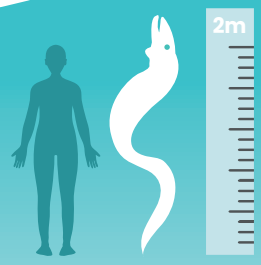
New Zealand longfin eel

Anguilla dieffenbachii

WORLD FISH MIGRATION FOUNDATION

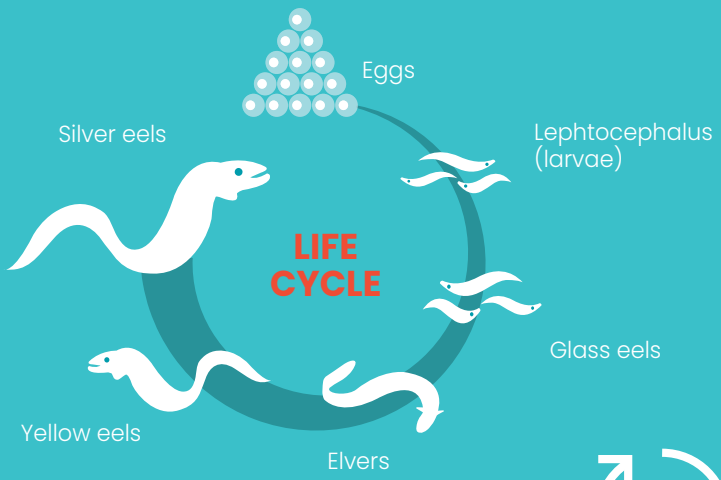
Endemic to
New Zealand



Up to 2 meters

Habitat

Longfin eel can inhabit **high country lakes** and **rivers above 1.150 meters**

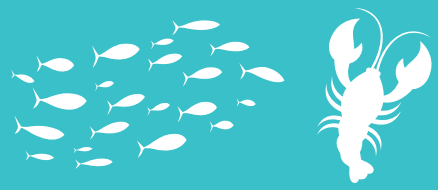


Migration

The **migratory route is still a mystery**, yet they are suggested to spawn in the south of the Fiji basin

Food

A nocturnal feeder, eating a wide range of **aquatic invertebrates** and **small fish**



ENDANGERED

Vulnerable

Vulnerable to **overfishing** and impeded by **dams**

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RANGE AND HABITAT

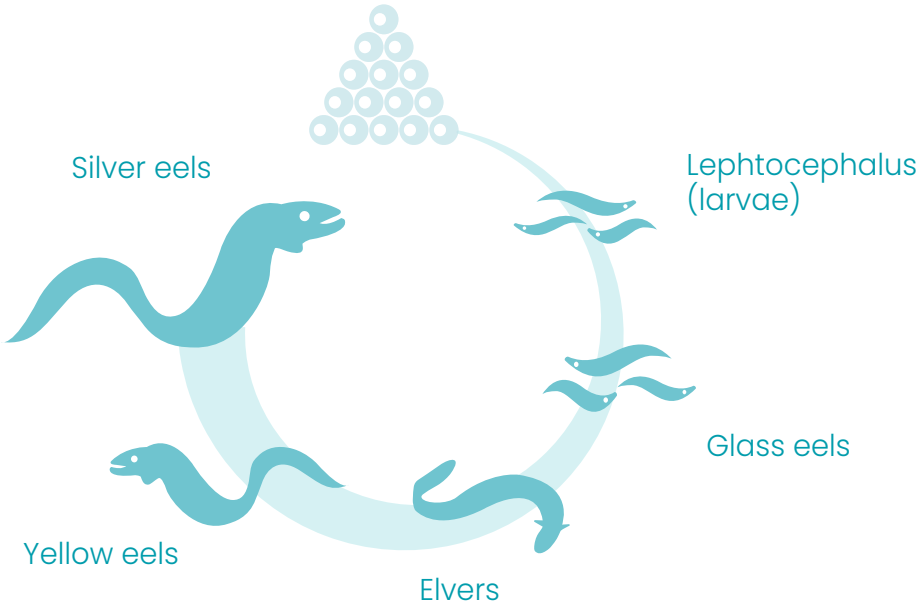
The New Zealand longfin eel, Anguilla dieffenbachii, is one of the largest species of freshwater eels. It is endemic in New Zealand, occurring in lakes, streams and rivers of the North and South islands, Stewart Island and the offshore Chatham Islands. Longfin eels travel up to 300 kilometers inland and inhabit waterways, including high country lakes and rivers above 1,150 meters.

This eel is an ecological generalist, inhabiting a wide range of environments from estuaries to mountainous streams. However, they are most commonly found in clear rivers with stony bottoms. Smaller individuals (below 30 centimeters) show a preference for faster flowing water with coarse sediments and high abundances of algae and invertebrates. Larger eels seem to prefer deeper water with a slower water velocity and plenty of cover.

The New Zealand longfin eel is believed to spawn in the south of the Fiji basin, yet the precise migratory route and spawning location of this species remains a mystery. It is thought likely that all juveniles are born within a single spawning area, implying that all longfin eels across New Zealand belong to just one population. The hatched larvae migrate on ocean currents to the coasts in about eight to ten months.

