Sedimentation impacts in Moreton Bay: a priority knowledge synthesis

IMPACTS:

Sharks and Rays

DBC
David Brewer Consulting

THE MORETON BAY FOUNDATION

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This impact statement is drawn from

Sedimentation Impacts in Moreton Bay, a priority knowledge-synthesis

The report was commissioned by The Moreton Bay Foundation in 2025 to summarise key evidence on how sedimentation affects Moreton Bay's coastal and marine ecosystems, and the ecological and cultural values they support. The report brings together published and grey literature, conceptual models, and expert review to provide a clear, high-level understanding of sedimentation pressures, their impacts, and remaining knowledge gaps.

This standalone document can be found in the full report. Where references are made to other sections, these are indicated by this symbol: †. A full list of external citations, data sources, and methods used in this document is included in the complete report, available at **moretonbayfoundation.org**

David Brewer Consulting (DBC) has prepared this report for The Moreton Bay Foundation under the contract titled 'TMBF Priority Knowledge Synthesis: Sedimentation Impacts in Moreton Bay'. Information about the Moreton Bay Foundation can be found at: https://moretonbayfoundation.org/

Authors:	David Brewer, Alex Milward
Approved:	David Brewer (Director, Upwelling Pty Ltd trading as David Brewer Consulting)
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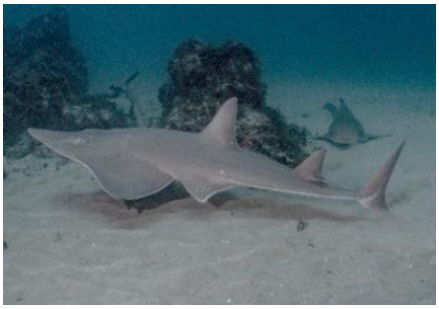
Sharks and Rays: Sedimentation Impact Statement



Critically Endangered Bottlenose wedgefish (Rhynchobatus australiae) in Moreton Bay
Photo credit: M. Erdmann

Status and trend summary

Despite historical and ongoing impacts, Moreton Bay still supports a high diversity and abundance of elasmobranchs, including many ray species that are common predators in intertidal zones. Table 1 provides a qualitative assessment of the shark and ray populations in Moreton Bay. The history of sharks and rays in Moreton Bay is largely characterised by long-term degradation, primarily due to human activities, with major declines indicated since pre-human times.

The International Union for Conservation of Nature (IUCN) Red List notes that 68% (30 of 45) shark species, and 67% (20 of 30) ray species that occur in Moreton Bay are Critically Endangered, Endangered, Vulnerable or Near Threatened. The absence of comprehensive baseline and monitoring data for most elasmobranch species makes it difficult to assess the current condition of these populations. However, the availability of status assessments, along with the likely impacts of habitat degradation, fishing, and pollution on these relatively vulnerable species, dictates that the current condition of shark and ray populations in Moreton Bay can be rated as 'Fair' with 'Medium' confidence.

Sedimentation in Moreton Bay, primarily driven by human activities in the catchment and flood events, has significantly altered fish habitats and assemblages, which are crucial for shark populations. Fine, muddy sediments deposited by rivers can modify the persistence of ray feeding pits, and increased turbidity is a crucial factor influencing the distribution of rays, as they are sensitive to changes in water quality, including salinity, temperature, dissolved oxygen, and pH. Hence, a condition trend rating of 'Declining' with 'Medium' confidence is applied. The contribution of sedimentation to the current condition and the condition trend is rated as 'Unknown' due to the broader range of impacts on these species. However, this rating is assigned with 'Low' confidence due to a lack of specifically targeted studies.

Table 1. Qualitative assessment of the overall status and trend in condition, and of the likely severity and direction of sedimentation-specific impacts on sharks and rays in Moreton Bay.

Value condition assessment	Assessment	Confidence
Current condition	Fair	Medium
Contribution of sedimentation to the current condition	Unknown	Low
Condition trend	Declining	Medium
Contribution of sedimentation to trend	Unknown	Low

Overview

Moreton Bay has a high species diversity of sharks and rays (elasmobranchs) (Pierce, 2008), with 69 elasmobranch species recorded by Johnson (2010). This diversity is attributed to the Bay's geographic location at the interface between temperate and tropical biomes, combined with its diverse range of sheltered habitats (Dudgeon *et al.*, 2019).

Johnson (2010) recorded 41 species of sharks in Moreton Bay and adjacent waters. However, a total of 44 species have been identified as occurring in the Bay for this current project, compiled from available literature as of July 2025. This includes species present across various areas, including coastal Moreton Bay, Flinders Reef, Flat Rock, Southport Seaway, and offshore waters (40–200 m depth) (Johnson, 2010).

