

## Priority Threats to Sunshine Coast Marine Turtles

### Climate change and variability

Climate change and variability is of particular concern for marine turtle nesting on the Sunshine Coast due to predicted changes to sand, air and sea temperatures, extreme weather, sea level rise, ocean acidification, reduced reproductive success, altered species ranges, nesting habitat availability, diminished survivorship and amplified coastal erosion that increases the risk of doomed clutches laid at or below the high tide level or exposed through extreme weather events.

### Light pollution

With population growth and proximity to Brisbane, the Sunshine Coast is an identified hotspot for altered light horizon impacts. Dark skies along the Sunshine Coast nesting beaches are an essential requirement for nesting marine turtles and hatchling success. Light pollution (excess artificial light spill and sky glow) often increases with urban and/or industrial development in the vicinity of nesting beaches (including direct light fall on nesting beaches and adjacent coastal waters and ambient night glow from inland development, from industry, street lighting, community facilities and residential buildings). Increased sky-glow and altered light horizons at nesting beaches disrupt hatchling ocean-finding behaviour and cause increased hatchling mortality (8) (10). It can also alter adult turtle nest site selection with resulting reduction in adult female nesting population (e.g. altered adult flatback turtle ocean-finding behaviour has been identified up to 18km distant from an industrial plant on Boyne Island) (1).

### Terrestrial predation

Terrestrial predation includes take by feral and native animals such as foxes, dogs, goannas, and birds. Excessive loss of eggs and hatchlings from feral and native predators of more than 30% of a season's egg or hatchling production, threatens the sustainability of the population. Ongoing control measures (for example, installing fox exclusion devices on nests) have effectively reduced loss of eggs and hatchlings by predation on Sunshine Coast beaches from an estimated 27% to less than 3% (10).



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### Marine debris

Marine debris, mostly synthetic items, can cause injury, illness or death of marine turtles from ingestion (e.g. post-hatchling turtles eating micro-plastics while foraging in surface waters) or entanglement (e.g. fishing nets, including discarded 'ghost nets', hooks, line or rope and beach debris). Micro-plastics (small particles of hard plastic) are now found everywhere in the marine environment and are being increasingly recognised as a chronic risk. The East Australian Current and south-east Queensland are local hotspots for loggerhead turtles with ingested debris. This can have a delayed impact on recruitment of large immature turtles into shallow coastal waters of Queensland some 16 years later.

### Habitat modification

Habitat modification (including marine and terrestrial elements of the coastline) has the potential to spatially displace individuals or modify behaviour. Habitat modification includes the construction of ports and marinas, public infrastructure and coastal urbanisation, and removal of coastal vegetation to maintain or improve views. Loss or modification of habitat can result in short-term impacts such as physical displacement. Where habitat is lost permanently there is likely to be an impact on the viability of the stock utilising that habitat.



Image: Clean up for the Hatchlings.



Photo: Marine debris collected at Clean Up for the Hatchlings.



Image: TurtleCare citizen scientists and Council officers assisting the Queensland Museum with research and engagement. Photo: Adriana Watson.

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### Recreation activities

Recreation activities that focus on or occur near marine turtle habitat can have great conservation value by raising public awareness of the issues relating to marine turtles (e.g. watching nesting females and hatchlings on the beach or turtles feeding on coral reefs). However, when mismanaged, these operations have the potential for disturbing marine turtle nesting, internesting and foraging behaviour, ultimately impacting the viability of the stock. In addition, disturbance of nesting behaviour by beach goers (e.g. beach parties and fires, litter, and vehicles on beaches especially at night) can have negative unintended consequences for turtle nesting and hatching behaviour.

### Fisheries by-catch

Fisheries by-catch (or incidental catch) includes all non-target interactions between fishing gear and marine turtles. Incidental catch can affect juvenile, sub-adult, and adult turtles in foraging areas, along migration routes or in internesting habitat. Interactions can be with commercial or recreational fisheries and includes shark control programs using baited drum lines and set nets. Reports of two leatherback deaths in south-east Queensland in 2020 appear linked to negative interaction with shark control nets.

### Chemical and terrestrial discharge

Sediments, nutrients, and a wide variety of pollutants can enter marine turtle habitat through processes including dumping, run-off from urban, agricultural or industrial sources; effluents; atmospheric deposition; and leakage. On the Sunshine Coast, chemical and terrestrial discharge can result from urban runoff, effluent treatment and land use changes in the catchment. Discharge of increased nutrients, sediments and pesticides can occur from point source and non-point sources.

### Vessel disturbance

Increased turtle/vessel interactions can disrupt important benthic feeding and internesting behaviours and cause serious injury and/or death to individual marine turtles. This is particularly an issue in shallow coastal foraging habitats (such as the Pumicestone Passage) and internesting areas where there are high numbers of recreational watercraft and commercial vessels, and in areas of marine development. Boat strike was the most frequent cause of marine turtle mortality in Queensland waters between 2000 - 2011. 'Go slow' zones in important marine turtle foraging habitats with high marine vessel traffic areas is an effective management approach.