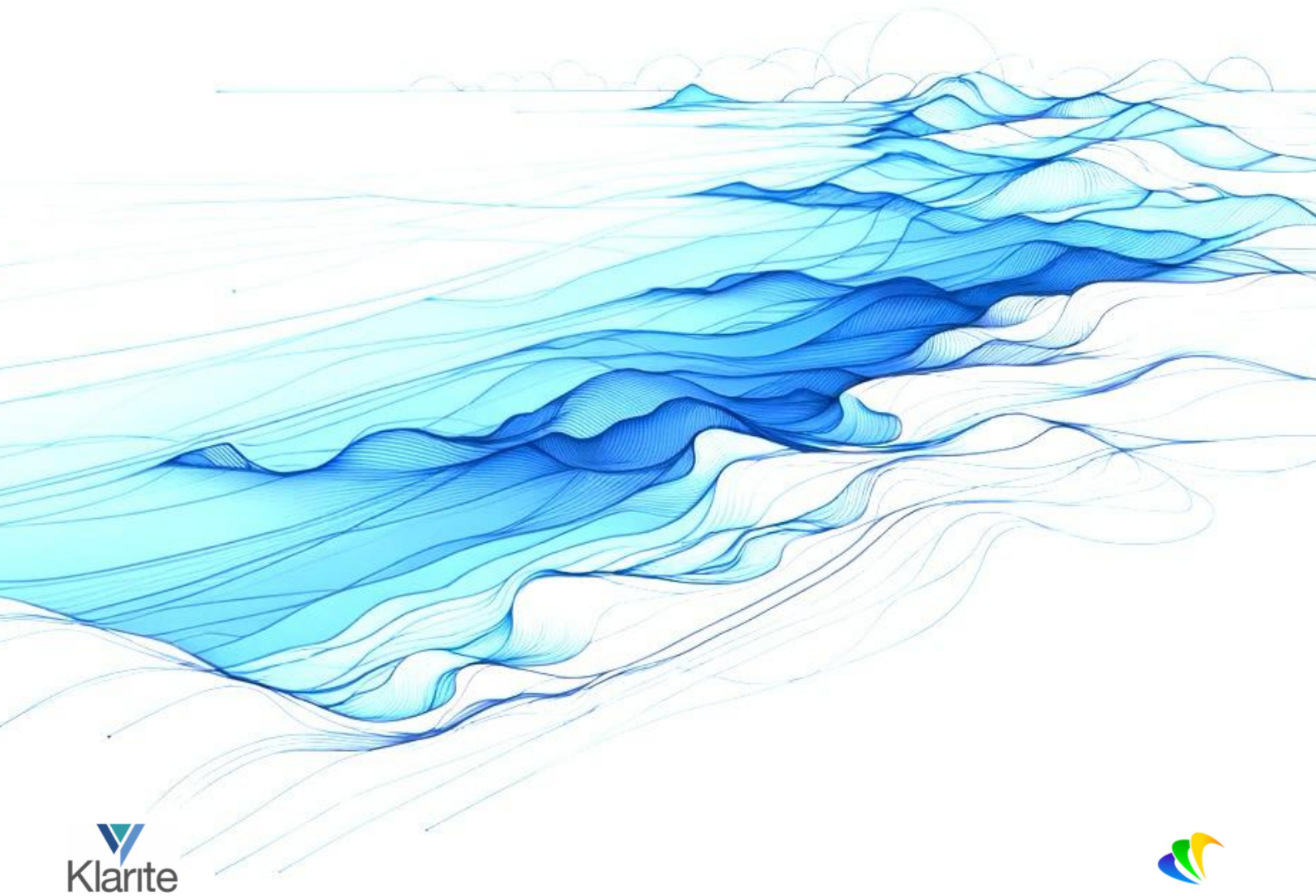
REGIA
Marine Seismic Survey

Impact Assessment
Underwater Sound: Fish

Appendix E3: REG-EP-022-E3

Rev 5

December 2025



Klarite

Contents

1 Introduction 5
1.1 Purpose and Scope 5
1.2 Consultation in Preparation of the EP 5
1.3 Modifications Arising from Further Assessment 5
2 Aspect – Underwater Sound 6
2.1 How the Aspect Occurs 6
2.2 Extent and Duration of the Aspect 6
3 Cause-Effect Pathway 7
4 Description of the Existing Environment That May be Affected by the Activity 8
4.1 Protected Species with Swim Bladder 8
4.1.1 Australian Grayling (*Prototroctes maraena*) 8
4.1.2 Blue Warehou (*Seriolella brama*) 9
4.1.3 Orange Roughy (*Hoplostethus atlanticus*) 10
4.1.4 Southern Bluefin Tuna (*Thunnus maccoyii*) 10
4.1.5 Syngnathids 11
4.1.6 Eels (*Anguilla spp.*) 11
4.2 Protected Species without Swim Bladder 13
4.2.1 Grey Nurse Shark (*Carcharias taurus*) 13
4.2.2 Little Gulper Shark (*Centrophorus uyato*) 13
4.2.3 School Shark (*Galeorhinus galeus*) 13
4.2.4 White Shark (*Carcharodon carcharias*) 14
4.3 Commercial Fish Species with Swim Bladder 14
4.3.1 Australian Salmon (*Arripis truttaceus* – Western Australian Salmon, *Arripis trutta* – Eastern Australian Salmon) 14
4.3.2 Australian Sardine (*Sardinops sagax*) 15
4.3.3 Bigeye Tuna (*Thunnus obesus*) 16
4.3.4 Blue Grenadier (*Macruronus novaezelandiae*) 16
4.3.5 Blue Mackerel (*Scomber australasicus*) 16
4.3.6 Blue-eye Trevalla (*Hyperoglyphe antarctica*) 16
4.3.7 Broadbill Swordfish (*Xiphias gladius*) 16
4.3.8 Eastern School Whiting (*Sillago flindersi*) 17
4.3.9 Jack Mackerel (*Trachurus declivus* and *T. murphyi*) 17
4.3.10 King George Whiting (*Sillaginodes punctatus*) 17
4.3.11 Pink Ling (*Genypterus blacodes*) 18
4.3.12 Redbait (*Emmelichthys nitidus*) 18
4.3.13 Ribaldo (*Mora moro*) 19

4.3.14 Striped Marlin (*Kajikia audax*) 19
4.3.15 Snapper (*Chrysophrys auratus*) 19
4.3.16 Southern Garfish (*Hyporhamphus melanochir*) 20
4.3.17 Tiger Flathead (*Platycephalus richardsoni*) 20
4.3.18 Yellowfin Tuna (*Thunnus albacares*) 20
4.3.19 Wrasse (multiple species) 20
4.4 Commercial Fish Species without Swim Bladder 21
4.4.1 Albacore Tuna (*Thunnus alalunga*) 21
4.4.2 Elephant Fish (*Callorhinchus mili, Harriotta haeckeli* and *H. raleighana)* 21
4.4.3 Gummy Shark (*Mustelus antarcticus*) 21
4.4.4 Saw Sharks (*Pristiophorus cirratus - Common*, *P. nudipinnis - Southern*, *P. peroniensis-Eastern)* 21
4.5 People and Communities 22
4.5.1 Social and Economic Features 22
4.5.2 Cultural Features 22
5 Relevant Legislative and Other Requirements 23
6 Defining Acceptable Levels of Impact 24
7 Consultation Input 28
8 Minimisation of Impacts Through Activity Design 29
8.1 Elimination 29
8.2 Substitution 30
9 Predicted Levels of Impact 31
9.1 Change in Fauna Behaviour, Hearing Capacity, and Physical Condition 31
9.1.1 Mortality and Potential Mortal Injury and Recoverable Injury 31
9.1.2 Temporary Threshold Shift 32
9.1.3 Change in Behaviour 33
9.1.4 Change in Commercial Catch 35
9.2 Measures Adopted to Manage Environmental Impacts 38
10 Demonstration Impacts will be of an Acceptable Level 39
10.1 Principles of ESD 39
10.2 Biological and Ecological Categories 39
10.3 Economic, Cultural and Social Categories 40
10.4 Consistency with Company Processes 40
11 Environmental Performance Outcomes 41
12 Recommendations 43
13 Document Control 44
14 References 45
Annex 1 51

Public Comment 51
Annex 2 52
Objections and Claims Raised from Consultation 52
Annex 3 90
Underwater Acoustic Sensitive Species 90

1 Introduction

Underwater Sound was identified through the Preliminary Environmental Impact and Risk Assessment (**PEIRA**) (Appendix B4) as an Aspect needing further assessment. Hence this document presents a detailed examination of Underwater **Sound**, as will typically be produced during the proposed Regia Marine Seismic Survey (**Regia MSS**), and its interaction with the environmental Receptor we are collectively calling **Fish.**

This assessment is built on the information contained in the following four core studies, which should be read in the order they are listed:

1. PEIRA
2. Seismic Sound Studies Report (Appendix B8)
3. Sound Emissions Modelling Reports (Appendix B7)

1.1 Purpose and Scope

The purpose of this document is to assess all acceptable sources of information to provide clear outcomes around levels-of-impact, and any associated mitigation and management measures that may be needed.

This assessment is the second stage of the environmental assessment. Its purpose is to rank the impact according to the criteria set out in the Environmental Assessment Process found in Appendix B3. The purpose of this stage of the assessment is to demonstrate that the impact can be managed to an acceptable level through the adoption of mitigation measures and the setting of an appropriate environmental performance outcome.

The measures adopted because of consultation and because of the assessment will be carried through to the ALARP assessment which occurs in stage three of the overall assessment process. Recommendations will be made if there is any further assessment required in the third stage of the assessment.

1.2 Consultation in Preparation of the EP

This document was initially published in draft form and uploaded to the Document Library of the Regia MSS Consultation Hub on 11 September 2023 as a stand-alone document, rather than as part of the much more substantial total EP document. This was done to maximise the ability of interested members of the public to read, interpret and respond within the mandated 30-day public comment period.

As such, public and Relevant persons were invited to comment on the document with an explicit request for feedback on:

- The accuracy of the described environment that may be affected.
- Any omissions of environmental values and sensitivities relevant to the environmental aspect.
- Any errors or omissions of scientific/peer reviewed literature that should be considered.
- Any errors or omissions of relevant legislation or documents of standing that should be considered.
- Any further mitigation or management measures that should be considered.

Up to 22 December 2023, there were no specific comments received on the content of the document.

1.3 Modifications Arising from Further Assessment

To ensure this environmental assessment remains contemporary, accurate, and reflects feedback from the regulator and relevant persons, this document will be updated from time-to-time. In particular, the CGG environmental assessment process requires consideration of whether further assessment was needed to verify, or dive deeper into a topic, to further improve the predictive quality of the assessment. When this has occurred, reference to such changes will be communicated in the Recommendation section and identified at relevant points in the assessment.

2 Aspect – Underwater Sound

2.1 How the Aspect Occurs

The primary sound source will be impulsive underwater acoustic emissions coming from the seismic source releasing compressed air (seismic pulse) and creating a sound wave directed downwards towards the seabed.

Secondary sound sources will include continuous underwater acoustic emissions generated by the survey and support vessels and helicopters. Sounds from vessels are generated by thrusters, engines, and propellers. Underwater acoustic emissions from helicopters are generated via the engine and rotors. Underwater acoustic emissions from Ultra-Short BaseLine positioning beacons are generated within the streamer spread.

An overview of underwater sound and studies relevant to seismic is in Appendix B8.

2.2 Extent and Duration of the Aspect

Impulsive Sound

Duration: 60 days

Extent: Active Source Area + 86 m – 10.95 km based on the furthest distance to modelled sound effect criteria. [Updated in response to Matter: F17]

Active seismic acquisition will occur for up to 60 days within the Active Source area.

Continuous Sound

Duration: 90 days

Extent: Operational Area +1.6 km based on the assessment of vessel sound.

The survey and support vessels will be active in the Operational Area for the duration of the survey undertaking support activities and acquisition.

3 Cause-Effect Pathway

The PEIRA (Appendix B4) identified a cause-effect pathway for impulsive (seismic) underwater sound for the following environmental receptors and their social, cultural, and economic features:

- Fish (including eels and sharks).
- People and communities.

In addition, indirect impacts were identified to the following, via relevant person consultation:

- Commercial fisheries and fishing tour operators

Potential environmental impacts to fish identified from the PEIRA are:

- Change in fauna behaviour.
- Change in hearing capacity.
- Change in physical condition.

Species are grouped according to their sound modelling characteristics which are influenced by the presence or absence of a swim bladder, as defined by Popper et al. (2014) Most bony fishes have a swim bladder which is used for buoyancy control but may also be used for hearing, sound production, and/or respiration. Species with a swim bladder have a greater potential to suffer from physiological trauma than those without. Fish species that lack a gas-filled cavity, such as elasmobranchs (sharks, skates, and rays) some tuna species and other pelagic and deep-sea species, are not as vulnerable to trauma from extreme sound pressure changes as fish with a gas-filled space (Popper et al 2014).

In 2006, the Working Group on the Effects of Sound on Fish and Turtles was formed to continue developing noise exposure criteria for fish and turtles, work begun by a panel convened by NOAA two years earlier. The resulting guidelines included specific thresholds for different levels of effects and for different groups of species (Popper et al. 2014). These guidelines defined quantitative thresholds for three types of immediate effects: ·

- Mortality, including injury leading to death.
- Recoverable injury, including injuries unlikely to result in mortality, such as hair cell damage and minor haematoma.
- TTS

PTS was not identified by Popper et al (2014), thus there is no cause-effect pathway for PTS effects to fish.

4 Description of the Existing Environment That May be Affected by the Activity

For a description of the baseline soundscape in the region relevant to the Regia MSS, refer to Section 1.1 of Appendix B8.

To identify fish species (including sharks and rays) that are covered by the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and that may be present within the area affected by underwater sound, a PMST search was undertaken. The PMST search area was defined as the Active Source Area plus an 8 km buffer. This buffer distance was based on the furthest distance to modelled sound effect criteria for fish of 8.35 km at the time of searching. The PMST Report is available in Appendix B5. Annex 3 provides details on these protected fish species and relevant conservation advice or management plans.

.PMST searches were run multiple times prior to resubmission to ensure any changes to species or listings were identified to control for passage of time. Yarra Pygmy Perch and Eastern Dwarf Galaxia have been removed from the 2025 PMST search for the underwater sound EMBA that may impact fish. Conservation Advice has also been updated for several species and subsequent changes have been made to Annex 3.

Changes relevant to the assessment of underwater sound and fish are:

- Southern Bluefin Tuna (*Thunnus maccoyii*) has been removed from the February 2025 PMST reports for all areas searched, as it is no longer listed as a threatened species under the EPBC Act (DCCEEW 2024k). This species has been retained for assessment based on a precautionary approach remains appropriate to assess this species that was only recently delisted, the species known relevance to regional fisheries, and to accurately reflect the passage of time over which this EP has been constructed.
- Grey Nurse Shark (*Carcharias taurus*) has been added to list as species or species habitat may occur within area.

[Section added in response to Matters: I16 and I17].

In addition to the fish species identified from the PMST searches, all commercial species of relevance as identified from a review of Appendix B6: Commercial Fisheries Analysis Report (Appendix B6) are described here.

Stakeholder consultation concerns were raised about the potential impact of seismic sound on eels, hence they are also included.

4.1 Protected Species with Swim Bladder

4.1.1 Australian Grayling (*Prototroctes maraena*)

The Australian Grayling is a small to medium-sized, slender, silvery fish with soft-rayed fins lacking any spines. It is endemic to south-eastern Australia, including Victoria, Tasmania, and New South Wales, and is a migratory species that inhabits estuarine waters and coastal seas as larvae/juveniles, and freshwater rivers and streams as adults (Backhouse et al. 2008) i.e. amphidromous. Australian Grayling generally migrate downstream to the lower freshwater reaches of rivers to spawn, usually over a two-week period, typically from late-summer to mid-winter (TSSC 2021). Fecundity of this species varies between 25,000 and 68,000 eggs, with an average of 47,000 eggs (TSSC 2021). Eggs hatch between 10 and 20 days after being laid. Larvae emerge at 6.5 mm in length, are buoyant, and while they are free swimming, they are typically swept downstream into marine habitats by river flow (TSSC 2021). A lack of genetic diversity between Australian Grayling collected from coastal rivers in Victoria suggested that a single population occurs in Victoria, as larvae are most likely dispersed during the marine stage of their life cycle (TSSC 2021). This result indicates that the marine larval and juvenile phase facilitates extensive gene flow among coastal rivers. Such a dispersal strategy would enable recolonization of rivers that experience localized extinction provided that connectivity between freshwater habitats and the sea is sufficient to permit migration and that enough source populations remain intact to support viability of the wider population. Similarly to the freshwater eels (Anguiulla sp.) the key threats to Australian Grayling come from pollution, loss and fragmentation of

their riverine habitat. The key riverine habitats for this species are all located to the east of the Regia MSS, along the south-east axis of Victoria and extending up into NSW (Figure E3-1).

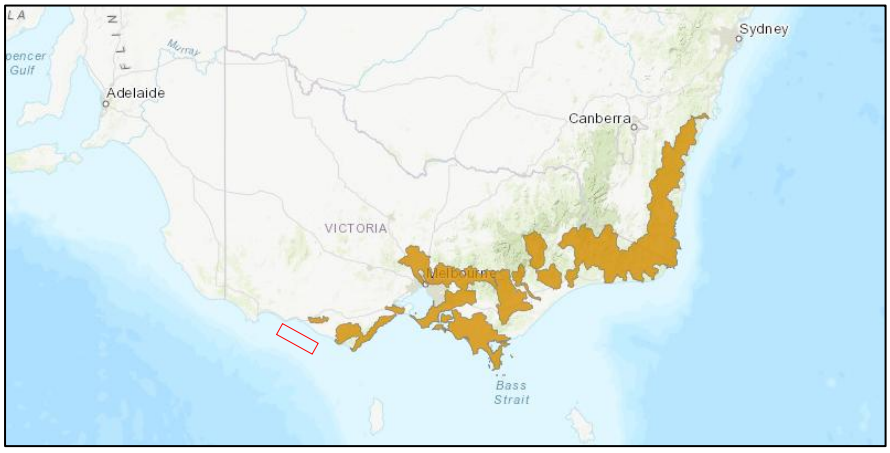


Figure E3-1 - Geographic range of the Australian Grayling (from Lintermans et al 2019 IUCN Red List Assessment). Red box is approximate location of proposed Regia MSS

4.1.2 Blue Warehou (*Seriolella brama*)

The Blue Warehou is a medium-sized, deep-bodied fish, reaching a maximum total length of 90 cm and a maximum weight of 7 kg (TSSC 2015). Globally, the Blue Warehou is confined to Australian and New Zealand waters predominantly in coastal shelf, upper continental slope, and seamount waters offshore from New South Wales, Tasmania, Victoria and South Australia (TSSC 2015). It is nevertheless a highly mobile species that is genetically well-connected over its range. [Paragraph updated in response to Matter: F03]

Blue Warehou is a bentho-pelagic species that inhabits continental shelf and slope waters. Adults can be found at depths from 50 - 300 m. Blue Warehou is a schooling fish and usually aggregates close to the seabed. Juveniles can sometimes be found schooling close to the surface in estuaries, often in association with jellyfish (AFMA 2023).

Spawning occurs during winter and early spring. Larval sampling has found that the major spawning locations are along the west coast of Tasmania (Figure E3-2 from Bruce et al 2001).

On average female's spawn around three times per season, producing 430,000 – 1,350,000 eggs per spawning event depending on their body size (AFMA 2023). [Paragraph updated in response to Matter: F03]

While Blue Warehou is a target species for the Southern and Eastern Scalefish and Shark Fishery and Tasmania Scalefish Fishery, catch levels are extremely small at ~4T and 1T per fishery respectively. AFMA (2023) states that the stock are depleted and actively avoided by fishers.

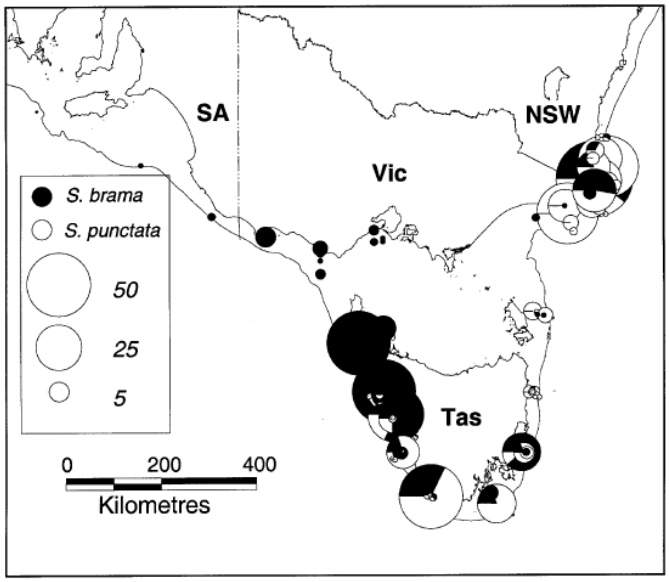


Figure E3-2 Distribution of S. brama larvae and S. punctata larvae in southern Australia (all sizes combined). Scale, number of larvae per 1000m³ (from Bruce et al 2001).

4.1.3 Orange Roughy (*Hoplostethus atlanticus*)

Orange Roughy are a deepwater species that inhabits waters over steep continental slopes and ocean ridges. They are usually found dispersed over rough bottoms and steeps at depths of 700 - 1400 m (AFMA 2023a). Orange Roughy form dense spawning aggregations in winter, with non-spawning aggregations occurring sporadically in summer and autumn. Aggregations usually occur from 5 - 10 m above the seabed, with some extending over 50 m in height from the sea floor. Aggregations are usually associated with submerged hills or pinnacles. Excluding substantial migrations to spawning grounds, Orange Roughy are a relatively sedentary species (AFMA 2023a).

