Expert Scientific Advice to Inform the CITES Non-Detriment Findings for Guitarfishes (Rhinobatidae), Wedgefishes (Rhinidae) and Giant Guitarfishes (Glaucostegidae)

- Goldeneye shovelnose ray (*Rhinobatos sainsburyi*)
- Whitespotted guitarfish/ bottlenose wedge fish (*Rhynchobatus australiae*)
- Eyebrow wedgefish (*Rhynchobatus palpebratus*)
- Bowmouth guitarfish (*Rhina ancylostoma*)
- Giant shovelnose ray (*Glaucostegus typus*)

Report for the Department of Climate Change, Energy, the Environment and Water

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Guitarfishes (Rhinobatidae), Wedgefishes (Rhinidae) and Giant Guitarfishes (Glaucostegidae)

Purpose of this document

This document provides expert scientific advice to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) – acting as Australia's CITES Scientific Authority – to form the basis for making a Non-Detriment finding (NDF) that the export will not be detrimental to, or contribute to trade which is detrimental to, the survival or recovery of this species. This expert scientific advice was developed using the CITES electronic Non-Detriment finding (e-NDF) tool for sharks and rays.

This document is not an NDF. Any conclusions reached or recommendations made in this document will be considered by DCCEEW when the associated NDF is made. However, the final conclusions and recommendations included in the associated NDF may differ from the recommendations included in this document based on further review of relevant information.

a) CITES Party	Australia
b) Management Authority (name, address, contact details)	Department of Climate Change, Energy, the Environment and Water Wildlife Trade Regulation Section John Gorton Building King Edward Terrace Parkes, ACT 2600 Australia wildlife.communications@dcceew.gov.au
c) Scientific Authority (name, address, contact details)	Department of Climate Change, Energy, the Environment and Water Sustainable Fisheries Section John Gorton Building King Edward Terrace Parkes, ACT 2600 Australia sustainablefisheries@dcceew.gov.au

Goldeneye Shovelnose ray (*Rhinobatos sainsburyi*)

Step 1: Preliminary Considerations

1.1a) Is the specimen subject to CITES controls?

a) Species	*Rhinobatos sainsburyi*
b) Will species be exported?	Yes
Comments/ Source(s) of information	Ray retention is prohibited in Australian fisheries across the species range in which it is known to be caught, and as such export of any products is unlikely. It is possible but unlikely that it is caught in a fishery and not yet reported from that fishery in which case, if that fishery does not prohibit ray retention, export may occur.
c) In what form is the product?	Mixed
Comments/ Source(s) of information	If any products were to be exported, these could be fins and meat.
d) Is the fishery domestic or high seas, or both?	Domestic
Is the fishery artisanal, large scale, or both?	Large scale
Comments/ Source(s) of information	McAuley and Kyne 2015, FRDC 2023.
f) Source of identification	Identified by expert immediately prior to export (morphology, DNA)
Comments/ Source(s) of information	The species will likely be identified when landed with fins attached, but if fins or meat are exported, the level of identification of the exported product may vary among state, Territory, and Commonwealth jurisdictions.
How likely is the product to be correctly identified:	Likely
Question 1.1(a): Is the specimen subject to CITES controls?	Yes

1.1b) From which stock will the specimen be taken/was the specimen taken?

a) Ocean Basin	Indian Ocean, Pacific Ocean
Comments/ Source(s) of information	It occurs in the eastern Indian Ocean off Australia. It is also taken in the Pacific Ocean, but most of its range is in the Indian Ocean (Last et al. 2016).
b) Is this a shared stock (i.e. occurring in more than one EEZ and/or the high seas)?	Yes
Comments/ Source(s) of information	Last et al. 2016.
c) If the stock occurs in more than one EEZ, which other Parties share this stock? (If unknown, type "Unknown")	Indonesia
Comments/ Source(s) of information	The species occurs off southern New Guinea, Indonesia (Last et al. 2016).
d) If a high seas stock, which other Parties fish this stock? (If unknown, type "Unknown")	Not a high seas stock
Comments/ Source(s) of information	The species occurs in continental shelf waters of Australia and southern New Guinea, Indonesia and thus, is not a high seas stock (Last et al. 2016).
e) Which, if any, RFB(s) cover(s) the range of this stock? (If unknown, type "Unknown")	Not applicable
Comments/ Source(s) of information	The species occurs in continental shelf waters and thus, is not highly migratory and not managed under the remit of the Western and Central Pacific Fisheries Commission (WCPFC) or the Indian Ocean Tuna Commission (IOTC).
f) Are all Parties listed above (which fish or share the stock concerned) members of the relevant RFB(s)?	Not Applicable.
Source(s) of information	
g) Are there geographical management gaps? If so, list in comments	No

Source(s) of information	All Australia commercial fisheries that interact with this species are regulated by management plans implemented by state, Territory, or Commonwealth governments.
h) How reliable is the information on origin?	Somewhat reliable
Comments/ Source(s) of information	With all fisheries managed, with limited entry provisions, and the requirement for some fisheries to report catches and provide catch disposal records the information on origin is somewhat reliable. However, there is no traceability system used to track products back to their origin.
Question 1.1(b): Can origin and stock be confidently identified?	Yes

1.2) Was (will) the specimen (be) legally obtained and is export allowed?

a) Strictly protected under wildlife legislation, a regional biodiversity Agreement, or (for a CMS Party) listed in CMS Appendix I?	No
Comments/ Source(s) of information	
b) Sourced from illegal fishing activities (e.g. in contravention of finning regulations, or where a TAC is zero or exceeded)?	No
Comments/ Source(s) of information	There is some IUU fishing in northern Australia, mostly from Indonesian vessels. However, it is currently believed that this effort is currently low given significant border controls that are currently in place. Illegal fishing by Australian operators is believed to be low, and many fishers are required to operate Vessel Monitoring Systems to monitor movements and ensure fishing only occurs in areas permitted.
c) Taken from a no-take marine protected area or during a closed season?	No
Comments/ Source(s) of information	No-take marine protected areas in Australia are well enforced, including by on-water and aerial patrols.
d) Taken in contravention of RFB recommendations, if any?	No

Comments/ Source(s) of information	
e) Listed as a species whose export is prohibited?	No
Comments/ Source(s) of information	There is no national prohibition on the export of this species. However, export of product is permitted only from fisheries that have a Wildlife Trade Operation (WTO) approval granted by the Minister for the Environment and Water or their delegate.
f) Of concern for any other reason?	No
Comments/ Source(s) of information	
Question 1.2: Were specimens legally obtained?	Yes

1.3) What does the available management information tell us?

1.3a) Global information

a) Reported global catch	There is no data on the global catch of this species. In Australia, although catch levels are unknown, they are likely minimal as there is minimal fisheries effort across its spatial and depth range, and if it is caught it would be released, as ray retention is prohibited in the Commonwealth, State, and Territory fisheries in which it may be caught. Catch levels are unknown in Indonesia.
Comments/ Source(s) of information	Watt et al. 2021; G. Johnson NT Fisheries, pers. Comm. 21 July 2022; A. Jarrett, NPF Industry Representative 18 August 2022.
b) Species distribution	The Golden Shovelnose Ray (*Rhinobatos sainsbury*) occurs in northwest Australia and southern New Guinea, Indonesia. In Australia, it occurs from Maningrida (Northern Territory) to the Monte Bello Islands (Western Australia). Depth range is 70–200 m. The most recent map is in Last et al. 2016.
Comments/ Source(s) of information	Last and Stevens 2009, McAuley and Kyne 2015, Last et al. 2016.
c) Known stocks/populations	Nothing is known of its population structure.
Comments/ Source(s) of information	FRDC 2023
d) Main catching countries	Australia and Indonesia

Comments/ Source(s) of information	FRDC 2023
e) Main gear types by which the species is taken	The species is mainly caught incidentally by trawl fisheries, and to a lesser extent by line fisheries.
Comments/ Source(s) of information	FRDC 2023
f) Global conservation status	IUCN Red List global status: Least Concern. Assessed in 2015.
Comments/ Source(s) of information	McAuley and Kyne 2015
g) Multilateral environmental agreements	CITES Appendix II. Listed at CoP19, effective date 23 February 2023. The species is not listed on any other multilateral environmental agreements and neither Australia or Indonesia has a CITES Reservation for this species.
Comments/ Source(s) of information	https://cites.org/eng/disc/species.php

1.3b) Stock/context-specific information

a) Stock assessments	No formal stock assessments. In Australian waters, a national Red List assessment lists this species as Least Concern.
Comments/ Source(s) of information	Kyne et al. 2021
b) Main management bodies	In Australian waters: Northern Territory: Department of Industry, Tourism and Trade (Fisheries Division) Western Australia: Department of Primary Industries and Regional Development Commonwealth: Australian Fisheries Management Authority. No gaps in management. In Indonesia: Ministry of Marine Affairs and Fisheries.
Comments/ Source(s) of information	

c) Cooperative management arrangements	The Government of Australia and the Government of the Republic of Indonesia cooperate in fisheries through the 1992 Fisheries Cooperation Agreement. Cooperation under the Agreement takes place under the Working Group on Marine Affairs and Fisheries. The Agreement provides for fisheries cooperation between Australia and Indonesia, and facilitates complementary management of shared stocks.
Comments/ Source(s) of information	https://www.agriculture.gov.au/agriculture-land/fisheries/international/cooperation/indonesia.
d) Non-membership of RFBs	Not Applicable
Comments/ Source(s) of information	
e) Nature of harvest	In Australia, the species is caught incidentally and is not targeted. Fishing effort varies across the Australian fisheries in which it is caught, with the highest (seasonal) effort in the Commonwealth Northern Prawn Fishery.
Comments/ Source(s) of information	Gaughan and Santoro 2021, Patterson et al. 2022, https://nt.gov.au/marine/commercial-fishing.

f) Fishery types	In Australia, the Goldeneye Shovelnose Ray is caught incidentally mainly by trawl fisheries, that is in the Commonwealth Northern Prawn Fishery (NPF) that targets prawns and in the Northern Territory Demersal Fishery (DF) and the Western Australian (WA) Pilbara Fish Trawl Fishery (PFTF) that target fish (DoF 2010, Kyne et al. 2021, FRDC 2023). It is also possibly taken incidentally by line in the Northern Territory Demersal Fishery and the Northern Territory Timor Reef Fishery (https://nt.gov.au/marine/commercial-fishing). It likely occurs too deep to be taken in the WA small inshore prawn trawl fisheries that mostly operate to a maximum depth of 50 m, and has refuge in deeper waters beyond the depths to which the other fisheries operate. The NPF generally operates at depths of 10–60 m, the DF at 40–100 m, and the PTFT at depths of 50–110 m (Kyne et al. 2021). Ray retention is prohibited in all of these fisheries and any Goldeneye Shovelnose Ray caught must be released, although post-release mortality is unknown (Gaughan and Santoro 2021; Sporcic et al. 2021, G. Johnson, NT Fisheries, pers. comm. 10 August 2022). Bycatch reduction devices are mandated in all the trawl fisheries, and while they have reduced the catch of large rays (>1 m total length) by >94%, they may not be as effective as excluding small rays such as this species (Brewer et al. 2006). The fishing effort is limited in most of these fisheries and the species would also receive considerable refuge from fishing; more than 90% of the area within the 200m isobath in Western Australian northern waters may have never been trawled due to a combination of spatial trawl closures and marine parks, and considerable areas of the Northern Territory are closed to trawling (Gaughan and Santoro 2021. Kyne et al. 2021).
Comments/ Source(s) of information	Brewer et al. 2006, DoF 2010, Gaughan and Santoro 2021, Kyne et al. 2021, Sporcic et al. 2021, FRDC 2023.
g) Management units	In Australian waters: Northern Territory: Department of Industry, Tourism and Trade (Fisheries Division) Western Australia: Department of Primary Industries and Regional Development Commonwealth: Australian Fisheries Management Authority. No gaps in management.
Comments/ Source(s) of information	

h) Products in trade	In Australia, the species is likely not currently traded as ray retention is prohibited in the fisheries in which it is caught. It is likely of minor commercial value due to its small size, minimal recovery of meat, and lack of current markets (McAuley and Kyne 2015). In Indonesia, it is possibly retained for trade in its fins, meat, skin, and cartilage (White et al. 2006).
Comments/ Source(s) of information	White et al. 2006, McAuley and Kyne 2015.

