

Bass

Bass is a name shared by many species of fish. The term encompasses both freshwater and marine species, all belonging to the large order Perciformes, or perch-like fishes. The word *bass* comes from Middle English *bars*, meaning "perch". We will discuss the three most popular basses; Australian Bass, largemouth bass and small mouth bass and just list the rest.

1. Australian bass

The **Australian bass** (*Macquaria novemaculeata*) is a small to medium-sized, primarily freshwater (but estuarine spawning) species of fish found in coastal rivers and streams along the east coast of Australia. It is a member of the family Percichthyidae and the genus *Macquaria* (although some researchers place it in the genus *Percalates* instead). Australian bass is an important member of the native fish assemblages found in east coast river systems. It is a predatory native fish and an extremely popular angling species. The species was simply called **perch** in most coastal rivers where it was caught until the 1960s, when the name **Australian bass** started to gain popularity.

Taxonomy

Australian bass are closely related and very similar in appearance to estuary perch. Estuary perch however tend to remain in the estuarine reaches or (occasionally) the extreme lower freshwater reaches. Hybridisation between the two species is rare overall but relatively common in the far southern extremities of the Australian bass's range. Results from recent research using genetic MtDNA analysis indicate Australian bass and estuary perch do belong in a separate genus to golden perch and Macquarie perch, and has resulted some in researchers resurrecting the genus *Percalates* and referring to Australian bass and estuary perch as *Percalates novemaculeata* and *Percalates colonorum* respectively. A rather surprising and unexpected finding of this research is that the Australian bass and estuary perch appears to be genetically closer to the Murray cod and other cod species than to the remnant golden perch and Macquarie perch.

Description and size

Australian bass have a moderately deep, elongated body that is laterally compressed. They have a forked caudal ("tail") fin and angular anal and soft dorsal fins. Their spiny dorsal fin is relatively high, strong and sharp. They have a medium-sized mouth and relatively large eyes than can appear dark in low light or red in bright light. The opercula or gill covers on Australian bass carry extremely sharp flat spines that can cut fishermen's fingers deeply. Australian bass vary in colour from metallic gold in clear sandy streams to the more usual bronze or bronze-green colouration in streams with darker substrates and/or some tannin staining to the water. Australian bass are, overall, a smallish-sized species. Wild river fish average around 0.4–0.5 kg and 20–30 cm.

Diet

Common items in the diet of Australian bass are:

- terrestrial insects, particularly cicadas
- aquatic macroinvertebrates, particularly Trichoptera (caddisfly) larvae
- crustaceans in the forms of freshwater shrimps and estuarine prawns
- small fish, particularly flathead gudgeon, which are common in their freshwater habitats.

However, Australian bass are fierce predators and any small creature that swims across a bass pool such as mice and native lizards or frogs are at risk of being taken by a large Australian bass, and are regularly taken.

Growth and age

For reasons that are not clear, Australian bass are extremely slow growing. Longevity is a survival strategy to ensure that most adults participate in at least one exceptional spawning and recruitment event, which are often linked to unusually wet years and may only occur every one or two decades. For many years, the maximum age recorded in wild Australian bass was 22 years. However, a wild bass from the Genoa River system has now been aged at 47 years of age. The same study recorded numerous wild bass aged 19 years of age and 29 years of age (corresponding to two separate years of strong recruitment).

