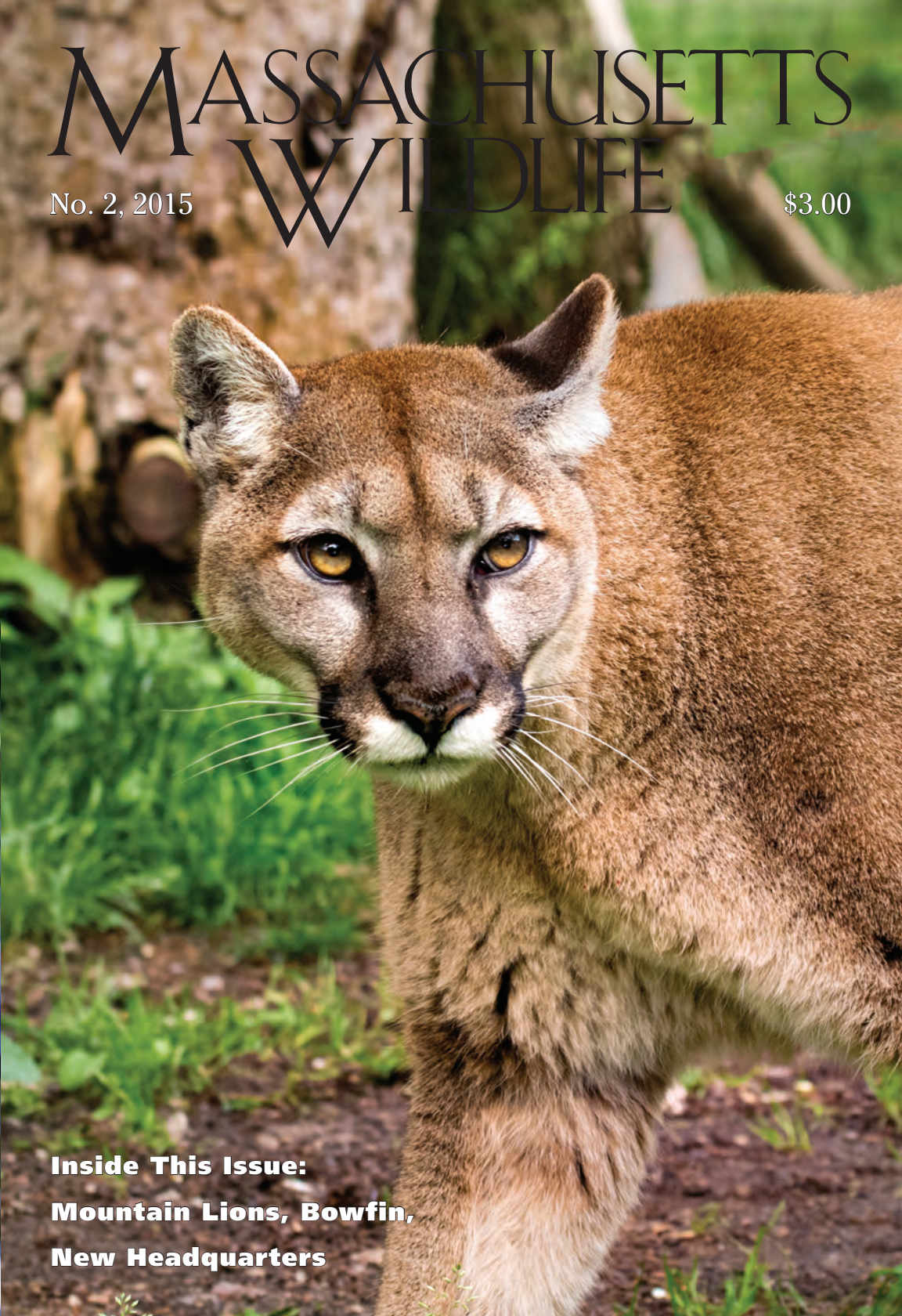

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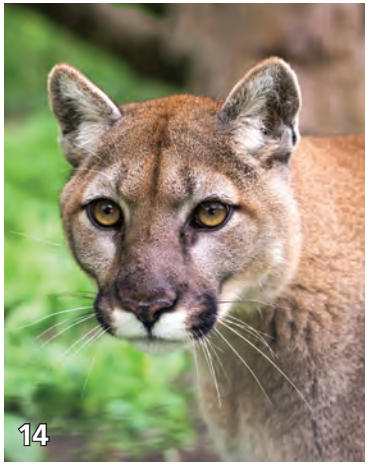
Photo courtesy Architerra, Inc.