1.3c) Data and data sharing

a) Reported national catch(es)	In Australia, the Goldeneye Shovelnose Ray is considered common and is not retained as ray retention is prohibited in the fisheries in which it is caught. There is no information on catch levels, although based on limited effort in most of the fisheries in which it is caught, catches are likely minimal (Kyne et al. 2021, FRDC 2023). In the Commonwealth Northern Prawn Fishery (NPF), it may be encountered in the Joseph Bonaparte Gulf (JBG) and the western Northern Territory which overlap with the species range, although it was not included in an ecological risk assessment in JBG (Zhou et al. 2015), which suggests catches in the NPF are minimal.
Comments/ Source(s) of information	Kyne et al. 2021, FRDC 2023
b) Are catch and/or trade data available from other States fishing this stock?	*In Indonesia, there is no species-specific catch and trade data for this species. However, Rhinobatos species are caught in the demersal gillnet and tangle net fisheries and traded for their meat, fins, skin, and cartilage (White et al. 2006).*
Comments/ Source(s) of information	White et al. 2006
c) Reported catches by other States	The range of this species does not occur in any other States other than Australia and Indonesia.
Comments/ Source(s) of information	
d) Catch trends and values	There is no information on catch trends and values for this species. However, the Goldeneye Shovelnose Ray is reportedly common throughout its range and in Australia, fisheries effort across its range is limited, and the species has significant refuge from fishing pressure due to extensive trawl closures and marine parks. Therefore, the population trend is suspected to be stable and the species is assessed as sustainable in Australia.
Comments/ Source(s) of information	Kyne et al. 2021, FRDC 2023.
e) Have RFBs and/or other States fishing this	No, but this NDF will be made public in order to enable other range states (Indonesia) to make

stock been consulted during or contributed data during this process?	informed decisions for the management of the population as a whole.
Comments/ Source(s) of information	

Step 2: Biological and conservation concerns

2.1) What is the level of intrinsic biological vulnerability of the species?

a) Median age at maturity	5-15 years
Comments/ Source(s) of information	Age parameters are unknown but female age-at-maturity is estimated as 5–10 years, based on known age parameters of other *Rhinobatos* species (https://www.iucnredlist.org/).
b) Median size at maturity	40-200 cm TL
Comments/ Source(s) of information	Males mature at 40–45 cm total length (Last and Stevens 2009).
c) Maximum age/longevity in an unfished population	10-25 years
Comments/ Source(s) of information	Age parameters are unknown but maximum age is estimated as 7–24 years, based on known age parameters of other *Rhinobatos* species and other Rhinobatidae species (https://www.iucnredlist.org/).
d) Maximum size	under 100 cm TL
Comments/ Source(s) of information	Maximum size is at least 60 cm total length (Last and Stevens 2009).
e) Natural mortality rate (M)	over 0.4
Comments/ Source(s) of information	Natural mortality is unknown but it is estimated as >0.4 based on a congener Common Guitarfish (*Rhinobatos rhinobatos*) for which M has been estimated (D'Alberto et al. 2019).
f) Maximum annual pup production (per mature female)	2-15
Comments/ Source(s) of information	Annual pup production is unknown but estimated as 1–14 based on litter sizes and an annual reproductive cycle of other Rhinobatidae species (D'Alberto et al. 2019, https://www.iucnredlist.org/estimate).

g) Intrinsic rate of population increase (r)	over 0.35
Comments/ Source(s) of information	Intrinsic rate of increase is unknown but estimated as >0.35 based on a congener Common Guitarfish (*Rhinobatos rhinobatos*) for which r has been estimated (D'Alberto et al. 2019).
h) Geographic distribution of stock	Ocean basin, unrestricted, limited fragmentation
Comments/ Source(s) of information	Wide and continuous range across northwest Australia and into Indonesia (Last et al. 2016).
i) Current stock size relative to historic abundance	over 50% baseline abundance
Comments/ Source(s) of information	Based on limited fishing effort across its Australian range (which accounts for approximately 80–90% of its range) (McAuley and Kyne 2015, Last et al. 2016, Kyne et al. 2021, FRDC 2023).
j) Behavioural factors	Some behavioral factors to increase risk to stock
Comments/ Source(s) of information	The species is demersal and thus susceptible to capture by trawl gears (Kyne et al. 2021).
k) Trophic level	Low
Comments/ Source(s) of information	3.7; based on size and trophic levels of closest relatives (Froese and Pauly 2022).
Overall biological vulnerability:	Low level of vulnerability

2.2) What is the severity and geographic extent of the conservation concern?

Conservation or stock assessment status:

Has a Fisheries stock assessment been conducted?	No
Comments/ Source(s) of information	Although a stock assessment has not been conducted, in Australia, the stock is considered sustainable due to the low levels of fishing effort in its range (Kyne et al. 2021, FRDC 2023).
Has a National Redlist Assessment been conducted?	Yes
If yes, what is the National Redlist Assessment?	The species, population, or stock has been assessed and is not threatened (Least Concern or equivalent)
Comments/ Source(s) of information	The Action Plan for Australian Sharks and Rays 2021 (Kyne et al. 2021).

What is the Regional IUCN Redlist Assessment?	The species, population, or stock has not been assessed (Not Evaluated or equivalent)
Comments/ Source(s) of information	Although a Regional IUCN Red List assessment has not been conducted, the Australian range accounts for approximately 80–90% of the global range and as it is Least Concern in Australia, it would likely also be Least Concern at a regional level (Last et al. 2016, C. Rigby pers. comm. IUCN Shark Specialist Group Red List Authority Coordinator, 7 March 2023).
What is the Global IUCN Redlist Assessment?	The species, population, or stock has been assessed and is not threatened (LC or equivalent)
Comments/ Source(s) of information	https://www.iucnredlist.org/species/42721/68641936
What are the population trends?	Area of distribution and/or population density is stable or increasing
Comments/ Source(s) of information	The population trend is unknown but it is suspected to be stable in Australia based on limited fishing effort within its range and large areas within its range with no fishing effort, significant refuge at depth from fishing pressure, and considerable areas of the species range closed to trawling due to a combination of spatial trawl closures and marine parks (Kyne et al. 2021).
What is the geographic extent/scope of conservation concern?	Identified threats affect only one or a few local stocks of the species, but other stocks are not affected
Comments/ Source(s) of information	In Australia, the fishing pressure is limited across its range and the species has refuge from fishing pressure at depth as it occurs at depths of 70–200 m, and thus it has refuge at depth beyond the operational depth of some of the fisheries that operate across its spatial range (Kyne et al. 2021, FRDC 2023). There are considerable areas of the species range closed to trawling due to a combination of spatial trawl closures and marine parks (Kyne et al. 2021).
Overall geographic conservation concern:	Medium level of concern

Step 3: Pressure on the Species

3.1) What is the severity of trade pressure on the stock of the species concerned?

a (i) Magnitude of legal trade	Low
ii) What is the level of confidence in the answer?	High
Comments/ Source(s) of information	In Australia, the species interacts with mainly low effort fisheries and it is currently prohibited from retention in all fisheries in which it is caught.
b (i) Magnitude of illegal trade	Low
ii) What is the level of confidence in the answer?	High
Comments/ Source(s) of information	In Australia, The Australian Fisheries Management Authority has a compliance program that includes: fisheries officers undertaking regular land and sea patrols, and port inspections, and Vessel Monitoring Systems (VMS) on all vessels, all of which lessen the risk of illegal trade. Western Australia and the Northern Territory also conduct at-sea patrols and port inspections, and Western Australia also has aerial surveillance which all contribute to reducing the risk of illegal trade. There is relatively good documentation of domestic and international trade.
Overall trade pressure:	Low
Overall level of confidence:	High

3.2) What is the severity of fishing pressure on the stock of the species concerned?

a (i) Fishing mortality (retained catch)	Low
ii) What is the level of confidence in the answer?	High

Comments/ Source(s) of information	A small proportion of the population is removed by all fishing activities in Australia. The Goldeye Shovelnose Ray is common in Australia and may be caught by mainly trawl fisheries, and to a lesser extent line fisheries, although these fisheries all have limited effort across the species' range. There are also considerable parts of its Australian range that are not trawled. Ray retention is prohibited in all of these fisheries and any Goldeneye Shovelnose Ray caught would be released, although post-release mortality is unknown (Gaughan and Santoro 2021; Sporcic et al. 2021, G. Johnson, NT Fisheries, pers. comm. 10 August 2022). Bycatch reduction devices are mandated in all the trawl fisheries, and while they have reduced the catch of large rays (>1 m total length) by >94%, they may not be as effective as excluding small rays such as this species (Brewer et al. 2006).
b (i) Discard mortality	Medium
ii) What is the level of confidence in the answer?	Low
Comments/ Source(s) of information	Post-release mortality is unknown. It is suspected to be medium based on other guitarfish species and a wedgefish species. Other guitarfish have reported at-vessel-mortalities of 10–33% from trawls, and up to 25% on longlines, depending on the time spent hooked (Ellis et al. 2017). Post-release mortality was reported as 36% for *Rhynchobatos australiae* (Bottlenose Wedgefish) taken in Western Australian gillnets (Braccini and Murua 2021).
c (i) Size/age/sex selectivity	Unknown
ii) What is the level of confidence in the answer?	Not applicable (Severity of pressure is unknown)
Comments/ Source(s) of information	
d (i) Magnitude of illegal, unreported and unregulated (IUU) fishing	Low
ii) What is the level of confidence in the answer?	High

Comments/ Source(s) of information	IUU fishing of this species is inferred to be non-existent or extremely low. IUU fishing in northern Australia is typically conducted by small-scale fishers from neighboring countries. These fishers target shark, ray, reef fish, and sedentary species such as sea cucumbers. Most of these fishers operate close to Australia's maritime border and recently, these fishers have rarely come near to the Australian mainland (Department of Agriculture 2014). Australia has a National Plan of Action to Prevent, Deter and Eliminate IUU Fishing (https://www.afma.gov.au/fisheries-management/international-fisheries-management/iuu-fishing).
Overall severity of fishing mortality:	Medium
Overall level of confidence:	Medium

Step 4: Existing Management Measures

4.1) Are existing management measures appropriately designed and implemented to mitigate pressures affecting the stock?

Pressure - Magnitude of Legal Trade	
Existing management measure	Prohibition on retention of rays in the Northern Territory Demersal Fishery and Timor Reef Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Logbooks, observer coverage, fisheries inspectors, and Aboriginal marine rangers (https://nt.gov.au/marine/fisheries-compliance).
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)

Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of Legal Trade	
Existing management measure	Prohibition on retention of rays in the Western Australia Pilbara Fish Trawl Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Compliance Strategy (September 2018, Department of Primary Industries and Regional Development) (DPIRD 2018 - https://www.fish.wa.gov.au › corporate_publications). Strategies include: mandatory reporting, VMS and e-monitoring compliance technology, high visibility patrols, aerial surveillance, fish dealer inspections, and at-sea inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of Legal Trade	
Existing management measure	Prohibition on retention of rays in the Commonwealth Northern Prawn Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	The Australian Fisheries Management Authority has a compliance program that includes: logbook reporting, Fisheries Officers undertaking regular land and sea patrols, and port inspections, VMS on all NPF vessels, and analytical tools for a risk-based compliance approach (MRAG 2017).
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of Legal Trade	
Existing management measure	Northern Prawn Fishery - Marine Stewardship Council certification
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Marine Stewardship Council certification issued October 2019 (https://fisheries.msc.org/en/fisheries/australia-northern-prawn/). The Australian Fisheries Management Authority has a compliance program that includes: logbook reporting, Fisheries Officers undertaking regular land and sea patrols, and port inspections, VMS on all NPF vessels, and analytical tools for a risk-based compliance approach (MRAG 2017).
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of Legal Trade	
Existing management measure	Wildlife Trade Operation approval
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	All Australian fisheries that export CITES-listed species require Wildlife Trade Operation (WTO) approval to demonstrate compliance with Ecologically Sustainable Development principles. Fisheries are normally assessed every 3 years, with conditions placed on fisheries where changes or improvements are required. Fisheries that lack WTO approvals do not meet the requirement for issuance of a CITES permit. In some instances, WTO approvals have been revoked or not renewed for fisheries.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of Illegal Trade	
Existing management measure	Issuance of CITES permits
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	CITES Permits to be issued for all CITES listed species exported.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Bycatch reduction devices mandated in most of the Australian fisheries that interact with this species
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Bycatch Reduction Devices are inspected by Fisheries Officers that conduct at-sea patrols (which include boardings) and port inspections to ensure compliance with standards.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Partially