Reproduction

As with other *Macquaria* species, there is sexual dimorphism in Australian bass. Males tend to have an absolute maximum size of 1.0 kg or less, while females regularly exceed 1.0 kg and sometimes reach the maximum size of 2.5–3.0 kg. Males reach sexual maturity at 3+ years of age, females at 5–6 years of age. Australian bass spawn in estuaries in winter, generally in the months of July or August. There is uncertainty about the salinity levels that Australian bass spawn in. Estuaries are dynamic habitats with daily fluxes in salinity due to tides, and are also affected by droughts, floods and freshes (minor, temporary rises in flow), making measurements of preferred spawning salinities for wild Australian bass difficult. However, based on capture of recently spawned larval and juvenile Australian bass in estuaries, the species appears to spawn in a salinity range of 8–12 parts per thousand (salt water is approximately 36 ppt). Australian bass sperm have no viability at or below 6 ppt, but are most viable at 12 ppt, the latter probably being the most relevant fact. However, it has been reported that Australian bass spawned in salinities of 12–18 ppt, with this statement based on fishermen's reports of observing wild Australian bass spawnings and some unpublished data gathered by the NSW Fisheries Department. Juvenile Australian bass migrate into the freshwater reaches after spending several months in estuarine waters.

Despite spawning in estuaries, Australian bass rely on floods coming down river systems into the estuaries throughout the winter period, both to stimulate migration and spawning in adult Australian bass and to create productivity increases that lead to strong survival and

recruitment of Australian bass larvae. Australian bass adults and larvae may also enter the sea (the latter perhaps involuntarily) during winter spawning in times of flood.

Fishing.

Fishing for Australian bass is a summertime affair, undertaken during the warmer months in the freshwater reaches of the rivers they inhabit. Australian bass are keenly fished for as they are an outstanding sports fish, extraordinarily fast and powerful for their size. Their extraordinary speed and power is probably due to their significant, strenuous annual migrations for spawning and a life-style that is migratory in general. Australian bass in their natural river habitats are not to be underestimated; they head straight for the nearest snags (sunken timber) when hooked and light but powerful tackle and stiff drag settings are needed to stop them.

2. Largemouth bass

The **largemouth bass** (*Micropterus salmoides*) is a carnivorous freshwater gamefish in the Centrarchidae (sunfish) family, a species of black bass native to the eastern and central United States, southeastern Canada and northern Mexico, but widely introduced elsewhere. It is known by a variety of regional names, such as the *widemouth bass*, *bigmouth bass*, *black bass*, *bucketmouth*, *largies*, *Potter's fish*, *Florida bass*, *Florida largemouth*, *green bass*, *bucketmouth bass*, *Green trout*, *gilsdorf bass*, *Oswego bass*, *LMB*, and *southern largemouth* and (paradoxically) *northern largemouth*. The largemouth bass is the state fish of Georgia and Mississippi, and the state freshwater fish of Florida and Alabama.

Description

The largemouth bass is an olive-green to greenish gray fish, marked by a series of dark, sometimes black, blotches forming a jagged horizontal stripe along each flank. The upper jaw (maxilla) of a largemouth bass extends beyond the rear margin of the orbit. The largemouth is the largest of the black basses, reaching a maximum recorded overall length of 29.5 in (75 cm) and a maximum unofficial weight of 25 pounds 1 ounce (11.4 kg). Sexual dimorphism is found, with the female larger than the male. Average lifespan in the wild is 10 to 16 years.

Feeding

The juvenile largemouth bass consumes mostly small bait fish, scuds, water fleas, copepods, small shrimp, and insects. Adults consume smaller fish (bluegill, banded killifish, minnows), shad, worms, snails, crawfish (crayfish), frogs, snakes, salamanders, bats and even small water birds, mammals, turtle hatchlings, and alligator hatchlings. In larger lakes and reservoirs, adult bass occupy deeper water than younger fish, and shift to a diet consisting almost entirely of smaller fish like shad, yellow perch, ciscoes, suckers, shiners, other cyprinids, freshwater silversides, and sunfish. It also consumes younger members of larger

fish species, such as catfish, trout, walleye, white bass, striped bass, and even smaller black bass. Prey items can be as large as 50% of the bass's body length or larger.