Orange Roughy reach reproductive maturity at 27-32 years of age. Spawning aggregations form between mid-July and late August. Adult males appear to spawn over a 1–2-week period, with females spawning for up to 1 week. Females produce 10,000 -,90,000 eggs in a single spawning event each season. The eggs float to the surface after fertilisation before sinking again to hatch close to the sea floor. Hatching is thought to occur 10-20 days after fertilisation. It is likely that females do not spawn every year (AFMA 2023a).

The Orange Roughy is a demersal fish targeted by the Southern and Eastern Scalefish and Shark Fishery. They are widely distributed throughout the world and form dense spawning and feeding aggregations on or near topographic features such as seamounts, canyons, and plateaus (DCCEEW 2023b). No spawning or feeding aggregation areas have been identified in the Operational Area, with their major spawning locations located on the east coast of Tasmania (Knucky & Smith 1997). [Paragraph updated in response to Matter: F03]

4.1.4 Southern Bluefin Tuna (*Thunnus maccoyii*)

Southern Bluefin Tuna can grow to 225 cm in length and 200 kg in weight (TSSC 2010). They are a highly migratory species that occurs globally in waters between 30°S and 50°S. In Australian waters, they range from northern Western Australia, around the southern region of the continent, to northern New South Wales (TSSC 2010). Southern Bluefin Tuna forms a single, widely distributed population in the southern, temperate oceans, but with a single known spawning ground in the Indian Ocean, between Java and northern Western Australia (TSSC 2010). Southern Bluefin Tuna are known to be among the fastest ocean swimmers in the world and can travel in speed bursts of up to 70 km/hr while feeding (TSSC 2010).

Southern Bluefin Tuna are a target species for the Southern Bluefin Tuna Fishery and in Australian waters, they are found mainly in the Great Australian Bight (AFMA 2023b) where they are most caught

during the summer months (December to April). They are also caught off the New South Wales coastline during winter (AFMA 2023b).

Southern Bluefin Tuna is not commercially caught in the Operational Area. It is sometimes caught recreationally off Victoria.

4.1.5 Syngnathids

Most of the listed marine ray-finned fish species identified in the PMST report are syngnathids, which includes seahorses and their relatives (sea dragon, pipehorse and pipefish). However, of the 26 species listed in the report all of them are assessed as "Species or species habitat may occur within area", which reflects the almost complete lack of evidence to support their presence. Nevertheless the majority of these species are associated with seagrass meadows, macroalgal seabed habitats, rocky reefs and sponge gardens which are all located in shallow, inshore waters such as protected coastal bays, harbours and jetties less than 50 m deep (Fishes of Australia, 2015). They can also be found in deeper offshore waters, where they are 'rafting' around floating seaweed such as sargassum, seen as a method of dispersal between locations.

The most common habitats they associate with in temperate waters are dominated by seagrass and algae (Foster & Vincent 2004) while also being regularly associated with anthropogenic features, such as aquaculture pens, moorings, swimming (shark) nets and jetty pylons (Clynick, 2008;;Harasti et al., 2010) to the extent that these features are likely important habitats for some, or even many, species.

Identified threats to Syngnathids include physical habitat modifications, decreased water quality and bycatch from commercial fishing.

There is a dearth of literature on effects of underwater noise on Syngnathids however Vincent et al (2011) noted a study by Anderson (2009) that found seahorses exposed to loud aquarium noises for a month displayed multiple stress responses but without any measured changes in reproduction or feeding. They also highlighted the work of Simpson et al (2008) that found Syngnathids showed a positive response to high frequency noise.

Given the lack of compelling evidence for significant populations of seahorses along the Otway Coast region and their prevalence for seagrass and algae dominated habitats, which are mostly confined to sheltered bays and estuaries in shallow water, there is no further assessment conducted on this group.

4.1.6 Eels (*Anguilla spp.*)

The Short-finned Eel (*Anguilla australis australis*) and the Long-finned Eel (*A. reinhardtii*) both occur naturally within Victoria and are the target species of the Victorian Eel Fishery. The eels have differing but overlapping distributions east and south of the Great Dividing Range in estuarine and freshwater catchments (VFA 2023) (Figure E3).

The Short-finned Eel is widespread across the southern parts of the Victoria and occurs occasionally in northern streams draining into the Murray River, while the Long-finned Eel is found within southeast parts of Victoria only (VFA 2023). Both species spend the majority of their life cycle in fresh water or estuaries before travelling to the ocean to spawn once before dying (VFA 2023). The Operational Area or area potentially impacted by underwater sound does not overlap habitat associated with the Long-finned Eel and hence is not discussed further.

Both species migrate to the ocean once matured; male Short-finned Eels generally mature at 8-12 years of age, whilst females mature at 10-20 years. Migration occurs during late summer to autumn (VFA 2023a). Spawning is thought to occur in the vicinity of the Coral Sea, although no precise spawning location for either species has been identified. Eggs are thought to be pelagic and hatch after about two days. Larvae are transported southwards along the east coast of Australia where they metamorphose into glass eels and swim into coastal bays and estuaries (VFA 2023). Most Short-finned glass eels migrate in the winter and spring, although glass eels may continue to arrive anytime throughout the year (VFA 2017).

The distributions of Short-finned Eels are extensive from subtropical Queensland to western Victoria, Tasmania, and New Zealand (VFA 2023).

Koster et al (2021) tracked the Short-finned Eel spawning migration for the first time in Australia. Sixteen eels were collected and tagged from the Hopkins and Fitzroy River estuaries as they migrated from the river mouths outwards to the Southern Ocean over a sandbar in 2019. They were then released at either Warrnambool Harbour, Hopkins mouth beach or Killarney beach. Of the 16 tags twelve returned data. The results showed that the Short-finned Eels exhibit diel vertical migration, where they travel in the top layers of water during the night and travel further down in the water column during the day (Koster et al. 2021). Of the small number of eels that made the entire journey to the spawning location their last movements were recorded in the Coral Sea. Many of the eels (about 30%) migrations were cut short due to predation, suspected by sharks, tuna, or other marine mammals.

It has been noted by Van Wichelen, et al (2022) that glass eels feeding during their migration is highly restricted, therefore when discussing impacts to glass eels, this has been considered.

Short-finned Eel is listed as 'near threatened' on the IUCN red list, with barriers to riverine movement and freshwater habitat loss being key threats. Additionally changes in ocean currents, primary production, and thermal regimes may also affect eel migration, spawning success, and recruitment (Koster et al. 2021). The long-finned eel is listed as 'least concern' by the IUCN. Short-finned Eel is not listed under the EPBC Act and is fished by the Victorian Eel Fishery.

Victorian Eel Fishery

Both the Long-finned and Short-finned Eel are the target species for the Victorian eel fishery. The first commercial catches of eel were recorded in 1914, and up until 1950 eel was primarily fished for bait. Export of frozen Short-finned eel to Europe began in the 1960s (VFA 2023a). Eel are harvested in Victorian coastal river basins south of the Great Dividing Range using fyke nets, with a maximum of 18 licences allowed in Victoria. Certain waterways are closed to fishing to allow for eels to escape and spawn (VFA 2023a). Short-finned Eels are the most abundant and the most keenly targeted eel species in Victoria, productivity from the fishery is highly susceptible to short and long term and seasonal environmental variations, particularly drought (VFA 2017).

The eel fishery comprises both a wild catch sector and a culture (stock enhanced) sector. The culture sector has developed strategies for growth consistent with the species life cycle by translocating juvenile eels from other parts of Victoria into lakes and impoundments (culture waters) in western inland Victoria where they continue to grow (VFA 2017). Fishing for glass eels has been of limited success due to the highly variable abundance in Victoria. Most of Victoria's eel catch is taken by commercial fishers and is comprised of adult eels during different stages of their migration.

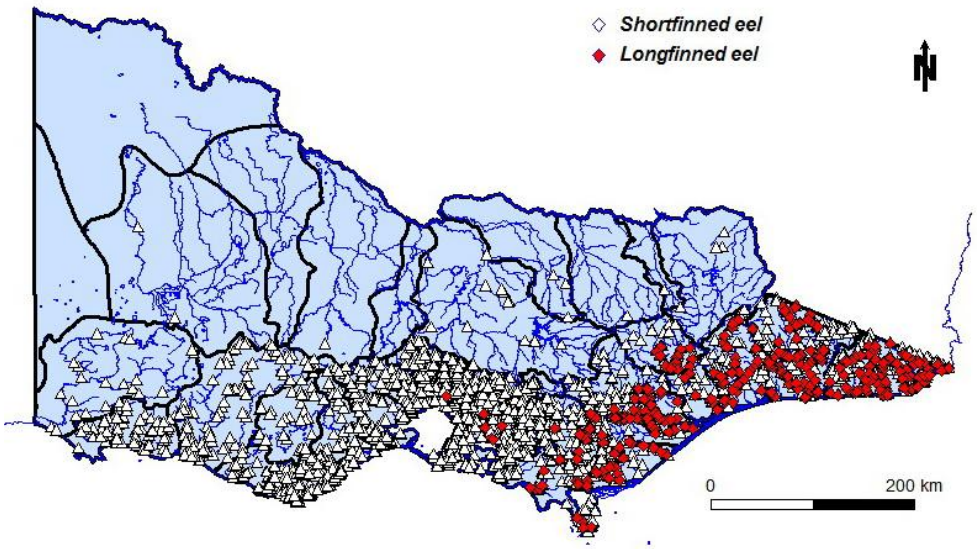


Figure E3-3: Distribution of Long-finned and Short-finned Eels in Victoria (VFA 2017)

4.2 Protected Species without Swim Bladder

4.2.1 Grey Nurse Shark (*Carcharias taurus*)

The east coast population status for the Grey Nurse Shark is critically endangered under the EPBC Act. In addition, this species is also protected in the coastal waters of Victoria under the Fisheries Act 1995. The recovery plan for this species highlights that all but one of the nineteen key aggregation sites for this species are listed as 'habitat critical for the survival of the species'. Of most relevance here is that none of these key aggregation sites are in waters off the Victoria coast (CoA 2014).

The Grey Nurse Shark is reported to have two distinct populations in Australia: a west coast population and an east coast population. This shark species is found mostly in inshore regions in cool temperate to sub-tropical waters (Compagno, 1984; Last & Stevens, 2009). The east coast population covers a range of approximately 2,700 km and extends from the Capricornia coast (central Queensland) to Narooma in southern New South Wales. Sightings data from the New South Wales Department of Primary Industries (NSW DPI) includes sightings as far south as the NSW/Victoria border (CoA 2014). Grey Nurse Sharks tend to live in shallow inshore waters with their preferred habitats being sandy-bottomed gutters or rocky caves and close to inshore rocky reefs or islands (DCCEEW 2021).

The Grey Nurse Shark is slow growing and long-lived with late onset sexual maturity and low fecundity. Lifespans of this species have been known to reach at least 40 years for females and 34 years for males (Passerotti et al. 2014, Harry 2018). The longest records for wild *C. taurus* in mark and recapture studies are 22 years (male) off the south coast of Western Australia and 26 years (female) off the coast of South Africa (Jakobs & Braccini 2019, Hoschke et al. 2023). The east coast population is currently estimated to be around 2,000 individuals with recovery of this population considered slow (DCCEEW 2023a).

As highlighted in this species' recovery plan, the principal threats to this population and contributors to the lack of Grey Nurse Shark recovery in Australia are mortality resulting from incidental (accidental and/or illegal) capture by commercial and recreational fishers and from shark control activities. Other potential threats to the species mentioned in the recovery plan include impacts from ecotourism, collection for public aquaria, pollution and disease and ecosystem effects as a result of habitat modification and climate change. Exploration activities, including seismic, have not being identified as key threats to this species (CoA 2014).

4.2.2 Little Gulper Shark (*Centrophorus uyato*)

The Little Gulper Shark is listed as Conservation Dependent. Gulper Sharks are targeted by the Southern and Eastern Scalefish and Shark Fishery but are mostly taken as bycatch in the trawl fishery. They are endemic to Australia, occupying demersal habitats on the upper slope of the southern continental shelf, between 180 m to 900 m (Williams et al. 2012). There are likely to be three distinct stocks of Gulper Shark:

- An eastern stock along the east coast of Australia down to eastern Tasmania.
- A central stock from western Tasmania through the Great Australian Bight.
- A western stock from the western Great Australian Bight, southwestern Australia.

Gulper Sharks have life history characteristics that make them vulnerable to overfishing, which is the biggest driver of declines in this species. These include slow growth, late age-at-maturity, low fecundity, and low natural mortality (TSSC 2013a). Young are born live, and reproduction is continuous and non-seasonal (TSSC 2013a). Estimated foraging range for Gulper sharks is up to 50 nm based on acoustic telemetry data (Williams et al. 2012). They undertake day-night migrations across their depth range from relatively deep day time residence depths (1000 m) to shallower nighttime feeding depths (to 200 m) (Williams et al. 2012). [Section updated in response to response to Matter: F03]

4.2.3 School Shark (*Galeorhinus galeus*)

School Shark are a temperate demersal species found on the continental shelf and slope. They can be found to depths of 550 m and often move up into the water column at night. School shark segregate into schools according to size and sex (AFMA 2023). Size generally increases from inshore to offshore. Pups and juveniles aggregate in shallower 'nursery' waters during the spring and

summer. School Shark undertake long migrations of up to 1400 km along the southern coast of Australia, which are thought to be associated with homing to natal mating and pupping grounds (Last and Stevens 1994). However, while extensive migrations within regions have been recorded, studies of different global populations indicate that each region hosts a genetically distinct population. Within regions, it is suspected that there may be localised subpopulations (TSSC 2009a).

School Shark are a target species for the Southern and Eastern Scalefish and Shark Fishery but are also taken as bycatch in the trawl fishery.

School Shark is listed as Conservation Dependent. It appears to have undergone a significant reduction in numbers as a result of commercial fishing in southeastern Australian waters (TSSC 2009a). School Sharks move extensively throughout the waters of southern Australia. School Shark is primarily a deep water demersal (bottom-dwelling) species, although individuals have been recorded undertaking daily vertical migrations, remaining at depths of around 500 m during the day and moving up to around 100 m at night (McLoughlin, 2007). Females and juveniles utilise inshore coastal areas around Victoria, Tasmania, and parts of South Australia for nursery areas (Pogonoski et al., 2002). Birth occurs in early summer after a gestation period of 12 months. Pups are born in shallow bays and estuaries (AFMA 2024).

4.2.4 White Shark (*Carcharodon carcharias*)

The White Shark is listed as Vulnerable. White Sharks are long-lived, living for 30 years or more (Bruce 2008), and are found throughout temperate and sub-tropical regions in the northern and southern hemispheres (Last & Stephens 2009). The species is also commonly found in inshore waters in the vicinity of islands, and often near seal colonies (Malcolm et al. 2001). The White Shark foraging BIA within the area that may be impacted by underwater sound above the behavioural threshold for sharks, is centred on Lady Julia Percy Island which is a known seal breeding colony (Appendix B12 MAP-REG-EPM-077).

4.3 Commercial Fish Species with Swim Bladder

The following commercial fish species were identified from the Commercial Fisheries Analysis Report available in Appendix B6.

4.3.1 Australian Salmon (*Arripis truttaceus* – Western Australian Salmon, *Arripis trutta* – Eastern Australian Salmon)

The following is from;

https://www.fish.gov.au/report/351-Western-Australian-Salmon-2023

https://www.fish.gov.au/report/350-Eastern-Australian-Salmon-2023

The Western Australian Salmon biological stock is distributed from Kalbarri in Western Australia southwards to South Australia, Victoria and the west coast of Tasmania. The species spawns in Western Australia and eggs and larvae are dispersed by the Leeuwin Current. The fish then grow and mature in eastern waters before moving back towards their spawning areas in the west.

This cross-jurisdictional biological stock has components in Western Australia, South Australia and Victoria. The status presented here for the entire biological stock has been established using evidence from all jurisdictions. However, the breeding component of this stock resides exclusively in Western Australia, with only immature/nonbreeding fish occurring in South Australia and Victoria [Cappo et al. 2000].

In Victoria, Western Australian Salmon are subject to very low exploitation by recreational and commercial fisheries. The species is not a common target in the major Victorian bay and inlet fisheries; for example, “Salmon” were listed as the primary target species by only 0.38% of recreational fishers interviewed in creel surveys in Port Phillip Bay [Bell et al. 2023]. Western Australian Salmon are targeted in small-scale recreational fisheries elsewhere (e.g., in estuaries and along the coast), however these catches are likely small within the context of the species' wide-ranging behaviour and ability to use a diverse range of habitats [Bell et al. 2023].

The above evidence indicates that the biomass of this stock is unlikely to be depleted, recruitment is unlikely to be impaired, and the current level of fishing mortality in each jurisdiction is unlikely to cause the stock to become recruitment impaired.

In Victoria, the Eastern Australian Salmon stock is targeted by the commercial purse seine ocean fishery, mostly off eastern Victoria, with small catches also taken from Corner Inlet and the Ocean Fishery. This cross-jurisdictional biological stock has components in New South Wales, Victoria and Tasmania. The entire Eastern Australia biological stock is classified as a sustainable stock.

Australian Salmon is a target of the Victorian Multispecies Ocean Fisheries.

4.3.2 Australian Sardine (*Sardinops sagax*)

The following is from AFMA 2023d ((https://www.afma.gov.au/species/australian-sardine)).

Australian Sardine is found primarily in temperate waters throughout the eastern Pacific Ocean. They are a coastal species that can usually be found from inshore waters to the edge of the continental shelf, down to depths of about 200 m. Australian Sardine is often found in large schools. Feeding is thought to mainly occur during the day.

Australian Sardines are a key food source in marine food chains throughout their range, being targeted by marine mammals, birds and pelagic fish species such as tuna. They are the dominant clupeoid in the region occurring throughout coastal and shelf waters in contrast to the Australian Anchovy which is mostly confined to inshore waters (Ward et al 2020).

There are four recognised sub-populations centered on Southwestern Australia, Eastern Australia, Southeastern Australia and Southern Australia. The major fishing grounds are in South Australia. Stocks are considered sustainable. Spawning occurs during spring-summer in the southern part of its range, and in summer-autumn in the northern part (Figure E3 - 4). It was previously thought that Australian Sardine only spawn once or twice in a season, but research on similar species suggests that they may spawn multiple times. Females produce 10,000 – 45,000 eggs per spawning event depending on their body size.

A recent study has discovered a hitherto unestimated large Australian Sardine resource off South Eastern Australia (Ward et al 2023). The new estimates suggest that catches could be increased by an order of magnitude without endangering the sustainability of the stock.

Australian Sardine is a target species for the Small Pelagic Fishery and the Southern and Eastern Scalefish and Shark Fishery. [Section updated in response to Matter: F03]

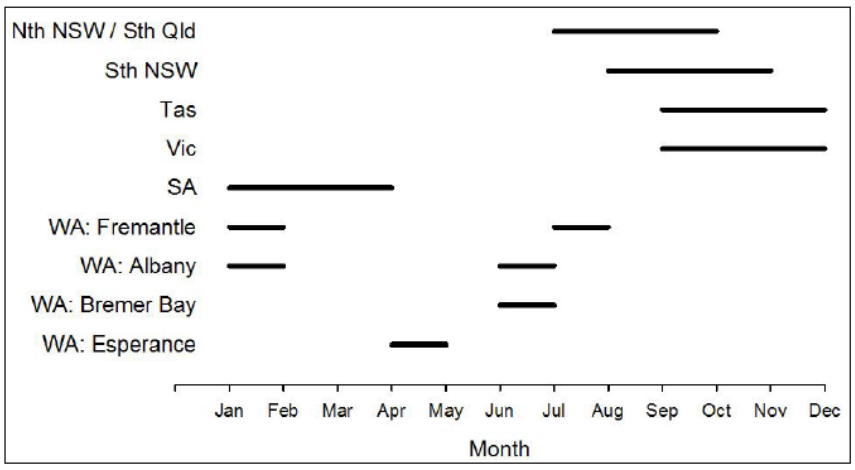


Figure E3 - 4 Periods of peak spawning of Australian sardine throughout its Australian distribution (from Izzo et al 2012).

4.3.3 Bigeye Tuna (*Thunnus obesus*)

The following is from AFMA 2023e.

Bigeye Tuna is a highly migratory species, swimming continuously over large distances. They are found commonly in eastern Australian waters, but they are also found in the waters of other countries within the Pacific and Indian Oceans.

In Australia, Bigeye Tuna is caught anywhere along both the east and west coasts and is a targeted species by fishers in both the Eastern Tuna and Billfish Fishery and the Western Tuna and Billfish Fishery.

Bigeye Tuna is a tropical tuna species and prefers warmer oceanic waters and is not likely to be present in the Otway area of the Operational Area.

4.3.4 Blue Grenadier (*Macruronus novaezelandiae*)

The following is from AFMA 2023f.

Blue Grenadier is a deepwater species that occurs on the continental slope. They can be found at depths of 200 - 700 m. Juveniles often occur in shallower bays and inlets. Blue Grenadier aggregate near the seabed during the day and move up into the water column at night. Spawning occurs in winter and early spring. The main spawning ground for blue grenadier is on the west coast of Tasmania. Females release about 1 million eggs in a single spawning event.

Blue Grenadier is a target species for the Southern and Eastern Scalefish and Shark Fishery. Catch rates in Australia are highest off the west coast of Tasmania on the shelf slope during winter where the species aggregates to spawn, and this region has been confirmed as a major spawning ground for the species (Gunn et al. 1989, and Bulman et al. 1999). [Paragraph updated in response to Matter: F03].

4.3.5 Blue Mackerel (*Scomber australasicus*)

The following is from AFMA 2023g.

