



FISHERIES FACT SHEET

SAWFISH



Sawfish
Family *Pristidae*

Photo © Commonwealth of Australia/Julie Jones

A saw subject

The unusual-looking sawfish family are a type of ray and are therefore related to sharks. Found in both marine and fresh water, these predatory fish derive their name from their long snouts lined with sharp points.

Overfishing and habitat change have caused major declines in sawfish stocks globally. Northern Australia is one of the few places where they may not be in immediate danger of extinction.

Hunting and defence

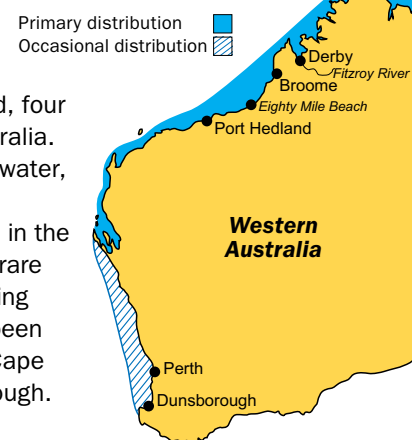
Fine electromagnetic sensors along a sawfish rostrum help it to detect movement. This is especially useful for hunting prey in murky water, such as tidal creeks in the Kimberley. In addition, the sensors may enable sawfish to detect prey buried in sand and mud, such as crabs and prawns.

Sawfish use their rostrum to club and slash prey, including other fish, before consuming it whole. Some sawfish have been found to have catfish spines embedded in their rostrum and fish scales impaled on the rostral 'teeth'.

Rostra may also be used in defence against sharks that prey on sawfish.

Distribution

Of seven sawfish species known to exist in the world, four are found in Western Australia. These species – the freshwater, dwarf, narrow and green sawfish – are mainly found in the Kimberley and Pilbara. On rare occasions, sawfish, including freshwater sawfish, have been recorded as far south as Cape Naturaliste near Dunsborough.



Cultural significance

Freshwater sawfish are a traditional food source for Aboriginal people living along the Fitzroy River. The species features in stories and beliefs. Bunuba people call freshwater sawfish 'galwany', the Gooniyandi people call it 'wirridanyiny', the Nyikina, 'pial pial' and the Walmajarri people, 'wirrdani'.

A traditional way of catching sawfish and other species by the Nyikina and Walmajarri people is to put bark from a freshwater mangrove tree in a waterhole. This removes oxygen from the water, causing the fish to float and become easy to catch.

Sawfish features

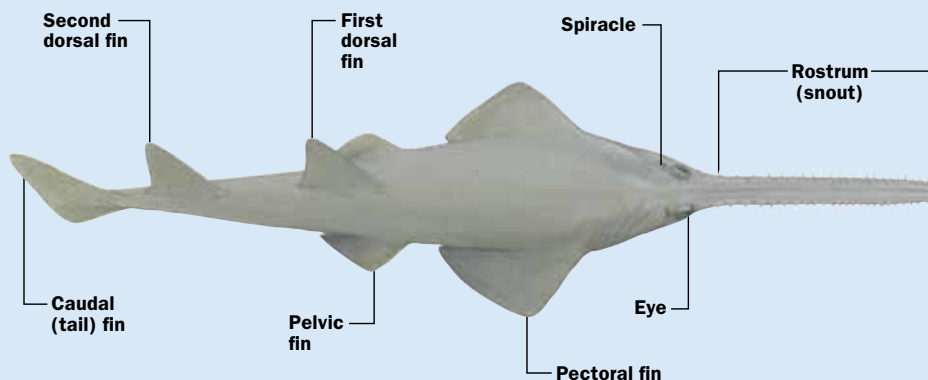
Shape: flattened, suited to spending time on the bottoms of rivers, estuaries and the ocean.

Spiracles: not to be mistaken for ears, these openings, behind and slightly up from the eyes, are used for taking in water while lying on the riverbed or seabed.

Rostrum: long snout resembling a saw, with 'teeth' made of modified scales. The number of pairs of teeth varies between species and individuals, ranging from 18 to 28 pairs. The rostrum itself is made of cartilage sheathed in skin.

Caudal fin: the powerful caudal or tail fin is used for forward motion.

Pectoral, pelvic and dorsal fins: sawfish have two prominent dorsal fins on their backs that are used with pectoral fins for stability. The first dorsal fin of the freshwater sawfish starts in front of the pelvic fins while the same fin in dwarf and narrow sawfish starts above the pelvic fins or slightly behind them.