A total of 29 species of rays have been identified as occurring in the Bay for this current project, which included 21 species of stingrays (suborder Myliobatoidei) and eight species of batoid rays, which include the shovelnose rays (guitarfish), wedgefish, electric rays and sawfish (Johnson, 2010). The Bay supports a relatively high diversity of ray species, particularly those that use the intertidal zone extensively, where they have been identified as the most common large predators in the shallow margins of the Bay (Pierce, 2008).

Population Status

Sharks and rays are highly susceptible to anthropogenic influences due to their life-history characteristics, including low fecundity, slow growth, and late sexual maturity (Kock *et al.*, 2013). As Moreton Bay is surrounded by one of the world's fastest-growing urban areas, resident sharks and rays may be at particular risk from anthropogenic processes, such as habitat degradation, pollution and fishing. However, there is little information available (e.g., local monitoring or population assessments) from which to compile estimates of the population status for most species.

At a broader, but indicative level, the susceptibility of shark and ray species is reflected by the high proportion of species that are listed as being at some level of risk on the IUCN Red List (IUCN, 2025). The most recent global analysis, in which experts assessed 1,199 chondrichthyan (shark, ray, and chimaera) species against IUCN Red List criteria and found 391 species (32%) qualified as either Critically Endangered, Endangered, or Vulnerable (Dulvy *et al.*, 2021). A recent Fisheries Research and Development Corporation (FRDC) report card for Australia's 322 chondrichthyan species (Current Shark and Ray Report) noted that in fishery assessment terms, 63 species were either recovering (11), depleting (15), depleted (19) or undefined (18); with 230 species assessed as sustainable (Fisheries Research and Development Corporation, 2023a).

A summary of the IUCN classifications for sharks and rays in the Bay is provided in Table 2. Lists of the shark and ray species that occur in Moreton Bay, along with their relative abundances and IUCN classifications, are presented in Table 3 and Table 4. These status indicators reveal that 68% (n=30) of the 45 shark species, and 67% (20) of the 30

ray species that occur in Moreton Bay (Johnson, 2010) are either Critically Endangered, Endangered, Vulnerable or Near Threatened. The Green sawfish (*Pristis zijsron*), for example, has not been recorded in Moreton Bay since the 1960s (Pierce, 2008). Its disappearance from local records indicates a significant conservation concern due to anthropogenic impacts.

Fishing is one of the main human pressures that impacts shark and ray populations (Pierce, 2008; Gilby *et al*., 2019c; Olds *et al*., 2019). Gilby *et al*. (2019c) note that many sharks and rays can be significantly affected by fishing outside the boundaries of marine reserves. Some shark species are fished commercially in Queensland and have fishery assessments in place (Fisheries Research and Development Corporation, 2023b). However, they are assessed at the broader stock level, which is usually a much larger region than Moreton Bay alone (see Queensland Fisheries).

Pierce (2008) notes that shovelnose rays and the Estuary Stingray (*Hemitrygon fluviorum*) - an Australian endemic species) are threatened coastal species impacted by commercial and recreational fisheries (as well as habitat modification and pollution) (Pierce, 2008). Moreton Bay is considered an important population centre for the Estuary Stingray, due to its suitable habitat, including seagrass meadows and mangroves (Pierce, 2008). However, this species faces various anthropogenic threats, including from habitat degradation, pollution, recreational line-fishing, and coastal commercial fisheries (Pierce, 2008). The Blue-spotted stingray (*Neotrygon australiae*) is a common bycatch in demersal prawn trawl fisheries that accounted for 53.8% of elasmobranch catches (Pierce, 2008). However, the relatively recent implementation of bycatch reduction devices in this fishery has substantially reduced interactions with medium and large rays in the Bay (e.g. Brewer *et al*., 2006).

Table 2. Number of species of sharks and rays that occur in Moreton Bay and their current listing status by the IUCN. See Table 3 for species-specific detail.

IUCN Listing	No. of shark species
Critically endangered	3
Endangered	9
Vulnerable	11
Near threatened	7
Least concern	13
Data deficient	1
IUCN Listing	**No. of ray species**
Critically endangered	3
Endangered	4
Vulnerable	6
Near threatened	6
Least concern	7
Data deficient	2

Eight elasmobranch species were caught by extensive mesh-netting in the intertidal and subtidal zones of Moreton Bay (Pierce, 2008). These included six stingray species (White-spotted eagle ray [*Aetobatus narinari*], Estuary stingray, Black-spotted whipray [*Maculabatis astra*], Brown whipray [*M. toshi*], Reticulate whipray [*H. uarnak*], and the Blue-spotted stingray). Numerically, stingray catches were dominated by the Blue-spotted stingray, making up 53.8% of catches, and the Estuary stingray, accounting for 22.2% (Pierce, 2008). While stingrays are susceptible to being taken as bycatch in trawl, seine and gill nets, in the tunnel net fishery of Moreton Bay, stingray mortality is very low due to well-developed bycatch reduction practices (M. Giaroli, pers. comm.).