Blue Mackerel are a schooling pelagic species that occurs in tropical and temperate waters of the Pacific Ocean. They can be found to depths of 200 m over the continental shelf, although juveniles inhabit inshore waters and shallower waters. Blue Mackerel tend to school by size, as well as with other fish such as jack mackerels. Feeding is thought to occur during the day.

Blue Mackerel reach reproductive maturity at about 3 years of age. Spawning occurs in spring and summer in outer continental shelf waters off northern New South Wales and southern Queensland.

Fishing for Blue Mackerel in the Small Pelagic Fishery has historically been focused off southeast NSW, eastern Tasmania, and South Australia. These areas are outside of the Operational Area.

4.3.6 Blue-eye Trevalla (*Hyperoglyphe antarctica*)

The following is from AFMA 2023h.

The Blue-eye Trevallas are stout-bodied fish with a blunt snout and small scales. The Blue-eye Trevallas are benthic species that are associated with rocky ground on continental slopes often found in continental shelf and upper slope waters at depths from 100 - 600 m and on seamounts and undersea features. They generally remain close to the seabed during the day and move up into the water column at night. Spawning occurs in summer and autumn. Mature fish are thought to move into shallower waters and aggregate over specific areas for spawning. Most spawning activity occurs in waters from central New South Wales to north-eastern Tasmania (AFMA 2024). [Reference added in response to Matter: F03]

Blue-eye Trevallas are a target species for the Southern and Eastern Scalefish and Shark Fishery.

4.3.7 Broadbill Swordfish (*Xiphias gladius*)

The following is from AFMA 2023i.

Broadbill Swordfish is an oceanic species and is caught worldwide throughout tropical, temperate, and occasionally cold waters. They are commonly found in eastern Australian waters, but they are also found in the waters of other countries within the Pacific and Indian Oceans.

In Australia, Broadbill Swordfish are caught anywhere along both the east and west coasts, and it is a targeted species by fishers in both the Eastern Tuna and Billfish Fishery and the Western Tuna and Billfish Fishery.

Broadbill Swordfish are not commercially caught in the Operational Area.

4.3.8 Eastern School Whiting (*Sillago flindersi*)

The following is from AFMA 2023j.

Eastern School Whiting is a benthic species found from shallow tidal flats down to depths of 180 m on the continental shelf. They are usually associated with sandy substrates. Juveniles tend to be found in shallower waters than adults.

Spawning is regionally variable and occurs from October to March in the eastern Bass Strait, late summer in Tasmania, and during winter in northern New South Wales. Females spawn twice each year in deeper waters. Females produce 30 000-110 000 eggs per spawning season depending on their body size.

Eastern School Whiting is a target species for the Southern and Eastern Scalefish and Shark Fishery.

4.3.9 Jack Mackerel (*Trachurus declivus* and *T. murphyi*)

The following is from AFMA 2023m.

Jack Mackerel are a pelagic schooling species found around the southeast and southern coasts of Australia over the continental shelf and outer shelf margin. They are commonly found at depths of 20 - 300 m. Jack Mackerel school by size. Juveniles tend to be found in shallower waters than adults. Feeding is thought to occur both during the day and at night.

Spawning occurs during late spring to early summer. Spawning begins off the southeast coast of Australia and moves progressively southwards over the summer.

Fishing for Jack Mackerel in the Small Pelagic Fishery has historically focused on the area of waters off Southeast NSW, Eastern Tasmania and South Australia.

4.3.10 King George Whiting (*Sillaginodes punctatus*)

King George Whiting are found within the bays, estuaries, and coastal waters of Victoria. They are a popular target of recreational fishers with most fish taken within the semi-sheltered waters of Port Phillip Bay (PPB), Corner Inlet-Nooramunga (CI) and Western Port (WP), where commercial fishers are also located. Population dynamics are strongly influenced by climatic factors determining numbers of larvae transported to bay and estuarine nurseries from coastal spawning areas in spring [Jenkins and May 1994, Hamer and Jenkins 1996, Jenkins et al. 2000, Jenkins 2005]. As most King George Whiting leave the bays and inlets permanently by four years of age (prior to adulthood) [Hamer et al. 2004], these fisheries are based on just a few age classes at any one time, making catches highly variable over relatively short time scales. Over the past 60 years catches have shown peaks and troughs at about 10 to 12-year intervals. These cycles are thought to be related to variation in westerly winds driving larval transport and survival (Jenkins 2005). Because fishing effort is concentrated in bays and inlets, adults in coastal waters are likely subject to low fishing mortality.

King George Whiting has a complex life history, exhibiting ontogenetic shifts in habitat at different life history stages (Fowler and Jones, 2008). Spawning occurs during late autumn and early winter at offshore reefs, shoals, and mounds in relatively deep water (30 – 100 m) in exposed locations (Fowler, 2000, Fowler et al., 1999, Steer et al., 2018). The larvae of King George Whiting can be advected across hundreds of kilometers over a prolonged pre-settlement period (3 – 5 months), dispersing larvae from the offshore spawning grounds to the shallow water nursery areas in protected shallow bays (Fowler et al., 2000b, Rogers, 2019). Juvenile fish develop and grow in the vicinity of these nursery areas until 3 - 4 years of age (Fowler et al., 2000a) when they move to their offshore spawning grounds to repeat the cycle (Fowler et al., 2000a, Fowler et al., 1999).

This species is a target species of the Marine Scalefish Fishery in South Australia as well as the Bays and Inlet Fisheries of Victoria.

Given the high level of significant interest from relevant persons further analysis and assessment of this species can be found in Appendix F3 - Further Assessment of Key Environmental Values and Sensitivities. Details of relevant references will also be found there.

4.3.11 Pink Ling (*Genypterus blacodes*)

The following is from AFMA 2023n.

Pink Ling are a demersal species that inhabits the continental shelf and slope. They can be found at depths of 20 - 1000 m. Juveniles tend to occur in shallower waters than adults. Pink Ling occur over a variety of substrates, from rock ground to soft sand and mud in which they burrow. Aside with some movement associated with spawning, pink ling are thought to be relatively sedentary.

Spawning occurs over an extended period during late winter and spring. Pink Ling are thought to be serial spawners, with egg batches being released in a floating gelatinous mass in each spawning event. Females produce about 333,000 eggs per spawning event depending on body size.

Spawning aggregations have been reported by commercial fishers off Strahan, Tasmania, Lakes Entrance Victoria, and Gabo Island NSW (Bruce et al 2002). [Sentence added in response to Matter: F03]

Pink Ling is a target species for the Southern and Eastern Scalefish and Shark Fishery.

4.3.12 Redbait (*Emmelichthys nitidus*)

The following description is from Ward et al (2019) except for paragraph 2 which is from AFMA website.

Redbait is widely distributed throughout the southern hemisphere, with the species reported from Tristan da Cunha in the southern Atlantic, the south-western coast of South Africa, St Paul and Amsterdam Islands, mid-oceanic ridges and seamounts through the Indian Ocean, Australia, New Zealand, submarine ridges in the south-eastern Pacific, and the southern coast of Chile (Markina and Boldyrev 1980, Meléndez and Céspedes 1986, Parin et al. 1997). Within Australian waters, the range of Redbait extends from mid New South Wales to south-west Western Australia, including Tasmania (Gomon et al. 2008).

They can be found at depths of 20 - 500 m and form schools by size and by depth. Juveniles tend to occur near the surface while adults are found in deeper water closure to the sea floor. Adults move up into the water column at night. They feed on large planktonic crustaceans, cephalopods and small fish and are themselves food for seals, seabirds and tunas (AFMA 2023o)

Redbait is an asynchronous batch spawner with indeterminate fecundity. Annual trends in Gonadosomatic Index (GSI) and macroscopic gonad stages indicated that Redbait from eastern Tasmania spawn between September and November, with a peak in activity during September and October (Ewing and Lyle 2009). A similar pattern was evident for south-western Tasmania, although the peak occurred one month later during October and November (Ewing and Lyle 2009). Spawning occurs along a 2.5 nautical mile (nm) corridor either side of the continental shelf break when mid-water temperatures are between 12 and 15.2°C (Neira et al. 2008). Redbait populations are spatially extensive and relatively abundant across southern Australia occurring continuously at the shelf break between southern NSW and south-western Western Australia (Ward et al 2019).

Redbait eggs are positively buoyant and hatch about 2–4 days after fertilisation depending on temperature (Neira et al. 2008). Newly hatched yolk sac larvae range from 1.9 – 3.3 mm TL. Little is known about the early life history of Redbait post-hatching, although the distribution of eggs and larvae off eastern Australia have been described by Neira et al. (2008).

The spawning habitat of Redbait was described from egg, larval and environmental data collected over shelf waters between north-eastern Bass Strait and lower south-western Tasmania in 2005 and 2006 (Neira et al. 2008).

Redbait is a target species of the Commonwealth Small Pelagic Fishery (Western sub-zone) however it is a minor component of the fishery with no catches reported for 2020-21 and 2021-22 for the CSPF and no state catches either (Status of Australian Fish Stocks – Redbait 2023).

4.3.13 Ribaldo (*Mora moro*)

The following is from AFMA 2023p.

Ribaldo are a temperate deepwater species that occurs on the continental shelf. They can be found near the seafloor at depths of 450 - 2,500m and it appears to be most common at depths of 500 – 1000 m. Ribaldo are associated with sea mounts and rough seabeds. Juveniles may be pelagic.

Spawning occurs in winter and early spring. Ribaldo are not thought to form large spawning aggregations.

Ribaldo is a target species for the Southern and Eastern Scalefish and Shark Fishery.

4.3.14 Striped Marlin (*Kajikia audax*)

The following is from AFMA 2023r.

Striped Marlin is an oceanic species caught worldwide throughout tropical, temperate, and occasionally cold waters. They are found commonly in eastern Australian waters, but they are also found in the waters of other countries within the Pacific and Indian Oceans.

In Australia, Striped Marlin are caught anywhere along both the east and west coasts and is a targeted species by fishers in both the Eastern Tuna and Billfish Fishery and the Western Tuna and Billfish Fishery.

Though Striped Marlin is not commercially caught in the Operational Area it is sometimes caught recreationally off Victoria.

4.3.15 Snapper (*Chrysophrys auratus*)

The following is from;

https://www.fish.gov.au/report/365-Snapper-2023

Snapper is widely distributed in Australia and managed as twelve stocks. Six are sustainable, one is recovering, four are depleted and one is undefined. The Western Victoria stock is currently defined as 'sustainable'.

Snapper has a wide distribution in Australia, ranging from waters off the north coast of Western Australia, around the south of the continent, and up to northern Queensland around Hinchinbrook Island [Kailola et al. 1993]. Within this broad distribution, the biological stock structure is complex and there are considerable differences in the spatial scales over which populations are divisible into separate stocks.

Snapper to the west of Wilsons Promontory, including the important fisheries of Port Phillip Bay and Western Port, constitute the Western Victorian biological stock. This stock extends westward from Wilsons Promontory to near the mouth of the Murray River in south-eastern South Australia [Sanders 1974; Donnellan and McGlennon 1996; Hamer et al. 2011; Fowler et al. 2017].

The Western Victorian stock extends westward into south-eastern South Australia, and depends on recruitment into, and subsequent emigration from, Port Phillip Bay in Victoria. Port Phillip Bay, the main spawning and nursery area for the stock [Hamer et al. 2011]. Although this stock extends throughout the coastal waters of central/western Victoria and south-east South Australia, the main indicator data are derived from the major bay fisheries in Victoria: Port Phillip Bay and Western Port.

Snapper is a target of the Victorian Multispecies Ocean Fisheries.

Given the high level of significant interest from relevant persons further analysis and assessment of this species can be found in Appendix F3 - Further Assessment of Key Environmental Values and Sensitivities

4.3.16 Southern Garfish (*Hyporhamphus melanochir*)

The following is from Earl et al (2024) Stock Assessment Report to PIRSA Fisheries and Aquaculture.

Southern Garfish are productive fast-growing members of the Hemiramphidae family and endemic to southern Australia. They form large schools in shallow, inshore marine waters and are particularly abundant in South Australia's northern Gulfs.

They are a multiple batch spawning species that has a protracted spawning period of 6 months from October to March, with only a small proportion of the population in spawning condition at any one time. Population studies have shown that adult garfish are mostly associated with a particular area for much of their lives indicating that the state-wide population consists of numerous discrete populations.

Southern Garfish are caught within the Marine Scalefish Fishery which operates within South Australia. The area of most relevance to the REGIA MSS is the South-Eastern fishing zone which extends from Kangaroo Island to the SA-Victorian border. The SE fishing zone has been the least productive zone for the southern garfish fishery since 1983/84 with total annual catches usually < 2 tonnes. This stock is classified as sustainable.

4.3.17 Tiger Flathead (*Platycephalus richardsoni*)

The following is from AFMA 2023s.

Tiger Flathead are a demersal species that is found at depths of 10 - 400 m. Juveniles inhabit shallow waters of the continental shelf and move into the deeper outer shelf zone as they reach maturity. They are not an active species and normally rest in areas of mud and sand on the seabed during the day and move into the water column at night to feed. There is evidence that mature fish migrate to shallower waters prior to the spawning period. Spawning occurs over an extended period from spring to autumn, with some variation on the timing of spawning depending on location. Females produce 1.5-2.5 million eggs per spawning season.

Tiger Flathead is a target species for the Southern and Eastern Scalefish and Shark Fishery. The southern Australian population is considered sustainable under current fishing effort. [Section updated in response to Matter: F03]

4.3.18 Yellowfin Tuna (*Thunnus albacares*)

The following is from AFMA 2023t.

Yellowfin Tuna is a highly migratory species, swimming continuously over large distances. They are usually found in eastern and western Australian waters but are also found in the waters of other countries within the Pacific and Indian Oceans.

Spawning occurs throughout the year in tropical waters and seasonally in subtropical waters. The peak spawning period in the southern hemisphere occurs in summer. In tropical waters females spawn almost daily. Spawning occurs almost entirely at night. Females can produce over 0.2-8 million eggs per spawning event depending on their body size.

In Australia, Yellowfin Tuna are caught along both the east and west coasts and is a targeted species by fishers in both the Eastern Tuna and Billfish Fishery and the Western Tuna and Billfish Fishery.

Though Yellowfin Tuna is not commercially caught in the Regia MSS area it is sometimes caught recreationally off Victoria.

4.3.19 Wrasse (multiple species)

The following is from VFA 2023.

The Victorian Wrasse (Ocean) Fishery targets Bluethroat Wrasse and Purple Wrasse, also called Saddled Wrasse (*Notolabrus fucicola*). Small catches of Rosy Wrasse, Senator Wrasse and Southern Maori Wrasse are also caught.

Wrasse inhabit depths up to 160 m where individuals tend to remain close to a home reef and are territorial. They are relatively long lived and have a relatively long larval period (Bluethroat Wrasse: 44

to 66 days; Purple Wrasse: 40 to 87 days) leading to potentially wide dispersal that can repopulate depleted areas. The two species are thought to interbreed to produce hybrids.

4.4 Commercial Fish Species without Swim Bladder

4.4.1 Albacore Tuna (*Thunnus alalunga*)

The following is from AFMA 2023c.

Albacore Tuna is a highly migratory species, swimming continuously over large distances. They are found commonly in eastern Australian waters, but they are also found in the waters of other countries within the Pacific and Indian Oceans. In Australia, Albacore Tuna are caught anywhere along the east coast and is a targeted species by fishers in the Eastern Tuna and Billfish Fishery.

Though Albacore tuna is not commercially caught in the Operational Area it is sometimes caught recreationally off Victoria.

4.4.2 Elephant Fish (*Callorhinchus mili, Harriotta haeckeli* and *H. raleighana)*

The following is from AFMA 2023k.

Elephant Fish are the common name for Ghost Shark (*Callorhinchus mili) and S*pookfish *(Harriotta haeckeli and H. raleighana)*

Ghost Sharks are often found in shallow bays and large estuaries, but also to depths of 200 m on the continental shelf. Juveniles inhabit shallow coastal waters for about three years and gradually move into deeper water as they mature. Ghost Sharks appear to school by gender.

Spookfish are a deepwater species that occurs on the continental slope. They can be found in depths of 380 – 2,600 m. *H haeckeli* are generally found in deeper water than *H. raleighana*. Little is known about the habitat of spookfish. Adults and juveniles probably occupy different habitats.

Ghost Sharks are oviparous (lay eggs) and it is presumed that spookfish do as well.

Elephant Fish have a broad distribution across much of southern Australia, but actual biological stock structure is unknown. The species is caught in relatively low quantities in NSW, Victoria and Tasmania. In Victoria, Elephant Fish were historically landed in low to moderate quantities by commercial bay and inlet fisheries, particularly in Western Port Bay (WPB). Females move inshore to lay pairs of leathery egg cases on sandy or muddy bottoms (AFMA 2024). [Paragraph added in response to Matter: F03]

Elephant Fish is a target species for the Southern and Eastern Scalefish and Shark Fishery although it is reported as incidental catch.

4.4.3 Gummy Shark (*Mustelus antarcticus*)

The following is from AFMA 2023l.

Gummy Sharks are a demersal species that inhabits the continental shelf from the near shore region to depths of 80 - 350 m. They remain either on or near the seabed. Newborn and juvenile Gummy Sharks aggregate in many areas across southern Australia, while young and adult gummy sharks are more widely distributed. Gummy Shark are considered a single genetic stock across their entire range from Bunbury, WA to Jervis Bay, NSW, with 3 sub-stocks centred on Bass Strait, Tasmania and Southern Australia. Gummy Sharks are oviparous (lay eggs).

Gummy Sharks are a target species for the Southern and Eastern Scalefish and Shark Fishery where catches have remained stable for many years. [Section in response to Matter: F03]

4.4.4 Saw Sharks (*Pristiophorus cirratus - Common, P. nudipinnis - Southern, P. peroniensis-Eastern)*

The following is from AFMA 2023q.

Sawsharks are a common demersal species that inhabits the continental shelf and upper slope. They can be found in depths to 300 metres. Sawsharks are sometimes found in large schools or feeding

aggregations. Some species segregate according to age, with adults being found in deeper water than juveniles.

- *Common*: in depths of 40 – 310 m
- *Southern*: in depths of 40 – 165 m
- *Eastern*: in depths of 100 – 630 m

Sawsharks are relatively small sharks growing up to 1.5 m in length and 4.3 kg depending on species. Females grow slightly larger than males. Common sawsharks are generally slightly larger than southern sawsharks. Lifespans are up to 9 years for southern sawsharks and 15 years for common sawsharks.

Sawsharks reach reproductive maturity at about 2 years of age. They are aplacental viviporous (bear live young). Young are born during winter in shallow coastal areas after a 12-month gestation period. Common and southern sawsharks produce about 5 - 20 pups per litter and probably breed only every second year. The rostral teeth emerge before birth but lie flat against the snout of the foetus until after birth.

Sawsharks are a target species of the Southern and Eastern Scalefish and Shark Fishery (SESSF) - Shark Gillnet and Hook Sector.

4.5 People and Communities

4.5.1 Social and Economic Features

During consultation, as presented in Annex 2, objections and claims were raised regarding concerns of impacts on the local economy and environment. Species that may be affected, including commercial and recreationally fished species, are described above in sections 4.1 to 4.4.

4.5.2 Cultural Features

Eels were, and continue to be, an important resource for certain First Nation communities. Their use for communal gatherings and for barter and trade was extensive in pre-colonial times. Today, eel remains a popular food for community events (VFA 2017). Short-finned Eels in particular hold a cultural significance to First Nations people (Appendix F3, Sections 3.7, 3.15 and 3.16). For example, the Gunditjmara people of south-western Victoria built and used sophisticated aquaculture systems throughout the Budj Bim Cultural Landscape to exploit eel migrations at least 7,000 years ago. These systems are outside of the area that may be affected by underwater sound.

Perch are also identified as being culturally significant to the Eastern Maar People as a resource and in traditional, social and economic practices (EMAC, 2015). Blackfish are also harvested by both Eastern Maar and Gunditjmara peoples (Appendix F3, Section 3.16). The PMST report did not find Blackfish as occurring in the area affected by underwater sound, and since Perch is associated with freshwater no impact from underwater sound from offshore seismic is predicted, so these species are not discussed further.

5 Relevant Legislative and Other Requirements

CGG has considered all the relevant legislative requirements, conservation management and recovery plans for all fish species that may be affected (see Annex 3). No specific requirements related to the effect of sound on fish were identified through this process.

6 Defining Acceptable Levels of Impact

Although hearing ranges and sensitivities vary substantially between species (Ladich and Fay 2013), all fish species tested to date can detect sound and vibration to some degree (Dale et al. 2015). Fishes have developed two sensory mechanisms for detecting, localising, and interpreting underwater sounds and vibrations: the inner ear, which is tuned to sound pressure detection, and the lateral line system, which allows a fish to detect vibration and water flow. Inter-specific variations in hearing range and sensitivity result from the different adaptations in these systems for perceiving sound pressure and particle motion information (Popper and Fay 2011).

Because the presence or absence of a swim bladder has a role in hearing, Popper et al. (2014) classified fishes into three categories for assessment of sound effects.

1. Fishes without a swim bladder that can sink and settle on the substrate when inactive. e.g., mackerel, Scomberomorus spp., some species of tuna, Thunnus sp. and sharks (Casper et al. 2012, Popper et al. 2014, Carroll et al. 2017).
2. Fishes with swim bladders whose hearing does not directly involve the swim bladder or other gas volumes. e.g. snappers, emperors, groupers and rock cods (Lutjanids and Lethrinids such as *Pristipomoides* spp., *Lethrinus* spp., *Lutjanus* spp., and family Serranidae), and some species of tuna (*Thunnus* sp.) (Tavolga and Wodinsky 1963, Higgs et al. 2006, Braun and Grande 2008, Engineering-Environmental Management Inc. 2008, United States Department of the Navy 2008, Caiger et al. 2012, Bertrand and Josse 2000, Song et al. 2006).
3. Fishes whose hearing does directly involve a swim bladder or other gas volume. e.g., family Clupeidae (herrings, sardines, pilchards and shads) and some Haemulidae (grunters and sweetlips) (Nedwell et al. 2004, Braun and Grande 2008, Popper et al. 2014). Eels are included in this group (Jerko et al 1989).