Eyes: positioned at the top of their heads so that sawfish can see even when they are partly buried in mud.

Nostrils (also called nares): like other rays, the mouths, nostrils and gill slits are on the underneath or ventral side of their bodies.

Skin: Resembles the sandpaper-like skin of sharks. Covered with very small, tooth-like scales called denticles.

Threats to sawfish in Western Australia

Unfortunately, sawfish life cycles, including their slow rates of growth and low numbers of offspring, mean their stocks are easily threatened.



This sawfish's rostrum has been illegally hacked off, probably for a souvenir. Photo: Dean Thorburn

Sawfish species that inhabit estuaries or rivers – such as the freshwater and dwarf sawfish – are particularly vulnerable because their reproductive and survival strategies are closely related to particular environments. Changes to water quality, habitat availability and land use (such as dams) can greatly affect them.

All sawfish are also at risk of being unintentionally caught by fishers as bycatch. This occurs throughout northern Australia during commercial fishing operations, as well as in rivers in the Kimberley due to the popularity of recreational barramundi fishing.

Sawfish carcasses with fishing line wrapped around the rostra have been found near fishing spots on the Fitzroy River. In addition, sawfish are sometimes illegally killed by people who want their rostra for souvenirs.

Although sawfish are probably not in immediate danger of extinction in Western Australia, they have become rare or locally extinct in many other parts of the world. Therefore, it has become even more important to look after sawfish in Australia.

Live births

Female sawfish produce eggs in their ovaries and these are fertilised by the males' sperm in a duct connecting the ovary to the uterus – rather like the fallopian tubes in humans. Like sharks, male sawfish have special organs called 'claspers' that they use to insert sperm inside the females.



These young freshwater sawfish were caught 150 kilometres upstream from the mouth of the Fitzroy River. They are about to be tagged and released. Photo: Dean Thorburn

From fertilization to birth takes several months. The sawfish embryos grow attached to eggs contained in the mother and when they are fully developed, they are born live. Narrow sawfish are known to have up to 23 pups.

A membrane protects the rostra of sawfish embryos inside the uterus. Just before birth their rostra harden. Shortly after birth, the membrane dissolves, allowing the young sawfish to hunt for small prey.

While growth rates vary between species and are poorly understood, young sawfish probably grow quickly. Freshwater sawfish may reach up to 100 centimetres in length by their first birthday and 140 centimetres by their second. As they reach maturity, their growth rate slows down.

Some sawfish species are thought to live to 30 years or more. Their relatively low rate of reproduction means that sawfish stocks are slow to recover if depleted.

i Because they will eat dead bait and strike at lures, sawfish are prone to being accidentally caught by anglers.

i In WA, all sawfish are totally protected from recreational and commercial fishing under State legislation. In addition, the freshwater sawfish is protected under Federal legislation. The export of sawfish and sawfish products is also restricted under the Convention on International Trade in Endangered Species (CITES).



This sawfish, injured by a fishing line, was released and is thought to have survived. Photo: Dean Thorburn

Releasing a sawfish

Most sawfish have a good chance of survival if caught on a fishing line or net and carefully released.

Fishers are advised to leave the sawfish in the water and, if possible, remove the hook and all of the line so that it can swim away. While a hook left in the sawfish's mouth will eventually corrode and dissolve, any fishing line attached to it may foul with aquatic organisms and could cause the sawfish a slow death. If the hook cannot be removed, fishers should at least remove the line.



Sawfish caught on a line or in a gillnet can be safely disentangled if care is taken. Photo: Dean Thorburn

Western Australian sawfish

Freshwater sawfish

Pristis microdon

Also called: Leichhardt's sawfish, largetooth sawfish.

Range: Some Asian and east African nations and northern Australia, including WA's Durack, Ord, Robinson and Fitzroy rivers, up to 400 kilometres inland. It appears juveniles live in rivers before moving to the ocean when mature to breed.

Size: Reportedly up to seven metres long. Immature specimens caught in rivers can be up to 2.8 metres long.

Conservation status: Critically endangered (IUCN Red List); vulnerable (EPBC Act); totally protected (FRMA).



Photo: Dean Thorburn

Dwarf sawfish

Pristis clavata

Also called: Queensland sawfish.

Range: Queensland, Northern Territory and WA, including King Sound near Derby and the lower reaches of rivers entering it, including the Fitzroy, May and Robinson rivers, as well as the ocean about as far south as Eighty Mile Beach.

Size: At least 3.1 metres.

Conservation status: Critically endangered (IUCN Red List); totally protected (FRMA).