Studies of prey utilization by largemouths show that in weedy waters, bass grow more slowly due to difficulty in acquiring prey. Less weed cover allows bass to more easily find and catch prey, but this consists of more open-water baitfish. With little or no cover, bass can devastate the prey population and starve or be stunted. Fisheries managers must consider these factors when designing regulations for specific bodies of water. Under overhead cover, such as overhanging banks, brush, or submerged structure, such as weedbeds, points, humps, ridges, and drop-offs, the largemouth bass uses its senses of hearing, sight, vibration, and smell to attack and seize its prey. Adult largemouth are generally apex predators within their habitat, but they are preyed upon by many animals while young, including great blue herons, larger bass, northern pike, walleye, muskellunge, yellow perch, channel catfish, northern water snakes, crappie, common carp, and American eels. Multiple species of kingfishers and bitterns feed on this bass, as well. Both the young and adult largemouths are targeted by the bald eagle. This feeding habit may impact the ecosystem positively, but more research must be conducted to verify this.

Spawning

Largemouth bass usually reach sexual maturity and begin spawning when they are about a year old. Spawning takes place in the spring season when the water temperature first holds steady above 60°F. In the northern region of the United States and Canada, this usually occurs anywhere from late April until early July. In the southern states, where the largest and healthiest specimens typically inhabit, this process can begin in March and is usually over by June. Males create nests by moving debris from the bottom of the body of water using their tails. These nests are usually about twice the length of the males, although this can vary. Bass prefer sand, muck, or gravel bottoms, but will also use rocky and weedy bottoms where there is cover for their nest, such as roots or twigs. After finishing the nest, the males swim near the nest looking for a female to mate with. After one is found, the two bass swim around the nest together, turning their bodies so that the eggs and sperm that are being released will come in contact on the way down to the nest. Bass will usually spawn twice per spring, with some spawning three or four times, although this is not as common. The male will then guard the nest until the eggs hatch, which can take about 2 to 4 days or slightly longer. Finally, depending on the water temperature, the male will stay with the nest until the infant bass are ready to swim out on their own, which can be about two more weeks after they hatch. After this, the male, female, and new-borns will switch to more of a summer mode, in which they then focus more on feeding.

Angling

Largemouth bass are keenly sought after by anglers and are noted for the excitement of their 'fight', meaning how vigorously the fish resists being hauled into the boat or onto shore after being hooked. The fish will often become airborne in their effort to throw the hook, but many

say that their cousin species, the smallmouth bass, is even more aggressive. Anglers most often fish for largemouth bass with lures such as Spinnerbait, plastic worms (and other plastic baits), jigs, crankbaits, and live bait, such as worms and minnows. Largemouth bass usually hang around big patches of weeds and other shallow water cover. These fish are very capable of surviving in a wide variety of climates and waters. They are perhaps, one of the World's most tolerant freshwater fish.

Strong cultural pressure among largemouth bass anglers encourages the practice of catch and release, especially the larger specimens, mainly because larger specimens are usually breeding females that contribute heavily to future sport fishing stocks. Largemouth bass respond well to catch and release, with a very high survival rate after release, especially if the fish is handled with care and is loosely hooked in the side or top of the mouth. However, if the fish swallows the hook, survival odds greatly decrease. Largemouth bass have a white, slightly mushy meat, lower quality than that of the smallmouth bass, bluegill, yellow perch, crappie or walleye. Small largemouth, of 10–14 inches, can contain higher quality meat, especially during the spring.

Invasive species

The largemouth bass has been introduced into many other regions and countries due to its popularity as a sport fish. It causes the decline, displacement or extinctions of species in its new habitat through predation and competition, for example in Namibia. They are also an invasive species in the Canadian province of New Brunswick, and are on the watch list across much of the far northern US and Canada. In colder waters, these fish are often a danger to native fish fry such as salmon and trout.

3. Smallmouth bass

The **smallmouth bass** (*Micropterus dolomieu*) is a species of freshwater fish in the sunfish family (Centrarchidae) of the order Perciformes. It is the type species of its genus. Its common names include *smallmouth*, *bronzeback*, *brown bass*, *brownie*, *smallie*, *bronze bass*, and *bareback bass*.