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MASSACHUSETTS WILDLIFE

Vol. 65 No. 2

FEATURES

On the Cover: Buttonwood Park Zoo in New Bedford is where you can see this adult Mountain Lion (*Felis concolor*). She was acquired as an orphaned kitten from Oregon, while her male companion was an orphaned kitten from South Dakota. The latter location is where a road-killed cougar originated before his record book 1800-mile travels came to an end in CT in 2011. At 100 pounds or more, stealthy and heavily muscled, Mountain Lions are well adapted to range widely in search of large prey. Note the back of the ears are dark-colored. Bobcats have distinct white patches edged in black on the back of their ears.

Captive cougar photographed with a Nikon 70-200 mm lens from outside the enclosure with assistance from Zoo personnel. Photo © Bill Byrne

Bring on the Bowfin!

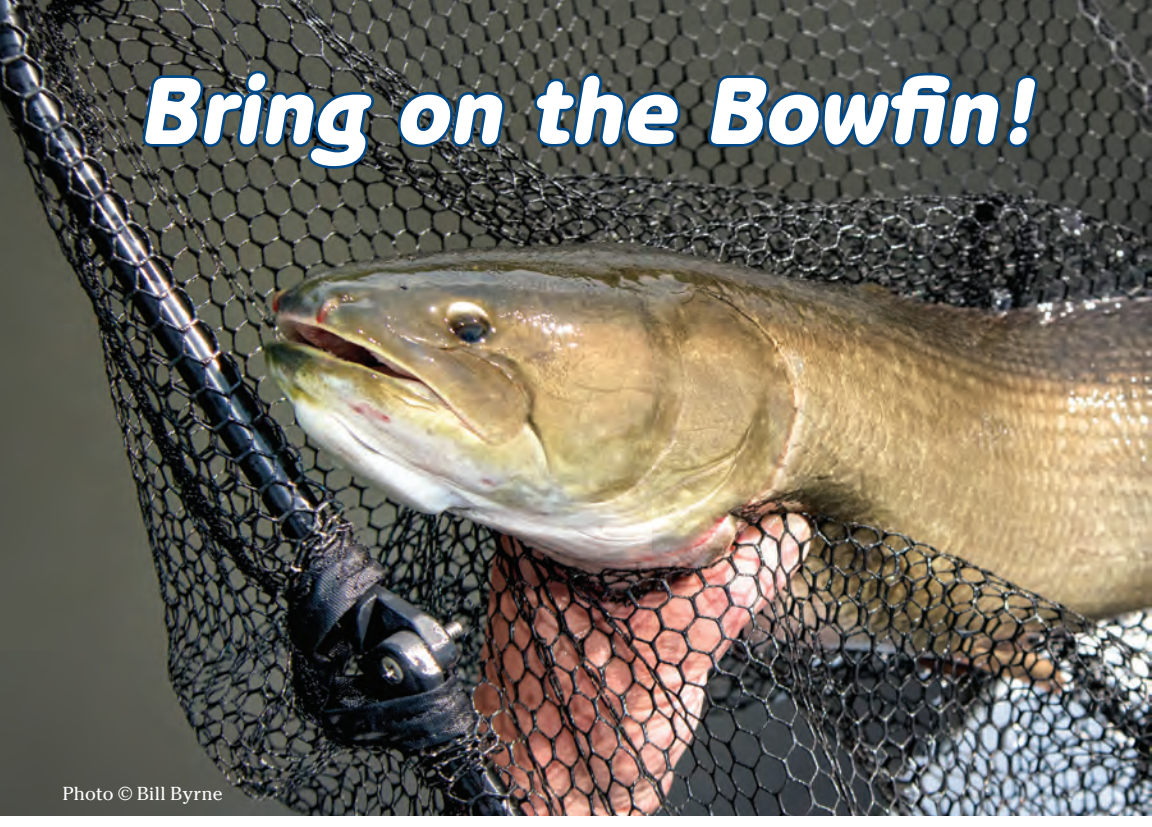


Photo © Bill Byrne

by Peter G. Mirick

Commonwealth anglers now have a new trophy category to pursue, a Jurassic gamefish with lots of teeth and the muscle, size, and aggressiveness to give even a bass or pike fanatic pause for thought.

It isn't all that often that a new species is added to the list of fishes eligible for awards under the Massachusetts Freshwater Sportfishing Awards Program (MFSAP). The last naturally occurring (although non-native) species added to the list was the Common Carp. It went on in 1979 after decades of being considered a so-called "trash" fish that was almost universally loathed, and, when caught, likely to be cast up on the shore and left to rot. (Even today it remains one of just two fish species that can legally be taken in Massachusetts with archery equipment, a subject of some contention we will leave for another day.) But times were changing, a growing number of anglers had come to respect and admire the carp's sporting qualities, and they requested recognition for the very largest freshwater fish that could be caught from our waters.