The most relevant metric for perceiving underwater sound for most fish species is particle motion (Popper and Hawkins 2019, Popper et al. 2019) but, except for a few species (Popper and Fay 2011, Popper et al. 2014), there is an almost complete lack of relevant data on particle motion sensitivity in fishes (Popper and Hawkins 2019).

Most fish species detect sounds from below 50 Hz up to 500-1500 Hz. A smaller number of species can detect sounds to over 3 kHz, and a very few can detect sounds to well over 100 kHz. Whether a particular anthropogenic sound affects hearing is contingent on the hearing frequency range of the species and whether the sound level is above a calculated minimum threshold. For this impact assessment, it is assumed that all fishes can detect signals below 500 Hz and therefore can 'hear' the seismic source.

Sound exposure guidelines for fish have been established by the American National Standards Institute (ANSI) accredited report of Sound Exposure Guidelines for Fishes and Sea Turtles (Popper et al. 2014). The sound exposure guidelines from Popper et al. (2014) are based on the presence or absence of a swim bladder and ancillary structures which determines the level of susceptibility of fishes to injurious effects from exposure to intense sound. Accordingly, different exposure guidelines were developed for fishes without a swim bladder, fishes with a swim bladder not involved in perception of acoustic signals and fishes that use their swim bladders for hearing.

No studies to date have demonstrated direct mortality of adult fish in response to seismic emissions, even at proximity (within 1–7 m; DFO 2004, Boeger et al. 2006, Popper et al. 2014, Carroll et al. 2017). Nevertheless, exposure guidelines from Popper et al. (2014) were still modelled as part of the impact assessment process. Outcomes were less than or equal to recoverable Injuries hence they are not tabulated here but can be referred to in the modelling report if interested.

Based on the above discussion, Table E3-1 justifies and defines the acceptable levels of impact from underwater sound on fish. Further information on studies in relation to seismic acoustic emission impacts to fishes is provided in the Regia MSS Seismic Studies Summary available in Appendix B8.

CGG defined acceptable levels of impact and risk as part of its decision-making processes and published them as part of its consultation efforts, inviting relevant persons to comment on their appropriateness. During the preparation of the EP, it became clear that aspect specific statements

would be necessary to create a stronger link between the defined acceptable level and the predictions of impacts and risks.

As such, Table E3-1 shows the general acceptable level statements which cover the whole of the activity (which are consistent across all environmental impacts and risks), and the corresponding aspect specific defined acceptable levels established for this assessment. Defining the acceptable levels is the starting point for the required demonstration that environmental impacts and risks of the activity will be of an acceptable level. The defined acceptable levels found in this section are subsequently carried through the prediction of impacts in this document, to the demonstration found in Section 10. [1]

Table E3-1 - Defined acceptable levels of impact from underwater sound effects to fish

Category	Defined Acceptable Levels (General)	Defined Acceptable Levels (Aspect Specific)	Rationale
Principles of ESD	The petroleum activity results in temporary / reversible, small scale, and/or low intensity environmental damage.	Fish and aquaculture stocks continue to be assessed as having the same stock status they held prior to commencement of the activity.	This acceptable level draws on established fisheries management frameworks which monitor stock status to ensure sustainable harvest and ecological balance. Retaining stock status through and beyond the activity period reflects that no material or sustained impact has occurred. People and communities rely on commercial fishing and commercial catch such that protecting the stock levels / biomass available for fishing is an appropriate level of impact to set.
	The impact and risk assessment process is based on sufficient information to understand if: Serious/irreversible environmental damage is predicted; or The application of the precautionary principle is applied in the presence of scientific uncertainty.		
	Environmental management of the activity must not be inconsistent with EPBC Act Management Plans and Recovery Plans.		

[1] Note: The acceptable levels related to demonstrating ALARP and the adoption of specific measures to ensure the effectiveness of control measures can be found in Appendix F2 and B3 respectively. As they are criteria integral to the acceptance of the Environment Plan, and they are documented elsewhere, these criteria are not discussed further in this assessment.

Category	Defined Acceptable Levels (General)	Defined Acceptable Levels (Aspect Specific)	Rationale
Biological	Impacts and risks to biological features will be temporary / reversible, small scale, and/or low intensity environmental damage at population levels.	No fish should be exposed to sound at or exceeding threshold levels for TTS set at 186 dB SEL24hr.	In fish with no swim bladder, TTS is a temporary reduction in hearing sensitivity caused by exposure to intense sound. After termination of the sound source normal hearing ability returns over a time that is variable, depending on the intensity and duration of sound exposure (Popper et al. 2014). Sound exposure guidelines proposed in Popper et al. (2014) use a cumulative sound exposure level of 24 hrs (SELcum24hrs) for TTS. Recoverable Injury: 216 dB SELcum24hr. TTS: 186 dB SELcum24hrs. In fish with a swim bladder not involved in hearing, pressure-related injuries may occur, but recovery is possible. TTS for this group is also set at 186 dB SELcum24hr, and recoverable injury at 203 dB SELcum24hr.
Ecological	Impacts and risks to ecological features will be temporary / reversible, small scale, and/or low intensity damage to the overall health, diversity, or functioning of the ecosystem.	As above for Principles of ESD.	
Economic	Affected persons will not be worse off because of the activity.	Industries, livelihoods, and ecosystem services remain viable, with no sustained financial or operational consequences resulting from changes in species behaviour, abundance, or access to resources.	Reflects Commonwealth and State policy objectives for sustainable resource use and protection of ecosystem services.
Cultural	Impacts and risks to cultural features including cultural values, traditions, or practices, will be temporary / reversible, small scale, and/or low intensity.	Culturally important species, places, and practices can continue without disruption to their role, accessibility, or long-term viability.	This level reflects the principle of maintaining cultural values and heritage as protected under national and state legislation. It ensures that activities do not interfere with traditional practices, spiritual connections, or ongoing access to culturally significant areas.
Social	Measures have been adopted based on the consultation process to address relevant objections and claims of relevant persons. The views of public have been considered in the impact and risk assessment.	People and communities can continue engaging with the natural environment, recreational activities, and heritage values without experiencing long-term or irreversible disruption.	This level reflects broader social licence to operate, ensuring that environmental activities do not lead to degradation of public amenity, loss of recreational use, or impacts to non-Indigenous heritage values. It aligns with Commonwealth policies promoting public access, well-being, and sustainable use of the marine environment.

Category	Defined Acceptable Levels (General)	Defined Acceptable Levels (Aspect Specific)	Rationale
Company	Environmental impacts and risks are consistent with the CGG impact and risk assessment process such that for an impact or risk the effect/ consequence rating is medium or below.	As per the general levels.	CGG is a company familiar with managing the effects of seismic sound on the marine environment, and its global operational history supports the reliability of its internal assessment process. The use of CGG's impact and risk matrix, when consistently applied, has not resulted in unacceptable environmental outcomes, which indicates the process produces conservative and realistic assessment outcomes.

7 Consultation Input

CGG carried out the consultations required by the regulations to:

- Improve the predictive quality of this assessment by seeking relevant person input into the preparation of the EP.
- To verify the description of the environment that CGG produced as part of its environmental assessment process through information provided to CGG by relevant persons.
- Receive objections or claims about the adverse effects of the activity on a relevant person's functions, interests, or activities.

The information received from relevant persons can be found in each relevant person consultation report. It has been considered in the preparation of this assessment.

Objections or claims about the adverse of the effects of the activity can also be found in each relevant person's consultation report. They have been assessed for merit and CGG has written a statement of its response to each objection or claim. Any objection or claim relevant to this assessment and subsequently considered in its preparation can be found in Annex 2.

8 Minimisation of Impacts Through Activity Design

As part of planning and design of the activity, several activity limitations were considered in accordance with the hierarchy of controls and through the consultation process (see Annex 2). These limitations were evaluated to determine whether the source of impact could be eliminated or substituted through changes in the timing, technology, or design of the activity. As described in Appendix F3, section 3.16.2, due to the interconnection between the tangible and intangible cultural values, all activity limitations are relevant to safeguarding social, economic, and cultural features and values, ensuring protection across all areas.

8.1 Elimination

Elimination involves removing the source of an impact or risk entirely through changes to the activity design. In the context of underwater sound, elimination involves removing the source of underwater sound or preventing its generation in the first place. Five main options were considered and subsequently adopted:

No discharge of the sound source within the West Tasmania Canyons KEF

This measure eliminates potential noise impacts in a KEF characterised by complex bathymetry and high productivity, which may be important for spawning, feeding, or migration of fish. It has been applied by CGG to protect the ecological integrity and fish biodiversity associated with this KEF, which is recognised for its national environmental significance.

No MSS acquisition beyond 200 m depth contour

Deepwater habitats may support unique and less-studied fish assemblages that could be sensitive to noise and extending the survey beyond this boundary may increase environmental uncertainty and operational risk. The limitation was applied to confine the activity within a well-characterised depth zone and reduce exposure of deepwater species to anthropogenic sound.

No seismic acquisition within 17 km of Deen Maar / Lady Percy Julia Island

This limitation reduced the overlap with most fishing effort in the region and is protective for mobile or short ranging fish species that are more likely to be present in water depth < 50 m. The shallow depths are also where most lobster will settle when ready to do so. This measure was adopted to avoid disturbance to coastal and nearshore invertebrate communities and to prevent elevated acoustic energy in shallow, sensitive environments. This was confirmed during consultation with commercial fishers who agreed that the data was correct and most fishing activities occurred in shallower waters close to ports (Event ID 4107, Feedback ID 1277).

This island is known for its ecological significance, including nearby fish habitats and potentially sensitive species that rely on the surrounding waters. The buffer zone was applied to provide spatial protection for species utilising this ecologically and culturally important area, thereby reducing potential impacts. For derivation of the 17 km buffer refer to Table 6 in the EP document under the constraint “Protection for marine fauna associated with Deen Maar/Lady Julia Percy Island”.

No sound source discharges within the Orange Roughy research program areas.

During consultation (Event IDs 2002, 3350, 1649, 2003, Feedback IDs 4125, 4305, 4124, 4337) claims were raised by a fishing association to avoid interference with an Orange Roughy Research Program by ensuring there was no data acquisition, or turns, over the sample collection areas, with a buffer between the acquisition and sample areas, with preferred non-acquisition months to be April to October. As shown in map MAP-REG-EPM-050_B (Appendix B12), the activity was reduced to ensure there is no overlap of sampling areas with the active source area, including turns. A small portion of the central sampling area overlaps with the operational area; however, this will not have a greater impact than any other vessel transiting the area. Therefore, there is no break to the time series of the data, due to lack of overlap with the active source area. In addition, the Regia MSS is not prohibiting the ability of the research program to catch the fish required for the study to continue uninterrupted, negating the need for exclusionary months. CGG has since committed to an additional activity limitation to include no petroleum activity being carried out between 1 January and 15 September.

8.2 Substitution

Where elimination is not viable, substitution involves altering the timing, location, or sequencing of the activity to reduce the likelihood or consequence of the impact. One option was considered and subsequently adopted:

Sound will not be emitted above the stated capacity

By selecting a sound source and operational settings that remain within a defined maximum acoustic output, the activity substitutes more harmful, higher energy alternatives for lower-intensity ones. This measure was adopted to ensure predicted effects on fish remain within modelled thresholds, avoiding excessive acoustic exposure that could disrupt behaviour or physiology.

9 Predicted Levels of Impact

To determine the predicted levels of impact of underwater sound on fish at this stage in the process requires the reader to have assimilated all prior relevant information that has been assessed on fish. The EP documentation is coded alphabetically to guide the reader through what is a natural process of temporal accumulation and review of evidence. The following documentation forms the evidence lineage for predictions on fish as described here.

- B5 – PMST Reports – The Protected Matter Search Tool was used to search for environmental values and sensitivities potentially located within the proposed Regia MSS planning area, with eight specific searches undertaken of which one was for Fish within the region defined by the Regia MSS Active Source Area with an included buffer area out to 8km.
- Commercial Fisheries Review – In August 2023 all commercial fisheries and their targeted species, associated with the Commonwealth and/or the states of Victoria were identified and mapped to indicate fishing effort relative to the proposed Regia MSS (Appendix B6: Commercial Fisheries Analysis Report. In March 2025, a further review was undertaken of the commercial fisheries to include the 2023 Commonwealth fishery data and the updated Operational Area. The outcomes of this latest review are detailed in Appendix E1 – Impact Assessment Physical Presence.
- B7 – Sound Modelling Reports - SLR performed a numerical modelling study of underwater sound levels associated with the planned Regia Marine Seismic Survey (MSS) to assist in understanding the potential acoustic impacts on key regional receptors including marine mammals, fish, turtles, benthic invertebrates, plankton and recreational divers and swimmers. Acoustic thresholds derived from this document are used to guide assessments of impacts.
- B8 – Seismic Studies Report – This report provides a detailed assessment of the scientific literature related to sound (and specifically seismic) effects on fish and other fauna. This literature is the key evidence base from which impact levels are derived and provides a template for how effects to fish can be assessed by following the recommendations of Popper et al (2014).

All species identified through B5 and the Commercial Fisheries Reviews (B6 and E1) have been assessed through the framework provided by B7 and B8. Because of commonalities among species in their sensitivity to seismic it is not necessary to describe effects to each species individually but rather as groups defined by swim bladder presence/absence.

9.1 Change in Fauna Behaviour, Hearing Capacity, and Physical Condition

As detailed from the underwater sound and studies relevant to seismic surveys (see Regia MSS Seismic Studies Summary available in Appendix B8), mortality and injury to fish are not predicted based on the received sound levels to these species.

Fishes were grouped and modelled according to the role of a swim bladder in their potential responses to seismic. However, in discussing predicted levels of impact here we group by type of impact. This is because modelled effects are very similar across the 3 groups.

9.1.1 Mortality and Potential Mortal Injury and Recoverable Injury

Maximum modelled distance to sound effect criteria for mortality/potential mortal injury and recoverable injury was 86 m – 2 km. The predicted effect level on these species is assessed as minor given the following:

- Mortality of fish (both immediate and delayed) is not predicted based on no scientifically documented cases of mortality in free-swimming fish exposed to seismic source emissions under experimental or field conditions (DFO 2004; Boeger et al. 2006; Popper et al. 2014; Popper et al. 2016; Carroll et al. 2017; Popper and Hawkins 2019).
- Injury impacts may occur if the seismic array commences at full power adjacent to fish. However, the implementation of the Fauna Management System requires the seismic source to be slowly ramped up to full power over 30 minutes. This would allow demersal and pelagic species to move away from the source before it is at full power. However, once

the source passes, animals will be free to move back into the habitat that they departed from. [Paragraph updated in response to Matter I04].

- Site-attached fish species are species that have a very high degree of site fidelity to the extent that they are unlikely or unable to flee an approaching seismic source and are likely to remain and/or seek refuge within habitat structures. Impacts to site-attached fish were studied by Woodside at Scott Reef during the Maxima 3D MSS activities (Miller and Cripps 2013) and no lethal or sub-lethal effects on fish were experienced nor any significant decreases in the diversity and abundance of fish after the seismic survey, compared with the long-term temporal trend before the survey.
- Commercially targeted fishes within the area of impact that are generally considered site attached include a range of commercially targeted species such as Blue-eye Trevalla, Eastern School Whiting, flathead, Gummy Shark, Orange Roughy, Pink Ling, Ribaldo and Sawsharks. Examination and testing of seismic effects on commercial catches of fish, (including flathead and shark species), in the Gippsland Basin region found little evidence of changes induced by seismic surveys for 12 species (Bruce et al. 2018).
- National Recovery Plans and Conservation List Advice for EPBC Act list and migratory for species do not identify underwater sound as a threat to the recovery of fish species.

The uncertainty level for impacts to fish causing mortality and potential mortal injury and recoverable injury from seismic sound is assessed as low based on:

- Sound effect criteria used in the impact assessment have been published in peer reviewed scientific journals.
- There is a significant body of published studies that demonstrate no cases of mortality in free-swimming fish exposed to seismic source emissions under experimental or field conditions.

Thus, the predicted level of impact based on the effect (minor) and uncertainty (low) is assessed as low. These validated impacts are of an acceptable level without further reduction measures being required.

9.1.2 Temporary Threshold Shift

As detailed in Table E3-1 maximum modelled distance to sound effect criteria for temporary threshold shift (TTS) is 10.95 km.

The predicted effect level to these species is assessed as minor because while impacts are predicted to have some effect on fish, they are not considered significant enough to affect the population given the following:

- The Popper et al. (2005) study that informed the Popper et al. (2014) TTS sound exposure guideline, was done using a static source (airgun array) and static receptors (fish in cages at 13-17 m from the array) and is therefore not representative of a marine seismic survey which is a moving source, and animals are not constrained in their movements. On this basis, the Popper et al (2005) study represents a worst-case scenario as the source is fixed and not moving (i.e. fish received five pulses of identical intensity over five minutes) and nor are the fish.
- Since the Popper et al. (2014) TTS sound exposure guidelines were developed Professor Popper has provided feedback on the appropriateness of using a 24-hour period to assess the potential for TTS and other effects associated with SEL_{cum} (Popper 2018). The review considered the potential impacts of cumulative seismic noise from the proposed Santos Bethany 3D seismic survey on fish, including TTS effects, and length of time for recovery and the applicability of a SEL24h metric. Though this information was based on another survey it is applicable to the Regia MSS as the premise for the modelling was a racetrack survey design that bought the vessel back to a similar starting point within 24 hours, thus receiving the closest shots within a 24-hour period. The review noted:
    - It is highly unlikely that there would be physical damage to fishes because of the survey unless the animals are very close to the source (perhaps within a few meters).

  - If TTS does take place, the duration of exposure to the most intense sounds that could result in TTS will be over just a few hours. Thus, accumulation of energy over longer periods than a few hours is probably not appropriate.
  - If TTS takes place, its level is likely to be sufficiently low that it will not be possible to easily differentiate it from normal variations in hearing sensitivity. Even if fishes do show some TTS, recovery will start as soon as the most intense sounds end, and recovery is likely to even occur, to a limited degree, between seismic pulses. Based on very limited data, recovery within 24 hours (or less) is very likely.
  - Little is known about the behavioural implications of TTS in fishes in the wild. However, since the TTS is likely very transitory, the uncertainty of it having a significant impact on fish fitness and survival is very low.

- As detailed above, Popper et al. (2005) reports that fish showing a TTS recovered to normal hearing levels within 18-24 hours, thus any hearing loss and subsequent decrease in fitness would be temporary with recovery taking place in a relatively short timeframe after the seismic source has moved away from the exposed fish. Based on this, the potential for impacts to individuals' fitness and survival is limited and impacts to fish community structures are not predicted.

The uncertainty level for impact to fish causing TTS from seismic sound is assessed as medium based on:

- The sound effect criteria used in the impact assessment have been published in peer reviewed scientific journals.
- Published studies show TTS impacts to fish are short lived (up to hours), however there are limited published studies on the effects of seismic sound on fish specifically in the Otway region.
- An absence of long-term monitoring data of the effects of seismic on fish in the presence of frequent seismic surveys, and other anthropogenic sound generating activities, in the region.

The predicted level of impact based on the effect (minor) and uncertainty (medium) is assessed as medium. For fish the predicted level of impact is clearly below the predefined acceptable levels of impact as detailed in Section 10.

9.1.3 Change in Behaviour

There are currently no quantitative exposure guidelines or criteria for behaviour or masking for fish for impulsive sounds. The Working Group on the Effects of Sound on Fish and Turtles (Popper et al. 2014) found that there was insufficient data available and instead applied a subjective approach using 'relative risk' to assess risk at three distances from the source. These are:

- Behavioural response: high at near (within tens of metres) and intermediate (hundreds of metres) distances from the seismic source and moderate at distances far (thousands of metres) from the source.
- Masking: low at near (within tens of metres) and intermediate (hundreds of metres) distances from the seismic source and moderate at distances far (thousands of metres) from the source.