Pressure - Fishing mortality (retained catch)	
Existing management measure	Licensing system of vessels in all Australian fisheries
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Vessel lists maintained and at sea and port inspections by Fisheries Officers.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Prohibition on retention of rays in the Northern Territory Demersal Fishery and Timor Reef Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Prohibition on retention of rays in the Western Australia Pilbara Fish Trawl Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Compliance Strategy (September 2018, Department of Primary Industries and Regional Development) (DPIRD 2018 - https://www.fish.wa.gov.au › corporate_publications). Strategies include: mandatory reporting, VMS and e-monitoring compliance technology, high visibility patrols, aerial surveillance, fish dealer inspections, and at-sea and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Prohibition on retention of rays in the Commonwealth Northern Prawn Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Fins naturally attached
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	In all fisheries in which the species can be retained, there are fins naturally attached rules in place which prohibit the practice of shark finning. All Australian jurisdictions now have fins naturally attached regulations which require trunks to be landed with fins attached. There are some exceptions in place for these rules for the Northern Territory and Queensland but this species is not taken in the exempt fishery (Northern Territory Offshore Net and Line Fishery) or Queensland jurisdiction. These rules are enforced by the managing jurisdiction using prior reporting of landings and port inspections of vessels and landings.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Northern Prawn Fishery seasonal closures
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Strictly enforced by prohibition of vessels fishing outside of designated fishing season. The Australian Fisheries Management Authority has a compliance program that includes: logbook reporting, Fisheries Officers undertaking regular land and sea patrols, and port inspections, VMS on all NPF vessels, and analytical tools for a risk-based compliance approach (MRAG 2017).
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Northern Territory - spatial trawl closures
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Western Australia - Permanent area closures - combination spatial trawl closures and marine parks
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Trawl fishing gear restrictions
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Marine Parks
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	There are a number of Commonwealth and state/Territory managed Marine Protected Areas (MPAs) within the range of this species. This includes no-take areas, and multiple-use marine parks that contain a range of zones from open access to no-take and sanctuary zones. There are regular patrols, both on-water and aerial to ensure compliance with zoning plans. Some commercial vessels are required to carry a Vessel Monitoring System to monitor fishing locations relative to marine park boundaries.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Bycatch reduction devices mandated in most of the Australian fisheries that interact with this species
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Bycatch Reduction Devices are inspected by Fisheries Officers that conduct at-sea patrols (which include boardings) and port inspections to ensure compliance with standards.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Partially

Pressure - Discard mortality	
Existing management measure	Prohibition on retention of rays in the Northern Territory Demersal Fishery and Timor Reef Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Prohibition on retention of rays in the Western Australia Pilbara Fish Trawl Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Compliance Strategy (September 2018, Department of Primary Industries and Regional Development) (DPIRD 2018 - https://www.fish.wa.gov.au › corporate_publications). Strategies include: mandatory reporting, VMS and e-monitoring compliance technology, high visibility patrols, aerial surveillance, fish dealer inspections, and at-sea and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Prohibition on retention of rays in the Commonwealth Northern Prawn Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Northern Prawn Fishery seasonal closures
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Northern Territory - spatial trawl closures
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Western Australia - Permanent area closures - combination spatial trawl closures and marine parks
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Trawl fishing gear restrictions
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Marine Parks
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	There are a number of commonwealth and state/territory managed Marine Protected Areas (MPAs) within the range of this species. This includes no-take areas, and multiple-use marine parks that contain a range of zones from open access to no-take and sanctuary zones. There are regular patrols, both on-water and aerial to ensure compliance with zoning plans. Some commercial vessels are required to carry a Vessel Monitoring System to monitor fishing locations relative to marine park boundaries.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Size/age/sex selectivity	
Existing management measure	Bycatch reduction devices mandated in most of the Australian fisheries that interact with this species
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Bycatch Reduction Devices are inspected by Fisheries Officers that conduct at-sea patrols (which include boardings) and port inspections to ensure compliance with standards.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Partially

Pressure - Size/age/sex selectivity	
Existing management measure	Trawl fishing gear restrictions
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of IUU fishing	
Existing management measure	Licensing system of vessels in all Australian fisheries
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Vessel lists maintained and at sea and port inspections by Fisheries Officers.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of IUU fishing	
Existing management measure	Prohibition on retention of rays in the Northern Territory Demersal Fishery and Timor Reef Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Northern Territory Logbooks, observer coverage, fisheries inspectors, and Aboriginal marine rangers (https://nt.gov.au/marine/fisheries-compliance). Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of IUU fishing	
Existing management measure	Prohibition on retention of rays in the Western Australia Pilbara Fish Trawl Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of IUU fishing	
Existing management measure	Prohibition on retention of rays in the Commonwealth Northern Prawn Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of IUU fishing	
Existing management measure	Fins naturally attached
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Step 5: Non-Detriment Finding and related advice

5.0	Non-Detriment Finding and related advice	
5.1	Based on the outcomes of the previous sections, is it possible to make a positive NDF (with or without associated conditions)?	
	STEP 1: Can/should an NDF be made?	
	Section 1.1(a): Is the specimen subject to CITES controls?	Yes
	Section 1.1(b): Can origin and stock be confidently identified?	Yes
	Section 1.2: Were specimens legally obtained?	Yes
	STEP 2: Intrinsic biological vulnerability and conservation concern	
	Section 2.1: Intrinsic biological vulnerability:	Low level of vulnerability
	Section 2.2: Conservation concern:	Medium level of concern

	STEP 3: Pressure on species			**STEP 4: Existing management measures**
	Pressure	Level of severity (Questions 3.1 and 3.2)	Level of confidence (Questions 3.1 and 3.2)	Are the management measures effective at addressing the concerns/ pressures/impacts identified?
	Trade pressures:			
a)	Magnitude of legal trade	Low level of risk	High level of confidence	Yes
b)	Magnitude of illegal trade	Low level of risk	High level of confidence	Yes
	Fishing pressures:			
a)	Fishing mortality (retained catch)	Low level of risk	High level of confidence	Yes
b)	Discard mortality	Medium level of risk	Low level of confidence	Yes
c)	Size/age/ sex selectivity	High level of risk	Not applicable (Severity of pressure is unknown)	Yes
d)	Magnitude of illegal, unreported and unregulated (IUU) fishing	Low level of risk	High level of confidence	Yes

	Automated Recommendation: 0 to 2 - Not recommended 2.1 to 5 - Not recommended unless mitigation measures applied 5.1 to 8 - Possible with conditions 8.1 to 10 - Recommended		Recommended
	Based on the above information, can a positive NDF be made?	Yes, without conditions	Go to Section 6 and list recommendations for measures to improve monitoring/management under reasoning/comments below
	Enter any reasoning/comments:		
	Goldeneye Shovelnose Ray (*Rhinobatos sainsbury*) is common in Australia and assessed as Least Concern (IUCN) and Sustainable. The fisheries in which it is taken are limited effort and all prohibit the retention of rays. The species has significant refuge from fishing pressure as part of its depth range is beyond the depth of fishing operations, and there is extensive trawl closures and marine parks across its range. Management measures are effective at mitigating risks to the species in Australian waters. It is unlikely but possible that it is caught in a fishery and not yet reported from that fishery in which case, export may occur. Export of this species from Australian waters is considered to be non-detrimental to the survival of the species.		
	NDF expiry (recommended validity: 1 or 2 years):	5 years maximum.	

[1]

[1] This is an automated recommendation based on the information included in the eNDF tool, and is not a binding outcome. The department will consider all of the Scientific Advice provided in this document, however the inclusion of conditions in NDFs, or Wildlife Trade Operation approvals may differ from those suggested in this report.

Step 6: Automated recommendations

6.1) Recommendations ordered based on severity of pressure

Recommendation	Population monitoring (fisheries-independent data)
Is this recommendation applicable?	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	The aim is to address the two main information gaps on the impact of fisheries on the Goldeneye Shovelnose Ray. That is, to assess the effectiveness of bycatch reduction devices to exclude this species, and to investigate the at-vessel and post-release mortality of this species. An independent observer program could also improve information on catch levels of this species across Australian fisheries in which it is caught. The risk is that minimal catch levels of the species could hinder sufficient data collection to enable determination of impacts.
Potential lead agencies	Australian Fisheries Management Authority (prawn trawl impacts of bycatch reduction devices (BRDs) and post-release mortality (PRM)), the Northern Territory Government (trawl and line fishery impacts on PRM), and the Western Australian Department of Primary Industries and Regional Development (fish trawl impacts of BRDs and PRM).
Timeframe	Suggested 1- 5 years
Recommendation	Fisheries monitoring (fisheries-dependent data)
Is this recommendation applicable?	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	The aim is to improve the information on catch levels of this species across Australian fisheries in which it is caught by collecting data on catch levels.
Potential lead agencies	Australian Fisheries Management Authority, the Northern Territory Government, and the Western Australian Department of Primary Industries and Regional Development.
Timeframe	Suggested 1- 5 years
Recommendation	Monitoring of domestic and international trade volumes and characteristics

Is this recommendation applicable?	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	The domestic and Australian international trade could be monitored for any trade in products (likely fins and meat) from this species.
Potential lead agencies	Australian Fisheries Management Authority, the Northern Territory Government, the Western Australian Department of Primary Industries and Regional Development, and Australian CITES Authorities (international trade).
Timeframe	Suggested 1- 5 years

Step 6.2: Additional measures (user defined)

Additional measure	Wildlife Trade Operation approval
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	All Australian fisheries that export CITES-listed species require Wildlife Trade Operation (WTO) approval to demonstrate compliance with Ecologically Sustainable Development principles. Fisheries are normally assessed every 3 years, with conditions placed on fisheries where changes or improvements are required. Fisheries that lack WTO approvals do not meet the requirement for issuance of a CITES permit. At present, there is no clear method of compliance to ensure product from fisheries without WTO approval is not exported. Consideration should be given to the need to develop such a method.
Potential lead agencies	Department of Climate Change, Energy, the Environment and Water.
Timeframe	1-5 years

Wedgefishes (Rhinidae) and Giant Guitarfishes (Glaucostegidae)

Step 1: Preliminary Considerations

1.1a) Is the specimen subject to CITES controls?

a) Species	Whitespotted guitarfish/ bottlenose wedgefish (*Rhynchobatus australiae*) Eyebrow wedgefish (*Rhynchobatus palpebratus*) Bowmouth guitarfish (*Rhina ancylostoma*) Giant shovelnose ray (*Glaucostegus typus*)
b) Will species be exported?	Yes
Comments/ Source(s) of information	Ray retention is prohibited in some Australian fisheries across the species' ranges but permitted in others and thus products from the species may be exported.
c) In what form is the product?	Mixed
Comments/ Source(s) of information	Fins and meat (Kyne and Rigby 2019, Kyne et al. 2019abc). The majority of product exported is likely to be fins with meat likely to be rarely exported.
d) Is the fishery domestic or high seas, or both?	Domestic
Is the fishery artisanal, large scale, or both?	Large scale
Comments/ Source(s) of information	*Rhynchobatus australiae*, *R. palpebratus*, *Rhina ancylostoma*, and *Glaucostegus typus*: all species are caught incidentally in commercial Australian trawl and gillnet fisheries targeting prawns and finfish, respectively, and while mostly released they may be retained in some fisheries.
f) Source of identification	Identified by expert immediately prior to export (morphology, DNA)
Comments/ Source(s) of information	The species will likely be identified when landed with fins attached, but if fins or meat are exported, the level of identification of the exported product may vary among state, Territory, and Commonwealth jurisdictions.
How likely is the product to be correctly identified:	Likely

Question 1.1(a): Is the specimen subject to CITES controls?	Yes

1.1b) From which stock will the specimen be taken/was the specimen taken?

a) Ocean Basin	Indian Ocean, Pacific Ocean
Comments/ Source(s) of information	All species occur in northern Australian waters that include both the Pacific and Indian Oceans.
b) Is this a shared stock (i.e. occurring in more than one EEZ and/or the high seas)?	No
Comments/ Source(s) of information	*R. australiae*: within the Southeast Asia and Australian region, genetic information suggests little connectivity among maternal stocks and little demographic connectivity (Giles et al. 2016). No samples were included from Papua New Guinea in the study. There may be episodic migration at long-term genetic time scales between Australia and Indonesia (Giles et al. 2016). However, in contemporary time scales, movement is not of sufficient scale to warrant consideration of regional threats and fishing mortality outside Australian waters and thus, for the purposes of this NDF, it is not considered a shared stock (Simpfendorfer and Rigby 2023). *R. palpebratus*: nothing is known of its population structure. However, on a regional scale, there is no evidence of frequent movement of between Australia to regional neighbours (Papua New Guinea). That is, movement is not of sufficient scale to warrant consideration of regional threats or fishing mortality outside Australian waters and thus, for the purposes of this NDF, it is not considered a shared stock (Simpfendorfer and Rigby 2023). *Rhina ancylostoma*: nothing is known of its population structure or levels of movement that would regularly connect it to areas outside of Australian waters. There is one record of this species from open ocean waters in the Philippines (Forget and Muir 2021), but this is insufficient evidence to infer substantial movements between Australia and adjacent nations. That is, movement is not of

	sufficient scale to warrant consideration of regional threats or fishing mortality outside Australian waters and thus, for the purposes of this NDF, it is not considered a shared stock (Simpfendorfer and Rigby 2023). *Glaucostegus typus*: nothing is known of its population structure. However, on a regional scale, there is no evidence of frequent movement of the species between Australia and regional neighbours (Papua New Guinea). Tracking studies indicate high residency and site fidelity in Australian studies (Cerutti-Pereyra et al. 2014, White et al. 2014b, Henderson et al. 2017). That is, movement is not of sufficient scale to warrant consideration of regional threats or fishing mortality outside Australian waters and thus, for the purposes of this NDF, it is not considered a shared stock (Simpfendorfer and Rigby 2023).
c) If the stock occurs in more than one EEZ, which other Parties share this stock? (If unknown, type "Unknown")	*R. australiae*: the species occurs in multiple countries from Mozambique to the Solomon Islands but the stock in Australia is not considered shared in terms of shared fishing mortality and threat impacts. *R. palpebratus*: the species occurs mainly in Australia and ranges to southern Papua New Guinea with a few disjunct records from Thailand and Taiwan but the stock in Australia is not considered shared in terms of shared fishing mortality and threat impacts. *Rhina ancylostoma*: the species occurs from northern Australia north to Japan and the Korean peninsula, and west to eastern Africa as far south as South Africa. The stock in Australia is not considered shared in terms of shared fishing mortality and threat impacts. *Glaucostegus typus*: the species occurs from northern Australia north to Taiwan, and west to India. The stock in Australia is not considered shared in terms of shared fishing mortality and threat impacts.
Comments/ Source(s) of information	Giles et al. 2016, Last et al. 2016, Hylton et al. 2017, Simpfendorfer and Rigby 2023
d) If a high seas stock, which other Parties fish this stock? (If unknown, type "Unknown")	None of the four species are high seas stocks.