In evidence of an additional impact on the rays of Moreton Bay, a study investigating Perfluoroalkyl substances (PFAAs) in six species (White-spotted eagle ray, Estuary stingray, Black-spotted whipray, Brown whipray, Reticulate whipray, and Blue-spotted stingray) from a mass stranding event on North Stradbroke Island (Minjerribah) found that PFAAs were detectable in all liver samples (Townsend *et al.*, 2019). However, the cumulative impact of this and other pressures on shark and ray populations is unknown.

Despite the ongoing re-zoning of the Moreton Bay Marine Park to enhance habitat protection, the broader protection of elasmobranch diversity has not been an explicit focus of the marine park rezoning, except for specific species like the Grey nurse shark (Carcharias taurus) (Pierce, 2008).

The absence of comprehensive baseline and monitoring data for most elasmobranch species, along with the impacts from habitat degradation, fishing and pollution, makes it difficult to assess the current condition of the populations of these relatively vulnerable species in Moreton Bay.

Value

Ecological value

Sharks and rays contribute to the ecological system through their roles as predators, their influence on habitat structure, and their broader contribution to biodiversity and food web dynamics (Giaroli *et al.*, 2024). Many species move widely among different habitats (e.g., for feeding or spawning), thereby functionally linking assemblages, food webs, and ecosystems across the diverse seascape of Moreton Bay (Olds *et al.,* 2019).

As apex predators, sharks play a crucial role in maintaining the balance of marine food webs (Gilby *et al.*, 2019c). For example, the Australian weasel shark (*Hemigaleus australiensis*) is common in Moreton Bay and is noted for its 'cephalopod dietary specialisation' (Olds *et al.*, 2019), an essential predator-prey relationship. These, along with the many other predatory and scavenging roles played by sharks and rays, help sustain biodiversity and modify benthic communities (Olds *et al.*, 2019).

Stingrays play a crucial ecological role in structuring intertidal and subtidal soft-bottom ecosystems by feeding directly on benthic invertebrates and influencing sediment turnover through the excavation of feeding pits or depressions (Figure 1) (Pierce, 2008;

Giaroli *et al.*, 2024). Their excavation of buried prey creates sediment turnover, which can influence the succession of invertebrate communities (Pierce, 2008; Giaroli *et al.*, 2024). These feeding pits also provide nursery habitat for commercially important nekton (free swimming organisms), such as post larval whiting (*Sillago* spp) and penaeid prawns (Giaroli *et al.*, 2024). Eastern Moreton Bay sites with higher ray feeding pit densities are estimated to host approximately 600,000 post-larval whiting and eight million post-larval penaeid prawns, underscoring their importance for local fisheries (Giaroli *et al.*, 2024).