Thus, the extent of the area of impact is predicted to be within thousands of metres of the seismic source. In the most recent acoustic modelling study (Appendix B7), a 150 dB threshold for behavioural disturbance for fish was applied. It is acknowledged in the report that the derivation and origin of the informal 150 dB threshold is not as well-defined as other thresholds. However, recent publications do not refute that behavioural disturbance for fish can occur around this level (Hawkins et al. 2014). The maximum predicted behavioural disturbance impacts for fish was predicted to be 13.81 km from the sound source. The predicted effect level to these species is assessed as minor because while the impacts are predicted to have some effect on fish, the effects are not considered significant or at a level high enough to affect the population given the following:

- Meekan et al. (2021) undertook a large-scale experiment that quantified the impacts of exposure of an assemblage of tropical demersal emperors, snappers and groupers targeted by commercial fisheries to a commercial-scale seismic source on the Northwest Shelf off Western Australia. They did not identify any short-term (days) or long-term (months) effects of exposure on the composition, abundance, size structure, behaviour, or movement of fishes at any exposure sites.
- Shark species are highly vagrant and naturally cover large distances. As such, short-term exposures from the transient seismic source are expected to result in localised behavioural responses and movements of sharks. Research by Bruce et al. (2018), which tagged two commercially targeted shark species (Broadnose Shark and School Shark) and monitored their movements in response to a seismic survey in Australian waters noted that both control sharks and exposed sharks moved freely in and out of the study area which did not indicate any changes in behaviour or distribution because of seismic sound exposure.
- No BIAs, critical habitats, or key aggregation sites have been identified within or adjacent to the area potentially affected by underwater sound for the critically endangered Grey Nurse Shark.
- The White Shark foraging BIA within the area that may be impacted by underwater sound above the behavioural threshold for sharks, is centred on Lady Julia Percy Island / Deen Maar which is a known seal breeding colony. The sound source will not be discharged within 17 km of Lady Percy Julia Island / Deen Maar which will significantly reduce the potential impacts of underwater sound on White Shark behaviour near the foraging BIA. [Point added in response to Matter F08 and F17]
- Fishes' awareness of the sound and any resultant behavioural responses may be limited to a few hours as the seismic source passes by, while significant behavioural responses (startle or avoidance) are more likely to be limited to a shorter period (less than an hour) when the seismic source is closest. As the seismic source will be transient (i.e., continuously moving) during seismic data acquisition, demersal fishes will only be exposed to significant sound levels for a relatively short period of time as the seismic survey vessel passes nearby before sailing away again.
- Impacts to site-attached fish were studied by Woodside at Scott Reef during the Maxima 3DMSS activities (Miller and Cripps 2013) and they determined that there was a lack of significant impacts to fish species considered sensitive because of their site-fidelity requirements (i.e., being restricted to reef habitat and unable move far when the seismic sound approaches) based on the following:
    - Behavioural responses were observed at close range with general movement from the water column to the seabed, however normal feeding behaviour returned within 20 minutes of the survey vessel passing and when the vessel was beyond 1.5 km.
    - No significant decreases in the diversity and abundance of fish after the seismic survey were detected compared with the long-term temporal trend before the survey.
- Any behavioural impacts are likely to be short-lived and fish would return to normal behaviours once the vessel has moved away based on research by Miller and Cripps (2013) and Wardle et al. (2001). Behavioural impacts to pelagic fish species are possible but would be temporary, localised, and unlikely to impact at a population level.
- Limited data on biochemical stress indicators in fishes exposed to seismic sound indicate there may not be any discernible change (e.g., McCauley et al. 2000, 2003). However, if fishes were to experience stress because of sound exposure, levels may return to normal within 72 hours (Santulli et al. 1999).

- Sardines are a key food source in the Otway region hence evidence of significant changes in behaviour of this species and other clupeids in response to a seismic MSS could have flow-on effects to their predators. However, research does not support significant changes in the behaviour of clupeids in the presence of MSS. A key reference that is cited to support seismic effects on penguins (Pichegru et al 2017) found there were no significant changes in distribution and/or abundance of small pelagic fish in the region compared to a few months

prior to or after the seismic operations (Pichegru et al 2017). An even more targeted study that exposed herring schools to a full-scale 3D seismic survey off Northern Norway found no changes in the behaviour of herring schools from a transmitting seismic vessel as it approached from a distance of 27 km to as close as 2 km (Pena et al 2013). The schooling behaviour of sardines is complex and varies within and among locations, days, months and years at both spatial and temporal scales (Ward et al 2011). This variability is clearly intrinsic to their behaviour and would influence feeding strategies and adaptability of those species that target them as a food source.

The uncertainty level for impact to fish causing a change in behaviour from seismic sound is assessed as medium based on:

- Published studies show behavioural impacts to fish are short lived with fish returning to normal behaviour once the vessel has moved away (in some cases within 20 minutes). While there are limited published studies on the effects of seismic sound on fish behaviour specifically in the Otway region there is no reason to expect different behaviour of similar species from different locations.
- An absence of long-term monitoring data of the effects of seismic on fish in the presence of frequent seismic surveys, and other anthropogenic sound generating activities, in the region.

The predicted level of impact based on the effect (minor) and uncertainty (medium) is assessed as medium. For fish the predicted level of impact is clearly below the defined acceptable levels of impact as detailed in Section 10.

9.1.4 Change in Commercial Catch

As detailed in the review of Commercial Fisheries (see Appendix B6 and subsequently updated in E1) the Operational Area overlaps with some fisheries to varying degrees.

Commonwealth Fisheries

Non-significant Overlap

- Bass Strait Central Zone Scallop (BSCZSF), Eastern Tuna and Billfish (ETBF), Small Pelagic (SPF) and Western Tuna and Billfish Fisheries (WTBF) all have allowable fishing areas located within some part of the Operational Area but with little or no active fishing in these areas for at least 10 years between 2010-2023. This is also the case for the Southern and Eastern Scalefish Fishery (SESSF) – Shark Hook sub-sector. Hence these fisheries are not assessed for impacts (refer to cited figures in B6 and E1 as needed).

Significant Overlap

- The SESSF- Commonwealth Trawl – Danish Seine sub-sector has seen declining fishing effort since 2019 however because it involves less than 5 fishers, confidentiality does not allow for assessment of fishing intensity.
- The SESSF – Shark Net sub-sector has significant fishing effort across the operational area including the acquisition area (MAP-REG-EPM-102_B). However, in the context of the entire fishery, it constitutes a tiny proportion of the fishing effort which is concentrated through Bass Strait and off South Australia (MAP-REG-EPM-130_B). The species targeted are elephant fish, gummy shark, saw sharks and school sharks.
- The SESSF – Trawl sub-sector has significant fishing effort in the southwest of the operational area (MAP-REG-EPM-103_B). However, in the context of the entire fishery, it constitutes a tiny proportion of the fishing effort which extends from northern NSW to Kangaroo Island South Australia (MAP-REG-EPM-131_B). The species targeted are blue-eye trevalla, blue grenadier, eastern school whiting, orange roughy, pink ling, ribald and tiger flathead. Danish Seine sub-sector
- The SESSF – Scalefish Hook sub-sector has a low level of fishing effort restricted to an area towards the SE corner of the operational area (MAP-REG-EPM-105_B). In the context of the entire fishery, it constitutes a tiny proportion of the fishing effort which is centred along the east coast of Tasmania and off the coast of Robe, South Australia (MAP-REG-EPM-133_B). However, because it involves less than 5 fishers, confidentiality does not allow for assessment

of fishing intensity. Species caught in this fishery have some overlap with the Trawl sub-sector, which is assessed.

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Victorian Fisheries

Non-significant Overlap

- The Bays and Inlets and Eel fisheries do not overlap with the operational area of the Regia MSS hence no impacts are expected. Nevertheless, further assessment has been done for Eels in response to feedback (see section 13).
- The Wrasse (Ocean) Fishery has minor overlap with the operational area in the northwest corner.

Significant Overlap

- While the multispecies Ocean Fishery has significant overlap with the operational area in terms of presence, less than 2% of >3000 days fished between 2011-2022 were within the operational area highlighting the relative lack of fishing that goes on inside this area (MAP-REG-EPM-113_B). The species targeted are gummy shark, school shark, Australian salmon and snapper.

In August 2023 a review of commercial fisheries was undertaken to identify Commonwealth and State (Victorian, Tasmanian, and South Australian) fisheries that fish or potentially fish within the Activity Planning Area and is available in Appendix B6: Commercial Fisheries Analysis Report. In March 2025, a further review was undertaken of the commercial fisheries to include the 2023 Commonwealth fishery data and the updated Operational Area. The outcomes of this latest review are detailed in Appendix E1 – Impact Assessment Physical Presence. Table E1-1. In summary

The following fisheries that target fish species were assessed as having or potentially having a high level of activity within the Operational Area:

- Commonwealth Southern and Eastern Scalefish and Shark Fishery
  - Commonwealth Trawl Sector.
  - Shark Gillnet Sub-sector.
  - Scalefish Hook Sector.

Impacts to commercial catch rates could occur through a number of pathways. The physical presence of seismic vessels could hinder the ability of fishers to access a fishing ground, and this type of disturbance is addressed in Appendix E1 – Impact Assessment Physical Presence.

The other pathway has two components – firstly, the impacts of seismic on individuals of a species or group i.e. the specific vulnerability to seismic according to their biological makeup and secondly, the impacts of seismic on the most vulnerable aspects of their life-history. This second component specifically refers to aggregation behaviours such as spawning which creates conditions where individuals are concentrated in relatively small areas such that if impacts from seismic are possible, they have the potential to be disproportionately harmful to a population. Because of the importance of commercial fishing and concerns raised by relevant persons further assessment has been undertaken for spawning behaviours of key fisheries species in Appendix F3 – Further Assessment of Key Values and Sensitivities under Section 3.14. This rationale is further explained in the Recommendations section of this document.

The effects of seismic on individuals has been assessed in B8 (Seismic Studies Summary) where the scientific literature has been interpreted and summarised to describe the consensus on seismic effects across species. Here is where the rationale for grouping species by the role of a swim bladder is clarified.

There have also been multiple studies looking at behavioural effects of commercial fish species in response to seismic sound to determine whether this has translated into reduced catches for commercial fishers.

Results across studies focussing on fisheries within Victorian waters have not been able to find clear, consistent, negative effects on commercial catch rates that can be attributed to seismic sound.

- A study by CSIRO and Geoscience Australia (Thomson et al. 2014) examined fisheries catches and catch rates for potential effects from 183 seismic surveys undertaken in the Gippsland Basin (Bass Strait). Fisheries catch and effort data was obtained from commercial logbooks for the following species: commercial scallops, school whiting, tiger flathead, eastern gemfish, silver warehou, jackass morwong, blue eye trevalla, arrow (Gould's) squid, school shark, and gummy shark. No clear or consistent relationships between seismic surveys and subsequent fisheries catch rates could be found and if effects occurred, they could not be distinguished from inter-annual changes in stock size or availability to fishing gear resulting from other dynamics.
- Catch studies undertaken as part of a marine seismic survey in the Gippsland Basin found no clear evidence of adverse effects on scallops, fish or commercial catch rates (Przeslawski et al. 2016a; Bruce et al. 2018). Species covered here included John dory (*Zeus faber*), tiger flathead (*Neoplatycephalus richardsoni*), red gurnard (*Chelidonichthys kumu*), morwong (*Nemadactylus macropterus*), goatfish (*Upeneichthys* spp), sawshark (*Pristiophorus* spp), elephantfish (*Callorhinchus milii*), gummy shark (*Mustelus antarcticus*); Gould's squid (Nototodarus gouldi), Boarfish (Pentacerotidae); sawshark; swell shark (*Cephaloscyllium* spp); elephantfish; angel shark (*Squatina* spp); broadnose shark (*Notorynchus cepedianus*); school shark (*Galeorhinus galeus*) and snapper (*Pagrus auratus*).
- An investigation into the effect of a 2015 seismic survey in the Gippsland Basin on deepwater flathead catches did conclude that the significant drop in catch per unit effort was very likely influenced by the seismic survey (Haddon 2017). However, Haddon (2017) went on to add that the seismic survey did not appear to have had a lasting impact on deepwater flathead catch per unit effort, which returned to typical values in the first month following the seismic survey.
- Preliminary results from a FRDC funded BACI study to investigate the effects of a 3D marine seismic survey in eastern Bass Strait on Danish Seine catch rates (Knuckey 2020) indicated a negative impact of seismic acquisition on whiting catch rates up to ~100 days following the survey and on flathead rates up to ~200 days. Unfortunately, this study has not been peer-reviewed and nor has a final report ever been issued, despite the project finishing in 2021. Given outstanding questions remain around study design and implementation and a lack of serious review, we do not consider these results robust to interpretation, so they have not been a consideration for this assessment.

The predicted effect level to commercial fisheries catches from the Regia MSS is assessed as minor based on the lack of clear negative outcomes from multiple targeted studies.

The uncertainty level in the assessment of impacts to commercial fish catches from seismic sound is assessed as medium based on:

- There have been multiple studies supporting lack of significant changes to commercial fish catches from seismic surveys with, at worst, possible short term but recoverable effects.
- There is no evidence for mortality of fish (both immediate and delayed) exposed to seismic source emissions either under experimental or field conditions.

The predicted level of impact based on the effect (minor) and uncertainty (medium) is assessed as medium.

9.2 Measures Adopted to Manage Environmental Impacts

The following measures have been adopted to ensure that the impacts associated with underwater sound from the survey and support vessels on fish will be of an acceptable level.

These measures have been taken through to the ALARP assessment in the next stage of the CGG assessment process. This assessment can be found in Appendix F2.

Table E3-2 Measures adopted to manage environmental impacts

Measure	Measure Type	Details and Justification
Ramp up of sound source to full power over 30 minutes.	Practice	Mobile marine fauna (including demersal and pelagic fish, octopus, squid, diving birds, penguins, and turtles) are expected to move away from the source before it is at full power, providing them a level of protection. However, once the source passes, animals will be free to move back into the habitat that they departed from. [Paragraph updated in response to Matter I04, I05, E08].
CGG Technical Operations Manager	Person	Reasonable, evidence-based claims are promptly assessed and paid as per the Otway Adjustment Protocol.
Quality Control and Reporting Representative	Person	Ensures that the contracted vessels follow the contract and deliver the survey as per the permitted activity by using the sail line plan.
Fisheries Liaison Officer (FLO)	Person	This person will conduct specific consultation with commercial fishers and support the processing of compensation claims.
Adjustment Protocol	Procedure	An adjustment process will be implemented if a commercial fisher has a financial loss due to the Regia MSS. The adjustment process will be developed in consultation with the fishery associations that represent the commercial fishers that fish within the Operational Area. This will extend to fishing cooperatives who can provide an evidence of commercial losses because of the survey.
Sail Line Plan	Resource	Ensures that the survey vessel will remain within the scope and boundaries of the EP and reflects the activity limitations.

10 Demonstration Impacts will be of an Acceptable Level

10.1 Principles of ESD

Temporary, Reversible, Small Scale and Natural variation

As described in the impact assessment, the Regia Marine Seismic Survey will generate impulsive underwater sound from a 2,820 in^3 airgun array over 60 days constrained within a 90-day period. Modelling predicts that sound exposure levels capable of causing for mortality/potential mortal injury and recoverable injury was reached between 86 m –2 km The distance to temporary threshold shift (TTS) is limited to 10.95 km Behavioural disturbance may occur up to 13.81 km from the sound source. As discussed in the impact assessment, Miller and Cripps (2013) found no significant impacts on site-attached fish species, with only short-term behavioural changes observed that resolved within 20 minutes and no long-term changes in fish diversity or abundance compared to pre-survey trends. Santulli et al. (1999) noted if fishes were to experience stress because of sound exposure, levels may return to normal within 72 hours, indicating any impacts will be temporary and reversible.

There has been no scientifically documented cases of mortality in free-swimming fish exposed to seismic source emissions under experimental or field conditions (DFO 2004; Boeger et al. 2006; Popper et al. 2014; Popper et al. 2016; Carroll et al. 2017; Popper and Hawkins 2019). Effects are most likely to be short-term behavioural responses, such as avoidance or startle, particularly in hearing-specialist fish.

Any physiological effects are expected to be minor and reversible, with no measurable impact on individual fitness or population viability. No critical spawning aggregations, fish nursery areas, or habitats of significance occur within area where thresholds are exceeded. Fish have high reproductive capacity and dispersal ability, and many species migrate through broad areas of habitat. The predicted sound footprint is narrow and transient, moving continuously with the vessel, resulting in limited and localised exposure. Overall, the potential environmental damage is temporary, reversible, and of low intensity.

Based on sufficient information

The assessment applied internationally recognised exposure thresholds for impulsive sound, including criteria recommended by Popper et al. (2014), to account for hearing sensitivity across fish groups. Site-specific acoustic modelling, literature on fish responses to seismic surveys, and expert judgment were used to define impact distances. While some uncertainty remains regarding variability in individual sensitivity and behavioural consequences, the assessment applied conservative thresholds and considered both physiological and behavioural endpoints. No potential for serious or irreversible harm was identified, and the precautionary principle was not triggered.

Activity not inconsistent with EPBC Act

The assessment considered all species listed under the EPBC Act and associated recovery or conservation plans. No protected fish species were found to have critical habitats within the Active Source Area. Activity design explicitly avoided areas like the West Tasmania Canyons Key Ecological Feature and Lady Julia Percy Island. No inconsistencies with management objectives or recovery plans were identified.

10.2 Biological and Ecological Categories

The modelled sound exposure areas are limited in scale, and most fish species are expected to respond to approaching vessels and sound sources by moving away. No mass mortality, spawning disruption, or physical injury is predicted (DFO 2004; Boeger et al. 2006; Popper et al. 2014; Popper et al. 2016; Carroll et al. 2017; Popper and Hawkins 2019, Miller and Cripps 2013). Populations are expected to remain dynamically stable within their natural ranges of variability without intervention. The assessment concluded that biological effects will be minor and unlikely to result in any population-level consequences.

Fish play important ecological roles as predators and prey, but the minor, localised and transient nature of the predicted impacts means that there will be no measurable effect on community structure or ecosystem processes. The sound footprint will not persist in any one area, and the short-

term displacement of individuals will not alter energy flows or trophic interactions. Ecosystem function and biodiversity will remain intact.

10.3 Economic, Cultural and Social Categories

Eels were identified through the cultural heritage review, consultation and desktop research as species with social, cultural and/or economic significance that may be impacted by underwater sound. The ecological impact of underwater sound on eel species has been assessed (see Appendix F3) and determined to be low intensity at a population level and within current accepted levels of impact as applied to the commercial fishing industry.

Several fish species were identified as valued to commercial and recreational fishing and, during consultation, a fishing tour operator. Assessed impacts to each fish species were all sub-lethal and mostly behavioural. There is no evidence of reduced fecundity nor developmental effects in any fish species, therefore long-term effects over multiple fishing seasons are not predicted.

As these values are closely tied to the physical presence and health of the species, the corresponding social, cultural and economic impacts are likewise considered acceptable. Ongoing assessment is conducted at the receptor level and via the corresponding measurement criteria and adopted mitigation measures. Therefore, industries, livelihoods, and ecosystem services remain viable, with no sustained financial or operational impacts; culturally significant species, places, and practices continue without disruption; and people and communities maintain ongoing access to the natural environment, recreational activities, and heritage values without long-term or irreversible effects.

10.4 Consistency with Company Processes

The impact assessment followed the methodology in Appendix B3 and applied peer-reviewed sources and defined thresholds where available, for physiological and behavioural effects based on fish hearing group classifications. The activity integrates all mitigation measures recommended through regulatory guidance and good industry practice, and the consequence ratings remain within CGG's established environmental limits. The conclusion of the assessment of seismic sound to fish is summarised below.

Table E3-3 Impact Assessment Effect Levels

Potential Impact	Predicted Level of Effect	Uncertainty	Predicted Level of Impact
Mortality and Potential Mortal Injury and Recoverable Injury	Minor	Low	Low
Temporary Threshold Shift	Minor	Medium	Medium
Change in Behaviour	Minor	Medium	Medium
Change in Commercial Catch	Minor	Medium	Medium

11 Environmental Performance Outcomes

Environmental Performance Outcomes (EPOs) are measurable and activity-specific outcomes that describe the environmental performance the titleholder must achieve to ensure impacts and risks are managed to acceptable levels. EPOs are critical to the structure of an Environment Plan because they form the clear link between the defined acceptable level of impact and the predicted level of environmental consequence. Each EPO must be measurable, achievable, and within the control of the titleholder to implement, providing a transparent and enforceable statement against which performance can be assessed.

Table E3-4 - Environmental Performance Outcomes and Justifications

Defined Acceptable Level (From Table E3-1)	Environmental Performance Outcome	Rationale
Fish and aquaculture stocks continue to be assessed as having the same stock status they held prior to commencement of the activity.	**No change in the assessed stock status of commercial and aquaculture species during and following the activity.**	The EPO can be supported through review of public fisheries stock reports and alignment with acoustic discharge levels remaining below modelled sound volume. No change in stock status indicates no unacceptable impact occurred.
No fish should be exposed to sound at or exceeding threshold levels for greater than 24 hrs for a TTS set at 186 dB SEL24hr.	**Fish will not be exposed to cumulative sound levels exceeding 186 dB SEL $_{cum24hr}$ for more than 24 hrs.**	This EPO is enforceable and verifiable through modelling of acoustic exposure fields and operational logs. It reflects a scientifically established threshold for temporary, recoverable effects and avoids threshold exceedance for both fish hearing sensitivity and pressure injury risk.
Industries, livelihoods, and ecosystem services remain viable, with no sustained financial or operational consequences resulting from changes in species behaviour, abundance, or access to resources.	**Social, cultural, and economic features are protected, sustaining their value for people and communities.**	Predicted impacts to fish are low intensity damage at the population level and within currently accepted levels of impact to these species as applied by the commercial fishing industry. The Otway Adjustment Protocol will be implemented to ensure that affected fishers will not be worse off because of the activity.
Culturally important species, places, and practices can continue without disruption to their role, accessibility, or long-term viability.		The Budj Bim eel traps are protected under the World Heritage Area listing, the eels themselves are not. No impacts to the World Heritage Area are predicted. The predicted impacts to eels are low intensity at a population level and within current accepted levels of impact as applied to the commercial fishing industry. The Yarra Pygmy Perch occurs in lakes, ponds, and slow flowing rivers (Saddlier and Hammer 2010). Because of their freshwater affiliation no impact from underwater sound from offshore seismic is predicted.
People and communities can continue engaging with the natural environment, recreational activities, and heritage values without experiencing long-term or irreversible disruption.		Predicted impacts to fish are low intensity damage at the population level and within currently accepted levels of impact to these species as applied by the commercial fishing industry.

Defined Acceptable Level (From Table E3-1)	Environmental Performance Outcome	Rationale
Environmental impacts and risks are consistent with the CGG impact and risk assessment process such that for an impact or risk the effect/ consequence rating is medium or below.	**The activity is conducted such that environmental impacts and risks remain within the range assessed as medium or lower, with mitigation measures in place and functioning as intended.**	This EPO enables ongoing assessment of effectiveness through internal reviews and operational audits. It provides a clear link between the impact and risk assessment process and implementation strategy, supporting regulatory compliance and continuous improvement without requiring environmental outcome monitoring.