Comments/ Source(s) of information	*R. australiae*: the species occurs in continental shelf waters throughout its range at depths of 0–60 m (Last et al. 2016). *R. palpebratus*: the species occurs in continental shelf waters throughout its range at depths of 5–60 m (Last et al. 2016). *Rhina ancylostoma*: the species occurs in continental shelf waters throughout its range at depths of 0–70 m (Last et al. 2016). One record from offshore water in the Philippines (Forget and Muir 2021). *Glaucostegus typus*: the species occurs in continental shelf waters throughout its range at depths of 0–100 m (Last et al. 2016).
e) Which, if any, RFB(s) cover(s) the range of this stock? (If unknown, type "Unknown")	Not applicable
Comments/ Source(s) of information	All species occur in continental shelf waters and thus, are not highly migratory and not managed under the remit of the Western Central Pacific Fisheries Commission (WCPFC) or the Indian Ocean Tuna Commission (IOTC).
f) Are all Parties listed above (which fish or share the stock concerned) members of the relevant RFB(s)?	Not applicable
Source(s) of information	
g) Are there geographical management gaps? If so, list in comments	No
Source(s) of information	All Australian commercial fisheries that interact with these species are regulated by management plans implemented by state, territory, or commonwealth governments.
h) How reliable is the information on origin?	Somewhat reliable
Comments/ Source(s) of information	With all fisheries managed, with limited entry provisions, and the requirement for most fisheries to report catches and provide catch disposal records the information on origin is somewhat reliable. However, there is no traceability system used to track products back to their origin.

Question 1.1(b): Can origin and stock be confidently identified?	Yes

1.2) Was (will) the specimen (be) legally obtained and is export allowed?

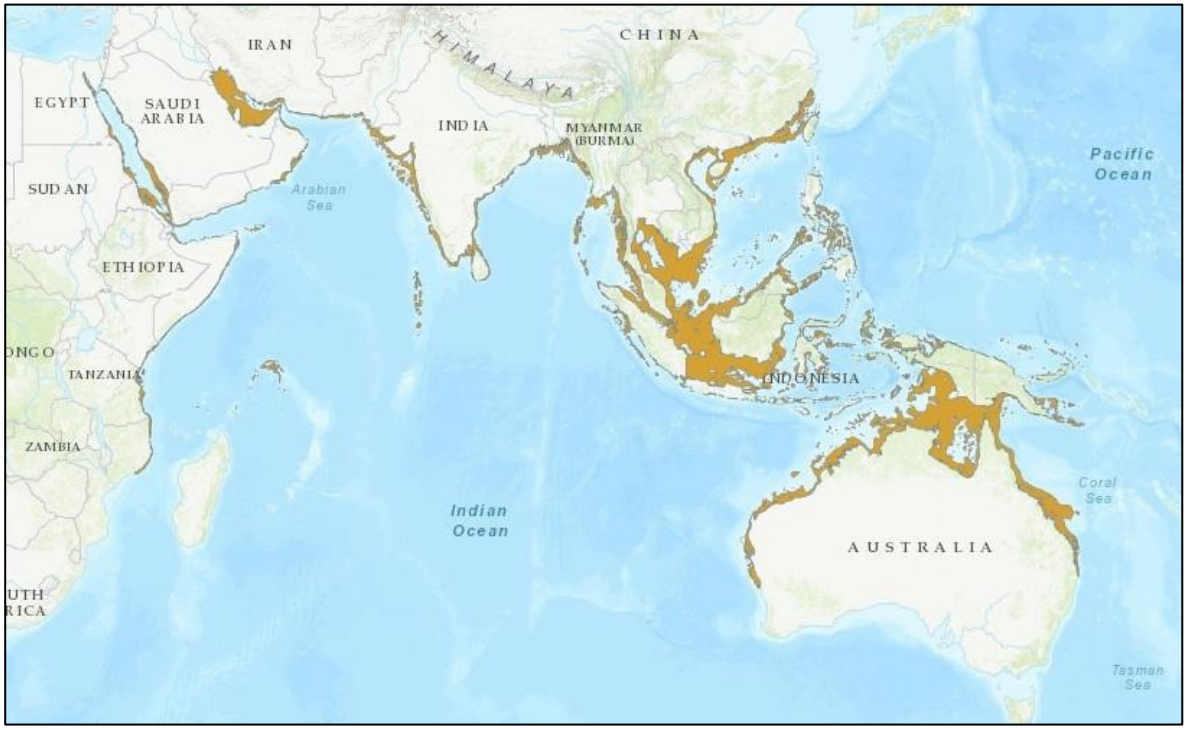
a) Strictly protected under wildlife legislation, a regional biodiversity Agreement, or (for a CMS Party) listed in CMS Appendix I?	No
Comments/ Source(s) of information	There are currently no strict protections of these four species in Australian waters. *Rhynchobatus australiae* was listed on Appendix II of the Convention on Migratory Species in 2017 and on the CMS Sharks MoU Annex 1 in 2018. Australia has a reservation against the Appendix II listing of this species, but not the MoU Annex 1 listing.
b) Sourced from illegal fishing activities (e.g. in contravention of finning regulations, or where a TAC is zero or exceeded)?	No
Comments/ Source(s) of information	There is some IUU fishing in northern Australia, mostly from Indonesian vessels. However, it is currently believed that this effort is low given significant border controls that are in place. Illegal fishing by Australian operators is believed to be low, and many fishers are required to operate Vessel Monitoring Systems to monitor movements and ensure fishing only occurs in areas permitted.
c) Taken from a no-take marine protected area or during a closed season?	No
Comments/ Source(s) of information	No-take marine protected areas in Australia are well enforced, including by on-water and aerial patrols.
d) Taken in contravention of RFB recommendations, if any?	No
Comments/ Source(s) of information	
e) Listed as a species whose export is	No

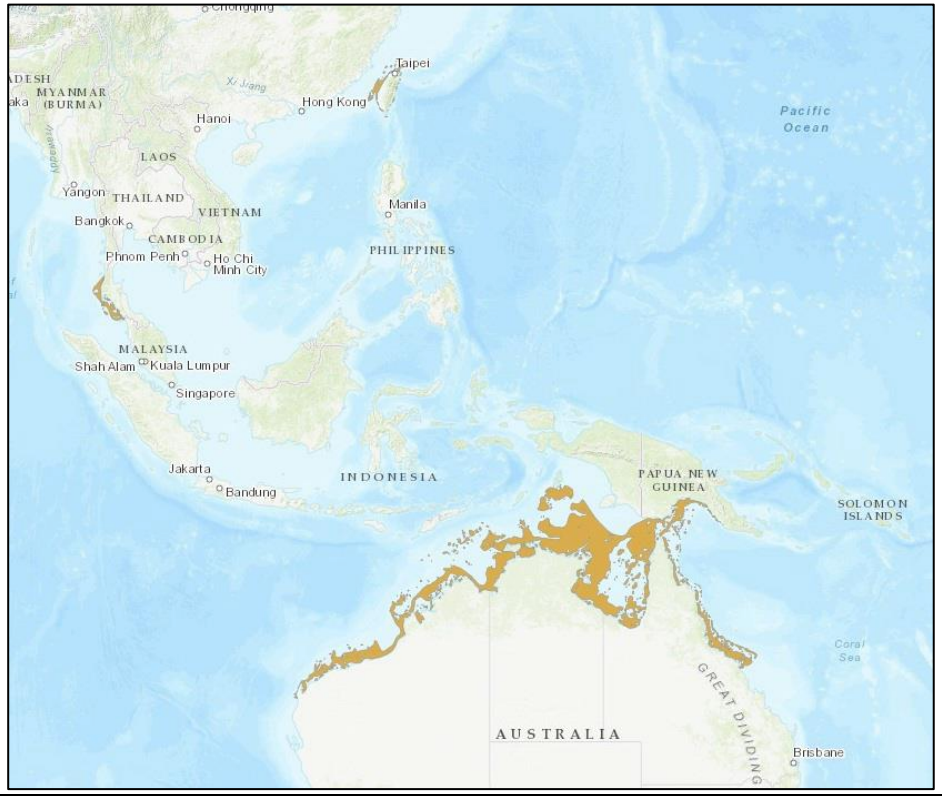
prohibited?	
Comments/ Source(s) of information	There is no national prohibition on the export of these species. However, export of product is permitted only from fisheries that have a Wildlife Trade Operation (WTO) approval granted by the Minister for the Environment and Water or their delegate. At present, several fisheries that take sharks and rays in northern Australia do not have WTO approval, including the Queensland East Coast Inshore Fishery and the Gulf of Carpentaria Inshore Fishery, and the Western Australian North Coast Shark Fishery. Some of these fisheries continue to operate to provide product to the domestic market, but legally cannot export product.
f) Of concern for any other reason?	No
Comments/ Source(s) of information	
Question 1.2: Were specimens legally obtained?	Yes

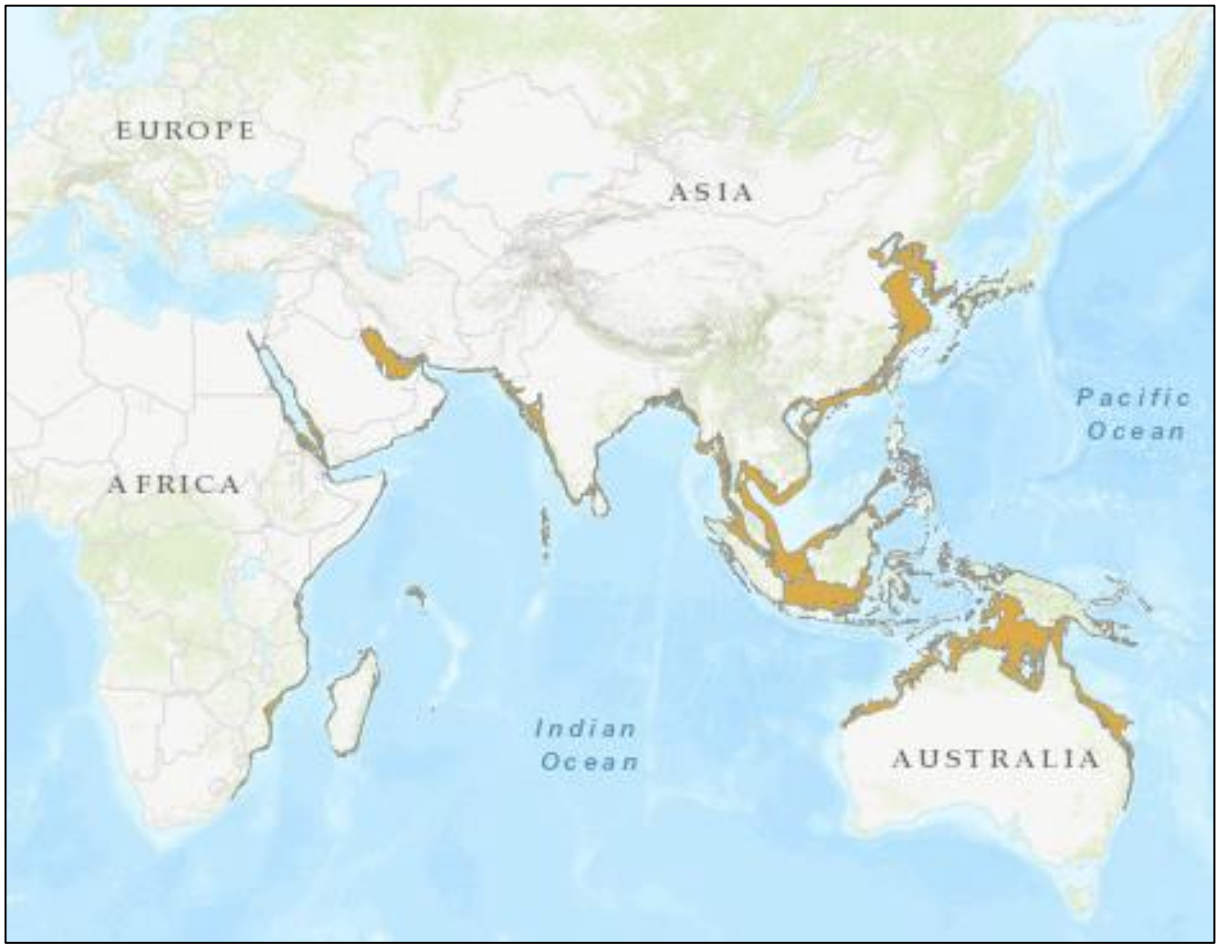
1.3) What does the available management information tell us?