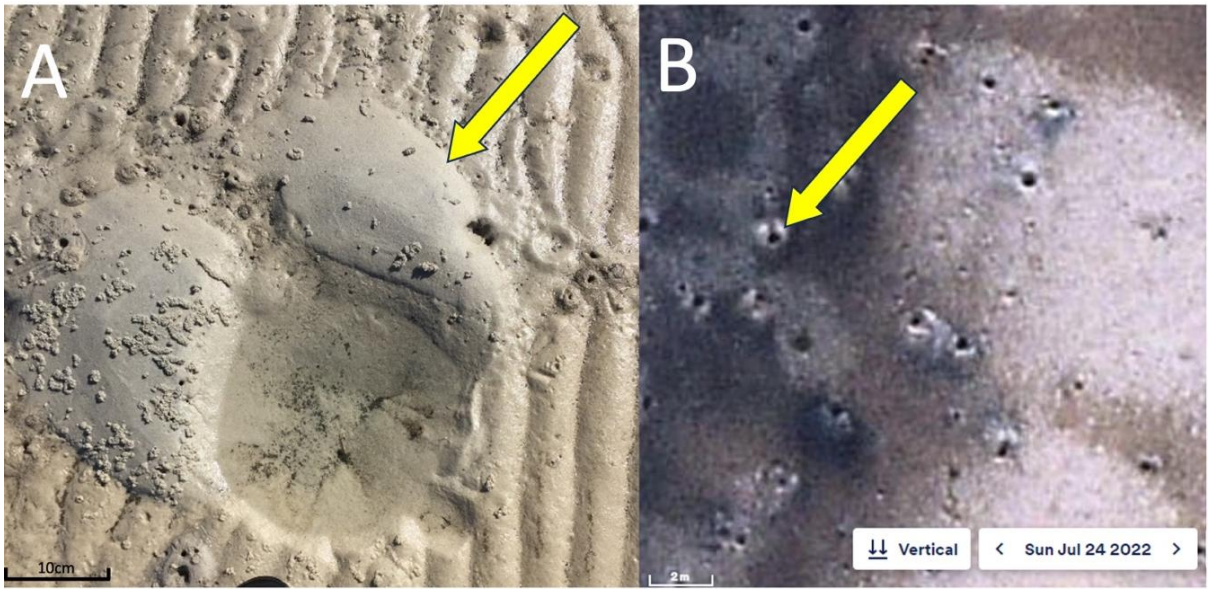


Figure 1. Images of stingray feeding pits in Quandamooka (Moreton Bay), Australia. (a) A water-filled stingray feeding pit with postero-lateral fans of sediment displaced by a foraging stingray. Bradbury's Beach, Dunwich (Goompi), Minjerribah (North Stradbroke Island). (b) Stingray feeding pits at Hays Inlet (−27°15 035 00 , 153°4 019 00), western Moreton Bay, showing postero-lateral sediment fans from a Nearmap aerial image. The image date function is visible in the lower right-hand corner and identifies the date the image was taken. Yellow arrows indicate a left sediment plume with respect to the orientation of the stingray. (from Giaroli et al., 2024).

Cultural value

Sharks and rays hold significant cultural value for Moreton Bay's Indigenous communities, particularly as sacred Aboriginal totems for saltwater people in coastal areas (Pinner *et al.,* 2019). The significance of these animals is also reflected in Aboriginal place names**.** For example, 'Ngarang-Wal' (the name for the Gold Coast Aboriginal Association Incorporated) translates to 'Shovel-nosed shark' and is an Aboriginal totem. This indicates a symbolic association with aspects of Aboriginal culture and connecting Indigenous people to these places as an expression of their historical, cultural and spiritual belonging (Ross *et al.,* 2019a).

Economic value

Although not directly targeted, the economic value of sharks and rays in Moreton Bay is primarily described through their contribution to the region's overall fisheries, both commercial (worth $24 million/year) and recreational (which estimated expenditure of $194 million/year) and indirectly through their ecological roles and conservation status (Olds *et al.*, 2019; Thurstan *et al.*, 2019).

As noted above (see Ecological value section), stingray feeding pits play a crucial role as nursery habitats for commercially important nekton, including post-larval whiting and penaeid prawns (Giaroli *et al*., 2024). This ecological function provides significant social and economic benefits to local communities by supporting valuable fisheries (Giaroli *et al*., 2024). For example, the Eastern king prawn (*Penaeus plebejus*) harvest in Queensland was valued at $64.8 million in 2019, and Sand whiting (*Sillago ciliata*) harvested from south-eastern Queensland had a retail value of over $8.6 million (Giaroli *et al*., 2024).

History

The history of shark and ray populations in Moreton Bay is characterised mainly by long-term degradation and altered abundance, primarily due to human activities (Pierce, 2008; Taylor, 2008; Olds *et al*., 2019). Major declines in large marine carnivores, including sharks and rays, have been reported for Moreton Bay since pre-settlement times, suggesting these vertebrate populations are severely degraded (Pierce, 2008).

European land-use practices significantly increased sediment flux into inshore regions by 1870 (Diggles, 2013). This, combined with organic enrichment from episodic flood events (starting 1887), is linked to the smothering of subtidal oyster reefs and broader ecosystem degradation that impacts fish and ray habitats (Diggles, 2013; Thurston *et al*., 2019) (e.g. see **† Section 5.7**). The expansion of canal estates, Brisbane Airport, and the Port of Brisbane has led to eutrophication and pollution, which has also likely altered the Bay's nekton community (Taylor, 2008).

Overall, water quality degradation and coastal urbanisation have significantly altered fish and elasmobranch assemblages and habitats, reducing diversity and abundance across estuaries, seagrass meadows, and coral reefs, which are vital for many shark and ray species (Pierce, 2008; Olds *et al*., 2019).

Sharks and rays have been extensively exploited by commercial and recreational fishers over many decades (Johnson, 2010; Thurstan *et al*., 2019). Combined shark catches from commercial net, line, and trawl fisheries increased significantly from 20,608 kg in 1988 to 53,026 kg in 2003, with species such as the Dusky shark (*C. obscurus*) and the Common blacktip shark (C. limbatus) identified as vulnerable to these activities (Taylor, 2008).

Despite historical and ongoing impacts, Moreton Bay still supports a high diversity and abundance of elasmobranchs, including many ray species that are common predators in intertidal zones (Taylor, 2008; Giaroli *et al*., 2024). The Bay continues to be important habitat and nursery grounds for both resident and migratory shark and ray species (Pierce, 2008; Taylor, 2008; Dudgeon *et al*., 2019) (Figure 2). However, comprehensive historical baseline data on species-specific abundance and community composition for elasmobranchs are limited, making precise long-term historical assessments challenging (Pierce, 2008; Taylor, 2008).