LIFE CYCLE

The New Zealand longfin eel has an exquisite life cycle. Leaf shaped marine larvae, each known as a leptocephalus, hatch from the eggs and drift with ocean currents before reaching the shores by which time they have developed to become transparent glass eels.



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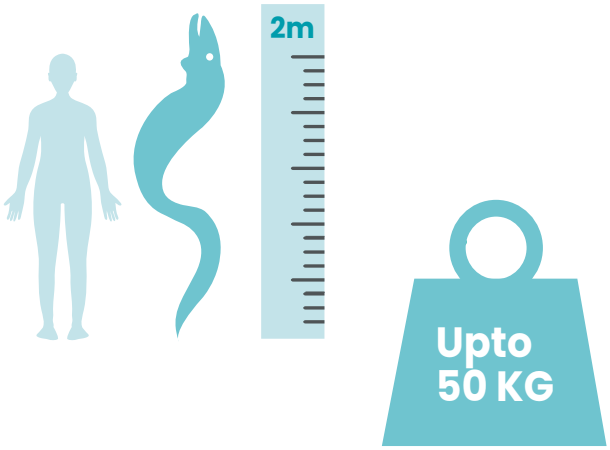
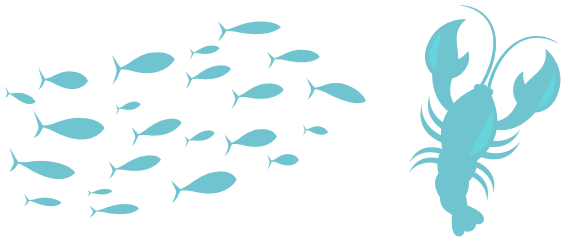
Glass eels develop into pigmented elvers and then after years of freshwater residence into yellow eels. This is the growth phase of the longfin eel. In the final phase the New Zealand longfin eel transforms again, this time into silver eels, characterized by their silvery countershading and large eyes, and commence their return to their marine spawning grounds. This migration is likely triggered by seasonal increased amounts of rainfall and water flow.

Female longfin eels mainly migrate downstream between April and June and males between March and April. Similar to other Anguillids, New Zealand longfin eels show an interesting diel vertical migration at sea with frequent dives to over 1000 meters and ascents up to <50 meters below the surface. This pattern is thought to be a response to thermoregulatory requirements or a tactic to avoid predation. After spawning, all mature eels are believed to die.

SIZE AND FEEDING

The New Zealand longfin eel grows up to 2 meters in length, however, they are more commonly found up to a length of about 120 centimeters. Reports of them reaching 2 meters and 50 kilograms, are increasingly rare and sightings of these real monster eels are mostly historical. Although being one of the largest species of freshwater eels and arguably the largest species in the genus, it is a very slow growing species, growing by only about 2 to 3 centimeters per year. Despite this slow growth, the New Zealand longfin eel grows large due to its longevity, being able to live to an age in excess of 100 years. The longfin eel is a nocturnal feeder, mostly predating on a wide range of aquatic invertebrates and small fish, including juvenile brown trout - a non-endemic species in New Zealand introduced by anglers.





COMMERCIAL, RECREATIONAL ROLE AND CURRENT STATUS

To Māori, the indigenous people of New Zealand, longfin eels are known as tuna and are one of their most valuable freshwater resources. Tuna were traditionally harvested to feed Māori, but also used to trade with other hapū (sub-tribes) for resources unavailable in their area, or rohe. Hapū wealth depended on the abundance of natural resources, including tuna. Traditional methods for catching tuna varied greatly between different hapū, with some of these methods still used today. However, increasing habitat degradation means that tuna are under threat. The loss of tuna and other species in freshwater ecosystems diminishes the mauri (life force) of the area. Māori people are kaitiaki, or guardians, of te taiao (the environment) and with this cultural responsibility, work to preserve the mauri is associated with their world.

To Māori people a decline in the health of te taiao coincided with European colonisation. After their arrival in New Zealand, European settlers targeted tuna for harvest due to their size and abundance. This resulted in a commercial longfin fishery that

continues to exist today. The commercialisation of this life sustaining resource by pākeha (European people) happened without input from Māori as kaitiaki. The fishery, in the eyes of Māori, conflicts with their cultural practices, like kaitiakitanga (guardianship). Despite the frequent concerns from Māori regarding the now heavily regulated fishery, their mātauranga Māori, meaning Māori knowledge, has been pushed aside. In some areas iwi (tribes) have voluntarily stopped fishing for tuna due to the declines in their size and abundance, in a bid to ensure sustainable tuna populations for future generations.

The IUCN lists this species as endangered based on multiple traits that play a role in the life cycle of the eel. New Zealand longfin eel's extremely slow growth rates make them vulnerable to a range of pressures. A conservative study has shown an average decline in glass eel recruitment of 77%. This decline in recruitment will likely lead to declines in future emigration of silver eel to the oceans, but, due to the longevity of the species, this decline has not yet been seen. Furthermore, imponding barriers like dams, and abstraction for agricultural irrigation still pose a threat to the New Zealand longfin eel, with an estimated decline in emigrating mature silver eel of 80% between the 1920s to 2008.

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