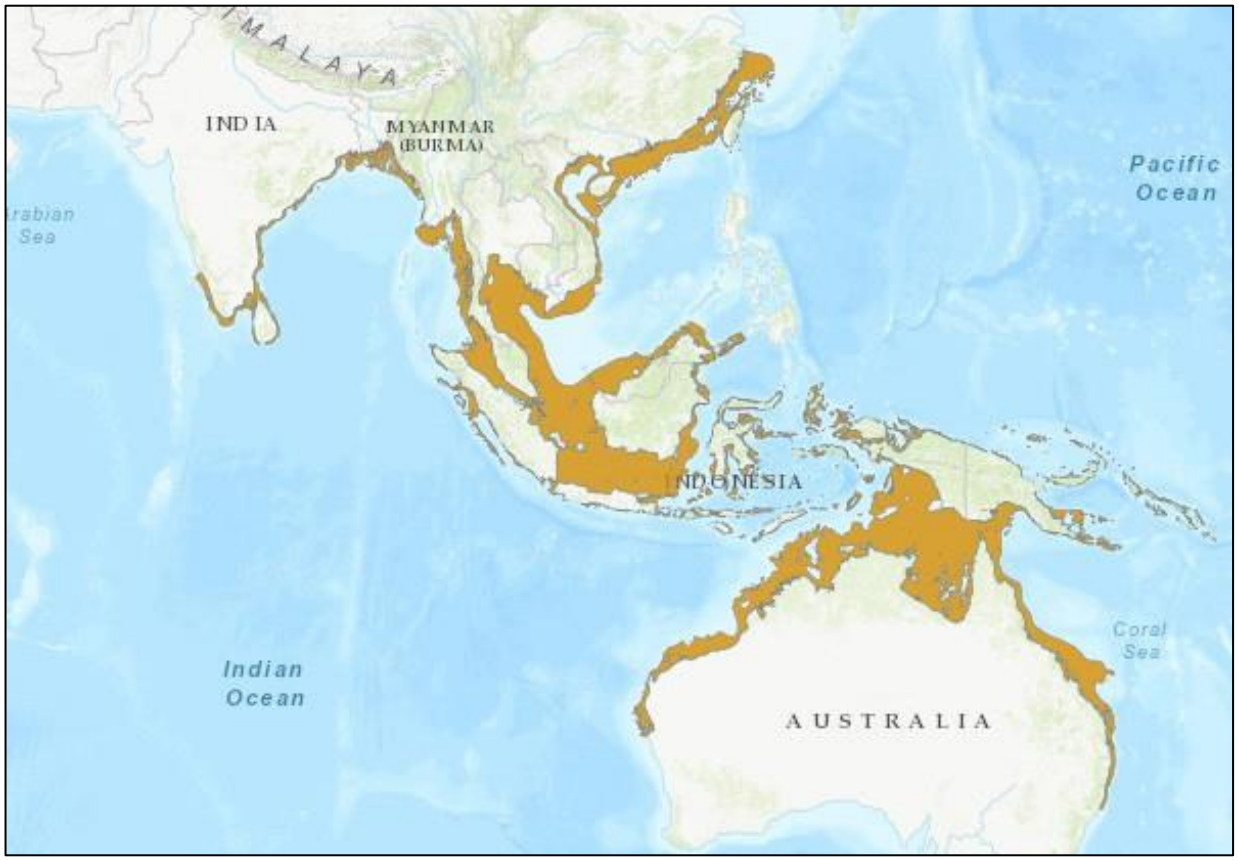
1.3a) Global information

a) Reported global catch	*R. australiae*: The FAO Capture Production database only reports catch of the Whitespotted Wedgefish (*Rhynchobatus djiddensis*). In the Asia and Oceania region, only Indonesia has reported the species in the past 5 years of available data (2016–2020) with catches decreasing over that period from 2,268 tonnes (live weight) in 2016, to 707 t in 2017 and 500–550 t per year from 2018–2020. These catches most likely refer to *R. australiae*; previously all Indo-West Pacific *Rhynchobatus* were considered *R. djiddensis* but in recent years, five more species have been reinstated or described for the Indo-West Pacific including *R. australiae*, *R. springeri*, and *R. cooki* (Indonesia) with *R. australiae* dominating catches across Southeast Asia (Giles et al. 2016). *R. palpebratus*, *Rhina ancylostoma*, and *Glaucostegus typus*: no global catch data of these species are reported to FAO.
Comments/ Source(s) of information	FAO Capture Production database: https://www.fao.org/fishery/statistics-query/en/capture/capture_quantity.

b) Species distribution	*R. australiae*: occurs across the Indo-Pacific Ocean from Mozambique to the Solomon Islands. In Australia, it occurs across northern waters from Crowdy Head (New South Wales) to Lancelin (Western Australia) (Last et al. 2016, Kyne et al. 2019a). 

	R. palpebratus: occurs in northern Australia from Gladstone (Queensland) to Exmouth Gulf (Western Australia). Outside of Australia, it occurs in southern Papua New Guinea, and possibly more widely with a few records from Thailand and Taiwan (Last et al. 2016, Kyne and Rigby 2019). 

	Rhina ancylostoma: occurs in the Indo-West Pacific from South Africa through the Western Indian Ocean, the Arabian Sea, Southeast Asia, and extending north to Japan, south to Australia (where it is wide-ranging across the north of the continent), and east to New Caledonia (Last et al. 2016). 

	Glaucostegus typus: occurs in continental shelf waters of the Eastern Indian and Western Pacific Oceans, where it occurs from India to Australia (where it is widespread across the north of the continent), Papua New Guinea, and the Solomon Islands, and north to Taiwan (Last et al. 2016). 

Comments/ Source(s) of information	Last et al. 2016, Hylton et al. 2017, Kyne and Rigby 2019.
c) Known stocks/populations	*R. australiae*: genetic sampling within Southeast Asia and Australia suggested three demographic stocks in the region: Australia, Southeast Asia, and the Andaman Sea (Giles et al. 2016). There was no stock differentiation within Australia (Giles et al. 2016). *R. palpebratus*, *Rhina ancylostoma*, and *Glaucostegus typus*: there is no information on population structure for these species.
Comments/ Source(s) of information	Giles et al. 2016 (for *R. australiae*).
d) Main catching countries	*R. australiae*: Indonesia (FAO Capture Production Database). *R. palpebratus*: Australia and Papua New Guinea (White et al. 2019, Simpfendorfer and Rigby 2023). *Rhina ancylostoma*: this species is or was caught in most countries throughout it range, including Indonesia (White et al. 2006), Papua New Guinea (White et al. 2017) and Malaysia (Last et al. 2010). *Glaucostegus typus*: this species is or was caught in most countries throughout it range, including Australia (Last and Stevens 2009), Indonesia (White et al. 2006), Papua New Guinea (White et al. 2017) and Malaysia (Last et al. 2010).
Comments/ Source(s) of information	FAO Capture Production database: https://www.fao.org/fishery/statistics-query/en/capture/capture_quantity; Last and Stevens 2009, Last et al. 2010; White et al. 2006, 2017, 2019; Simpfendorfer and Rigby 2023
e) Main gear types by which the species is taken	All four species: in Australia, all species are caught incidentally by mainly trawl and gillnet fisheries. There is some minor catch in line fisheries (including recreational) and those that target species for the aquarium industry (especially for *Rhina ancylostoma*) (Hanna and Hazeres 2021).
Comments/ Source(s) of information	Simpfendorfer and Rigby 2023

f) Global conservation status	*R. australiae*: IUCN Red List global status: Critically Endangered. Assessed in 2019. *R. palpebratus*: IUCN Red List global status: Near Threatened. Assessed in 2019. *Rhina ancylostoma*: IUCN Red List global status: Critically Endangered. Assessed in 2019. *Glaucostegus typus*: IUCN Red List global status: Critically Endangered. Assessed in 2019.
Comments/ Source(s) of information	Kyne and Rigby 2019, Kyne et al. 2019a,b,c
g) Multilateral environmental agreements	All four species are listed on CITES Appendix II. No range Parties have a CITES Reservation for any of the four species. *Rhynchobatus australiae* is also listed on CMS Appendix II (with an Australian reservation) and CMS MOU Annex 1. No other range Parties have a CMS reservation for *R. australiae*. None of the species are listed on any other multilateral environmental agreements.
Comments/ Source(s) of information	https://cites.org/eng/disc/species.php; https://www.cms.int/sharks/en http://www.cms.int/species/index.htm; https://www.cms.int/en/species/overseas-territoriesautonomous-regions-reservations; https://cites.org/eng/app/reserve.php

1.3b) Stock/context-specific information

a) Stock assessments	*R. australiae* and *R. palpebratus*: no formal stock assessments. In Australian waters, a national Red List assessment lists both species as Near Threatened based on suspected 20–29% population reduction over the last 45 years (3 generations) (Kyne et al. 2021). The Australian Shark and Ray Report Card listed both species as Sustainable (Simpfendorfer and Rigby 2023). Ecological risk assessments (ERA) in two main trawl fisheries in which both species are caught (Northern Prawn Fishery and Queensland East Coast Trawl Fishery) found *Rhynchobatus* species at low risk of overfishing as estimated fishing mortality was below levels leading to population reduction (Zhou and Griffiths 2008, Campbell et al. 2018). An ERA for the Queensland East Coast Inshore Fishery assessed both species as Precautionary High Risk (Jacobsen et al. 2021). These species were not included in an ERA for the Northern Territory Offshore Net and Line Fishery. *Rhina ancylostoma* and *Glaucostegus typus*: no formal stock assessments. In Australian waters, a national Red List assessment lists both species as Least Concern (Kyne et al. 2021). The Australian Shark and Ray Report Card listed both species as Sustainable (Simpfendorfer and Rigby 2023). ERAs in two main trawl fisheries in which both species are caught (Northern Prawn Fishery and Queensland East Coast Trawl Fishery) found both species at low risk of overfishing as estimated fishing mortality is below levels leading to population reduction (Zhou and Griffiths 2008, Campbell et al. 2018). An ERA for the Queensland East Coast Inshore Fishery assessed *Glaucostegus typus* as Precautionary High Risk, but did not assess *Rhina ancylostoma* (Jacobsen et al. 2021). These species were not included in an ERA for the Northern Territory Offshore Net and Line Fishery.
Comments/ Source(s) of information	Zhou and Griffiths 2008, Campbell et al. 2018, Jacobsen et al. 2021, Kyne et al. 2021, Simpfendorfer and Rigby 2023
b) Main management bodies	In Australian waters: Queensland: Department of Agriculture and Fisheries Northern Territory: Department of Industry, Tourism and Trade (Fisheries Division) Western Australia: Department of Primary Industries and Regional Development Commonwealth: Australian Fisheries Management Authority. No gaps in management in Australia.