While anti-carp prejudice can still be found lingering among a small minority of the Commonwealth's anglers, now there are literally dozens of organizations promoting carp and carp fishing worldwide. Carp are easily the number one species entered in the MFSAP's new Catch & Release category, and always rank high in the Catch & Keep category. There are professional carp tournaments with top purses that rival those of the professional bass circuit. And, of course, there is now a multi-million dollar industry that revolves around designing and providing carp fishing equipment and baits. Unless you were fishing back then, today it's hard to conceive that if you'd asked most Bay State anglers 50 years ago if the carp was a gamefish, they would have laughed out loud at the very idea!

Given the angling history of carp in the last half century, it is easy to imagine that the newest addition to the list of eligible species recognized by the MFSAP – the Bowfin (*Amia calva*) – will be enjoying similar popularity and fame in just another decade or two; maybe in even less time thanks to the advent of social media. While most Massachusetts anglers have never caught one of these prehistoric battlers – and in fact many anglers have never even heard of this fish and wouldn't know one if they caught one – the Bowfin is gathering an ever-increasing number of fans who admire its outstanding fighting qualities, exotic appearance, large potential size, interesting life history, and its propensity to strike baits and lures. To those already hooked on Bowfin, adding it to the list of eligible species validates that it is finally getting the respect it has always deserved.

Since the carp was added to the list of fishes eligible for awards, three additional species, all of which are strictly hatchery-produced resources that depend on stocking for maintenance, have also been added: Tiger Muskie in 1984, Broodstock Salmon in 1993, and Tiger Trout in 1999. Since Broodstock Salmon was recently removed from the list because the federal hatchery/stocking program that provided these surplus behemoths is no longer in operation, it was an opportune time to add a new species to the list. Rich Hartley, who heads up the MFSAP, had been hearing requests from a few anglers to add the Bowfin, but he had also heard some concerns. Chief among them was the apprehension that by promoting this non-native species – currently restricted to the Taunton and Connecticut rivers, some of their tributaries, and a handful of lakes and ponds where it was clearly introduced without legal authorization – he would be encouraging anglers to illegally stock and establish it in other locations and river systems.

So let's make this clear right up front: **It is absolutely illegal to transport and release ANY live fish (other than the specifically designated baitfish species) anywhere but in the water from which they were originally taken.** Penalties for ignoring this regulation are significant. We can't do much more than that to dis-

