

Species Spotlight: Patagonian toothfish



(Dissostichus eleginoides)

A.K.A. Chilean seabass, Bacalao or Bacalao de profundidad (Chile), Austromerluza negra (Spain), Légine australe (France), Merluza negra (Argentina and Uruguay), Ookuchi or Mero (Japan), butterfish (Mauritius)

Class: Actinopterygii (ray-finned fishes)

Order: Perciformes (perch-like fishes)

Suborder: Notothenioidei (Antarctic ice fishes)

Family: Nototheniidae (cod ice fishes)

Genus: *Dissostichus*

Species: *eleginoides*



This month we focus on a fish often found in the United States not as a free swimming oceanic denizen, but as a meal on our dinner plates. The Patagonian toothfish, or the Chilean seabass, as it is more commonly referred to in fish markets and restaurants, is a slow growing and long lived fish that can grow to over 7 feet long, weigh over 250 pounds, and has been known to live as long as 50 years. These fish inhabit the deep waters (from 950 to 11,000 or more feet deep) on the seamounts and continental shelves around sub-Antarctic islands.

Related genera are: The Antarctic Toothfish (*Dissostichus mawsonii*), which tends to inhabit colder and more southerly waters than *D. eleginoides* - typically south of 65 degrees latitude and sometimes under pack ice. This species also possesses an "anti-freeze" like component in its circulatory system which enables it to survive near freezing conditions.

Description: As of the mid 1980s, the Patagonian toothfish was relatively unknown outside of the fish markets of Chile, Argentina, and Uruguay. Within a decade, this decidedly unattractive and fearsome looking grey-black skinned fish with a mouth full of inward pointing conical teeth and bulging eyes, was in high demand as a luxury seafood specialty dish in the restaurants of Los Angeles, New York, Paris and Tokyo. Often referred to as "the white gold" of the sea (its meat is almost pure white), this species quickly rose to worldwide popularity-and just as quickly saw its population



plummet into the danger zone due to intense fishing pressure, both legal and illegal.

Size: Patagonian toothfish may attain a maximum weight of approximately 440 lbs and a maximum length of approximately 7 ft. The average weight of a commercially caught toothfish is about 20 lbs.

Range: Patagonian Toothfish inhabit deep-sea continental shelf slopes of the southern oceans, Antarctica, and the small islands dotting this oceanic region.

- McDonald and Heard Islands (Australia)
- South Georgia and South Orkney Islands (UK)
- Prince Edward and Marion Islands (South Africa) Crozet and Keruelen Islands (France)

The Patagonian toothfish also occurs in the Exclusive Economic Zones (EEZ) of southern Chile and Argentina.

Habits: The Patagonian toothfish is an ambush, lay-in-wait predator, as evidenced by the firm white flesh of its filets which are typical of a fish whose metabolism is geared for short bursts of energy, as opposed to the deep red muscle tissue found in species that require sustained swimming abilities like tunas or billfishes. At 4 - 6 inches total length, semi-pelagic juveniles become demersal at 490 - 1300 ft depth. Adults migrate to deeper habitats at depths greater than 3,280 feet.

Feeding: Patagonian toothfish feed mainly on squid, octopods, crustaceans, amphipods, shrimps, krill, and other bony fishes including other toothfish. They are preyed upon by sperm whales, Southern elephant seals (*Mirounga leonina*) and colossal squid (*Mesonychoteuthis hamiltoni*) and Antarctic seals (*Arctocephalus gazella*) at Heard Island, Australia. Killer whales (*Orcinus orca*) have been filmed eating toothfish when they were caught on longlines around Île Crozet.

Reproduction: Toothfish reach sexual maturity at age 6 -10 years, by which time they will have grown to a length of between 15 to 24 inches. Present toothfish populations are estimated to possess a minimum population doubling time 4.5 - 14 years, which is exceptionally long when compared to the population doubling time of many commercially and recreationally harvested fish stocks.

Conservation status: According to Seafood Watch, the "Chilean sea bass" is currently on the list of fish that American consumers who are sustainability-minded should avoid. The Patagonian Toothfish, once abundant in southern oceans, now suffers immensely from overfishing, and is coming dangerously close to commercial extinction. The long life span and late sexual maturity of the Patagonian toothfish make it highly vulnerable to overfishing. Patagonian toothfish populations have been experiencing high levels of exploitation due to high international demand for what is considered to be luxury seafood in the USA, Japan and the European Union. Toothfish populations are also in severe decline due to illegal pirate fishing (IUU - illegal uncontrolled and unregulated fishing) fueled by international consumer demand.

Toothfish Pirates in the News:

September 23, 2006 - Sydney, Australia - The captain and fishing master of the Cambodian flagged F/V Taruman were found guilty of illegally catching Patagonian toothfish. The vessel's 143 ton catch was sold for \$1.5 million.

