Six turtle species that live in Australia are all vulnerable or endangered, but there's hope

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Leatherback sea turtle. Credit: Public Domain

The six turtle species that call Australia home appear to have few similarities at first. Some turtles are large, others are much smaller. Some turtles are herbivores, others enjoy a varied diet. Unfortunately, their threats are almost universal.

Leatherback (Dermochelys coriacea), Loggerhead (Caretta caretta) and Olive Ridley Turtles (Lepidochelys olivacea) are all endangered. Flatback (Natator depressus), Green (Chelonia mydas), and Hawksbill Turtles (Eretmochelys imbricata) are all vulnerable and may become endangered.

Noting, the Kemp's Ridley (Lepidochelys kempii), also called the Atlantic Ridley Turtle, doesn't visit Australia.

Marine turtles feeling the heat

Sea turtles, as a group, are over 100 million years old, but they face existential threats from humans. For example, human-driven climate change could shift the number of turtles born male or female. This is because, for most marine turtles, external temperatures determine their offspring's sex.

Eggs incubated in sand at temperatures above 31°C produce all female turtle hatchlings, while those incubated below 28°C produce males. For broods incubated at temperatures in between, the eggs are a mix.

Even small temperature increases can have outsized effects. Researchers have already recorded warming trends correlating with a sex ratio of 99% females in green turtles. Because turtles can take decades to mature, and don't nest every year, it can take a while for problems in the population to show up.

Rising sea levels associated with a changing global climate also threaten marine turtles. Flooded nests mean losing whole broods, and destructive storms can cause erosion, making beaches less suitable for nesting.

Risks from coastal development

Coastal development, such as ports and marinas or oil and gas infrastructure, also risk turtle nesting. The Federal Government's Recovery Plan for Marine Turtles in Australia mentions several Western Australia (WA) islands popular with turtles including flatbacks.

As well as reducing suitable nesting habitat, and light pollution can disorientate hatchlings and disrupt nesting. Other potential risks include boat and human activity which bring increased noise and danger of boat strikes.

Plastic perils for turtles

Leatherback Turtles are remarkable. They grow over two meters (m) long and, as their name suggests, have a rubber-like back instead of a hard shell. Leatherbacks are deep-sea divers, reaching depths of over 1000m, and their soft shell can cope with the changes in pressure.

Leatherback turtles also have a fairly narrow diet, eating mainly jellyfish and squid. Their favorite foods put leatherbacks especially at risk of ingesting plastic waste. Our research shows marine turtles have a 22% chance of dying if they eat just one piece of plastic.

A big threat to Loggerhead Turtles is bycatch—unintended capture in fishing nets such as prawn trawls. Australian research shows Loggerhead annual breeding populations have dramatically declined since the 1970s. Estimates indicate a decrease from around 3,500 females in the 1976–1977 breeding seasons to fewer than 500 females in 1999–2000.

Feral threats to turtle eggs

Feral animals, including pigs and foxes, preying on unhatched turtles are a major threat to marine turtle species, including Olive Ridley Turtles.

Olive Ridley Turtles nest at five isolated sites in the Gulf of Carpentaria, off Queensland's northern coast. Known as northern Australia's biggest unspoilt wilderness, it also hosts Australia's largest concentration of feral pigs.

When pigs dig up and eat the unhatched eggs on a 50 kilometer (km) stretch of beach, that's around 2000 turtles. Repeat this every nesting season, it's a very serious problem.

Encouraging conservation efforts

In Queensland, Aak Puul Ngantam (APN) is a Cape York not-for-profit organization belonging to Southern Wik Traditional Owners. We've previously worked with APN's rangers to help manage the feral pig threat.

In 2021, we collaborated with APN and Microsoft on a world-first AI-infused cloud-based system to protect turtles. Automating and accelerating turtle nest monitoring helped give Indigenous rangers the best chance of protecting nests and controlling predators.

Our Flatback Futures project works in partnership with the WA state government to conserve and protect Flatback Turtles. It's part of WA's Department of Biodiversity, Conservation and Attractions (DBCA)'s North West Shelf Flatback Turtle Conservation Program (NWSFTCP).

NWSFTCP survey, monitor, and research turtles, working to reduce interference to turtle breeding and feeding locations. Flatback Futures combines information about the turtles and the community, acts on the results, and finds ways to adjust to change.

Elsewhere, turtle excluder devices for preventing bycatch have been compulsory since 2000 in northern Australia and eastern Queensland.

The Queensland government reports a rebound in nesting Loggerhead Turtle numbers.

The Australian Government's Threatened Species Action Plan includes nest cooling methods, helping balance the climate's impact on unhatched Olive Ridley Turtles.

In 2019, a team of researchers led by Dr. Ben Mayne discovered how to use DNA to calculate marine turtle lifespans. Ben's DNA-based method is aiding conservation efforts.

"Before our study, out of the world's seven marine turtle species, only green turtles had a reliable lifespan estimate," Ben said.

"Turtle lifespans have been so difficult to determine because turtles have long lives and migrate vast distances throughout the world's oceans. Knowing their natural lifespans is essential for wildlife management because it is used for population modeling."

Researchers found a correlation between natural lifespan and species that weigh more and have longer shells. Leatherback Turtles can reach two meters long and live for 90 years, while smaller flatbacks live a comparatively short 50 years.

Some uplifting news

Some species of marine turtles (not including flatbacks) migrate vast distances between foraging areas and nesting beaches. In 2020, researchers tracked a loggerhead swimming 37,000 kilometers from South Africa to Western Australia.

In March 2024, a conservation volunteer found an Olive Ridley Turtle nest on Queensland's east coast for first time. Researchers have

previously only found the turtles nesting in the Gulf of Carpentaria, despite 50 years of surveys.

Long distance migration is common for some of these ancient turtle mariners. Published research records hawksbills migrating over 2,400km, and ships have spotted Olive Ridley Turtles over 3,500km from shore. The turtle nesting on Queensland's Campwin Beach is thought to have traveled close to 2,000km.

So much of our science is benefiting these ancient marine turtle mariners. From our Ending Plastic Waste and AquaWatch Australia Missions, to oceanographic research on coral reefs, marine health, and climate change. We hope to support turtle preservation for generations to come.

Provided by CSIRO

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