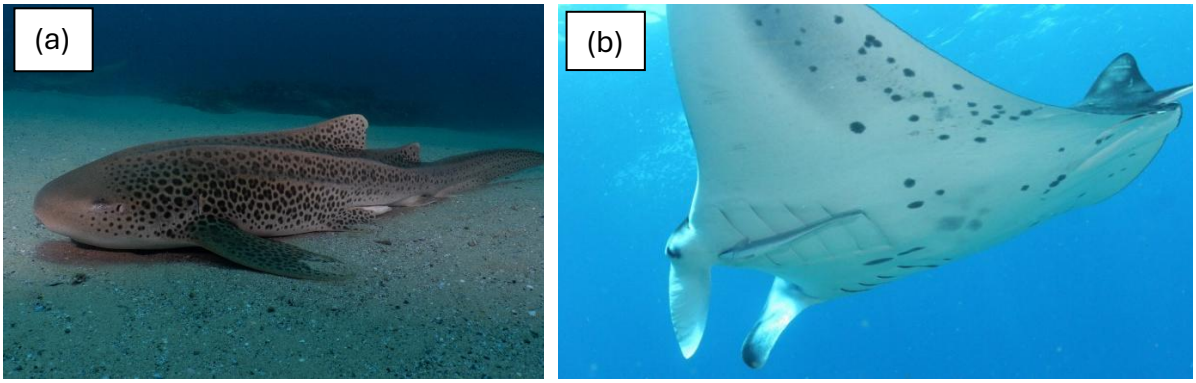


Figure 2. (a) The endangered Leopard shark (Stegostoma tigrinum), photo credit: M. Erdmann; (b) The vulnerable Reef manta ray (Mobula alfredi), Photo credit: K. Townsend.

Impacts of sedimentation

Sharks

Sedimentation in Moreton Bay, primarily stemming from human activities and flood events, has significantly altered fish habitats and assemblages, which are vital for shark populations (Dudgeon *et al.*, 2019; Olds *et al.*, 2019) (see conceptual model in Figure 3). Sedimentation contributes to increased turbidity, which is a crucial factor influencing the distribution of sharks (Pierce, 2008; Taylor, 2008). The juveniles of some shark species, such as the Pigeye shark (*C. amboinensis)*, the Dusky shark, and the Nervous shark (C. cautus), are predominantly found in the more turbid waters of the western Bay, suggesting a preference or adaptation to these conditions (Taylor, 2008). Here, high turbidity may confer an advantage for some sharks by reducing the ability of their teleost (bony fish) prey to see the predator and evade capture (Taylor, 2008). However, larger predatory sharks also occupy these turbid areas, posing a threat to smaller elasmobranchs (Taylor, 2008).

Sediment-laden floodwaters can lead to a reduction in overall fish abundance, thereby impacting the food sources for sharks and rays (Taylor, 2008; Henderson *et al.*, 2024). Additionally, sedimentation contributes to the accumulation of toxic trace elements in the marine environment, which can become bioavailable and impact species like stingrays (Townsend *et al.*, 2019).

Rays

Sedimentation from river inputs, especially in the western Bay, contributes to increased turbidity, which is a crucial factor influencing the distribution of stingrays, as they are sensitive to changes in water quality, including salinity, temperature, dissolved oxygen, and pH (Giaroli *et al.*, 2024).

Foraging stingrays leave pits on intertidal shores, with many of these pits becoming shallow pools as the tide recedes. They provide significant nursery habitats for the young of commercially important nekton, including whiting and prawns (Giaroli *et al.*, 2024). Pollution, poor water quality and settled sediments from flood events can exclude stingrays from such shores, preventing the creation of nursery pool habitats and halting the bioturbation (sediment turnover) by rays that helps maintain habitat

health. Importantly, the shores are also darkened by the covering of mud, which reduces their albedo (reflectiveness), leading to increased absorption of solar energy and warming. It is feared that nursery pools so affected will warm to temperatures lethal for juvenile prawns and whiting, turning their nurseries into death traps (I. Tibbetts, pers. comm.). The consequences may be dire for these animals and the ecological cascades that are linked to these species.

Three of the four most abundant rays in Moreton Bay – the Coral Sea mask ray (*Neotrygon trigonoides*), Estuary stingray, and Brown whipray – have limited freshwater penetration capacity (Giaroli *et al*., 2024). This limited tolerance means they must remain in higher-salinity water. Consequently, increased runoff and degraded water quality from urbanised, agricultural, and industrial catchments have likely contributed to their limited penetration into estuaries (Giaroli *et al*., 2024), thereby reducing their available habitat.