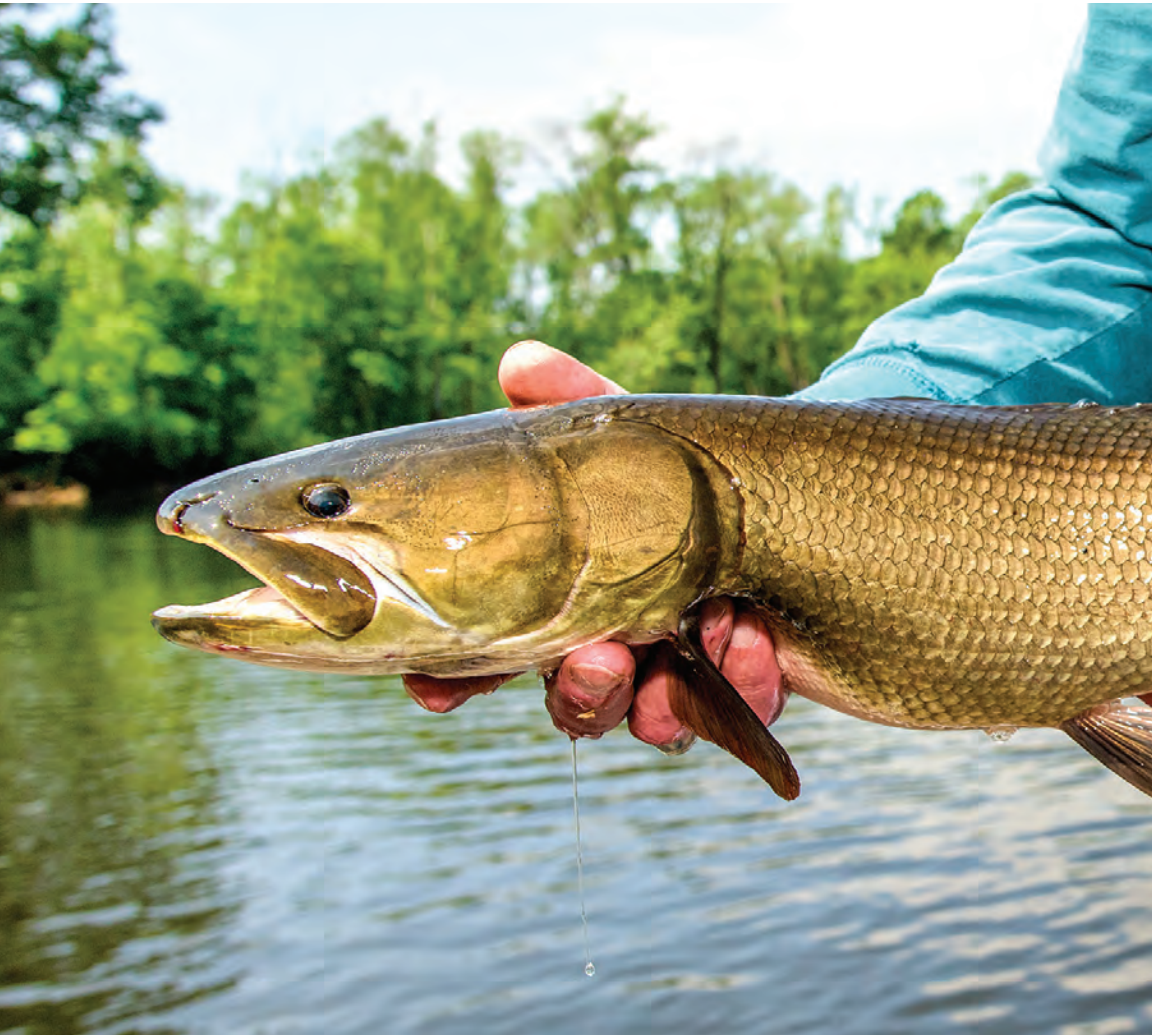
Photo © Bill Byrne

Like the Bowfin, the Common Carp was once considered a trash fish, but today it is revered by many anglers as an important and desirable gamefish.

courage the introduction and spread of non-native species with the potential to disrupt and/or spread disease into our established freshwater fisheries, and while most of those fisheries are populated with non-native species (including Largemouth Bass, Smallmouth Bass, Bluegill, Black Crappie, Channel Catfish, White Catfish, Brown Trout, Rainbow Trout, Lake Trout, Northern Pike, Walleye, etc.) that does not mean that introducing a new species will have no impact on them. So even if you discover that you love Bowfin, don't make the mistake of trying to transfer a few into your local fishing hole in hopes of establishing them there. Enjoy them where they are. The fact that they are geographically limited to just a couple of large river systems makes them that much more desirable as trophies to add to your fishing experiences.

Living Fossils

The Bowfin is the last of a great and diverse fish lineage that ranged worldwide in both fresh and saltwater systems a couple hundred million years ago. Today it is the last surviving representative of its family, found naturally only in the freshwaters of central and eastern North America from Canada to the Gulf of Mexico, and including the Mississippi drainage and the Great Lakes. It occurs naturally in New England only in Vermont, where it inhabits Lake Champlain and its tributaries. While it retains some relatively primitive features, the broad range and abundance of the Bowfin indicates it has evolved to compete quite successfully with more modern contenders, particularly in warm, muddy, shallow habitats. One of its old but valuable features is a



valved opening from its throat to its air bladder, a characteristic most modern fish lack. The Bowfin has perfectly fine gills that it uses for respiration most of the time, but if high temperatures and stagnant conditions lower oxygen levels in the water to the point where conventional gill breathers must either leave or die, the Bowfin simply rises to the surface and gulps in air to meet its oxygen needs.

The Bowfin's body is tubular in shape with a long, spineless dorsal fin that undulates along more than half the length of the back. The tail, or caudal fin, is very rounded in silhouette, and while many authorities assert the Bowfin was named for its dorsal fin's resemblance to a bow, it seems just as likely that it was the curved sweep of the tail that reminded someone of a drawn bow. The head is bullet-shaped – somewhat reminiscent of a salamander's in fact – with a row of sharp, pegged teeth running the length of the upper and lower jaws. The skull is solidly built, an internal helmet that is heavier than that of most fish, and includes a primitive gular plate (again lacking in most modern fish) that spans

Bowfin aren't always easy to find: A day on the Connecticut River Oxbow in June with two anglers fishing live bait and a large assortment of recommended lures resulted in only this single fish, a nice 26-inch female that took a live, medium shiner fished about 3 feet under a bobber. Note long dorsal fin, rounded tail, cylindrical body and salamander-like head. Great fighter, but unfortunately, not good eating.