Description

The smallmouth bass is generally brown, appearing sometimes as black or green (seldom yellow) with red or brown eyes, and dark brown vertical bands, rather than a horizontal band along the side. There are 13–15 soft rays in the dorsal fin. The upper jaw of smallmouth bass extends to the middle of the eye. The smallmouth's coloration and hue may vary according to environmental variables such as water clarity or diet. Males are generally smaller than females. The males tend to range around two pounds, while females can range from three to six pounds. Their average sizes can differ, depending on where they are found; those found in American waters tend to be larger due to the longer summers, which allow them to eat and grow for a longer period of time.

Their habitat plays a significant role in their colour, weight, and shape. River water smallmouth that live in dark water tend to be rather torpedo-shaped and very dark brown to be more efficient for feeding. Lakeside smallmouth bass, however, that live in sandy areas, tend to be a light yellow-brown and are more oval-shaped.

They have been seen eating tadpoles, fish, aquatic insects, and crayfish. There are two recognized subspecies, the Northern smallmouth bass (*M. dolomieu dolomieu*) and the Neosho smallmouth bass (*M. dolomieu velox*)

Habitat

The smallmouth bass is found in clearer water than the largemouth, especially streams, rivers, and the rocky areas and stumps and also sandy bottoms of lakes and reservoirs. It can also survive in a stronger current than other black bass. The smallmouth prefers cooler water temperatures than its cousin the largemouth bass, and may be found in both still and running water. Because it is intolerant of pollution, the smallmouth bass is a good natural indicator of a healthy environment, though it can better adjust to changes in water condition than most trout species. Carnivorous, its diet comprises crayfish, amphibians, insects, and smaller fish, while the larvae feed on various zooplankton and insect larvae. Adults also cannibalize young of other parents. The female can lay up to 21,100 eggs, which are guarded by the male in his nest

Migration

When the weather gets colder, and the water temperature drops below 15°C (60 F), smallmouth will often migrate in search of deeper pools in which they enter a semi-hibernation state, moving sluggishly and feeding very little until the warm season returns. The migration patterns of smallmouth have been tracked and it is not unusual for a smallmouth to travel 12 miles in a single day in a stream, creek or river. The overall migration can exceed 60 miles.

Angling

With increased industrialization and land use changes, many of the nation's eastern trout rivers were polluted or experienced elevated water temperatures, reducing the range of native brook trout. Smallmouth bass were often introduced to northern rivers with increased water temperatures and slowly became a popular gamefish with many anglers. Equally adaptable to large, cool-water impoundments and reservoirs, the smallmouth also spread far beyond its original native range. Later, smallmouth populations also began to decline after years of damage caused by overdevelopment and pollution, as well as a loss of river habitat caused by damming many formerly wild rivers to form lakes or reservoirs. In recent years, a renewed emphasis on preserving water quality and riparian habitat in the nation's rivers and lakes, together with stricter management practices, eventually benefited smallmouth populations and has caused a resurgence in their popularity with anglers.

Today, smallmouth bass are very popular game fish, frequently sought by anglers using conventional spinning and bait casting gear, as well as fly fishing tackle. The smallmouth bass is potentially the toughest fighting freshwater fish in North America, and is commonly the targeted species in many fresh water fishing tournaments. In shallow streams, it is a wary fish, though usually not to the extent of most trout. The smallmouth is highly regarded for its topwater fighting ability when hooked – old fishing journals referred to the smallmouth bass as "ounce for ounce and pound for pound the gamest fish that swims". Smallmouth bass are not usually taken for the table, but rather are caught and released by most anglers. However, smaller specimens in cooler water often have higher quality filets of white, firm flesh when cooked.