12 Recommendations

For most species/taxa/groups of fish reviewed, this document provides the final assessment of impacts. However, despite an extensive review of the relevant literature on the effects of seismic on fish, there has been a high level of concern voiced throughout consultation with relevant persons, in relation to the importance of certain commercially targeted species and/or species of high cultural value. High levels of engagement on an aspect are a trigger for CGG to undertake additional assessment. In this case looking at the effects of the activity on the following species and/or behaviours. This additional assessment is detailed in Appendix F3 – Further Assessment of Key Values and Sensitivities under the following Sections

- 3.7 – Glass Eels
- 3.11 – Pink Snapper
- 3.12 – King George Whiting
- 3.14 – Spawning Patterns

It is important to note that the assessments detailed in Appendix F3 are as a response to further information requests and/or clarification and not a reflection of any prior assessment being insufficiently thorough. It is a recognition that more explanation and detail was sometimes necessary to better inform all groups involved in the consultation process, including the regulatory authority.

Hence, Appendix F3 does not provide further assessment on all aspects and values identified through the EP process only those that were identified as:

- Having some residual uncertainty about whether impacts or risks were of an acceptable level; and/or
- Contained environmental values and sensitivities (species) of key importance due to their protection status or commercial value; and/or
- Consultation with relevant persons revealed a particular value or sensitivity required further attention and material to support the consultation.

13 Document Control

Date	Revision	Update
6 August 2023	A	Draft prepared for initial comment
29 August 2023	B	Update based on comments and relevant person feedback
11 Sept 2023	0	Approved for release on Regia MSS website
20 Dec 2023	1	EP submission to NOPSEMA
14 May 2024	2	Review and update following public comment
23 October 2024	3	Updated following NOPSEMA assessment
16 April 2025	4	Updated following NOPSEMA OMR 1 Letter
6 December 2025	5	Updated following NOPSEMA OMR 2 Letter

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Annex 1

Public Comment

The following consultation feedback was received since the beginning of the public comment period starting 25 January 2024. Table E3-5 shows how this feedback has been incorporated into the environmental assessments.

Table E3-5 - Public comment input.

Matter	Matter ID	Changes made arising from public comment
Matter: Flawed argument regarding animals moving away	I04	CGG has considered these claims and has updated the EP Impact Assessments (Appendices E, and F where relevant) to clarify that, while some displacement is expected from mobile taxa during the Regia MSS, the survey will not preclude animals from the Operational Area in its entirety. Instead, animals are expected to temporarily move away from the active acoustic source, but once the source passes, animals will be free to move back into the habitat that they departed from.
Matter: Additional information to support impact assessment for fish	F03	CGG has reassessed and referenced literature in Section 4, which clarifies that there is no evidence of significant spawning aggregations occurring within the proposed Regia MSS area for the following species: Blue Warehou, Orange Roughy, Gulper Shark, School Shark, Australian Sardine, Blue Grenadies, Blue-eye Trevalla, Elephant Fish, Gummy Shark, Pink Ling, and Tiger Flathead.
Matter: Impacts of underwater sound on elasmobranchs	F07	CGG has considered these claims and is satisfied that the concerns raised were adequately addressed but has include reference to activity limitation where the sound source will not be discharged within 17km of Deen Maar and it's mitigating effect against potential impacts to sharks and rays in EP Appendix E3.
Matter: Impacts of underwater sound on white sharks	F08	CGG has considered these claims and is satisfied that the concerns raised were adequately addressed but has include additional information on the White Shark BIA and activity limitation here the sound source will not be discharged within 17km of Deen Maar, and it's mitigating effect against potential impacts to White Sharks, in EP Appendix E3.
Matter: Impacts to dive-based fisheries	F17	CGG has considered this claim and, based on the updated secondary sound modelling, has updated EP Appendix E8 (Impact Assessment – Underwater Sound: Surfers, Divers and Swimmers), Appendix A2 (Description of the Activity) and the following Activity limitation: the sound source will not be discharged at full power from areas which have been predicted to result in an exceedance of the safety criterion human health safety criterion for recreational divers, surfers and swimmers along the coastline CGG has also made updates to modelling in Appendices (E1, E2, E3, E4, E5, E6, E7, F1 F3, G1 and G2). feedback
Matter: Geographic range and all species need to be defined and considered	I16	CGG has considered these claims and has rerun the PMST reports to ensure that all information on the likely/known presence of relevant species within the area, as well as information on their protection status, Biologically Important Areas (BIAs) and behaviours is up to date. The updated PMST reports are provided in full in EP Appendix B5.
Matter: Lack of detail on EPBC-listed species and enforceable measures	I17	CGG has considered these claims and has rerun the PMST reports to ensure that all information on the likely/known presence of relevant species within the area, as well as information on their protection status, Biologically Important Areas (BIAs) and behaviours is up to date. The updated PMST reports are provided in full in EP Appendix B5.

Annex 2

Objections and Claims Raised from Consultation

During the consultation process relevant persons were invited to raise objections and claims about the adverse effects of the activity. An assessment of merit of each objection or claim has been made by CGG which can be found in the consultation report using the Feedback ID number shown in Table E3-6. If an objection or claim had merit and was relevant to this assessment it has been included in the table below.

Table E3-6 - Objections and Claims raised from consultation.

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
4030	CGG's email on September 14 indicated that the project's timing has changed to two separate 3-month windows: April-June and September-November. AMCS is concerned that the December sound speed profile may not accurately reflect the physical conditions during these new survey periods. Since acoustic propagation modelling is critical for subsequent analyses and for setting thresholds for mitigation measures required for NOPSEMA approval, AMCS requests an explanation of how the December sound speed profile differs from those in April-June and September-November.	We acknowledge this concern and agree that acoustic propagation modelling is the foundation of subsequent analysis. We will complete another modelling report prior to submission to cover the changed timeframes of the proposed survey.	3384
4035	Comment about the impact of human activities on wildlife habitats and calls for a halt to such destruction for profit. It emphasises the negative consequences of competing interests in the area.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable.	2109
4036	Comment claims that seismic activity is known to cause significant harm to marine life, arguing that the proposed project will lead to further degradation of the coastal environment and should be abandoned as a result.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable.	2098
4038	Commenter highlights that fish populations have been adversely affected by seismic testing over the past few years, leading to a decline in their numbers. This decline could also impact other marine species and have negative effects on whale populations.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable. A fauna management plan is in place to manage whale interactions.	1432
4226	The email expresses concern about the adverse effects of blasting the Southern Ocean and its creatures, particularly	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa	2940

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
	mentioning the geologically sensitive Bonney upwelling.	within the area of operation. Mitigation plans are in place to reduce any impacts to as low as practicable.	
4230	The feedback asserts that seismic testing is harmful to oceans and marine life, highlighting detrimental effects on the ecosystem.	We acknowledge that the Regia MSS will have some short-term, localised and recoverable effects on some parts of the environment. We will try demonstrating to our independent regulator that these impacts are of an acceptable level and not as detrimental as you claim. We welcome any evidence you can share so that we can consider it fully prior to our submission.	2080
4356	Concerns about the harm and damage to the marine ecosystem.	Titleholder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the marine environment within the area of operation. Mitigation plans are in place to reduce any impacts to as low as practicable.	2831
4033	Claim that seismic testing is proven to damage and kill marine life.	The titleholder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable.	1024
4035	Comment about the impact of human activities on wildlife habitats and calls for a halt to such destruction for profit. It emphasises the negative consequences of competing interests in the area.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable.	2109
4036	Comment claims that seismic activity is known to cause significant harm to marine life, arguing that the proposed project will lead to further degradation of the coastal environment and should be abandoned as a result.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable.	2098
4038	Commenter highlights that fish populations have been adversely affected by seismic testing over the past few years, leading to a decline in their numbers. This decline could also impact other marine species and have negative effects on whale populations.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable. A fauna management plan is in place to manage whale interactions.	1432

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
4050	Concern about the destruction of smaller sea life and the wounding of larger marine animals due to seismic blasting.	Regia EP has conducted thorough assessments of the literature for all relevant receptors including plankton, fish, invertebrates, birds, turtles, and marine mammals. The Regia MSS is required to define acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan. Measures to minimise adverse impacts on relevant biological receptors in the region and relevant mitigation measures are outlined in the EP.	1669
4051	Concern about the detrimental impacts on marine animals.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable.	1452
4053	Concern about the impact on marine creatures due to noise pollution from seismic surveys.	The titleholder acknowledged the feedback, noting that potential impacts from underwater sound to relevant receptors, including plankton, fish, invertebrates, birds, turtles, and marine mammals, are assessed in the Environmental Plan (EP) and can be found in E2, E3, E4, E5, E6, and E7. Measures to minimise adverse impacts on biological receptors are outlined in the EP also and can be found in G2.	3237
4064	Concern raised by the stakeholder regarding the potential damage/kill of marine life due to seismic testing.	Titleholder responded to individual advising that CGG would not propose an activity that would lead to unacceptable impacts to marine life and advised that environmental impact assessments for each aspect of the proposed activity that has the potential to impact marine life were currently being prepared and that they would be based on scientific literature and published shortly for consultation and feedback.	1024
4067	Concern regarding the repeated seismic blasting in the area, which may have effects on marine life. Stakeholder is questioning the impact of multiple blasts and the potential for further exploration	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation.	879

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
	by other companies, particularly regarding the sale of seismic data.	Mitigation plans are also in place to reduce any impacts to as low as practicable. Cumulative impacts are also assessed as negligible.	
4068	Concerned about the harm being inflicted on oceans by unnecessary gas exploration.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable.	1656
4069	Concerned about the harm being inflicted on oceans by unnecessary gas exploration.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	1673
4073	Concerns about impacts both reputational and physical to the region if the activity is allowed.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable.	1244
4075	Concerns about marine life and ecosystems.	The effects of underwater sound have been extensively assessed based on the latest scientific literature. CGG has committed to a variety of protective measures for various marine fauna (see G1)	2117
4076	Concerns about potential disturbance to the marine environment, including marine parks and areas of Biological Importance.	The titleholder acknowledged this concern and noted that potential impacts to the marine environment including marine parks and biologically important areas as a result of the Regia MSS is assessed in E1 to E9 and F3 of the EP. There will be no activities with Australian Marine Parks. All areas of biological importance have been identified and assessment in the respective impact and risk assessments.	2278
4077	Concerns about potential harm to zooplankton, whales, dolphins, sharks, seals, the Bonney Upwelling, rock lobster fishery and other local fishing industries.	Titleholder has undertaken a comprehensive assessment of all available scientific literature to develop an appropriate EP. All potential risks have been identified with appropriate mitigation	722

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		methods applied where necessary. There are no identified levels of harm that would endanger the population stability of any taxa.	
4078	Concerns about seismic testing and drilling rigs impacting marine life and fishing activities.	Titleholder has undertaken a comprehensive assessment of all available scientific literature to develop an appropriate EP. All potential risks have been identified with appropriate mitigation methods applied where necessary. There are no identified levels of harm that would endanger the population stability of any taxa.	917
4080	Concerns about the impact of seismic testing on various marine species.	Titleholder has undertaken a comprehensive assessment of all available scientific literature to develop an appropriate EP. All potential risks have been identified with appropriate mitigation methods applied where necessary. There are no identified levels of harm that would endanger the population stability of any taxa.	2179
4081	Concerns about the impact on whale habitat, endangered marine life, and commercial fisheries	Titleholder acknowledged this concern and noted that potential impacts to whales and relevant endangered marine species is assessed in the EP Chapters on underwater sound and light (E2-E7, and E9). Any interactions with seismic are mitigated and managed through spatial boundaries and a comprehensive fauna management plan. Advised that control measures to reduce impacts to commercial fishers as a result of displacement are outlined in the EP and include Adjustment Protocol stipulates an adjustment process will be implemented if a commercial fisher has a financial loss due to the Regia MSS. The adjustment process will be developed in consultation with the fishery associations that represent the commercial fishers that fish within the Operational Area.	4551
4083	Concerns about why more seismic needed and what time of the year was the survey going to be done to minimise impacts to fishing for sharks, lobsters, squid	Titleholder acknowledged this concern and each of the species within this claim has been subject to extensive assessment in E1, E3, E4 and F3 with various measure adopted to limit the sound exposure to the lowest level possible to meet geophysical objectives and to protect marine fauna (see G1).	740
4085	Concerns of damage to the marine environment by seismic blasting and gas extraction	All available scientific evidence is used to inform the environmental assessment on seismic impacts. There are no impacts identified that will affect the population stability of any taxa.	825

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
4088	Condemns seismic testing, asserting that it is deadly to marine life and unacceptable for ocean ecosystems. Call for a total ban, citing the large number of marine animals harmed by the practice. Argument that the destruction of marine ecosystems and the fishing industry is unjustifiable and express frustration, telling the parties responsible to stop.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable. Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	422
4093	Doubted the effectiveness of mitigation measures and believed the reports/information provided were absent of action /intention.	The mitigations applied by CGG are industry standard and comply with government policy. They have been proven to be as effective as reasonably practical for a number of years. The measures adopted to protect species from the aspects of the activity are found in the respective impact and risk assessments.	2830
4096	Environmental Risk: Concerns about the environmental impact of seismic testing on marine life and the clash between business interests and environmental protection.	Regia EP has conducted thorough impact assessments for all relevant receptors including plankton, fish, invertebrates, birds, turtles, and marine mammals, in relation to underwater sound and artificial light as aspects of the activity. Other marine users have also been considered in another impact assessment that considers physical presence as an aspect of the activity. The Regia MSS is required to define acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan. Measures to minimise adverse impacts on relevant biological	2766

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		receptors in the region and relevant mitigation measures are outlined in the EP.	
4102	Expresses opposition due to proximity to local fishing industries. Emphasises concern about potential risks this testing poses.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable. Adjustment protocol in place for fishers to seek compensation if impacted by MSS.	428
4118	Impact on marine animals, which are the livelihood of the community.	Regia EP has conducted thorough impact assessments for all relevant receptors including plankton, fish, invertebrates, birds, turtles, and marine mammals. The Regia MSS will not impact the population stability of any taxa within the area of operation. Measures to minimise adverse impacts on relevant biological receptors in the region and relevant mitigation measures have been outlined in the EP.	2274
4123	Insufficient information about potential damage from seismic testing.	The titleholder is confident that sufficient relevant and available information has been used to inform this this EP and to complete a comprehensive assessment of relevant aspects of the activity. Information used based around sound, peer reviewed scientific literature.	4190
4130	Lasting and unrecoverable damage mentioned.	The titleholder acknowledged the feedback, noting that risks and impacts are assessed in the Environmental Plan (EP) and can be found in D1 to D4 and E1 to E9, and F3. Measures to minimise adverse impacts on marine life are outlined in the EP in G1.	4808
4133	Mass destruction of marine populations through the blasting process.	Regia EP has conducted thorough impact assessments for all relevant receptors including plankton, fish, invertebrates, birds, turtles, and marine mammals. The Regia MSS will not impact the population stability of any taxa within the area of operation. Measures to minimise adverse impacts on relevant biological receptors in the region and relevant mitigation measures have been outlined in the EP.	2274
4136	Mention of considerable damage to marine life outweighing the benefits of mapping seafloors for gas drilling.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to	1389

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		reduce any impacts to as low as practicable.	
4145	Opposes seismic exploration claiming it is dangerous to all marine life. Cannot ensure zero risk.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable. Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	427
4146	Opposes seismic testing, claiming it will have catastrophic effects on marine life due to high decibel blasting sounds. States activities can harm various marine species and may cause whales to beach themselves from the pain, making them unacceptable in a whale sanctuary area.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable. Regia EP has found seismic impacts to cetaceans can be mitigated and managed through appropriate timing of the survey and a comprehensive fauna management plan	537
4153	Presents a historical account of their catch rates over 24 years, indicating that seismic surveys in the past led to a significant decrease in their catch from 10-15 tons per trip to just 5-6 tons per trip for over two years. They now report a catch rate of 10-14 tons per 7 days, suggesting lingering concerns about how current seismic activities may similarly affect their fishing operations.	Titleholder acknowledged this concern and noted that potential impacts to molluscs the Regia MSS is assessed in E1, E4 and F3 of the EP. Advised that control measures to reduce impacts to commercial fishers as a result of loss of catch are outlined in the EP and include Adjustment Protocol stipulates an adjustment process will be implemented if a commercial fisher has a financial loss due to the Regia MSS. The adjustment process will be developed in consultation with the fishery associations that represent the commercial fishers that fish within the Operational Area.	5190
4154	Questions a previous statement that indicated there would be no mortal effects from seismic activities.	The titleholder acknowledged the feedback, noting that impacts and risks to the marine environment are assessed in the Environmental Plan	2088

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		(EP) and can be found in D1 to D4 and E1 to E9, and F3. Measures to minimise adverse impacts on the marine environment are outlined in the EP in G1.	
4155	Raised concerns about sound levels from the survey and associated effects on marine mammals and other species.	Acknowledged concerns and outlined the predicted effects of sound levels of different species of marine mammals including difference between high and low frequency cetaceans, sound propagation and modelling, and different effect level thresholds. Also outlined the whale management and mitigation measures in place for Southern Right Whales and Blue Whales including timing of the activity, vessel-based monitoring (MMO's and PAM Operators), detection technology trails, and citizen science program access. Also outlined the effects on zooplankton and the case for acceptability of these	3697
4158	Reference to the destruction and degradation of the marine environment observed during diving trips.	The titleholder acknowledged the feedback, noting that impacts and risks to the marine environment are assessed in the Environmental Plan (EP) and can be found in D1 to D4 and E1 to E9, and F3. Measures to minimise adverse impacts on the marine environment are outlined in the EP in G1.	2830
4173	Seismic blasting has adverse effects on the marine environment, with critical gaps in understanding the effects on individual species and the marine environment.	The titleholder responded with an explanation of the information sources used to inform the Regia MSS impact and risk assessments, and explained how these information sources and resulting measures are specific to the potential impact. The titleholder also referred to documents relevant to this claim within the environment plan (Event ID 4092).	4091
4175	Seismic blasting is harmful and disruptive to marine life of many species.	The titleholder acknowledged the feedback, noting that impacts and risks to marine life are assessed in the Environmental Plan (EP) and can be found in D1 to D4 and E1 to E9, and F3. Measures to minimise adverse impacts on marine life are outlined in the EP in G1.	3343
4176	Seismic blasting negatively affects not only whales but also crucial marine life, including fish, crustaceans, and zooplankton, all of which play vital roles in the marine ecosystem.	The titleholder acknowledged the feedback, noting that impacts and risks to marine life are assessed in the Environmental Plan (EP) and can be found in D1 to D4 and E1 to E9, and F3. Measures to minimise adverse impacts on marine life are outlined in the EP in G1.	2074

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
4177	Seismic blasting would have a significant negative effect on marine creatures and ecosystems.	The titleholder acknowledged the feedback, noting that impacts and risks to marine life are assessed in the Environmental Plan (EP) and can be found in D1 to D4 and E1 to E9, and F3. Measures to minimise adverse impacts on marine life are outlined in the EP in G1.	3343
4179	Seismic sounds have far-reaching effects on the marine environment, causing damage and suffering to species.	The titleholder acknowledged the feedback, noting that impacts and risks to marine life are assessed in the Environmental Plan (EP) and can be found in D1 to D4 and E1 to E9, and F3. Measures to minimise adverse impacts to marine life are outlined in the EP in G1.	3237
4180	Seismic testing and gas exploration/drilling pose undeniable risks to marine fauna, flora, ecosystems, local fishing, and tourism industries.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	2118
4181	Seismic testing has also been found to have sub-lethal impacts on fisheries species	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	1893
4186	Stakeholder expressed concern about the destruction and depletion of the ocean due to the activity.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and	2963

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		compares those to the previously defined acceptable levels and is presented in the Environment Plan	
4187	Stakeholder expressed concern about the potentially devastating impact of seismic testing on ocean marine life.	The titleholder acknowledged the feedback, noting that impacts and risks to marine life are assessed in the Environmental Plan (EP) and can be found in D1 to D4 and E1 to E9, and F3. Measures to minimise adverse impacts to marine life are outlined in the EP in G1.	3209
4189	Stakeholder noted concern for harm being inflicted on our oceans by unnecessary gas exploration.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	1653
4190	Stakeholder noted concern for harm being inflicted on our oceans by unnecessary gas exploration.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	1655
4191	Stakeholder noted concern for harm being inflicted on our oceans by unnecessary gas exploration.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	1659

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
4192	Stakeholder noted concern for harm being inflicted on our oceans by unnecessary gas exploration.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	1661
4193	Stakeholder noted concern for harm being inflicted on our oceans by unnecessary gas exploration.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	1662
4194	Stakeholder noted concern for harm being inflicted on our oceans by unnecessary gas exploration.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	1663
4195	Stakeholder noted concern for harm being inflicted on our oceans by unnecessary gas exploration.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and	1665

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		compares those to the previously defined acceptable levels and is presented in the Environment Plan	
4196	Stakeholder noted concern for harm being inflicted on our oceans by unnecessary gas exploration.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	1667
4197	Stakeholder noted concern for harm being inflicted on our oceans by unnecessary gas exploration.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	1670
4198	Stakeholder noted concern for harm being inflicted on our oceans by unnecessary gas exploration.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	1672
4199	Stakeholder noted concern for harm being inflicted on our oceans by unnecessary gas exploration.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information	2586