Sedimentation also facilitates the accumulation of toxic trace elements (e.g., arsenic, cadmium, copper, selenium) in the marine environment (Townsend *et al*., 2019). These elements, initially bound to mineral particles and organic matter in the sediment, can be liberated and become bioavailable, especially during rainfall and flood events (Townsend *et al*., 2019). This poses a risk to stingrays, as evidenced by studies showing accumulation of substances like perfluoroalkyl substances (PFAAs) in their livers following flood events, with smaller rays potentially taking up chemicals more rapidly and eliminating them more slowly (Townsend *et al*., 2019).

Poor water quality and the presence of pollutants have been linked with health disturbances and decreased reproductive health in elasmobranch populations (Cortés and Parsons, 1996). Reductions in habitat quality and quantity, such as those caused by sedimentation, have likely contributed to further population declines in stingrays (Pierce, 2008).

Rays are increasingly threatened with extinction, which may also compromise their key habitat features (e.g., feeding pits) on sedimentary shores (Giaroli *et al.,* 2024). The Estuary stingray's distribution largely overlaps with urbanised coastal areas in eastern Australia. This has led to the reduction, modification, and degradation of their habitat, which substantially increases the population-level risk to this species (Pierce, 2008).

Recommendations

To manage the impacts of sedimentation on shark and ray communities in Moreton Bay, most recommendations focus on reducing the influx of fine sediments, nutrients and pollutants from catchments and adopting informed management practices. Key recommendations include:

1. Implement effective catchment management, targeting reductions in nutrient and sediment loads (Diggles, 2013) by maintaining existing vegetation cover, restoring catchment riparian vegetation, and rehabilitation efforts in streams and tributaries (Gilby *et al*., 2016).

2. Implement intelligent design in urban water runoff systems (Gilby *et al.*, 2016).
3. Increase environmental monitoring and develop new strategies to reduce pollutant inputs to the Bay, as coordinated programs are currently deficient, making it difficult to understand the impact of major weather events that cause flooding (Townsend *et al.*, 2019).
4. Maximise the extent of natural habitats across estuaries to help mediate the impacts of floods, which transport sediment (Henderson *et al.*, 2024).
5. Strategically place marine reserves to account for water quality gradients and areas less impacted by riverine runoff and floods, enhancing their effectiveness (Gilby *et al.*, 2019a).

Expert reviews

Associate Professor Ian Tibbetts (School of the Environment, University of Queensland) and Dr Christine Dudgeon (School of Biomedical Sciences, University of Queensland) kindly provided expert review of the Sharks and rays: Sedimentation Impact Statement.

Table 3. List of sharks of Moreton Bay and abundance categories: A = abundant, C = common, U = uncommon, R = rare (from Johnson, 2010). Species listings under the IUCN Red List are indicated (taken from www.iucnredlist.org).

Shark Family/Species	Abundance	IUCN Listing
Chimaeridae		
Blackfin ghostshark *(Hydrolagus lemures)*	C	Near Threatened
Marbled ghostshark (*Hydrolagus marmoratus*)	U	Least Concern
Heterodontidae		
Crested horn shark (Heterodontus galeatus)	U	Least Concern
Odontaspididae		
Grey nurse shark (Carcharias taurus)	U	Critically Endangered
Alopiidae		
Thresher shark (Alopias vulpinus)	R	Vulnerable
Lamnidae		
Longfin mako (Isurus paucus)	R	Endangered
Shortfin mako (Isurus oxyrinchus)	U	Endangered
White shark (Carcharodon carcharias)	U	Vulnerable
Scyliorhinidae		
Grey-spotted catshark (Asymbolus analis)	U	Least Concern
Orange-spotted catshark (Asymbolus rubiginosus)	U	Least Concern
Sawtail catshark (Figaro boardmani)	U	Least Concern
Triakidae		
Gummy shark (Mustelus walkeri)	C	Data deficient
Hemigaleidae		
Australian weasel shark (Hemigaleus australiensis)	C	Least Concern
Snaggletooth shark (Hemipristis elongata)	R	Endangered
Carcharhinidae		
Australian sharpnose shark (Rhizoprionodon taylori)	U	Least Concern
Bull shark (Carcharhinus leucas)	C	Vulnerable
Common blacktip shark (Carcharhinus limbatus)	C	Vulnerable
Copper shark (Carcharhinus brachyurus)	R	Vulnerable
Dusky shark (Carcharhinus obscurus)	C	Endangered
Milk shark (Rhizoprionodon acutus)	U	Vulnerable
Nervous shark (Carcharhinus cautus)	U	Least Concern
Pigeye shark (Carcharhinus amboinensis)	C	Vulnerable
Sandbar shark *(*Carcharhinus plumbeus)	C	Endangered
Sicklefin lemon shark (Negaprion acutidens)	U	Endangered
Sliteye shark (Loxodon macrorhinus)	R	Near Threatened
Spinner shark (Carcharhinus brevipinna)	C	Vulnerable
Spottail shark (Carcharhinus sorrah)	C	Near Threatened
Tiger shark (Galeocerdo cuvier)	U	Near Threatened
Whitetip reef shark (Triaenodon obesus)	R	Vulnerable
Sphyrnidae		
Great hammerhead shark (Sphyrna mokarran)	U	Critically Endangered
Scalloped hammerhead shark (Sphyrna lewini)	C	Critically Endangered
Parascylliidae		
Collared carpetshark (Parascyllium collare)	U	Least Concern
Brachaeluridae		
Blind shark (Brachaelurus waddi)	U	Least Concern
Colclough's carpetshark (Brachaelurus colcloughi)	U	Vulnerable