Comments/ Source(s) of information	
c) Cooperative management arrangements	Not applicable - no shared stocks.
Comments/ Source(s) of information	
d) Non-membership of RFBs	Not applicable
Comments/ Source(s) of information	
e) Nature of harvest	In Australia, all four species are caught incidentally in gillnet and trawl fisheries. Fishing effort varies across the Australian fisheries in which they are caught, with the highest effort in the Northern Prawn Fishery (seasonal effort), Queensland East Coast Trawl Fishery, Queensland East Coast Inshore Fishery, Queensland Gulf of Carpentaria Inshore Fishery, and the Northern Territory Offshore Net and Line Fishery.
Comments/ Source(s) of information	Gaughan and Santoro 2021, Patterson et al. 2022, https://nt.gov.au/marine/commercial-fishing.
f) Fishery types	In Australia, *R. australiae* (Bottlenose Wedgefish), *R. palpebratus* (Eyebrow Wedgefish), *Rhina ancylostoma* (Shark Ray), and *Glaucostegus typus* (Giant Shovelnose) have mostly sympatric spatial and depth distributions, and thus are caught in the same fisheries; most reports of catches are at the generic level of Rhynchobatus species. *Rynchobatus australiae* ranges slightly further south on the west coast, and *Rhina ancylostoma* and *Glaucostegus typus* range further south on the east coast and thus, these species are exposed to a few more fisheries. All species are caught incidentally by trawl and gillnet fisheries, including the Commonwealth Northern Prawn Fishery (NPF) and the Queensland East Coast Trawl Fishery (ECTF) which are both trawl fisheries that target prawns, and in the Queensland East Coast (ECIF) and Gulf of Carpentaria (GoCIF) Inshore Fisheries (Stobutzki et al. 2001, Harry et al. 2011, Campbell et al. 2018, Jacobsen et al. 2019a). The ECIF uses net (gillnet, seine net, tunnel nets, small mesh gillnets, cast nets) and hook and line gear to target finfish and sharks while the GoCIF uses solely gillnet to target finfish and sharks. All species are also possibly caught

	incidentally in the Gulf of Carpentaria Developmental Fishery (Jacobsen et al. 2019b), the Northern Territory Demersal Fishery and the Offshore Net and Line Fishery, and Western Australian prawn fisheries, Pilbara Fish Trawl Fishery, and for *R. australiae*, the Western Australian Temperate Demersal Gillnet and Demersal Longline Fisheries (Jacobsen et al. 2019b, Braccini et al. 2021). *R. australiae* and *R. ancylostoma* are also caught incidentally in the New South Wales inshore prawn trawl fishery (Johnson and Barnes 2023). Across the remainder of their range in the Northern Territory and Western Australia, fishing effort is limited and the species would receive considerable refuge from fishing; for example, more than 90% of the area within the 200m isobath in Western Australian northern waters may have never been trawled due to a combination of spatial trawl closures and marine parks, and considerable areas of the Northern Territory are closed to trawling (Gaughan and Santoro 2021, Kyne et al. 2021). Bycatch reduction devices are mandated in all the trawl fisheries and where observed, have reduced the catch of Rhynchobatus spp. by 39% and of *Glaucostegus typus* and *Rhina ancylostoma* by 100% (Brewer et al. 2004). Ray retention is prohibited in most of the trawl fisheries in which these species are caught with the exception of Queensland where there are possession limits on Wedgefishes (Rhinidae species - *Rhynchobatus* and *Rhina*) and Guitarfishes (Rhinobatidae, but also likely Glaucostegidae as the intent of the regulation was to include *Glaucostegus typus* and it was removed from this family after the regulation was in place); the commercial limit is five individuals in total under 1.5 m total length combined between Wedgefishes (Rhinidae), Guitarfishes (Rhinobatidae) and Giant Guitarfishes (Glaucostegidae); and recreational fishers are limited to one individual in-possession of any of these species (combined) (Pidd et al. 2021). Thus, in most trawl fisheries, excepting in Queensland, these species would be released. Post-release mortality for *R. australiae* was reported as 36% in Western Australian gillnets (Braccini and Murua 2021). Other Guitarfish have reported at-vessel-mortalities of 10–33% from trawls, and up to 25% on longlines, depending on the time spent hooked (Ellis et al. 2017).
Comments/ Source(s) of information	Stobutzki et al. 2001, Brewer et al. 2004, Harry et al. 2011, Ellis et al. 2017, Campbell et al. 2018, Jacobsen et al. 2019ab, Braccini and Murua 2021, Braccini et al. 2021, Gaughan and Santoro 2021, Kyne et al. 2021, Pidd et al. 2021, Johnson and Barnes 2023

g) Management units	In Australian waters: Queensland: Department of Agriculture and Fisheries Northern Territory: Department of Industry, Tourism and Trade (Fisheries Division) Western Australia: Department of Primary Industries and Regional Development New South Wales: Department of Primary Industries Commonwealth: Australian Fisheries Management Authority. No gaps in management in Australia
Comments/ Source(s) of information	
h) Products in trade	These species are not commonly in trade from Australia, in part because they are relatively infrequently caught and may not be retained in some fisheries that catch them. The fins of all of these species are among the highest valued in the fin trade and the meat is good quality for human consumption (Kyne and Rigby 2019, Kyne et al. 2019abc). Meat is likely to be rarely exported, but fins retained in fisheries that have Wildlife Trade Operation approval in place are likely to be exported. Thorns from the enlarged dorsal ridges of *Rhina ancylostoma* are traded from Thailand (Pytka et al. 2023). *Rhina ancylostoma* are caught in small numbers for displayed in public aquaria (Hanna and Hazeres 2021).
Comments/ Source(s) of information	Kyne and Rigby 2019, Kyne et al. 2019abc, Hanna and Hazeres 2021, Pytka et al. 2023

1.3c) Data and data sharing

a) Reported national catch(es)	In Australia, *Rhynchobatus* species-specific catch levels are difficult to ascertain due to the previous taxonomic confusion of *Rhynchobatus* species, and the overall morphological similarity between species. It is now known that the *Rhynchobatus* species complex consists of two species in Australian waters: *R. australiae* and *R. palpebratus*, with *R. australiae* dominating catches (Giles et al. 2016). The *Rhynchobatus* species and *Glaucostegus typus* are a small component of the Queensland East Coast Inshore Fishery. *Rhynchobatus* species make up about 1% of the overall catch by number, while

	Glaucostegus typus makes up about 0.4% of the catch by numbers (Harry et al. 2011). *Rhynchobatos australiae* and *Glaucostegus typus* were also estimated as a minimal catch of the Queensland East Coast Trawl Fishery (ECTF) with only 16 individuals of each species caught from 1,175 trawl shots during research surveys and observer-based sampling (Campbell et al. 2018). All four species are minor components of the Northern Prawn Fishery representing <0.1% by number of the fish and elasmobranch bycatch in observed trawls prior to the introduction of bycatch reduction devices (Stobutzki et al. 2000, Stobutzki et al. 2001, Zhou and Griffiths 2008). The *R. australiae* and *R. ancylostoma* are minimal catch of the New South Wales inshore prawn trawl fishery with individuals observed in 8 and 3 trawl shots, respectively over 2 years of observer surveys (Johnson and Barnes 2023). The four species are rarely caught in the Northern Territory Offshore Net and Line Fishery. The nets used by the gillnet sector do not reach the bottom and so rarely encounter these species. Effort in the longline sector is currently limited, and these species are only a small component of this sector. Catches of these four species in Western Australia are likely minimal, given effort is limited and negligible ray bycatch has been reported in recent years (Gaughan and Santoro 2021).
Comments/ Source(s) of information	Stobutzki et al. 2001, Zhou and Griffiths 2008, Harry et al. 2011, Giles et al. 2016, Campbell et al. 2018, Gaughan and Santoro 2021, Johnson and Barnes 2023
b) Are catch and/or trade data available from other States fishing this stock?	All catches of these species in Australian waters are considered to come from stocks that are not shared with other nations (see section 1.1b). As such there is no additional information on catches and trade of these stocks. However, these species are all captured in fisheries through their ranges, and the high value of the fins and meat mean that they are often retained and products exported.
Comments/ Source(s) of information	
c) Reported catches by other States	All catches of these species in Australian waters are considered to come from stocks that are not shared with other nations/States (see section 1.1b). As such, reported catches from other States are not relevant to this Non-Detriment Finding for the Australian stocks of these four species. However, these species are all captured in fisheries through their ranges, with information on catches of these species across the Indo-West Pacific (mostly as *Rhynchobatus* spp. and Rhinopristiformes) detailed in the Red List assessments (Kyne and Rigby 2019, Kyne et al. 2019abc) and in an overview of Wedgefishes and Giant Guitarfishes (Kyne et al. 2020).

Comments/ Source(s) of information	Kyne and Rigby 2019, Kyne et al. 2019 abc, Kyne et al. 2020
d) Catch trends and values	Despite being regularly caught in fisheries throughout their ranges, there are few data on catch or catch rate trends. Kyne et al. (2020) summarised the available data on all Wedgefishes and Giant Guitarfishes, showing population decreases of: 67% between 1997–2016 for *Glaucostegus typus* landings in Iran, 81% between 1994–2011 for Rhinopristiformes landings (includes *R. australiae* and G. typus, as well as other species in the order) in Pakistan, 87% between 2002–2006 for "Guitarfish" landings (potentially includes all four species) in India, and 88% between 2005–2015 for *Rhynchobatus* species (including *R. australiae*) in Indonesia.
Comments/ Source(s) of information	Kyne et al. 2020
e) Have RFBs and/or other States fishing this stock been consulted during or contributed data during this process?	No, but this NDF will be made public in order to enable other range states to make informed decisions for the management of the species' populations as a whole.
Comments/ Source(s) of information	

Step 2: Biological and conservation concerns

2.1) What is the level of intrinsic biological vulnerability of the species?

a) Median age at maturity	5-15 years
Comments/ Source(s) of information	*R. australiae*: 3–6 years (mean 4.5 years) in Australia based on growth parameters and size-at-maturity for *Rhynchobatus* spp. which consisted of *R. australiae* and *R. palpebratus* (White et al. 2014a, D'Alberto et al. 2019). *R. palpebratus*: 3–6 years (mean 4.5 years) in Australia based on growth parameters and size-at-maturity for *Rhynchobatus* spp. which consisted of *R. australiae* and *R. palpebratus* (White et al. 2014a, D'Alberto et al. 2019). *Rhina ancylostoma*: No information available, but assumed to be similar to the other species. *Glaucostegus typus*: estimated to be about 8–10 years based on the growth curve provided by White et al. (2014a) and the size at maturity.
b) Median size at maturity	40-200 cm TL
Comments/ Source(s) of information	*R. australiae*: males mature at 110–130 cm total length (TL) and females mature at ~ 155 cm TL (White and Dharmadi 2007, Last and Stevens 2009, Last et al. 2016). *R. palpebratus*: males mature at 99–106 cm TL; female size-at-maturity is unknown (Last et al. 2016, White et al. 2019). *Rhina ancylostoma*: males mature at 150–175 cm TL; females mature at ~180 cm TL (Last et al. 2016). *Glaucostegus typus*: size-at-maturity for both sexes is 150–180 cm TL (Last et al. 2016).

c) Maximum age/longevity in an unfished population	10-25 years
Comments/ Source(s) of information	Maximum age was observed in Australia for *R. australiae* and *R. palpebratus* combined and was 12 years (White et al. 2014a). The age was reported for *Rhynchobatus* spp. which has since been shown to be mainly *R. australiae* but also *R. palpebratus* (D'Alberto et al. 2019). Maximum age estimates for *Rhina ancylostoma* are not available. Maximum age observed for *Glaucostegus typus* by White et al. (2014a) was 18 years.
d) Maximum size	100-300 cm TL
Comments/ Source(s) of information	*R. australiae*: approximately 300 cm total length (TL) (Last et al. 2016). *R. palpebratus*: at least 262 cm total length (TL) (Last et al. 2016). Rhina ancylostoma: reaches 275 cm TL (Weigmann 2016) *Glaucostegus typus*: reaches 284 cm TL (White et al. 2014a)
e) Natural mortality rate (M)	under 0.17
Comments/ Source(s) of information	The three species for which data is available (all except *Rhina ancylostoma*) have an estimated mortality rate <0.17 using the method of reciprocal of life span to estimate M (D'Alberto et al. 2019).
f) Maximum annual pup production (per mature female)	2-15
Comments/ Source(s) of information	*R. australiae*: litter size is 7–19 (mean 14) pups; reproductive periodicity is unknown but is assumed to be annual (White and Dharmadi 2007, D'Alberto et al. 2019, Kyne et al. 2019). *R. palpebratus*: litter size is unknown but estimated to be small (i.e., 2–15 pups) based on other Rhinidae species (Kyne and Rigby 2019, Kyne et al. 2020). *Rhina ancylostoma*: litter size is 2–11 (Last et al. 2016) *Glaucostegus typus*: litter size is unknown but estimated to be small (i.e., 2–15 pups) based on other Glaucostegidae species (Kyne and Rigby 2019, Kyne et al. 2020).

