

## Student reading

# Bonefish



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Bonefish (*Albula spp.*) are amazing fish! They are extremely fun but hard to catch. It's all about the challenge. **Anglers** stalk bonefish in shallow-water boats called flats skiffs. These boats can get into the really shallow places where bonefish like to live and eat when they are adults. Sometimes these areas are less than knee deep. Bonefish are very easily scared away, so an angler trying to catch a bonefish has to be very careful and gentle when fishing. The angler has to convince the bonefish to eat a fly or lure that looks just like food, or with natural bait like a shrimp or crab. It really helps if you're casting something that looks a lot like what they're eating. When the angler tosses a lure or fly toward the bonefish, he or she has to be very careful. If the bait or fly lands too close or too loud, the fish will quickly swim away from the flat, stirring up the sand and water as it goes and likely scaring its friends away too.

As their name suggests, bonefish are not a good fish to eat. Instead, bonefish are worth a lot of money to the communities in the areas where they are caught. Anglers from around the world travel to catch the **elusive** bonefish and this tourism creates jobs in the boat-building, travel, tackle and tourism industries. Some of the places that make lots of money off the bonefishing industry are South Florida; The Bahamas; Turks & Caicos; Cuba; Puerto Rico; Belize; Mexico; the Seychelles; Hawaii; and the Christmas Islands. All of these places make money off tourists coming to fish their beautiful waters for this important species.

Originally we thought there was only one type of bonefish. But as we learn more, research scientists have actually found 11 species of bonefish and the possibility of more discoveries exists. These species live in different areas around the globe, but a few live in the same places. There are three species of bonefish found in Florida alone! The species that is found most often in the Florida Keys and The Bahamas is *Albula vulpes*. Those Latin words translate as "white fox," due to the fish's whitish coloring and its fast swimming speed. In fact, its mirror-like scales make it almost invisible, and the shape of its body allows it to reach great speeds very quickly.



A pre-spawning aggregation of bonefish heads offshore to reproduce. Some pre-spawning aggregation spots, where the fish meet up, have been discovered. These areas need to be protected, and so do the places we've yet to discover where they spawn offshore.

*Albula vulpes* is one of the most valuable, popular and best understood species of bonefish that lives near us. Generally, we agree that most things in nature are "interconnected" and in the marine environment this is especially true. The waves caused by winds (air currents), tides (water currents), moon phases and the chemistry and geology of the oceans and lagoons are all interconnected. The animals who live in these habitats (like bonefish) rely heavily on strong, healthy connections between different parts of nature to live, eat and reproduce.

Many people think bonefish spend their entire lives in shallow seagrass meadows and back reef flats, because that's where the adults are fished for. But bonefish actually need many habitats throughout their lives. A bonefish relies on habitats as different as coral reefs, the open ocean, and seagrass meadows all within one lifetime - even within a given season or year!

Bonefish may **spawn** many times over their lifespan and are able to produce young once they reach three or four years of age. During spawning season, which is roughly November through April in our part of the world, they gather in large groups called "**spawning aggregations.**" Imagine thousands of adult fish realizing they all need to meet in a certain place at a certain time to reproduce. That's what a pre-spawning aggregation is for bonefish. Those large groups of bonefish have been observed and recorded next to channels that offer a quick way for the fish to go into the open ocean where they actually spawn.

Bonefish use a reproduction method called **broadcast spawning.** where all the fish release eggs or sperm into the water at the same time



Bonefish larvae are called leptocephalus. They are almost clear because they drift around in the open ocean.



Adult bonefish blend in with the sand and seagrass on the flats where they feed.



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while swimming in a group.

This spawning usually happens when the tides and currents are the strongest. This time period typically occurs on a new moon and a full moon.

During those moon phases, the eggs and sperm they release meet in the water, where they combine in the act of fertilization and start the **cell division** process that eventually will make, in the case of a bonefish, a tiny eel-like baby fish called a leptocephalus **larvae**. Most fish begin their lives as larvae before changing into the shape of a fish.

After the egg and sperm meet and the egg is fertilized, the fertilized egg can be carried away by

these tides and currents. At some point, a larva with some luck settles in an area where the tiny bonefish can grow. The best place for bonefish to settle based on the current research is a shallow **flat** protected from waves and current where the tiny baby fish could be safe from larger predators.

Larval bonefish are tiny and **transparent!** Their small size and transparency makes them almost invisible, which helps them avoid being eaten by larger fish. After about 40-70 days in this stage they change into little fish with some silvery coloring and begin to look more like a mature bonefish. When they are completely done morphing into the tiny bonefish they leave what scientists consider the "larval stage" and become **"juveniles."**

Even when bonefish become juveniles, they are still small fish that have a high risk of being eaten by a predator. These small juveniles need to find a shallow creek or area of the lagoon with plants in and above the water. These plants will help block the view of the juveniles from birds, larger fish and other predators that want to eat the small fish.

There are still lots of things that scientists need to learn about this stage of bonefish life. But there's a basic understanding that when the bonefish are "teenagers," or **sub-adults**, they like to live in calm sandy or mud-bottomed areas. Scientists are not sure why this is where they

live during this portion of their lives. Our best guess is that their mirror-like scales camouflage them well in these open habitats. Adult bonefish spend most of their time in the flats, mangroves and creeks that are flushed by the incoming and outgoing tides. They can live in areas in schools of up to 1 00 fish! Larger bonefish adults tend to be found in smaller groups of two to three and the very large bonefish are found by themselves and not in groups at all.

Bonefish tend to have patterns to their days, coming to specific areas in the morning and then another area mid-day. They tend to move into shallower water as the tide rises and then move out to deeper water as the tide goes low.

Water and air temperatures can affect where in the water the bonefish can be found too. For example, if the water is too hot, it won't have enough oxygen to support a bonefish. Climate change threatens bonefish habitat because a warming planet can make their feeding areas too hot to hold oxygen.



**Bonefishing brings lots of tourists to The Bahamas, and the Bahamian government recognized the species- importance by putting images of bonefish on their dime.**