Juvenile dwarf sawfish Photo: Stirling Peverell

Green sawfish

Pristis zijsron

Also called: Longcomb sawfish.

Range: Recorded off WA, Northern Territory, Queensland and Victoria. Prefers inshore marine areas and bays as a juvenile, while adults can be found in the ocean in water 70 metres deep or more. Adults are also known to frequent rivers and inshore waters to pup during the wet season.

Size: Up to 7.3 metres.

Conservation status: Critically endangered (IUCN Red List); rare or likely to become extinct (Western Australian Wildlife Conservation Act, 1950); totally protected (FRMA).



Photo: Rory McAuley

Narrow sawfish

Anoxypristis cuspidate

Range: Queensland, Northern Territory and WA, such as off Eighty Mile Beach. Occurs inshore and offshore to at least 100 metres.

Size: Up to 4.7 metres.

Conservation status: Critically endangered (IUCN Red List); totally protected (FRMA).



Photo: Stirling Peverell

The Fitzroy River: an important nursery

Scientists use non-fatal tagging studies to find out more about sawfish. Some tags are just a number to identify the animal. Others include acoustic or satellite devices to track their movements.

Tagging exercises show that the Fitzroy River, including its upper reaches, is an important nursery for freshwater sawfish until they are about five years old and about 2.8 metres long.

During the dry season, the river level drops and sawfish become restricted to waterholes. As food sources are eaten up, they become more inclined to strike at baits or lures.



Camballin Barrage impedes the upstream migration of young freshwater sawfish. Photo: Dean Thorburn

Camballin Barrage, 150 kilometres upstream from the limit of tidal influence, is thought to obstruct the upstream migration of juvenile freshwater sawfish during much of the year when the river level is below the height of the weir. Originally built to divert water for farming, the weir is now a fishing and tourism spot.



A dwarf sawfish tagged with a satellite device. Photo: Colin Simpfordorfer

References

Websites

Department of Fisheries, Western Australia:
www.fish.wa.gov.au

Department of Sustainability, Environment, Water, Population and Communities:
www.environment.gov.au

Marine Education Society of Australasia:
www.mesa.edu.au

Commonwealth Scientific and Industrial Research Organisation:
www.csiro.gov.au

World Conservation Union (IUCN):
www.iucnredlist.org

Murdoch University Centre for Fish and Fisheries Research:
www.cffr.murdoch.edu.au

Department of Fisheries, Freshwater Fish Distribution in Western Australia:
<http://freshwater.fish.wa.gov.au>

Papers

Thorburn, D.C., Morgan, D.L., Rowland, A.J. & Gill, H. S. 2007. **Freshwater Sawfish *Pristis microdon* Latham, 1794 (Chondrichthyes: Pristidae) in the Kimberley region of Western Australia.**

Morgan, D.L., Thorburn, D.C., Fenton, J., Wallace-Smith, H. and Goodson, S. 2005. **Influence of the Camballin Barrage on fish communities in the Fitzroy River, Western Australia.**

Thorburn, D.C., Morgan, D.L., Rowland, A.J. & Gill, H.S. 2004. **Elasmobranchs in the Fitzroy River, Western Australia.**

Thorburn, D.C., Morgan, D.L., Gill, H.S., Johnson, M., Wallace-Smith, H., Vigilante, T., Goring, A., Croft, I., Fenton, J. et al. 2004. **Biology and cultural significance of the freshwater sawfish (*Pristis microdon*) in the Fitzroy River, Kimberley, Western Australia.**

Thorburn, D. C., Morgan, D. L., Rowland, A.J., Gill, H.S. & Paling, E. (in press). **Life history notes of the critically endangered dwarf sawfish *Pristis clavata* Garman 1906 from the Kimberley region of Western Australia.**

Glossary

Bycatch

The accidental capture of unwanted or non-targeted fish or other animals

Dorsal

The back or upper surface of an animal

EPBC Act

The Commonwealth Government of Australia's *Environment Protection and Biodiversity Conservation Act 1999*

Endangered

At a very high risk of becoming extinct

Extinct

When there are no more living representatives of a species

FRMA

The Government of Western Australia's *Fish Resources Management Act 1994*

IUCN Red List

A list issued by the World Conservation Union describing the global conservation status of different plant and animal species

Pup

A newborn sawfish (also used to describe young sharks)

Rostrum

 (plural: rostra)

A long snout (in sawfish, this is lined with scales that resemble the teeth of a saw)

Ventral

The under side of an animal

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FURTHER INFORMATION

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