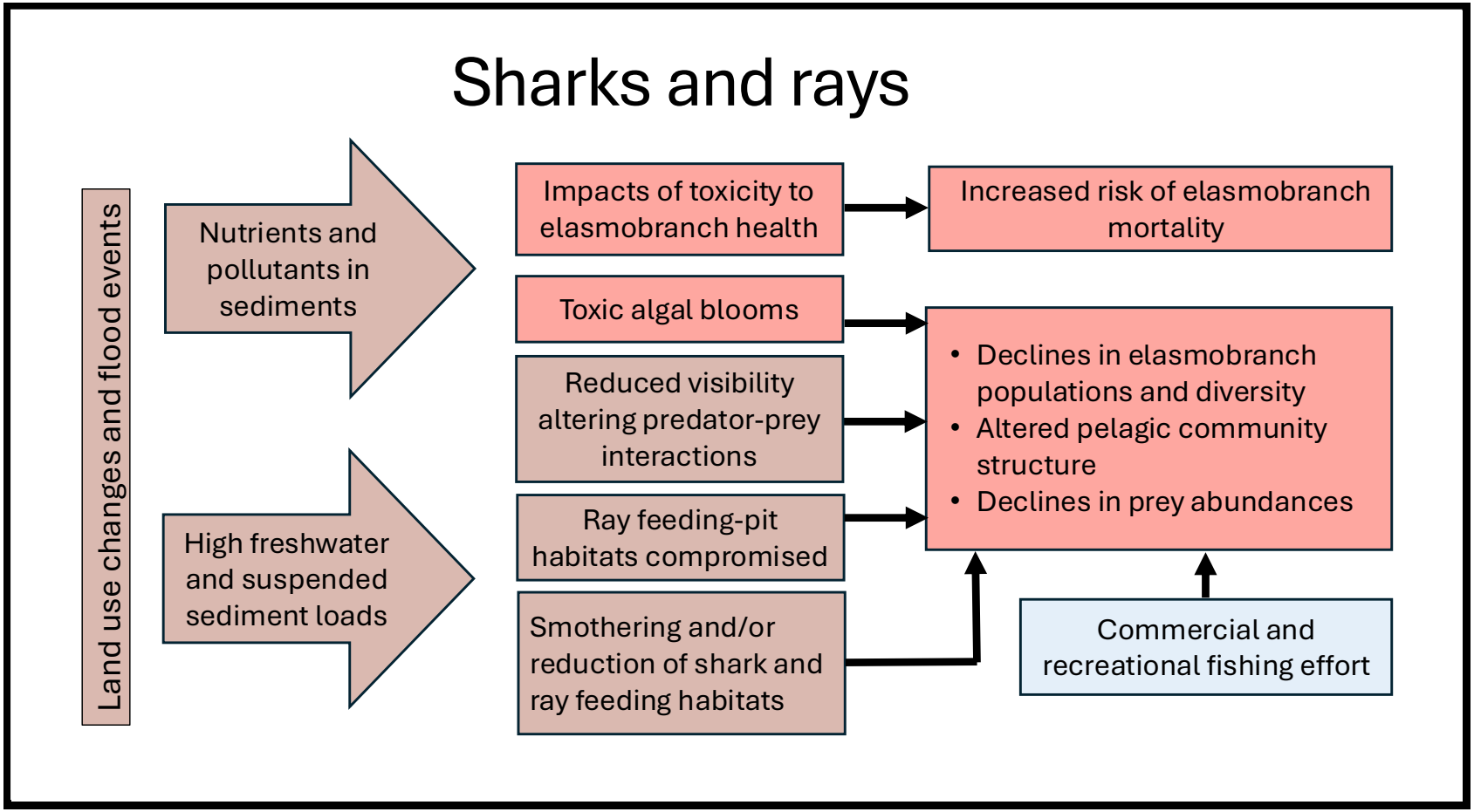
Shark Family/Species	**Abundance**	**IUCN Listing**
Orectolobidae		
Banded wobbegong (Orectolobus halei)	U	Least Concern
Ornate wobbegong (Orectolobus ornatus)	C	Least Concern
Spotted wobbegong (Orectolobus maculatus)	C	Least Concern
Hemiscylliidae		
Brownbanded bamboo shark (Chiloscyllium punctatum)	A	Near Threatened
Stegostomatidae		
Leopard shark (Stegostoma tigrinum)	C	Endangered
Rhincodontidae		
Whale shark (Rhincodon typus)	R	Endangered
Hexanchidae		
Bigeye sixgill shark (Hexanchus nakamurai)	R	Near Threatened
Squalidae		
Eastern longnose spurdog (Squalus grahami)	C	Near Threatened
Shortnose spurdog (Squalus megalops)	C	Least Concern
Squatinidae		
Eastern angelshark (Squatina albipunctata)	U	Vulnerable