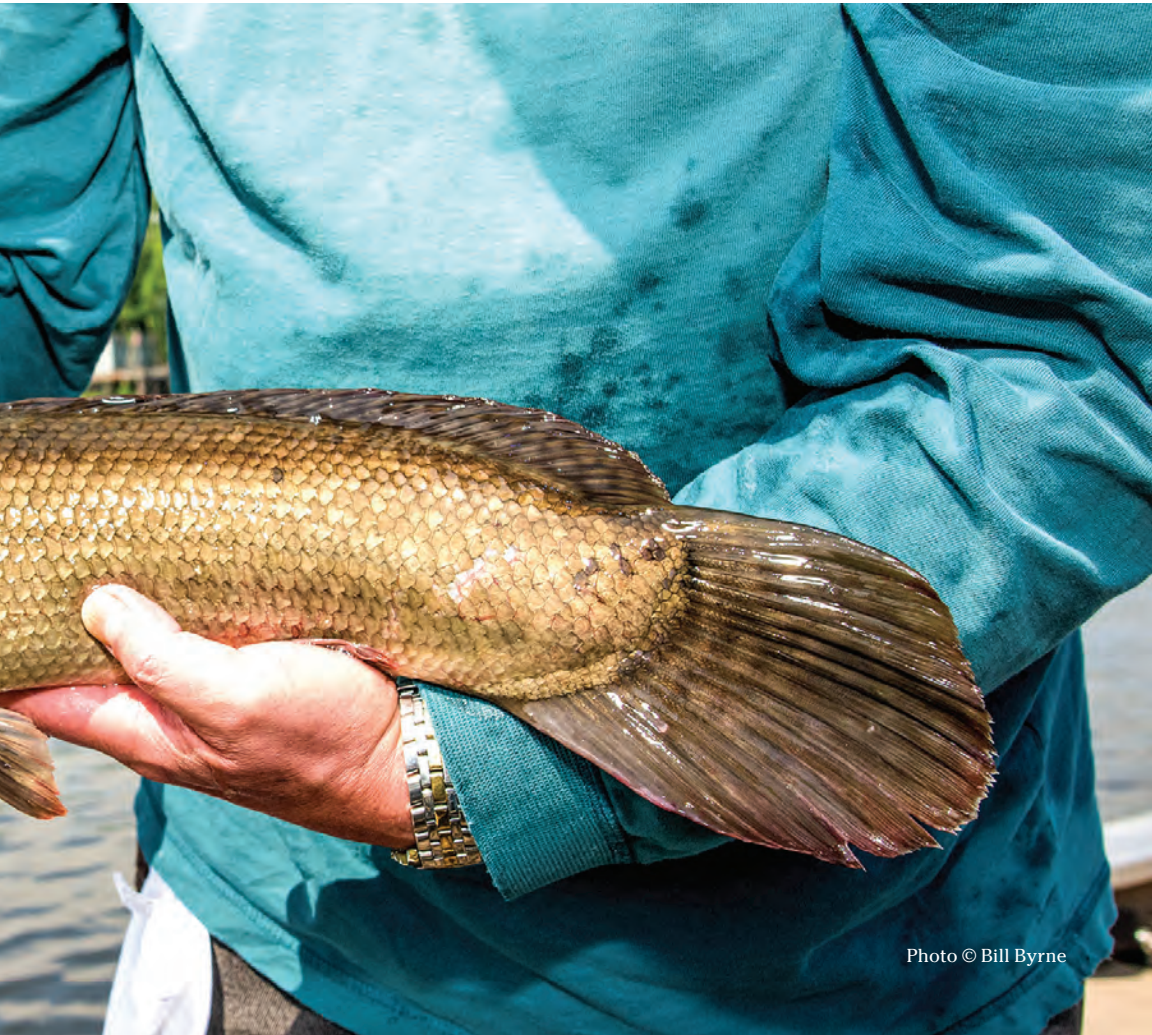


Photo © Bill Byrne

Photo © Timothy Spillane

A male Bowfin caught in the Nemasket River in late spring exhibits the almost fluorescent green fins that males acquire during the spawning season. The inside of the mouth often turns the same shade as the fins, and the eye-spot near the tail also becomes more prominent in color. Males guard their nests and fry aggressively, and, like bass, will attack almost any lure or bait tossed near them at this time.

and reinforces the two sides of the lower jaw. There are two nostrils on the front of the head that sport peculiar, tube-like extensions and presumably increase the owner's perception of various scents.

Most specimens are olive to brownish gray, often with mottling, and males and sub-adult females typically sport a black spot near the upper base of the tail. This "eyespot" is thought to be a distracter of sorts that fools potential predators into attacking the tail instead of the head, presumably giving the owner a better chance of escape. During the spawning period, it is surrounded by a yellowish-to-orange halo as pretty as that on any butterfly. Interestingly, the tail spot is typically absent or very faint on adult females, implying it is not there solely for survival advantage, but also functions in sex recognition, perhaps to help prevent the pugnacious males from mistakenly attacking females. The fins, interior mouth parts, and sometimes even the entire bellies of males in full spawning mode take on garish, almost fluorescent, lime green hues; just another factor that adds to the panache of this species.