g) Intrinsic rate of population increase (r)	over 0.35
Comments/ Source(s) of information	Both species of *Rhynchobatus* have an intrinsic rate of increase estimated as >0.35 (D'Alberto et al. 2019). There was uncertainty in the r value but estimated values using the most realistic parameter estimates were >0.35 (D'Alberto et al. 2019). Intrinsic rate of increase for *Glaucostegus typus* was estimated to be 0.34 by D'Alberto et al. (2019)
h) Geographic distribution of stock	Ocean basin, unrestricted, limited fragmentation
Comments/ Source(s) of information	All species have a wide and continuous range across their distributions (Last et al. 2016).
i) Current stock size relative to historic abundance	over 50% baseline abundance
Comments/ Source(s) of information	In Australian waters, all four species are considered to not be overfished (Simpfendorfer et al. 2019, Simpfendorfer and Rigby 2023) and all species are considered common, except *Rhina ancylostoma* which is rare (Kyne et al. 2021). The two *Rhynchobatus* species are assessed as Near Threatened in Australia, which implies a 20–29% population reduction over the past three generation lengths (45 years), while the other two species are assessed as Least Concern, indicating <20% decline over the past three generation lengths (45 years) (Kyne et al. 2021). Thus, it is most likely that the current stock size of all four species is >50% of historic abundance in Australia.
j) Behavioural factors	Some behavioral factors to increase risk to stock
Comments/ Source(s) of information	All species are demersal and inshore and thus susceptible to capture by multiple fishing gears (White et al. 2014b, Kyne and Rigby 2019, Kyne et al. 2019abc, White et al. 2014b). For example, *Glaucostegus typus* newborn and young-of-the-year use very shallow (<0.5 m) inshore waters (Gaskins et al. 2020). Post-release mortality is relatively low (<36%; Ellis et al. 2017, Braccini and Murua 2021) across a range of gears although it has not been studied for all species and it may have an impact on populations.
k) Trophic level	Medium

Comments/ Source(s) of information	*R. australiae*: 3.54 (Froese and Pauly 2022). *R. palpebratus*: unknown but likely to be similar to *R. australiae*. *Rhina ancylostoma*: 3.55 (Froese and Pauly 2022). *Glaucostegus typus*: 3.60 (Froese and Pauly 2022).
Overall biological vulnerability:	Medium level of vulnerability

2.2) What is the severity and geographic extent of the conservation concern?

Conservation or stock assessment status:

Has a Fisheries stock assessment been conducted?	Yes
If yes, what is the Fisheries stock assessment status?	The stock is not overfished AND overfishing is not taking place
Comments/ Source(s) of information	Although a formal stock assessment has not been conducted, in Australia, all species have national assessments aligned to the Status of Australian Fish Stocks process. These assessments are contained within the Report Card on Australian Sharks (Simpfendorfer et al. 2019) and the Australian Sharks and Rays Report Card (Simpfendorfer and Rigby 2023). All four species are assessed through this process as Sustainable, meaning that they are not Overfished, and Overfishing is not occurring. These assessments are supported by national Red List assessments that show these species are either Near Threatened (*Rhynchobatus* species and *Rhina ancylostoma*) or Least Concern (*Rhina ancylostomaGlaucostegus typus*).
Has a National Redlist Assessment been conducted?	Yes
If yes, what is the National Redlist Assessment?	The species, population, or stock has been assessed and is moderately threatened (NT, VU or equivalent)
Comments/ Source(s) of information	*R. australiae*: Near Threatened (Kyne et al. 2021). *R. palpebratus*: Near Threatened (Kyne et. 2021) *Rhina ancylostoma*: Near Threatened (Kyne et al. 2021). *Glaucostegus typus*: Least Concern (Kyne et al. 2021).

	The highest level of threat was selected as a precautionary approach.
What is the Regional IUCN Redlist Assessment?	The species, population, or stock has been assessed and is seriously threatened (CR, EN or equivalent)
Comments/ Source(s) of information	*R. australiae*: Endangered in United Arab Emirates. Assessed in 2019. https://www.iucnredlist.org/species/41853/68643043. *R. palpebtratus*: no regional Red List assessment. *Rhina ancylostoma*: Vulnerable in United Arab Emirates. Assessed in 2019. https://www.iucnredlist.org/species/41848/124421912 *Glaucostegus typus*: no regional Red List assessment. The highest level of threat was selected as a precautionary approach.
What is the Global IUCN Redlist Assessment?	The species, population, or stock has been assessed and is seriously threatened (CR, EN or equivalent)

Comments/ Source(s) of information	*R. australiae*: Critically Endangered. Assessed in 2019. https://www.iucnredlist.org/species/41853/68643043. *R. palpebratus*: Near Threatened. Assessed in 2019. https://www.iucnredlist.org/species/195475/2382420. *Rhina ancylostoma*: Critically Endangered. Assessed in 2019. https://www.iucnredlist.org/species/41848/124421912 *Glaucostegus typus*: Critically Endangered. Assessed in 2019. https://www.iucnredlist.org/species/104061138/68623995 The highest level of threat was selected as a precautionary approach.
What are the population trends?	Area of distribution and/or population density is stable or increasing
Comments/ Source(s) of information	For all species, the population trends are suspected to be stable in Australia based on: they are all common (except *R. ancylostoma* which is rare), fisheries are well managed and there is limited fishing effort within their ranges, the use of bycatch reduction devices in Australian trawl fisheries that have significantly reduced the catches of all bycatch species, and significant refuge from fishing pressure across considerable areas of the species range due to marine parks (Kyne et al. 2021).
What is the geographic extent/scope of conservation concern?	Identified threats affect only one or a few local stocks of the species, but other stocks are not affected
Comments/ Source(s) of information	For all species in Australia, the fishing pressure is limited in many parts of their ranges and the species have refuge from fishing pressure in the marine parks network (Kyne and Rigby 2019, Kyne et al. 2019abc, Simpfendorfer and Rigby 2023).
Overall geographic conservation concern:	Medium level of concern

Step 3: Pressure on the Species

3.1) What is the severity of trade pressure on the stock of the species concerned?

A (i) Magnitude of legal trade	Low
ii) What is the level of confidence in the answer?	High
Comments/ Source(s) of information	In Australia, these species interact with mainly low effort fisheries and are currently prohibited from retention in some trawl fisheries in which they are caught. There are trip limits for some commercial fisheries, and small retention limits for recreational fishers. In fisheries where these species can be retained they make up only a small proportion of the overall catch (e.g., <1% by numbers in the Queensland East Coast Inshore Fishery, Harry et al. 2011). As such, the magnitude of trade is small.
b (i) Magnitude of illegal trade	Low
ii) What is the level of confidence in the answer?	High
Comments/ Source(s) of information	All four species are known to occur in the fin trade in Hong Kong and/or mainland China, but only in very small volumes (<1%) (Fields et al. 2018, Cardeñosa et al. 2020). However, until their CITES listing in 2019 there was no restriction on the trade of these species and so little evidence of evidence of illegal trade. Given that Australia has not had an NDF in place for any of these species prior to 2023, any export since their listing and the implementation of this NDF would have been illegal.
Overall trade pressure:	Low
Overall level of confidence:	High

3.2) What is the severity of fishing pressure on the stock of the species concerned?

a (i) Fishing mortality (retained catch)	Low

ii) What is the level of confidence in the answer?	High
Comments/ Source(s) of information	The severity of fishing mortality for all four species is low. These species interact with mainly low effort fisheries and they are prohibited from retention in some trawl fisheries in which they are caught. There are trip limits for some commercial gillnet fisheries, and small retention limits for recreational fishers. In fisheries where these species can be retained they make up only a small proportion of the overall catch (e.g., <1% by numbers in the Queensland East Coast Inshore Fishery, Harry et al. 2011).
b (i) Discard mortality	Medium
ii) What is the level of confidence in the answer?	Low
Comments/ Source(s) of information	Post-release mortality for *R. australiae* was reported as 36% in Western Australian gillnets (Braccini and Murua 2021). Other Guitarfish have reported at-vessel-mortalities of 10–33% from trawls, and up to 25% on longlines, depending on the time spent hooked (Ellis et al. 2017). Further research is needed on this topic to better understand the levels of discard mortality, especially in fisheries where retention is prohibited.
c (i) Size/age/sex selectivity	Medium
ii) What is the level of confidence in the answer?	Medium
Comments/ Source(s) of information	For capture in gillnets Lemke and Simpfendorfer (2023) provided size selectivity data for *Glaucostegus typus* that demonstrated a relatively broad selectivity pattern. Size selection parameters for species of *Rhynchobatus* are likely to be similar. However, selectivity of *Rhina ancylostoma* is likely to be lower because of its broad rounded head that is likely less likely to be caught in gillnets. All trawl fisheries that catch these species are required to use bycatch reduction devices (BRDs) and these have been shown to successfully exclude larger rhino rays, meaning that they are more likely to retain smaller, juvenile individuals of all of these species (Brewer et al. 2004, 2006; Campbell et al. 2020).

d (i) Magnitude of illegal, unreported and unregulated (IUU) fishing	Low
ii) What is the level of confidence in the answer?	High
Comments/ Source(s) of information	IUU fishing in northern Australia for sharks and rays does occur, mostly by Indonesian fishers. However, levels of IUU catch since about 2009 have been relatively low, and the minor catch of these species in fisheries suggests that the level of illegal trade would be low. IUU fishing in northern Australia is typically conducted by small-scale fishers from neighboring countries. These fishers target shark, ray, reef fish, and sedentary species such as sea cucumbers. Most of these fishers operate close to Australia's maritime border and recently, these fishers have rarely come near to the Australian mainland (Department of Agriculture 2014). Australia has a National Plan of Action to Prevent, Deter and Eliminate IUU Fishing (https://www.afma.gov.au/fisheries-management/international-fisheries-management/iuu-fishing).
Overall severity of fishing mortality:	Low
Overall level of confidence:	Medium

Step 4: Existing Management Measures

4.1) Are existing management measures appropriately designed and implemented to mitigate pressures affecting the stock?

Pressure - Magnitude of Legal Trade	
Existing management measure	Prohibition on retention of rays in the Northern Territory Demersal Fishery and Timor Reef Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Regulations prohibit the retention of rays in these species in these fisheries. Logbooks, observer coverage, fisheries inspectors, and Aboriginal marine rangers are all used to ensure compliance with this rule (https://nt.gov.au/marine/fisheries-compliance).
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of Legal Trade	
Existing management measure	Prohibition on retention of rays in the Western Australia Pilbara Fish Trawl Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Regulations prohibit the retention of rays in these species in these fisheries. Fisheries Compliance Strategy (September 2018, Department of Primary Industries and Regional Development) (DPIRD 2018 - https://www.fish.wa.gov.au › corporate_publications). Strategies include: mandatory reporting, VMS and e-monitoring compliance technology, high visibility patrols, aerial surveillance, fish dealer inspections, and at-sea inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of Legal Trade	
Existing management measure	Prohibition on retention of rays in the Commonwealth Northern Prawn Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	The Australian Fisheries Management Authority has a compliance program that includes: logbook reporting, Fisheries Officers undertaking regular land and sea patrols, and port inspections, VMS on all NPF vessels, and analytical tools for a risk-based compliance approach (MRAG 2017).
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of Legal Trade	
Existing management measure	Commonwealth Northern Prawn Fishery - Marine Stewardship Council certification
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Marine Stewardship Council certification issued October 2019 (https://fisheries.msc.org/en/fisheries/australia-northern-prawn/). The Australian Fisheries Management Authority has a compliance program that includes: logbook reporting, Fisheries Officers undertaking regular land and sea patrols, and port inspections, VMS on all NPF vessels, and analytical tools for a risk-based compliance approach (MRAG 2017).
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of Legal Trade	
Existing management measure	Wildlife Trade Operation approval
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	All Australian fisheries that export CITES-listed species require Wildlife Trade Operation (WTO) approval to demonstrate compliance with Ecologically Sustainable Development principles. Fisheries are normally assessed every 3 years, with conditions placed on fisheries where changes or improvements are required. As such, fisheries that lack WTO approvals do not meet the requirement for issuance of a CITES permit. In some instances WTO approvals have been revoked or not renewed for fisheries.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of Legal Trade	
Existing management measure	Possession limit
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Species specific
Relevant monitoring, control, and surveillance (MSC) measure(s)	In Queensland, the commercial take and in-possession limit of five rays (maximum) under 1.5 m total length is applied to all Wedgefishes (Rhinidae), Guitarfishes (Rhinobatidae), and Giant Guitarfishes (Glaucostegidae) or any combination of these rays (Jacobsen et al. 2019a, Pidd et al. 2021). The recreational possession limit is a combined limit of 1 shark or ray per person/ 2 sharks or rays per boat. Wedgefishes cannot be filleted or have the tails and fins removed on board. The Guitarfishes and Giant Guitarfishes cannot be filleted or trunked or gutted and fins must be naturally attached https://www.qld.gov.au/recreation/activities/boating-fishing/rec-fishing/rules/limits-tidal#rays. Note: this text uses the revised taxonomic terminology whereas the Queensland documents refer to the old terminology but note that the revisions have yet to be reflected in legislation and that the intent of the legislation will remain unchanged. These regulations are enforced by at-sea and port inspections and prior reporting of landing.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of Illegal Trade	
Existing management measure	Issuance of CITES permits
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	CITES Permits are issued for all CITES listed species exported.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Bycatch reduction devices mandated in most of the Australian fisheries that interact with this species
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	BRDs are inspected by Fisheries Officers that conduct at-sea patrols (which include boardings) and port inspections to ensure compliance with standards.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Partially