Table 4. List of rays of Moreton Bay and abundance categories: A = abundant, C = common, U = uncommon, R = rare (from Johnson, 2010). Species listings under the IUCN Red List and EPBC Act 1999 are indicated (IUCN listings are taken from www.iucnredlist.org).

Ray Family/Species	Abundance	IUCN Listing
Pristidae		
Green sawfish (Pristis zijsron)	R	Critically Endangered
Rhinidae		
Bottlenose wedgefish (*Rhynchobatus australiae*)	C	Critically Endangered
Bowmouth guitarfish (Rhina Ancylostoma)	U	Critically Endangered
Rhinobatidae		
Eastern fiddler ray (Trygonorrhina fasciata)	U	Least Concern
Eastern shovelnose ray (Aptychotrema rostrata)	C	Least Concern
Torpedinidae		
Coffin ray (Hypnos monopterygius)	C	Least Concern
Rajidae		
Endeavour skate (Dipturus endeavouri)	C	Near Threatened
Sydney skate (Dipturus australis)	U	Near Threatened
Dasyatidae		
Australian whipray (Himantura australis)	R	Least Concern
Black-spotted whipray (Maculabatis astra)	U	Near Threatened
Blue-spotted stingray (Neotrygon *australiae*)	A	Data deficient
Brown whipray (Maculabatis toshi)	U	Least Concern
Coral Sea maskray (*Neotrygon trigonoides*)	C	Least Concern
Cowtail stingray (Pastinachus ater)	U	Vulnerable
Estuary stingray (Hemitrygon fluviorum)	U	Near Threatened
Pink whipray (Himantura fai)	U	Vulnerable
Reticulate whipray (Himantura uarnak)	C	Endangered
Round ribbontail Ray (Taeniurops meyenii)	U	Vulnerable
Thorntail ray (Dasyatis thetidis)	U	Vulnerable
Urolophidae		
Common stingaree (Trygonoptera Testacea)	U	Near Threatened
Kapala stingaree (Urolophus kapalensis)	R	Near Threatened
Yellowback stingaree (Urolophus sufflavus)	R	Vulnerable
Gymnuridae		
Australian butterfly ray (Gymnura australis)	C	Least Concern
Myliobatidae		
White-spotted eagle ray (Aetobatus *narinari*)	U	Endangered
Myliobatidae		
Cownose ray (Rhinoptera neglecta)	C	Data deficient
Japanese devil ray (Mobula mobula)	U	Endangered
Purple eagle ray (Myliobatis hamlyni)	T	Near Threatened
Pygmy devil ray (Mobula eregoodoo)	U	Endangered
Reef manta ray (Mobula alfredi)	U	Vulnerable
Southern eagle ray (Myliobatis tenuicaudatus)	R	Least Concern

Conceptual model - impacts of sedimentation on sharks and rays

Figure 3. Conceptual model that qualitatively describes the major impacts of sedimentation on shark and ray communities in Moreton Bay. Brown boxes signify sedimentation-related processes; blue boxes signify other relevant and interacting consequential inputs or impacts; red boxes signify adverse impacts/outcomes.



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This impact statement is drawn from

Sedimentation Impacts in Moreton Bay, a priority knowledge-synthesis

The report was commissioned by The Moreton Bay Foundation in 2025 to summarise key evidence on how sedimentation affects Moreton Bay's coastal and marine ecosystems, and the ecological and cultural values they support. The report brings together published and grey literature, conceptual models, and expert review to provide a clear, high-level understanding of sedimentation pressures, their impacts, and remaining knowledge gaps.

This standalone document corresponds to **Section 5.10** of the full report. A full list of external citations, data sources, and methods used in this document is included in the complete report, available at

moretonbayfoundation.org

Cover Images:
(Top) The endangered Leopard shark (Stegostoma tigrinum). Photo credit: M. Erdmann
(Bottom) The vulnerable Reef manta ray (Mobula alfredi). Photo credit: K. Townsend

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David Brewer Consulting