The numbers of colloquial names applied to the Bowfin seem almost limitless, and while its relatively large geographic range accounts for some of this diversity, surely there are other factors in play. Common monikers include mudfish, grindle, cottonfish, cypress trout, dogfish, and, down in the bayou country of Louisiana, choupique, but there are literally dozens of others. It is not considered good eating in most of its range, which helps explain why it was considered a trash fish until the advent of modern sport fishing (where the fight is of far more consequence than table quality). My fishing buddy Mark Cerulli of Mashpee, who has tried Bowfin, reports that it "tastes OK, but has an odd, mealy kind of texture," and at least one source reports that the "cottonfish" name does not refer to the fact that the species is common in cotton country, but rather that chewing the meat results in the sensation of having a mouthful of cotton! If the Bowfin itself is somewhat unpalatable, however, it is redeemed by the quality of its dark brown or black roe. The Bowfin's eggs are commercially harvested in some southern states and the resulting product competes quite successfully with traditional caviar on the international market for gourmet commodities.

Bowfins spawn in the spring in much the same manner as bass and sunfish. When water temperatures reach the upper 50s, lower 60s, males acquire their extraordinary spawning colors and begin to construct nests in shallow water, clearing an area 1.5-3 feet across. Nests are often congregated in specific areas, often built under logs, stumps, or other cover, and are usually in well vegetated zones. Males guard their nests, and females visit the nests, usually at night, to spawn.

The externally fertilized eggs are sticky and adhere to the bottom of the nest. Spawning can be hard on the females, who may deposit more than 50,000 eggs in a season even though most nests contain only 2-5 thousand eggs. Obviously females tend to spawn in more than one nest, and most nests contain the eggs of more than one female. Like female sharks during mating, female Bowfin often sustain bites from their aggressive mates. Still, their contribution is over once the eggs are deposited. Not so for the males, who must guard the eggs for 8-10 days until they hatch, and will then guard the resulting fry for several additional weeks.

Upon hatching, the helpless fry utilize an adhesive organ on their heads that allows them to hold their positions on vegetation and other structure in and around the nest until they develop mobility in 7 to 9 days. At that point they resemble little black tadpoles. They school up and begin to wander around in shallow water, feeding for the first time in their lives. The male remains with this black cloud of fry, keeping it together and guarding it from potential predators. These male guards can be fearless and very pugnacious, and have been known to bite even wading swimmers and fishermen perceived to threaten their young. Fishermen take advantage of their guarding instincts (just as they do with bass and other sunfish) and often deliberately target fish guarding their nests or schools of fry. A cast to such a fish, regardless of the lure or bait, is almost guaranteed to result in a strike.

Limited studies indicate that Bowfin populations have poor recruitment in most years, though the factors responsible remain unknown. The data indicate that once in a decade or so, conditions are apparently ideal and recruitment is

Shallow, mud-bottomed, slow-moving or still water offers the best habitat for Bowfin. When such waters become too anoxic to support most fish, the Bowfin simply switches from gill-breathing to air-breathing, a very useful survival mechanism..

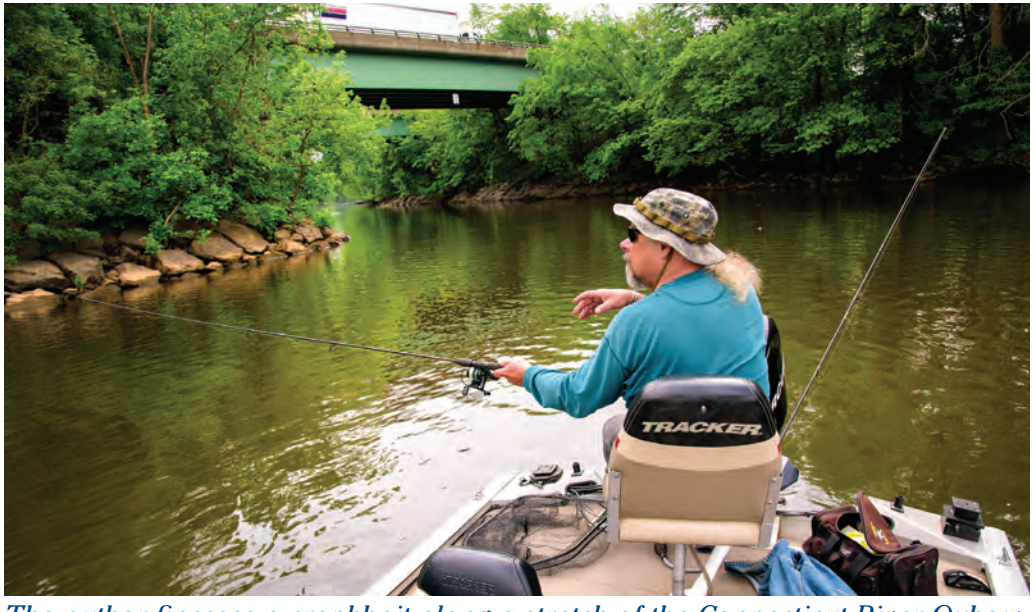
excellent, producing a large year class that ensures the population will remain viable. Whether or not our local Bowfin populations fluctuate this drastically is not yet known, and since their introduction was obviously quite recent, they are still in the colonization stage and unlikely to exhibit the same dynamics as well established populations.