Tackle

In conventional fishing, smallmouth may be successfully caught on a wide range of natural and artificial baits or lures, including crankbaits, hair jigs, plastic jerkbaits, artificial worms, spinnerbaits, and all types of soft plastic lures, including curly tail grubs or tubes with lead head jigs. Spinning reels or baitcasting reels may be used, with line strengths of 6 to 15 pounds typically utilised. According to many, smallmouth typically put up a better, more exciting fight than any other black bass. Rods are usually of ultralight to medium-heavy action. They may also be caught with a fly rod using a dry or wet artificial fly, nymphs, streamers, or imitations of larger aquatic creatures, such as hellgrammites, crawfish, or leeches. Floating topwater popper fly patterns and buzz baits are also popular for smallmouth fishing. When fishing in colder water, it is believed to be more effective to fish with smaller lures like hair jigs or small spinners. During the rest of the year, smallmouth are usually taken using soft plastic tubes or spinnerbaits. The best spots in rivers to fish for smallmouth are behind rocks or in eddies, where water swirls around. Smallmouth can also be taken in cool lakes like Lake Erie or any of the northern lakes.

Other species known as bass

Many species are also known as basses, including:

- The black sea bass, *Centropristis striata*, is a member of the sea bass and sea grouper family Serranidae.
- The Chilean sea bass, *Dissostichus eleginoides*, also known as the Patagonian toothfish, is a member of the cod icefish family Nototheniidae.
- The giant sea bass *Stereolepis gigas*, also known as the black sea bass, is a member of the wreckfish family Polyprionidae.
- The "lanternbellies" or "temperate ocean-basses", Acropomatidae.
- The "butterfly peacock bass", *Cichla ocellaris*, is a member of the cichlid family, Cichlidae and a prized game fish along with its relatives in the genus *Cichla*.

- The **black basses**, such as the Choctaw bass (*Micropterus haiaka*), Guadalupe bass (*M. treculii*), largemouth bass (*M. salmoides*), smallmouth bass (*M. dolomieu*), and spotted bass (*M. punctulatus*), belong to the sunfish family Centrarchidae.
- The **temperate basses**, such as the European seabass (*Dicentrarchus labrax*), striped bass (*Morone saxatilis*) and white bass (*M. chrysops*), belong to the family Moronidae.
- The **Asian seabasses**, such as the Japanese seabass (*Lateolabrax japonicus*) and Blackfin seabass (*L. latus*), belong to the family Lateolabracidae.

Largemouth, smallmouth, and spotted bass are the most popular game fish in North America which are also very popular in South Africa. In the country, largemouth bass is often found in lakes, rivers, creeks, and dams. When fishing, lures (Bass worms) or live bait will work. Lures that mimic baitfish, worms, crayfish, frogs, and mice are all effective.

REFERENCE

1. Food and Agriculture Organization (FAO) -
https://en.wikipedia.org/wiki/Food_and_Agriculture_Organization
<http://www.fao.org>
2. Lawson T.B. (1995) Aquaculture in open Systems. In: Fundamentals of Aquacultural Engineering. Springer, Boston, MA. https://doi.org/10.1007/978-1-4613-0479-1_5
3. "Global Annual Mean Surface Air Temperature Change". NASA. Retrieved 23 February 2020.
https://data.giss.nasa.gov/gistemp/graphs_v4/
4. BOYD, C. E. (1982) Water Quality Management for Pond Fish Culture. Developments in Aquaculture and Fisheries Science, Vol. 9. Elsevier, Amsterdam, The Netherlands.
5. Irons, Robert (July 2019). *The Fundamental Principles of Finance*. Google Books: Routledge. ISBN 9781000024357. Retrieved 3 April 2021.
6. *Aquaculture: Environmental, toxicological, and health issues*
 David W. Cole Richard Cole Steven J. Gaydos Jon Gray Greg Hyland Mark L. Jacques Nicole Powell-Dunford Charu Sawhney William
7. Pał, M. & Morgan, D.L. (2019). "Lates calcarifer". IUCN Red List of Threatened Species. 2019: e.T166627A1139469. doi:10.2305/IUCN.UK.2019-3.RLTS.T166627A1139469.en. Retrieved 22 February 2020.
8. Wikipedia