September 27, 2005 - A federal grand jury in Miami, Florida, returned an indictment charging defendants, Antonio Vidal Pego, a Spanish national, and Fadilur, S.A., a

Uruguayan corporation, with importing and conspiring to sell illegally possessed toothfish. According to records in the case, the government seized more than 53,000 pounds of toothfish, valued at wholesale prices of \$314,397.30. - convicted in 2006, fined \$400,000, and barred from US fishery trade.

In 2003 Australian fishing patrol vessels detected the F/V Viarsa illegally catching Patagonian toothfish in the Exclusive Economic Zone (EEZ) of Australia, close to the McDonald islands. The pursuit of the Viarsa over 3900 nautical miles, considered one of the longest in maritime history, lasted 21 days, and ended with the detention of the pirate vessel in the South Atlantic, off the coast of South Africa. These events inspired the book "Hooked: pirates, poaching and the perfect fish" by G. Bruce Knecht.

The Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) is responsible for fisheries management in the Southern Ocean. The Convention came into force in 1982.

1982-(CCAMLR) - Convention for the Conservation of Antarctic Marine Living Resources.

- 2000 - CCAMLR adopts (CDS) - catch document scheme to monitor harvest and trade in Toothfish to ensure that CCAMLR conservation guidelines are being enforced.
- (COLTO) - Coalition of Legal Toothfish Operators.

The 23 member nations of CCAMLR include: Argentina, Australia, Belgium, Brazil, Chile, European Community, France, Germany, India, Italy, Japan, Republic of Korea, New Zealand, Norway, Poland, Russian Federation, South Africa, Spain, Sweden, Ukraine, United Kingdom, USA and Uruguay.

The South Georgia Patagonian Toothfish Longline Fishery of this species has been certified by the Marine Stewardship Council as well-managed and sustainable (http://www.msc.org/html/content_1062.htm).

Pathways to Conservation:

Restrict smuggling via mislabeling by requiring all toothfish to be shipped whole (not as "trunks" or filets), and with proper labeling. Deny known toothfish poachers access to ports and mid-ocean re-supply, re-fueling and cargo transfer. Restrict the practice of registering vessels under "flags of convenience" - a tactic often employed by poachers. Increased use, monitoring and enforcement of satellite controlled (CVMS) - centralized vessel monitoring systems. Ban all "high seas" imports of toothfish.

Illegal fishing for toothfish in the Southern Ocean has also been reported to be detrimental to other wildlife inhabiting the area. According to The Antarctica Project, "It is common practice in the illegal fishery to dynamite Sperm and Killer whales when they are discovered in areas where illegal fishing is taking place" and, "hundreds of thousands of endangered albatrosses and petrels dive for baited longline hooks and become ensnared and drown."

Necessity is the mother of invention: Entrepreneurs seized upon the opportunity to capture a new market while furthering the conservation of endangered sea birds. A

simple tube-like device was developed that released the longline baits below the surface of the water - seabird mortality was drastically reduced. Bird scaring lines, also known as "tori" lines by Japanese fisherman, are paired or single streamers tied from a pole or other high point near the stern of the vessel, which stream out over the area where the line of hooks sinks. They tend to discourage birds from diving where the baited hooks are sinking.

Heavier line weights, interspersed between the hooks, have been shown to sink the baits quicker than birds can dive on them, and can reduce longline deaths by over 75%. Even simple changes not requiring extra equipment can make a difference: Seabird mortality can also be reduced by using thawed bait - which sinks faster, setting gear only at night - when most seabirds are less active; and ensuring that offal is not discharged while lines are being set out,

References:

Australian Government Department of Agriculture, Fisheries and Forestry October 2005
Gianni, M., Simpson, W. How flags of convenience provide cover for illegal, unreported and unregulated fishing.

http://cmsdata.iucn.org/downloads/supply_chain_management_roheim.pdf

<http://www.fishbase.org/summary/speciessummary.php?id=467>

[Knecht, G. Bruce., "Hooked: pirates, poaching and the perfect fish"](#)

Dissostichus Links: <http://www.fishbase.org/summary/speciessummary.php?id=467>

<http://www.fao.org/docrep/006/y5261e/y5261e09.htm>

<http://www.ccamlr.org/pu/e/gen-intro.htm>

http://www.ccamlr.org/pu/E/e_pubs/fr/drt.htm

<http://www.ccamlr.org/pu/E/sc/tag/intro.htm>

<http://www.msc.org/>(Marine Stewardship Council)

<http://www.msc.org/home-page/search?SearchableText=toothfish>

<http://www.colto.org/index.htm>

http://www.montereybayaquarium.org/cr/SeafoodWatch/web/sfw_factsheet.aspx?gid=6

<http://www.youtube.com/watch?v=nyl838piKIs>

(Marine Stewardship Council)