Bowfins grow rapidly and at a length of around 4 inches switch from their "baby" diet of mostly insects and tiny crustaceans to fish. They reach sexual maturity in 2-3 years and may live for 10-12 years in the wild. Females tend to grow a little larger than males and, at least in southern regions, can attain weights in excess of 20 pounds and lengths over 40 inches. In our more northern, colder waters, a 10 pounder pushing 3 feet in length would be a spectacular trophy, but a fish well in to the teens is not beyond the realm of possibility. Most adults in our area appear to be in the 16-28 inch range with average weights of 2-5 pounds. Anglers who manage to land one weighing 6 pounds or more (4 pounds for the youth category) or with a length of 26 inches or more are now eligible for Massachusetts Sportfishing Awards.

Fishing for Bowfin

We don't have a lot of experience fishing for Bowfin in Massachusetts. The first documented specimen from our state was taken from Lake Onota in 1974. We don't know its origin, but since the Northern Pike population in that body of water was purportedly introduced from Lake Champlain, it is plausible the Bowfin came from the same source. The species began turning up in quantity in the Connecticut River and elsewhere in the 1980s, however, and we speculate that these fish were more likely aquarium releases or possibly liberated from commercial markets offering live fish for food. Short of conducting DNA analyses on these fish, we may never know where they originated.

A specimen was recorded from the lower Merrimack River in the 1980s, but the species apparently failed to thrive there, at least in the section of the river within our borders. The first Bowfins we are aware of in the Taunton River system showed up in D.W. Field Park in Brockton in 1996, and in a short period of time they also began appearing in the Taunton River and at least three of its trib-



The author finesses a crankbait along a stretch of the Connecticut River Oxbow, a prime fishing location for Bowfin. When male Bowfin are defending nests and young in the spring, they will readily strike crankbaits, spinnerbaits, and plastic worms, as well as the more traditional live and chunk baits that work all year.

utaries: the Nemasket, Three Mile, and Mill rivers. If you want to catch a Bowfin in Massachusetts, the Taunton and Connecticut basins are the places to go, and based on very limited fishing reports, the Taunton system, and particularly the lower Nemasket, may provide a bit more ideal habitat and a slightly higher chance of success. The Oxbow in Northampton, attached to the Connecticut, is probably the best bet in that region and the only place where Bowfin are commonly taken through the ice in Massachusetts.

After interviewing several anglers who have taken Bowfin in the Commonwealth, plus reviewing much of the fishing literature available on this species, it is possible to offer a few tips on how to target these powerful, predatory fish. First off, their diet consists primarily of fish, crayfish, insects, and frogs. Observers report they are ambush predators that sight, then stalk, their prey. They use their long, undulating dorsal fin for propulsion when approaching potential meals, allowing them to close the distance almost imperceptibly, with minimal movement, until they get within striking distance, whereupon they attack with great speed and ferocity. This is likely how they approach a live shiner under a bobber, the only technique that has worked for me so far. This does not mean they won't strike a lure going past them, however, just as a pickerel or bass will do. Bay State anglers have taken them on all manner of artificial lures, with the top choices being crankbaits, spinnerbaits, and plastic worms. What I am unsure of is whether or not artificials are all that effective other than during the breeding season when males guarding nests and young are compelled to attack.

Photo © Bill Byrne

The fact that Bowfin are demersal or "bottom-loving" fish, like most of our catfish, suggests that the best habitat to scout for them is shallow, sluggish, mud-bottomed water with plenty of weed beds. On rivers, this means coves, oxbows, and similar backwaters. Dave Souza, patriarch of a fishing family that has produced a two-time MFSAP Master Angler (Jake Sousa), told me his crew began catching Bowfin by accident while targeting catfish on the Taunton River on summer evenings. They have had the best luck using chunk bait: 1-1.5-inch squares of pumpkinseed sunfish or shiners fished on the bottom. He reports that maintaining a tight line is crucial, as Bowfin have tough mouths and can be more tentative feeders than most people would expect. His crew misses the fish on about 30% of "takes" despite their proven angling skills.

Dave reports he gets the best Bowfin action -- at least in his area, using chunk bait -- from August through September, fishing in the evenings from roughly 6:00 to 9:30 PM. His chunking success appears to validate a much-repeated observation that Bowfin usually spend their days loafing in cooler, deeper water, then head into the shallows to hunt for food in the evening. Most authorities classify them as crepuscular in their habits (meaning they are active in the hours around dawn and dusk) while others classify them as nocturnal. Personally, I look at the size of their eyes in relation to the size of the small eyes on a truly nocturnal species – the Brown Bullhead for example – and I think crepuscular is probably the most accurate label. But like bass, which also move into the shallows to feed with the

An added bonus to fishing for Bowfin is the possibility of hooking other trophies. Our fishing buddy, Todd Matera, hooked two northern pike on our Bowfin expedition in June.

coming of evening, Bowfin can be caught at any time of the day or night.