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		gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	
4200	Stakeholder noted that dolphins use clicks and whistles as a complex form of communication, with observations of bottlenose dolphins using distinctive whistles for individuals within their pod, similar to how humans use names. Claimed that blasts from seismic testing could cause temporary and permanent hearing loss in dolphins and whales, citing instance near Peru, where some 900 long-beaked common dolphins and black porpoises washed up dead along a stretch of beach, shown to have had fractures in their ear bones and signs of bleeding from their middle ears. - LINK provided.	A Preliminary Environmental Impact and Risk Assessment is undertaken during an impact assessment process (our PEIRA is available here). The PEIRA is compiled to identify environmental values and sensitivities, to provide an evaluation of the environmental impacts and risks associated with the project. The PEIRA is then used to inform the environmental assessment documents, and as above, the environmental impact and risk treatments, which are being uploaded in the document library. The draft Environmental Impact Assessments are in the document library now, for review and feedback. For transparency we are uploading the entire documents, however if there is a concern you would like a summary or specific information on, please let us know. Further information on marine mammal treatments is covered below in response to concern 6.	2886
4202	Stakeholder objects to the proposed blasting activity due to its detrimental effects on marine ecosystems.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	2255
4211	Stakeholder stated they were extremely concerned about the risks, damage and destruction caused by exploration activities in the marine environment.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously	1049

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		defined acceptable levels and is presented in the Environment Plan.	
4217	Strong objection to the proposal for 3D seismic blast in the Otway Basin due to harm to oceans and unacceptable environmental impact or risk.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable.	1656
4218	Strong opposition to seismic testing in the ocean due to its effects on both wildlife and the fishing industry. Individual firmly disapproves of the practice.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to as low as practicable. Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan.	425
4226	The email expresses concern about the adverse effects of blasting the Southern Ocean and its creatures, particularly mentioning the geologically sensitive Bonney upwelling.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are in place to reduce any impacts to as low as practicable.	2940
4230	The feedback asserts that seismic testing is harmful to oceans and marine life, highlighting detrimental effects on the ecosystem.	We acknowledge that the Regia MSS will have some short-term, localised and recoverable effects on some parts of the environment. We will try demonstrating to our independent regulator that these impacts are of an acceptable level and not as detrimental as you claim. We welcome any evidence you can share so that we can consider it fully prior to our submission.	2080
4232	The feedback expresses frustration over repeated seismic blasts in the same area, emphasising the significant environmental impacts associated with these activities. It calls for accountability	The Regia MSS is targeting areas that have not been surveyed before though we acknowledge there may be some overlap with previous surveys. We have to show that the	2104

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
	from NOPSEMA to prevent future occurrences, highlighting the ongoing threat to the environment.	environmental impacts are short-term, localised, or recoverable and that they are controllable with appropriate measures in place.	
4241	The fisher expressed concerns about the adverse effects of seismic activities on the stocks he relies on, indicating that the surveys have negatively impacted fish availability.	This claim was thoroughly assessed both in E3 and in F3. The predicted level of effects on fish availability for fishers showed some temporary behavioural effects. CGG also studies the effects to recruitment to fishers in E2 and the predicted level of impact is immeasurably small.	2026
4253	The possible effects to marine life and ecosystems are my primary concern	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	2117
4259	The proposed works will harm and damage the climate and ocean life.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	2256
4260	The protection of wildlife in the Otway Basin is directly affected by drilling and seismic surveying.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan.	1901

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
4265	The seismic process is going to affect local marine life, ecosystems, and the climate in the community.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are also in place to reduce any impacts to defined acceptable levels and as low as reasonably practicable.	1259
4267	The Stakeholder also objected to the project on the basis that it would impact every marine creature and sea bird.	Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan. Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are in place to reduce any impacts to as low as practicable.	2064
4268	The stakeholder argues that it is impossible to ensure zero risk from seismic activities, emphasising that only zero risk is acceptable. This position reflects a strong concern regarding the potential negative impacts of seismic exploration on the marine environment.	The legislative framework in Australia permits some impact from offshore petroleum if it is managed and of an acceptable level. We believe that responsible development of gas is essential for maintaining the current quality of life we all enjoy and ensuring we pass that quality of life on to future generations. Gas is part of the Labour governments energy transition plan.	2107
4270	The stakeholder asserts seismic surveying has been proven to be harmful and disruptive to marine life of many species.	Regia EP has conducted thorough impact assessments for all relevant receptors including plankton, fish, invertebrates, birds, turtles, and marine mammals. The Regia MSS will not impact the population stability of any taxa within the area of operation. Measures to minimise adverse impacts on relevant biological receptors in the region and relevant mitigation measures have been outlined in the EP.	3343
4271	The stakeholder asserts that seismic blasts will have a direct negative impact on marine life, specifically mentioning that an “exclusion zone” will not effectively prevent the effects of the blasts from travelling through the ocean.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are in place to reduce any impacts to as low as practicable. The titleholder is aware	2108

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		of the environmental, cultural, and spiritual importance of Deen Maar and will talk with local traditional owners to learn more about Deen Maar and understand how to protect and preserve the values of this site.	
4272	The stakeholder asserts that the survey will have a harmful effect on millions of sea creatures.	It would be unacceptable to have long-term or permanent/unrecoverable impacts, fortunately, impacts from marine seismic surveys are short-term, temporary, and recoverable. (Event ID: 3419)	3343
4274	The stakeholder claims that seismic exploration poses a significant danger to marine life in general. This claim suggests a strong opposition to the practice due to its perceived harmful effects on the marine ecosystem as a whole.	The titleholder publicly responded to this interactive map comment explaining that legislative framework in Australia permits some impact from offshore petroleum if it is managed and of an acceptable level. We believe that responsible development of gas is essential for maintaining the current quality of life we all enjoy and ensuring we pass that quality of life on to future generations. Gas is part of the Labour governments energy transition plan.	2107
4276	The stakeholder does not accept the blasting activity as beneficial or more important than existing marine life and structures.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	2255
4278	The stakeholder expresses an active interest in the wellbeing of the coastline and its flora and fauna, indicating a general concern for environmental conservation.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any taxa within the area of operation. Mitigation plans are in place to reduce any impacts to as low as practicable.	1325
4285	The stakeholder noted their concern as a resident of Port Fairy: noise (land and sea), impact on marine life, potential impacts on the environment and the future potential if gas is found.	We are also concerned about the welfare of marine fauna. We have undertaken an impact assessment process that includes whale, seals, pelagic and shorebirds. As part of this assessment, we must show that impacts to these species will be of an acceptable level. We have determined that it is acceptable to	1747

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		have temporary behavioural changes, such as moving away from the survey vessel, and no injury or long-term impacts. Our Preliminary Environmental Impact and Risk Assessment document has been published on the project website and is available here. We are also publishing environmental impact, risk and mitigation documents as they are completed, in the document library. We are publishing the entire documents in order to remain transparent, but I have also attached a summary document.	
4287	The stakeholder objected to the activities due to sound levels/acoustic trauma experienced by sea creatures	The scientific literature supports that marine fauna may potentially be displaced due to a seismic survey but that these impacts are typically short term with no impact to ecosystem function. Large scale studies undertaken in Australia that you may be interested in are: Australian Institute of Marine Science. North West Shoals to Shore Marine Noise Monitoring and Impacts https://www.aims.gov.au/research-topics/monitoring-and-discovery/north-west-shoals-shore Behavioural Response of Australian Humpback whales to Seismic Surveys https://www.brahss.org.au/ Assessing the impact of marine seismic surveys on southeast Australian scallop and lobster fisheries https://www.frdc.com.au/project/2012-008 Marine Seismic Survey Impacts on Fish and Invertebrates: Final Report for Gippsland Marine Environmental Monitoring Study https://ecat.ga.gov.au/geonetwork/srv/api/records/2292f4a7-ba2e-3533-e053-12a3070aaf2c Maxima 3D Marine Seismic Survey at Scott Reef https://www.sciencedirect.com/science/article/abs/pii/S0025326X13006528 https://www.sciencedirect.com/science/article/abs/pii/S0025326X18300687 Regarding Marine Fauna Observer's (MFOs), companies that contract MFOs such as Blue Planet Marine and RPS Group provide training for	2389

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		MFOs. As part of contracting MFOs we will ensure that the persons provided meet the requirement of the Australian Government EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales, that requires MFOs to be trained and experienced in whale identification and behaviour, distance estimation, and be capable of making accurate identifications and observations of whales in Australian waters. The Regia MSS Implementation Strategy, which will form part of the environment plan to be submitted to NOPSEMA, details the competency requirements for MFOs and ongoing awareness (page 23 and 24). The Regia MSS Implementation Strategy is available on the Regia MSS Website Document Library see https://klarite.mysocialpinpoint.com.au/regiamss/document-library As detailed in the Regia MSS Implementation Strategy, which will form part of the environment plan to be submitted to NOPSEMA, CGG will only use appropriately experienced MFOs as determined by a review of their CVs (page 23). The Regia MSS Implementation Strategy also details how CGG will monitor the performance of the control measures during the activity (page 25). For example: Audits and Inspections Post acceptance of the EP, conformance will be monitored on an at least quarterly basis by the Client Site Representative, or delegate, via audits and inspections, as well as through the commitments under the Management of Risk, Management of Change, and Management of Knowledge parts of this Implementation Strategy. During the activity, conformance will be monitored on an at least fortnightly basis by the Client Site Representative, or delegate, via audits and inspections during the activity. Conformance auditing or inspection while the EP is in-force will be based on the Conformance Register and will target the following: • Conformance with regulatory requirements detailed in the accepted EP. • Management strategies and procedures to ensure EPOs and	

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		EPSs are being implemented, monitored, measured, and evaluated. • Emissions and discharges are being monitored, measured, and documented As stated in the previous email, matters of national energy policy are not within the purview of CGG or the Regia MSS. We will however register claims related to the ongoing need for gas and provide those to NOPSEMA. Please find attached a brochure from NOPSEMA that describes this and may be of use to you.	
4288	The stakeholder objected to the project on the basis that it would impact the Stakeholder personally and every person in the community who love the ocean. Stakeholder noted that they do not support the activity and find it distressing to even think about the damage that could be caused for thousands of creatures and the future of herself, other people of Port Fairy and the greater community.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan.	2064
4301	The stakeholder stated that the proposed activity is environmentally unsound irrespective of the assessment process and predicted environmental risk.	Petroleum activities do not operate to a no-impact standard. Instead, the Regia MSS is required to define the acceptable levels of impact and risk, and work below those levels. Acceptable levels of impact are established based on relevant up-to-date technical and scientific studies, government advice, and are considerate of the information gathered through the consultation process. This information is used to make predictions of the levels of impact we expect to occur and compares those to the previously defined acceptable levels and is presented in the Environment Plan	1747
4305	The stakeholder was concerned about interference with the Orange Roughy Research Program.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact any research being done on Orange Roughy. While this species is found throughout southern Australia, no spawning or feeding aggregations have been identified in the Operational area.	3350
4306	The stakeholder was concerned about potential negative impacts of gas exploration and development on Country,	The titleholder acknowledged the feedback, noting that all relevant impacts are assessed in the	3152

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
	the marine and coastal environment, the local economy, Traditional Owners, and local communities.	Environmental Plan (EP) and can be found in E1-E9. Measures to minimise adverse impacts on functions, interests and activities on relevant receptors are also adopted and can be found in G1.	
4309	The stakeholder was concerned about the impact on marine life sensibilities and populations.	Regia EP has conducted thorough impact assessments for all relevant receptors including plankton, fish, invertebrates, birds, turtles, and marine mammals. The Regia MSS will not impact the population stability of any taxa within the area of operation. Measures to minimise adverse impacts on relevant biological receptors in the region and relevant mitigation measures have been outlined in the EP.	2273
4315	The statement suggests that the significant harm caused by seismic activity to marine life and commercial fisheries, along with the existing natural gas supplies and climate change issues, renders the industrialisation of Port Fairy's coastline unacceptable. It emphasises community disapproval of allowing major oil companies to profit at the expense of the local environment and tourism.	We believe impacts from our activity can be managed to below acceptable levels. Further development of the offshore area would be subject to multiple future approvals. The visual impact from this survey would be temporary and similar to the shipping/fishing activity that already occurs in the region (Event ID 2076).	2076
4323	There will be potential permanent damage to marine life due to sonic testing and drilling.	Titleholder responded and listed various information needs related to the activity, environmental assessment process, environmental aspects, predicted levels of environmental impact and risk, environmental management, consultation processes, and regulations or regulatory processes. Links to the project website and document library was provided.	1046
4354	Uncertainty about the full extent of damage to the marine ecosystem.	Titleholder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the marine environment within the area of operation. Mitigation plans are in place to reduce any impacts to as low as practicable.	2831
4358	The stakeholder was concerned about the impacts on flora and fauna being damaged and killed away from the coastline.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of any flora or fauna within the area of operation. Mitigation plans are in place to reduce any impacts to as low as practicable.	2821
4362	Concerns about the lack of environmental reviews of seismic surveys at necessary scales to assess, mitigate and monitor impacts.	The titleholder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The titleholder responded providing links to large scale studies on seismic undertaken in Australian	1389

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		waters and offered to provide individual with impact assessments when they became available.	
4363	Stakeholder noted opposition to the harmful effects on marine life and the pristine coast.	The titleholder provided information on identifying potential impacts and risks and putting mitigations in place such as, conducting survey during time of year marine mammals are less likely to be in area, reducing sound source to lowest setting and reducing number of times activated, implementing marine mammal and fish monitoring programs, exclusion zones, following strict NOPSEMA guidelines. Provided link to PEIRA and document library on website.	786
4364	Concern about the future of ocean health for children and sea life, including whale children.	Titleholder responded in Event ID: 1416, describing CGG's commitment to safeguarding marine mammals, the assessment process, regulations and measures currently in place. The stakeholder was provided with consultation information and invited to engage.	1410
4365	Concerns about the lack of definitive clarification on how seismic testing affects the marine environment and the clash between economic interests and environmental risks.	The titleholder acknowledged the feedback, noting that they have undertaken a thorough analysis and assessment of all relevant literature to inform the impact assessments conducted to assess potential impacts from underwater sound to relevant receptors, including plankton, fish, invertebrates, birds, turtles, and marine mammals in the Environmental Plan (EP). These findings can be found in E2, E3, E4, E5, E6, and E7 under Section 8: Predicted Levels of Impact. Additional assessments of key receptors were also completed to demonstrate that environmental impacts and risks arising from the activity will be of an acceptable level (F3). Titleholder also conducted an assessment to investigate potential impacts to other marine users from physical presence resulting from the activity (E1).	2383
4357	The stakeholder raised an objection to seismic surveys as they negatively affect the fishing industry, local economy and environment.	Title holder has undertaken a thorough analysis and assessment of all relevant literature to inform its decisions. The MSS will not impact the population stability of commercial fish species and sensitive species within the area of operation. The MSS will also not impact the local economy. Mitigation plans are in place to reduce any impacts to as low as practicable.	424
4433	Claims seismic impacts can linger longer than the few hours suggested, the	OMICC announces that the latest version of the OMICC Otway	6749

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
	insistence on peer-reviewed work to prove this is opportunistic and suits OMICC's agenda.	Adjustment Protocol has been published, along with a video briefing for fishers, which can be accessed through a provided link. In the briefing, OMICC confirms that, following the relevant persons feedback, a "claim period" and a "lodgement period" have been incorporated into the definitions of the protocol. The claim period is set to 30 days after the end of any activity, while the lodgement period extends up to 6 months after the end date of any activity. OMICC further informs the relevant person that the OMICC Founders reviewed the request for claims up to 6 months after an activity. However, the decision was made to adopt a 30-day claim period, as this duration resulted in a positive compensation outcome for fishers affected by the Gippsland survey in 2019.	
4417	The relevant person was concerned that about the proposed seismic activity effecting the behaviours of certain species.	Event ID 6880 - The Regia team responded in-meeting that the first half of the EP is associated with assessment work undertaken prior to commencing the activity. First and foremost, because there are so many different species, they explained that they had grouped species together from a physiological perspective. Secondly, the Regia team explained that their focus is on the mega-fauna and species which have protection under the EPBC act.	6880
4452	Stakeholder claims that potential impacts on World Heritage Values of Budj Bim and the life-cycle of Kooyang have not been properly assessed or addressed.	Regia team responded by referencing the relevant impact assessments in the Environment Plan (EP) (EVT070), this information was also provided in Event ID 7363. Previously provided in Event ID 2521, 2356, 2357, 2358, 2359, 2360, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417.	7136
4453	Stakeholder claims that potential impacts on World Heritage Values of Budj Bim and the life-cycle of Kooyang have not been properly assessed or addressed	Regia team responded by referencing the relevant impact assessments in the Environment Plan (EP) (EVT070), this information was also provided in Event ID 7363. Previously provided in Event ID 2521, 2356, 2357, 2358, 2359, 2360, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417.	EVT070
4469	Objects to the negative effects of seismic testing on the short-finned eel.	CGG undertook scientific assessment for underwater sound impacts on Fish (Appendix E3 and F3), including short-finned eels. Short-finned Eels possess a swim bladder and were grouped with	EVT178

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		other fish having swim bladders for acoustic impact analysis, following the guidance of Popper et al. (2014). For fish in general, and eels in particular, the key impact mechanisms considered were potential for hearing damage or physiological injury from intense sound close to the source, and behavioural disturbance (e.g. startle responses or avoidance movement) at various distances. The EP concluded that no fish, including eels, would be close enough to the seismic source to suffer mortality or physical injury, with measures in place such as soft-starts the free-swimming fish are able to move away from the sound source, and that they anticipate no direct fatalities or lasting injuries to adult eels in the water. The titleholder acknowledges that fish may exhibit behavioural reactions to seismic noise and they assumed a conservative scenario where fish might show avoidance responses at substantial distances. In the worst case, an eel migrating through the area might detect the seismic pulses at distance and alter its course or depth to avoid the highest sound levels. The EP considered such avoidance to be a temporary and localised effect and that any diversion would likely be on the scale of hundreds of meters to a few kilometres at most. Given that migrating eels travel thousands of kilometres to reach spawning grounds, a short detour or a brief pause is not expected to jeopardize their overall journey. The EP's finding was that behavioural changes would be temporary and would not have long-term impacts on individuals or the population. (Responded to in EVT346)	
4470	Objects to the insufficient consideration of the physical presence and migration interference caused by seismic activities in eel migratory pathways.	Appendix E3, and additional species-specific assessment in F3, provides a thorough summary of short-finned eel biology, aligned with the best available science and fisheries data. The titleholder acknowledged that the Regia MSS Operational Area is offshore in the Otway Basin (south-west of Vic), which is adjacent to, with some limited overlap, to the potential migration corridor for these eels heading toward the western Tasman Sea. Appendix E3 identified "Eels (Anguilla spp.)" as a receptor in the environment that could be affected by underwater sound (section 4.1.6), precisely because	EVT178

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		Short-finned Eels are present in coastal catchments adjacent to the survey area and undertake marine migrations. (Responded to in EVT346)	
4471	Objects to the insufficient consideration of daily vertical migrations of the short-finned eel.	Appendix E3, and additional species-specific assessment in F3, provides a thorough summary of short-finned eel biology, aligned with the best available science and fisheries data. CGG recognises that Short-finned Eels spend most of their life in freshwater/estuarine environments and undertake a once-in-a-lifetime spawning migration to the ocean. Specifically, the EP notes that mature adults (typically 8–20 years old, depending on sex) depart their rivers in late summer to autumn to migrate to oceanic spawning grounds. The EP also describes the return journey of the progeny: eggs hatch into larvae that drift southward on currents, metamorphose into “glass eels” and eventually enter coastal estuaries (with peak recruitment in winter–spring), which is consistent with established literature and references cited by the stakeholder (e.g. Gooley et al. 2002 , Jacoby et al. 2015). Appendix E3 incorporated the latest research on eel migration behaviour, notably Koster et al. (2021). The EP explicitly references Koster et al. and confirms the phenomenon of diel (daily) vertical migration in migrating eels: tagged eels from the Hopkins and Fitzroy Rivers exhibited a pattern of surfacing at night and diving deeper during the day while at sea. CGG acknowledges that this is a crucial behavioural detail that the EP does acknowledge. (Responded to in EVT346)	EVT178
4472	Objects to the insufficient consideration in Regia MSS Environment Plan's of the cultural value of the short-finned eel in South-West Victoria and South Australia beyond Budj Bim.	The Regia MSS EP was prepared and assessed under an objective based regulatory regime, which requires the titleholder to consider a broad definition of the environment which may be affected, including cultural heritage. The EP recognises the intangible cultural or spiritual connections to Sea Country and undertook research and assessment, including consultation with Traditional Owner groups, within the relevant Sea Country. While no significant impact is predicted, they remain committed to respectful ongoing engagement with Indigenous stakeholders regarding any spiritual or cultural concerns. Cultural heritage to the	EVT178

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		eels is stated in Appendix E3 section 4.6.1, Appendix F3 section 3.7 and 3.16. Titleholder also explained that the EP contains a dedicated assessment of the Budj Bim Cultural Landscape (World Heritage Site) and its connection to Short-finned Eels and directed the stakeholder to Appendix F3 (Section 3.15). They stated that the conclusion of that assessment was that no threat or damage to Budj Bim's heritage values is expected from the proposed activity and that the cultural practices and eel stocks that underpin Budj Bim's value will not be materially affected. They stated that the EP goes further to acknowledge that beyond formally listed World Heritage values, there may be intangible cultural or spiritual connections to Sea Country that are difficult to quantify and that the Titleholder has regognised these and consulted Traditional Owner groups to better understand them.	
4478	Objects to the inadequate consideration of the habitat and lifecycle of the short-finned eel as their habitat includes all the areas essential to its lifecycle.	Appendix E3, and additional species-specific assessment in F3, provides a thorough summary of short-finned eel biology, aligned with the best available science and fisheries data. The titleholder acknowledged that the Regia MSS Operational Area is offshore in the Otway Basin (south-west of Vic), which is adjacent to, with some limited overlap, to the potential migration corridor for these eels heading toward the western Tasman Sea. Appendix E3 identified "Eels (Anguilla spp.)" as a receptor in the environment that could be affected by underwater sound (section 4.1.6), precisely because Short-finned Eels are present in coastal catchments adjacent to the survey area and undertake marine migrations. The EP outlines the broad geographic distribution of Anguilla australi, extending from Queensland through Victoria, Tasmania, South Australia, and New Zealand, to demonstrate that eels from various regions may pass through or near the survey area. Accordingly, the EP did not overlook the potential for eels originating from rivers west of the survey area (such as the Glenelg River, Coorong, and Murray River) to travel along the continental slope. Instead, it treated the Short-finned Eel as a wide-ranging species and assessed it on that basis. The EP did not list each river individually because it considered the species at a regional	EVT178

