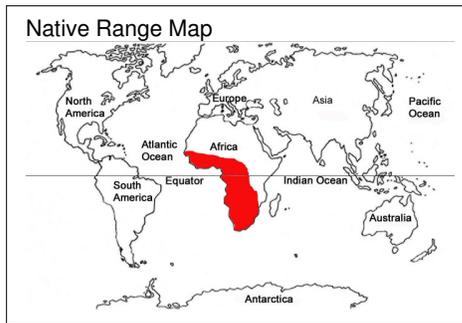


Native Range Map



African Lungfish

Kingdom: Animalia
Phylum: Chordata
Subphylum: Vertebrata
Class: Sarcopterygii
Order: Lepidosireniformes
Family: Protopteridae
Genus: *Protopterus*
Species: *undefined*



Photo courtesy of Kate Woodle

Habitat

- **In the Wild:** The African lungfish is found in freshwater swamps and small rivers in West and South Africa. Some of the countries include Senegal, Niger, Gambia, Western Sudan, Cote d'Ivoire, Sierra Leone, and Guinea. It is a tropical fish preferring water temperatures between 76°-86°F between latitudes of 22°N and 30°S.
- **Exhibit Location:** USS Antiquities

Characteristics

- Length: 6.5-39 inches; Weight: maximum 8.5 pounds
- This fish has a prominent snout and small eyes. It has external gills located behind the gill slits and above the pectoral fins (just behind the head). The dorsal (back) side is brown or olive, while the ventral (belly) side is lighter. There are blackish or brownish spots on the body and fins, but not on the belly.
- The lungfish has two lungs that allow it to breathe when water dries up. It is able to survive drought by aestivating or burying in mud. Aestivation (a dormant condition) occurs usually between the end of one wet season and the start of another. It surrounds itself with a secretion that will allow it to survive up to 4 years, but usually only a matter of months. For aestivating, the lungfish literally chews its way into the substrate ejecting mud out of its gill openings. It may reach a depth of 1-10 inches below the bottom, depending on the length of the fish. The lungfish wriggles around, thereby hollowing out a bulb-shaped chamber and coming to rest with its nose pointing upward. It breathes air at the mouth of the chamber's tube and then sinks back into the expanded part of the chamber. As the water disappears, the respiratory trips cease and air reaches the fish via the tube to the surface.
- **Lifespan: In the Wild** - Unknown; **In Captivity** - Unknown

Behaviors

- Lungfish are very aggressive predators. They are best left alone, or they may attack an intruder.
- Usually the rate of gill breathing (using the mouth and cranial cavity) exceeds air breathing. A study at the University of Washington found that as the carbon dioxide level was increased in the aquarium, there was a decrease in gill breathing and an increase in air breathing.
- The lungfish does not walk on its fins on land. The fins are not muscular enough to support the weight of the fish. They use them underwater by alternating front and back fin movement as do other fish.
- **Enrichments at the Zoo:** food items and guppies

Reproduction

- The lungfish lays eggs surrounded by mucus in a nest usually located in the weedy area of a swamp during the wet season. The eggs are white in color and are about 0.3 inches in diameter.
- The larvae hatch in about a week and leave the nest in about 20 days. The larvae have external gills that are reabsorbed during metamorphosis. Males guard the nest and then the hatchlings for the first 2 months.

Diet

- **In the Wild:** frogs, small fish, mollusks, seeds, and plant material like roots
- **At the Zoo:** smelt, squid, fish gel, night crawlers, and trout chow

Conservation Status

- **IUCN status:** not listed; **CITES Appendix:** not listed
- Data for the period 1973-1990 demonstrate a dramatic decline of lungfish in the Tanzanian waters of Lake Victoria. Low levels of oxygen in the deeper waters of Lake Victoria, the algae blooms, and the decline of water transparency, are not likely to have contributed to the decrease. This decline may reflect the interaction of overexploitation by the fishery and a low level of Nile perch predation that restricts lungfish to wetland refuges. It is thought that the conversion of wetlands to agricultural land and harvesting of nest-guarding male lungfish has led to the decreased young.
- Predators: bony fish such as the finfish

Did You Know?/Fun Facts

- There is no movement of the ribs when lungfish breathe. Air breathing is powered by a buccal pump mechanism derived from the aquatic living environment similar to that used to bring water across the gills. It is thought that the ventilation mechanism for breathing did not evolve until later when a more terrestrial stage evolved.
- The lungfish is important for fisheries as a minor commercial product.
- The lungfish may be related to the coelacanth. It is also thought that amphibians may have developed their limbs from the muscular fins of the lungfish. This fish is not as primitive as one would think. It has adapted well to its environment.
- The oldest known lungfish is *Uraolophus* dated at about 410 million years.

Sources:

- Brainerd, E.L. (2005, March 22). New perspectives on the evolution of lung ventilation mechanisms in vertebrates. Retrieved January 31, 2007, from SpringerLink Web site: <http://www.springerlink.com/content/p2638883xxn6n025/>
- Goudswaard K.P.C., Witte, F., & Chapman, L.J. Decline of the african lungfish (*protopterus aethiopicus*) in lake victoria (east africa). *African Journal of Ecology*, 40, Issue 1, Retrieved January 31, 2007, from <http://www.blackwell-synergy.com/doi/abs/10.1046/j.0141-6707.2001.00335.x?journalCode=aje>
- Johansen, K. & C. Lenfant. (1968). Respiration in the african lungfish *protopterus aethiopicus*: II. control of breathing. Retrieved January 30, 2007, from The Journal of Experimental Biology Web site: <http://jeb.biologists.org/cgi/content/abstract/49/2/453>
- McMahan, B.R. (1969). A functional analysis of the aquatic and aerial respiratory movements of an african lungfish, *protopterus aethiopicus*, with reference to the evolution of the lung-ventilation mechanism in vertebrates. Retrieved January 31, 2007, from The Journal of Experimental Biology Web site: <http://jeb.biologists.org/cgi/content/abstract/51/2/407>
- Myers, P., R. Espinoza, C.S. Parr, T. Jones, G.S. Hammond, and T.A. Dewey. 2006. The Animal Diversity Web (online). Accessed December 14, 2006 at <http://animaldiversity.ummz.umich.edu/site/accounts/classification/Protopteridae.html>
- Oregon Zoo, (2005). Animals: african lungfish. Retrieved December 14, 2006, from Oregon Zoo Web site: <http://www.oregonzoo.org/Cards/Rainforest/lungfish.african.htm>
- Teugels, G.G. (1988). *Protopterus annectens annectens*: west african lungfish. Retrieved January 30, 2007, from FishBase Web site: <http://fishbase.org/Summary/SpeciesSummary.php?id=2384>