Pressure - Fishing mortality (retained catch)	
Existing management measure	Licensing system of vessels in all Australian fisheries
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Vessel lists maintained and at sea and port inspections are conducted by Fisheries Officers.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Prohibition on retention of rays in the Northern Territory Demersal Fishery and Timor Reef Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Prohibition on retention of rays in the Western Australia Pilbara Fish Trawl Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Compliance Strategy (September 2018, Department of Primary Industries and Regional Development) (DPIRD 2018 - https://www.fish.wa.gov.au › corporate_publications). Strategies include: mandatory reporting, VMS and e-monitoring compliance technology, high visibility patrols, aerial surveillance, fish dealer inspections, and at-sea and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Prohibition on retention of rays in the Commonwealth Northern Prawn Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Fins naturally attached
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Northern Prawn Fishery seasonal closures
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Strictly enforced by prohibition of vessels fishing outside of designated fishing season. The Australian Fisheries Management Authority has a compliance program that includes: logbook reporting, Fisheries Officers undertaking regular land and sea patrols, and port inspections, VMS on all NPF vessels, and analytical tools for a risk-based compliance approach (MRAG 2017).
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Northern Territory - spatial trawl closures
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Western Australia - Permanent area closures - combination spatial trawl closures and marine parks
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Trawl fishing gear restrictions
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Marine Parks
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Fishing mortality (retained catch)	
Existing management measure	Total Allowable Catch for sharks and rays in Queensland East Coast Inshore Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Total Allowable Commercial Catch (TACC) levels for Sharks and Rays are set for five regions along the Queensland east coast. From north to south these are: 8,924 kg (region 1), 48,276 kg (region 2), 137,033 kg (region 3), 55,583 kg (region 4), and 150,184 kg (region 5). The total TACC on the east coast is 400 t. All four species are included in this TACC group but make up only a minor component of the catch, with each species only making up <1% of the total catch in the fishery, and because there is a five-body trip limit (combined) for this group of species. Fishers are required to report catches, provide catch disposal records, and prior report catches before landing to enable inspection by enforcement staff. The proportion of the TACC caught each year is carefully monitored through the data provided and fishing restricted if it is reached.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Partially

Pressure - Fishing mortality (retained catch)	
Existing management measure	Total Allowable Catch in the Northern Territory Offshore Net and Line Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	All four species are rarely caught in this fishery. The nets used by the gillnet sector do not reach the bottom and so rarely encounter these species. Effort in the longline sector is currently limited, and these species are only a small component of this sector. The fishery is managed using total allowable catches (TAC) for groups of species, and these species are included in the "combined other Shark group species" which has TAC of 126 t that is allocated as Individual Transferable Quota units. These regulations are enforced by a range of mechanisms typically associated with TACs and quota management, including: observers, catch reporting, catch reconciliation using disposal records, restricted landing locations, and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Partially

Pressure - Discard mortality	
Existing management measure	Bycatch reduction devices mandated in most of the Australian fisheries that interact with this species
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Bycatch Reduction Devices are inspected by Fisheries Officers that conduct at-sea patrols (which include boardings) and port inspections to ensure compliance with standards.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Partially

Pressure - Discard mortality	
Existing management measure	Prohibition on retention of rays in the Northern Territory Demersal Fishery and Timor Reef Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Prohibition on retention of rays in the Western Australia Pilbara Fish Trawl Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Compliance Strategy (September 2018, Department of Primary Industries and Regional Development) (DPIRD 2018 - https://www.fish.wa.gov.au › corporate_publications). Strategies include: mandatory reporting, VMS and e-monitoring compliance technology, high visibility patrols, aerial surveillance, fish dealer inspections, and at-sea and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Prohibition on retention of rays in the Commonwealth Northern Prawn Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Commonwealth Northern Prawn Fishery seasonal closures
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Northern Territory - spatial trawl closures
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Western Australia - Permanent area closures - combination spatial trawl closures and marine parks
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Trawl fishing gear restrictions
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Discard mortality	
Existing management measure	Marine Parks
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure – Size/age/sex selectivity	
Existing management measure	Bycatch reduction devices mandated in most of the Australian fisheries that interact with this species
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Bycatch Reduction Devices are inspected by Fisheries Officers that conduct at-sea patrols (which include boardings) and port inspections to ensure compliance with standards.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Partially

Pressure - Size/age/sex selectivity	
Existing management measure	Trawl fishing gear restrictions
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Size/age/sex selectivity	
Existing management measure	Gear controls
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	All fisheries that encounter this species have gear controls in place that limit the amount of gear, characteristics that control size selectivity (e.g., mesh size, hook size), etc. The controls ensure constraints on overall fishing effort, the size of species caught, and often limits the age classes of individuals taken. There are regular port and at-sea inspections of gear to ensure compliance with regulations.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Partially

Pressure - Magnitude of IUU fishing	
Existing management measure	Licensing system of vessels in all Australian fisheries
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Vessel lists maintained and at sea and port inspections by Fisheries Officers.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of IUU fishing	
Existing management measure	Prohibition on retention of rays in the Northern Territory Demersal Fishery and Timor Reef Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Northern Territory Logbooks, observer coverage, fisheries inspectors, and Aboriginal marine rangers (https://nt.gov.au/marine/fisheries-compliance). Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of IUU fishing	
Existing management measure	Prohibition on retention of rays in the Western Australia Pilbara Fish Trawl Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of IUU fishing	
Existing management measure	Prohibition on retention of rays in the Commonwealth Northern Prawn Fishery
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections.
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Comprehensive data collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Pressure - Magnitude of IUU fishing	
Existing management measure	Fins naturally attached
Is it a Sub-national/National, or Regional/International measure?	Sub National/National
Is the measure generic, species-specific or both?	Generic
Relevant monitoring, control, and surveillance (MSC) measure(s)	Fisheries Officers conduct at-sea patrols (that include boardings) and port inspections
Overall assessment of compliance regime	Good (comprehensive relevant compliance measures in place)
Are relevant data collected and analysed to inform management decisions?	Some relevant data are collected AND analysed to inform management
Is management consistent with expert advice?	Consistent
Is the management measure effective at addressing the pressure?	Yes

Step 5: Non-Detriment Finding and related advice

5.0	Non-Detriment Finding and related advice	
5.1	Based on the outcomes of the previous sections, is it possible to make a positive NDF (with or without associated conditions)?	
	STEP 1: Can/should an NDF be made?	
	Section 1.1(a): Is the specimen subject to CITES controls?	Yes
	Section 1.1(b): Can origin and stock be confidently identified?	Yes
	Section 1.2: Were specimens legally obtained?	Yes
	STEP 2: Intrinsic biological vulnerability and conservation concern	
	Section 2.1: Intrinsic biological vulnerability:	Medium level of vulnerability
	Section 2.2: Conservation concern:	Medium level of concern

	STEP 3: Pressure on species	**STEP 4: Existing management measures**

	Pressure	Level of severity (Questions 3.1 and 3.2)	Level of confidence (Questions 3.1 and 3.2)	Are the management measures effective at addressing the concerns/ pressures/impacts identified?
	Trade pressures:			
a)	Magnitude of legal trade	Low level of risk	High level of confidence	Yes
b)	Magnitude of illegal trade	Low level of risk	High level of confidence	Yes
	Fishing pressures:			
a)	Fishing mortality (retained catch)	Low level of risk	High level of confidence	Yes
b)	Discard mortality	Medium level of risk	Low level of confidence	Yes
c)	Size/age/ sex selectivity	Medium level of risk	Medium level of confidence	Yes
d)	Magnitude of illegal, unreported and unregulated (IUU) fishing	Low level of risk	High level of confidence	Yes

Automated Recommendation: 0 to 2 - Not recommended 2.1 to 5 - Not recommended unless mitigation measures applied 5.1 to 8 - Possible with conditions 8.1 to 10 - Recommended	8.4	Recommended

Based on the above information, can a positive NDF be made?	Yes, without conditions	Go to Section 6 and list recommendations for measures to improve monitoring/management under reasoning/comments below
Enter any reasoning/comments:		
All three species of Wedgefishes (*Rynchobatus australiae* (Bottlenose Wedgefish), *R. palpebratus* (Eyebrow Wedgefish), *Rhina ancylostoma* (Shark Ray)) and the single species of Giant Guitarfish (*Glaucostegus typus* (Giant Guitarfish)) are assessed within Australia as Sustainable through national assessments aligned to the Status of Australian Fish Stocks process. These assessments are supported by the national Red List assessments that show these species are either Near Threatened (*Rhynchobatus* species and *R. ancylostoma*) or Least Concern (*G. typus*). All four species are incidentally caught in gillnet and trawl fisheries with minimal catches and suspected stable populations as they are all common (except *R. ancylostoma* which is rare), the fisheries in which the species are taken are well managed, the use of bycatch reduction devices in trawl fisheries has significantly reduced their catches, and the retention of rays is prohibited in some fisheries. Furthermore, the species have significant refuge from fishing pressure across considerable parts of their ranges due to trawl closures and marine parks. Management measures are effective at mitigating risks to the species in Australian waters. Any export of these species from Australian waters is considered to be non-detrimental to the survival of these species.		
NDF expiry (recommended validity: 1 or 2 years):	5 years	

Step 6: Automated recommendations

6.1) Recommendations ordered based on severity of pressure

Recommendation	Fisheries monitoring (fisheries-dependent data)
Is this recommendation applicable?	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	The aim is to improve the information on catch levels of these species across Australian fisheries in which they are caught by collecting data on landed catch at the species level. This is implemented currently in all fisheries using logbooks that fishers are required to complete and provide to management agencies. However, not all fisheries collect this data at species level, and reporting processes that do not collect species-specific data should move to include the ability to record each of these species. The collection of specific-specific data will enable the monitoring of catch levels at a national level and ensure they stay within sustainable bounds. Where catches of any of these species increases significantly (>20%) over two consecutive years, or >50% over one year, the reasons for the increases and the impact on the species should be investigated and the NDF updated if necessary.
Potential lead agencies	Australian Fisheries Management Authority, the Northern Territory Government, the Queensland Government and the Western Australian Department of Primary Industries and Regional Development.
Timeframe	Suggested 1- 5 years
Recommendation	Monitoring of domestic and international trade volumes and characteristics
Is this recommendation applicable?	Yes
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	The domestic and Australian international trade should be monitored for any trade in products (likely fins and meat) from these species using CITES permits and this level compared to catches reported from fisheries.

Potential lead agencies	Australian Fisheries Management Authority, the Northern Territory Government, the Western Australian Department of Primary Industries and Regional Development, the Queensland Department of Agriculture and Fisheries, and Australian CITES Authorities (international trade).
Timeframe	Suggested 1- 5 years

Step 6.2: Additional measures (user defined)

Additional measure	Post-release mortality
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	The aim is to address an information gaps on the impact of fisheries on the Wedgefishes and Giant Guitarfishes. That is, to investigate post-release mortality of these species, especially in fisheries where retention is prohibited or limited.
Potential lead agencies	Australian Fisheries Management Authority (trawl post-release mortality (PRM)), the Queensland Department of Agriculture and Fisheries (trawl and net fishery impacts on PRM), Northern Territory Government (trawl and line fishery impacts on PRM), and the Western Australian Department of Primary Industries and Regional Development (fish trawl and net impacts of PRM).
Timeframe	1-5 years
Additional measure	Wildlife Trade Operation approval
Aims, objectives, implementation, relevant compliance measures, and other notes/comments	All Australian fisheries that export CITES-listed species require Wildlife Trade Operation (WTO) approval to demonstrate compliance with Ecologically Sustainable Development principles. Fisheries are normally assessed every 3 years, with conditions placed on fisheries where changes or improvements are required. Fisheries that lack WTO approvals do not meet the requirement for issuance of a CITES permit. At present, there is no clear method of compliance to ensure product from fisheries without WTO approval is not exported. Consideration should be given to the need to develop such a method.
Potential lead agencies	Department of Climate Change, Energy, the Environment and Water.
Timeframe	1-5 years

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