Recommended equipment is pretty much what you would expect to use when pursing fish that can reach over 10 pounds in size. Spinning, spin-casting, or bait-casting gear used for bass fishing is fine for throwing lures, but if you are going to use live or chunk bait, go with a longer-than-usual rod of 7- 9 feet to help maneuver fish out of weeds, particularly if you are fishing from shore instead of a boat. Line should be 8-12 pound test to handle both the fish and the masses of weeds that often pile on with them during battles. Using a leader is a personal choice, but keeping the Bowfin's nasty array of teeth in mind, some anglers use a 6-18 inch strip of fine wire or braided line between a terminal swivel and the hook. Most anglers who pursue Bowfin with lures don't bother with a leader, betting the body of the lure will end up mostly outside the Bowfin's mouth and leave the line beyond the reach of those teeth.

Be prepared for a tough battle: Bowfin have very supple bodies that allow them turn on a dime; they are known for sudden, powerful surges; and they are apt to get a second wind just when you think they have given up, exhausted, and are nearing the boat or shore. A net or Boga Grip is highly recommended; you certainly don't want to try "lipping" a fish equipped with the Bowfin's dentition! To extract hooks, needle nose pliers, fishing pliers, or a large pair of hemostats are recommended for the same reason.

With little Massachusetts Bowfin fishing experience to draw on, here's my summary of advice: Fish shallow, generally in less than 8 feet of water and preferably in less than 4 feet of water, with mud bottoms and scattered weeds. Peak sport will be found in the late spring and early summer, during the spawning season, by fishing actively with live baitfish or artificials. These will draw strikes, day or night, from highly aggressive, colorful males guarding nests and young. Expect average sizes to fall in the 2-4 pound range, as most fish will be males which are smaller on average than females, but it is certainly possible to catch a big female at this time.

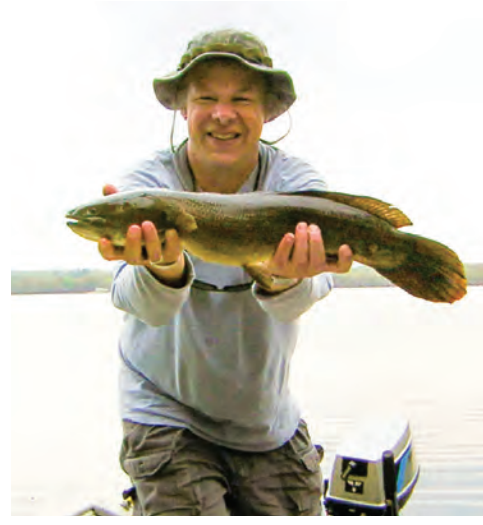


Photo © John Rogers

If you really want to target a trophy Bowfin, one that will get you over that magic goal of 6 pounds, your best odds are likely to be when waters reach peak summer temperatures in August and September. The big females have fully recovered from spawning stress by this time and are feeding heavily to put on weight for egg production. Fish for them late in the day and into darkness with live baitfish or chunk bait (Golden Shiner, Pumpkinseed, Fallfish, Yellow Perch), much as you would fish for bullheads, White Cats, or Channel Cats.

Don't be afraid to experiment. We look forward to seeing what our anglers come up with for techniques, times, baits, and equipment to catch this new, ancient gamefish, and have faith that there will be some surprises. So get right out there: After all, the very first Massachusetts Bowfin that qualifies for a Catch & Keep Sportfishing Award and is taken to one of our offices for official identification will automatically be the new state record! If that's you, enjoy your fame, but try not to get a swelled head: It's very likely the record will be broken multiple times this year, and probably for several years to come.

Addendum: *As we went to press, we received a Facebook photo of a nearly 10-pound Bowfin caught from the Housatonic River in Berkshire County, so it looks like Bowfin anglers may have another destination option...*

Division of Fisheries & Wildlife
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A fine specimen of an adult, male Bowfin (*Amia calva*) – taken, in this case, from the Oxbow off the Connecticut River in Northampton – displays the heavy skull. tubular body shape, long dorsal fin, and rounded tail (caudal fin) that are among the chief identification features of this ancient species. The eye-spot near the tail is a fairly reliable indicator of the sex, as adult females typically lack the spot, although it is usually present on sub-adults of both sexes. A tough, voracious predator that can reach weights of 10 pounds or more, this newly recognized Massachusetts gamefish is currently thriving in the Taunton and Connecticut river systems,

Photo © by Bill Byrne