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		population level. The evidence and conclusions therefore apply to all Short-finned Eels in the area, irrespective of origin, as their marine behaviour and sensitivities are expected to be consistent across populations. The EP also includes detailed description of lifecycles, referencing the latest science, including the migrations in these lifecycles. (Responded to in EVT346)	
4474	Claims that seismic sounds can cause sublethal and lethal impacts on short-finned eels, such as disorientation, reduced energy budgets, stress or mortality.	Scientific assessment was completed for underwater sound impacts on Fish (Appendix E3) and how short-finned eels were accounted for in that assessment. As Short-finned Eels possess a swim bladder they were grouped with other fish having swim bladders for acoustic impact analysis, following the guidance of Popper et al. (2014). For fish in general, and eels in particular, the key impact mechanisms considered were potential for hearing damage or physiological injury from intense sound close to the source, and behavioural disturbance (e.g. startle responses or avoidance movement) at various distances. The assessment concluded that no fish, including eels, would be close enough to the seismic source to suffer mortality or physical injury, with measures in place such as soft-starts the free-swimming fish are able to move away from the sound source, and that they anticipate no direct fatalities or lasting injuries to adult eels in the water. The titleholder also acknowledged that fish may exhibit behavioural reactions to seismic noise and that they assumed a conservative scenario where fish might show avoidance responses at substantial distances. In the worst case, an eel migrating through the area might detect the seismic pulses at distance and alter its course or depth to avoid the highest sound levels. The EP considered such avoidance to be a temporary and localized effect and that any diversion would likely be on the scale of hundreds of meters to a few kilometres at most. Given that migrating eels travel thousands of kilometres to reach spawning grounds, a short detour or a brief pause is not expected to jeopardize their overall journey. The EP's finding was that behavioural changes would be temporary and would not have long-term impacts	EVT178

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		on individuals or the population. (Responded to in EVT346)	
4475	Objects to the inconsistent consideration of short-finned glass eels arriving during April to October as they have been recorded to arrive throughout the year.	The EP describes the Short-finned Eel migration from Victoria largely occurring during late summer through autumn consistent with prevailing scientific theory. (Responded to in EVT346)	EVT178
4476	Objects to the lack of consideration of glass eel feeding, or the potential of having to 'swim out of the way' of seismic testing on energy budgets.	The Environment Plan (EP) fully considered potential effects of seismic activity on Short-finned Eels, particularly in relation to their ability to detect, avoid, and respond to underwater sound while migrating. The assessment followed internationally recognised scientific frameworks (e.g., Popper et al. 2014) and incorporated conservative sound-modelling to determine thresholds for injury and behavioural disturbance. The assessment concluded that no eels would be close enough to the seismic source to suffer injury or mortality, as eels are free-swimming and capable of moving away from noise. A soft-start procedure will also allow animals to detect and avoid the source gradually. Behavioural responses such as temporary avoidance or course adjustment were acknowledged and assessed as the most likely effect. Any such diversion would be localised and short-term, on the scale of hundreds of metres to a few kilometres, and would not meaningfully affect the eels' long-distance migration or energy reserves, given their natural capacity for endurance. The EP therefore determined that behavioural changes would be temporary, reversible, and of low intensity, with no population-level consequences. Supporting evidence from global studies shows no recorded cases of eel mortality or population decline linked to seismic surveys, including in the Otway Basin, where over 80 surveys have occurred in the past six decades. The assessment concludes that Short-finned Eels may move away from the survey area when exposed to sound, but will resume migration without harm or delay, and that predicted impacts are minor, transient, and not significant at individual or population scales. (Responded to in EVT346) Appendix E3 section 4.1.6 has been updated to include: It has been noted by Van Wichelen, et al (2022) that glass eels feeding during their migration is highly restricted, therefore when	EVT178

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		discussing impacts to glass eels, this has been considered.	
4477	Objection about the lack of adequate recognition and consideration of non-lethal, cumulative, and long-term impact of seismic noise on short finned eel.	Short-finned Eels possess a swim bladder and were grouped with other fish having swim bladders for acoustic impact analysis, following the guidance of Popper et al. (2014). For fish in general, and eels in particular, the key impact mechanisms considered were potential for hearing damage or physiological injury from intense sound close to the source, and behavioural disturbance (e.g. startle responses or avoidance movement) at various distances. The assessment concluded that no fish, including eels, would be close enough to the seismic source to suffer mortality or physical injury, with measures in place such as soft-starts the free-swimming fish are able to move away from the sound source, and that they anticipate no direct fatalities or lasting injuries to adult eels in the water. The titleholder also acknowledged that fish may exhibit behavioural reactions to seismic noise and that they assumed a conservative scenario where fish might show avoidance responses at substantial distances. In the worst case, an eel migrating through the area might detect the seismic pulses at distance and alter its course or depth to avoid the highest sound levels. The EP considered such avoidance to be a temporary and localized effect and that any diversion would likely be on the scale of hundreds of meters to a few kilometres at most. Given that migrating eels travel thousands of kilometres to reach spawning grounds, a short detour or a brief pause is not expected to jeopardize their overall journey. The EP's finding was that behavioural changes would be temporary and would not have long-term impacts on individuals or the population. The Titleholder noted that the EP acknowledges the existing pressures on the Short-finned Eel population and was developed to demonstrate that the proposed seismic survey would not materially increase the cumulative impact on the species. The cumulative impact assessment concluded that, even when accounting for other regional activities, the incremental effect of the survey on overall conservation values would be neutral to	EVT178

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		negligible. (Responded to in EVT346)	
4478	Objection to CGG's statements of 'no predicted mortality' on short finned eels is not supported.	This conclusion is supported by conservative modelling, peer-reviewed scientific research, and a precautionary evaluation of worst-case scenarios. No new scientific information was identified in the submission that had not already been considered in the Environment Plan. References such as Koster et al. (2021) were already incorporated into the EP, which includes the IUCN listing of near threatened. CGG notes that while Jacoby et al. (2015) raised conservation concerns for the species, the EP's findings are consistent with ensuring that the proposed activities do not exacerbate those concerns. (Responded to in EVT346)	EVT178
4479	Objection to CGG's statements about proposed mitigation measures in relation to the short finned eel.	The Environment Plan (EP) adopts an evidence-based, risk-weighted, and precautionary approach, consistent with both the letter and spirit of the precautionary principle in Australian law. The EP concludes that the impacts and risks to Short-finned Eels have been reduced to As Low As Reasonably Practicable (ALARP) and remain acceptable, meeting the requirements for EP acceptance under Regulation 34. While recognising that NOPSEMA's independent review will make the final determination on the EP's adequacy, CGG's view is that the document meets the regulatory acceptance tests, including demonstrating no unacceptable impacts on World Heritage values and consistency with the principles of Ecologically Sustainable Development (ESD). (Responded to in EVT346)	EVT178
4480	Objection to CGG's frequency range of 0-200Hz on migrating eels, stating the EP minimises how seismic testing may affect the eels.	Short-finned Eels possess a swim bladder, though it is not primarily used for hearing, and were therefore grouped with other fish possessing swim bladders for the purpose of acoustic impact assessment. The Environment Plan (EP) applied the internationally recognised framework of Popper et al. (2014) to establish scientifically validated thresholds for potential injury and behavioural disturbance. The assessment considered possible hearing damage, physiological effects from intense sound near the source, and behavioural responses, such as avoidance or startle reactions, at varying distances. As no specific audiograms exist for Short-	EVT178

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		finned Eels, the EP adopted a conservative approach, assuming they would respond similarly to other fish with comparable anatomy. (Responded to in EVT346)	
4481	Claims that content provided in the Regia Environment Plan is inconsistent, incomplete, misleading and has multiple errors in logic and critical thinking and does not accurately represent the evidence about the life cycle of the short-finned eel.	The version of the EP referenced by the stakeholder (June 2024) had been substantively updated with multiple iterations during NOPSEMA's assessment and following public comment which addresses all scientific and policy related claims. Titleholder also explained that the Regia MSS EP was prepared and assessed under an objective based regulatory regime, which requires the titleholder to consider a broad definition of the environment, including cultural heritage and social values, not just the immediate onshore operational area.	EVT178
4482	Claims the inadequacy of the Regia MSS Environment Plan in applying the precautionary principle and using transparent, comprehensive evidence for impact assessment.	The claim that the process lacked transparency is not supported by record as the project ran an unusually open process where the EP and appendices were published on the Consultation Hub, and the public were provided with updates at every revision. The EP's approach is fully consistent with Australian regulatory requirements for EP's which demand evidence-based assessment and precaution in the face of uncertainty and that the Regia MSS EP applied conservative assumptions and safety margins wherever scientific uncertainty existed. CGG are confident that the EP's evidence-based, risk-weighted approach – supplemented by precautionary, worst-case scenarios – meets both the letter and spirit of the precautionary principle in Australian law. The EP applies precaution through conservative assumptions, rigorous modelling, and layered safeguards, while also ensuring that conclusions remain scientifically defensible and evidence based. CGG have taken precautionary measures without abandoning accuracy or overstating unverified threats.	EVT178
4483	Claims insufficient monitoring and need for application of conservation recommendations and the IUCN's ongoing monitoring advice.	The EP applies the precautionary principle and ESD, using a conservative risk assessment that predicts negligible impact and is consistent with avoiding any deterioration in the species' conservation status. The EP acknowledges the conservation concerns highlighted in scientific literature, noting that the Short-finned Eel is classified as Near	EVT178

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		Threatened on the IUCN Red List. However, this classification is attributed primarily to freshwater habitat issues, not marine threats. The EP did not propose species-specific monitoring for eels because the predicted impacts were deemed so low (minor, transient disturbances with no lasting harm to individuals or the population), however would be open to assisting researchers.	
4484	Claims that the Regia MSS assessment on mortality of eels shows a critical thinking error, confirmation bias, logical fallacy and exaggerated language.	CGG maintains that the EP contains no fundamental logical flaws and expresses confidence that NOPSEMA, as the independent regulator, would identify any such issues in fulfilling its statutory role. The EP applies a structured weight-of-evidence approach, drawing on multiple lines of scientific information rather than selectively minimising impacts; where uncertainty was identified, the EP adopts precautionary assumptions. CGG states that the EP meets all regulatory requirements by describing the activity and environment, identifying all credible impacts and risks, and demonstrating that they are reduced to ALARP and acceptable levels. Regarding eel mortality, CGG notes that the EP explicitly predicts no mortality or injury based on modelled sound levels. Acoustic modelling shows the distance at which injury could occur is limited (60–230 m), and because eels are mobile, combined with the soft-start procedure, the likelihood of harm is extremely low. In response to concerns about confirmation bias or minimising language, CGG explains that terms such as “low risk” and “no measurable impact” are technical descriptors supported by evidence, not value judgments. They state that contextual information—such as the species’ resilience and broader existing pressures—is provided to ensure accuracy rather than diminish concerns. CGG also acknowledges minor typographical errors in species names but clarifies that these do not affect the scientific assessment.	EVT178
4485	Claims the activity will exacerbate existing pressures on freshwater eel.	The EP directly acknowledges the conservation concerns identified in the scientific literature and states that its impact conclusions are designed to ensure the proposed	EVT200

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		activity does not exacerbate those threats. It contextualises the Short-finned Eel's resilience by noting that the species faces far greater long-term pressures, such as overfishing, river barriers, drought, and climate-driven changes to ocean currents, and that its Near Threatened status on the IUCN Red List is primarily due to freshwater habitat issues rather than marine impacts. Within this broader context, the EP concludes that the Regia MSS survey will not materially add to the cumulative pressures on the eel population. The cumulative impact assessment predicts the survey's incremental effect to be neutral to negligible, and that any impacts will be minor and temporary, with no risk of jeopardising migration success or the species' viability.	
4486	Claims that the overall ecological health of systems is impacted by stressors affecting the short finned eel.	The EP recognises the ecological significance of the Short-finned Eel within the wider system. It notes that the species plays an important dual role in aquatic food webs, as both predator and prey, and is an ecologically connected component of marine and freshwater ecosystems. The EP describes the species' resilience, highlighting that Short-finned Eels are broadly distributed, migratory, and have persisted through natural environmental fluctuations over millennia. The EP assesses whether any predicted impacts could translate into population-level or ecosystem-level consequences. It concludes that Short-finned Eels are expected to experience only minor and temporary behavioural disturbance from the seismic survey, with no lasting harm to individuals or the population. Because abundance and function are predicted to remain intact, the species' ecological roles are not expected to change. Consistent with defined acceptable impact criteria, the assessment finds that effects will be temporary, reversible, small-scale, and low intensity at the population level. On this basis, the EP concludes there will be no ripple effects on predators, prey, or ecosystem processes. The document further supports this conclusion by noting that more than 80 seismic surveys have taken place in the Otway Basin over six decades, with no recorded decline in Short-	EVT200

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		finned Eel populations attributable to seismic activity.	
4490	CGG has failed to adequately assess the impacts of its proposed activity on the Budj Bim World Heritage Cultural Landscape. GMTOAC further states that CGG did not sufficiently evaluate impacts on Kooyang, a culturally significant species whose lifecycle and migration underpin the world heritage values of the Budj Bim Cultural Landscape and extend well beyond its physical boundaries.	Culturally significant features, including the Budj Bim landscape, were included in both impact and cumulative risk assessments using a methodology that blends scientific evidence with cultural narratives. Regarding Kooyang (Eel), CGG maintains that this culturally important species, whose lifecycle is central to the world heritage values of Budj Bim, was addressed within the EP's impact and cumulative assessments. These assessments include both Kooyang's cultural significance and ecological role. CGG reiterates that its EP is consistent with statutory obligations, based on best-available science, and tailored to the cultural and ecological sensitivities identified. CGG maintains that the Budj Bim Cultural Landscape and Kooyang have been incorporated into the EP and that this inclusion meets regulatory standards for demonstrating ALARP and acceptable levels of impact.	EVT352
4491	Claims about the SRW and BW BIAs. States proposed activity will cause unacceptable impacts to all Karntubul species, including temporary & permanent hearing loss, displacement from BIAs, vessel strike, prey depletion during peak feeding/migration period, calving interruption, and impact to ecosystems and cultural landscapes as a result of the cumulative impact of these.	CGG has identified all Biologically Important Areas (BIAs) relevant to blue whales (BWs) and southern right whales (SRWs) and incorporated seasonal BIA use into the survey design through substantial temporal and spatial restrictions detailed in the EP. Predicted underwater-sound impacts on these Karntubul species, along with mitigation measures presented in Appendices E7 and F3, demonstrate impacts will remain acceptable and will avoid auditory impairment or displacement from BIAs or Habitats Critical to Survival (HCTS). CGG further notes that vessel-strike risk is already extremely low during seismic surveys and that additional controls in Appendix D2 ensure this risk is prevented and acceptable. It concludes that no changes to ecosystem structure, diversity, or function are expected from the one-off survey, with sound exposure too limited in extent and duration to affect prey, food webs, or predator–prey relationships. A cumulative impact assessment found residual cumulative effects to be low, reduced to ALARP, and acceptable, with no impacts predicted for regional marine parks. CGG also asserts consistency with the National Recovery Plan for Southern	EVT352

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
		Right Whales and the Blue Whale Conservation Management Plan, stating that their objectives and recommended measures have been incorporated. Finally, CGG maintains that all marine mammal species likely to occur in the region have been adequately assessed using up-to-date EPBC Protected Matters data, and that mitigation measures ensure impacts to all listed species will remain acceptable and not inconsistent with EPBC Act protection provisions.	
4492	Claims that the eastern population of the Southern Right Whale, estimated at only 200–300 individuals, is at particularly high risk because its migration and reproduction Biologically Important Areas (BIAs) overlap directly with CGG's Operational Area and sound propagation footprint. According to the Southern Right Whale Recovery Plan, these whales use the affected region for reproduction between May and September and for migration between April and October. The Recovery Plan also notes that Southern Right Whales do not feed in coastal waters but are expected to feed, and possibly conceive, within the Australian Whale Sanctuary—an area entirely overlapped by the proposed Regia MSS activity. As a result, the seismic survey could occur within, or affect, conceiving, calving, and feeding grounds for this critically endangered sub-population. The species is particularly vulnerable to human impacts due to its low reproductive rate, long lifespan, and strong site fidelity to key habitats. The submission therefore emphasises the relevance of underwater noise, habitat degradation, and vessel-strike risks in the context of the proposed seismic activities.	The Recovery Plan explains that BIAs can be designated for key behaviours such as reproduction, foraging, migration, and resting. While Southern Right Whale BIAs in the Plan cover reproduction and migration, the Plan notes that foraging occurs across a much broader offshore latitudinal range (30°S–65°S) and is not linked to these BIAs. Because the Regia MSS is not located in Antarctic waters, it will not affect cetaceans that forage there. CGG states the survey will avoid peak SRW abundance in the mapped BIA and apply mitigation measures to ensure no SRWs are harmed, injured, or interfered with.	EVT352
4496	GMTOAC objects to CGG removing a previous control measure limiting seismic discharge in the Pygmy Blue Whale foraging BIA during periods of low whale presence, replacing it with a vague condition requiring CGG to determine whether whale presence is "compatible" with proceeding. GMTOAC argues this new measure lacks detail on how whale presence or "unacceptable disturbance" will be assessed, and that it fails to reference Recovery Plans which define unacceptable impacts. GMTOAC warns that the proposed survey timing (April–June 2026) coincides with peak Pygmy Blue Whale foraging season and Southern Right Whale migration and calving periods, meaning the seismic survey is likely to occur when both species are using their BIAs. Preventing whales from accessing these areas, or exposing	CGG has further reduced the likelihood of interactions with marine mammals by excluding the April–June period and commencing the survey only after 15 September. Because blue whales typically do not arrive from Western Australia until November, CGG argues that most of the survey will occur when blue whales are absent from the area. It adds that sighting data show very few blue whales in November and December, with peak abundance occurring later, from January to March during the Bonney Upwelling.	EVT352

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
	them to injury while they remain, would constitute unacceptable impacts inconsistent with Recovery Plan objectives.		
4508	GMTOAC claims inadequate assessment of noise on culturally important Kooyang. GMTOAC notes that CGG's EP groups Kooyang with other fish possessing swim bladders, and acknowledges that fish with swim bladders may be more susceptible to physiological trauma from seismic noise. However, while the EP claims no studies have demonstrated direct mortality of adult fish from seismic emissions, GMTOAC highlights that it has repeatedly requested an independent study on Kooyang specifically, a request CGG has refused. Across multiple appendices, CGG's assessment appears inconsistent. Some sections state that eels fall within the category of fish whose hearing directly involves a swim bladder, while other parts of the EP fail to mention this heightened sensitivity or cross-reference relevant acoustic impact studies. GMTOAC argues these inconsistencies obscure the true risk profile and hinder meaningful evaluation of proposed controls. Finally, GMTOAC challenges CGG's conclusion that risks to adult Kooyang will be "extremely low" and indistinguishable from natural population variation. GMTOAC notes that this claim lacks scientific justification and appears to rely on the eel's behavioural avoidance or instinctual drive to migrate rather than on concrete control measures to prevent harm.	CGG recognises kooyang as a profoundly important Gunditjmara cultural value and not just an ecological species. The Environment Plan explicitly protects kooyang by applying culturally defined acceptability criteria, including ensuring no material reduction in kooyang abundance, recruitment, or sustainable harvesting that could impact Budj Bim practices or World Heritage values. This cultural framing underpins the entire assessment. CGG rejects claims that its underwater-noise assessment is inadequate, noting that it is detailed, conservative, peer-reviewed, and fully compliant with best-practice standards. Kooyang are assessed using the highest-sensitivity category under EPBC Policy 2.1, and predicted noise-effect zones are extremely small. The survey timing has been shifted to September–December, avoiding: peak adult silver-eel migration (Feb–May), most glass-eel recruitment (Oct–Feb), and juveniles that would already be inside river/estuary systems. This means minimal temporal or spatial overlap with key life stages. There is no credible pathway for population-level or culturally significant effects, and global evidence shows no seismic survey has ever been linked to effects on anguillid eel recruitment. Overall, the assessment is precautionary, culturally informed, and reduces risks to ALARP. CGG remains open to incorporating additional Gunditjmara knowledge or scientific evidence, but based on current information, no material impact on kooyang is credible.	EVT352
4509	GMTOAC claims that CGG's approach to assessing impacts on Kooyang is inconsistent with the precautionary principle under the EPBC Act, especially given Kooyang's cultural significance and its central role in the World Heritage–listed Budj Bim Cultural Landscape. GMTOAC states that CGG has repeatedly	CGG affirms the deep cultural importance of kooyang to the Gunditjmara People and agrees that any activity causing a population-level decline in kooyang that recruit into the Budj Bim wetland systems would be unacceptable. However, the claims in paragraphs 118–132 are	EVT352

Feedback ID	Objection or Claim Summary	Titleholder Response	Event ID
	asserted, without scientific evidence, that juvenile eels will not be near the seismic activity, despite the absence of data tracking their migration from the Coral Sea to Gunditjmara Sea Country. They outline the well-established seasonal migration patterns of adult and juvenile Kooyang and state that these movements directly link the open ocean to the Budj Bim aquaculture systems. UNESCO inscribed Budj Bim as a World Heritage property because of Gunditjmara's long-standing eel aquaculture, which relies on the uninterrupted migration of Kooyang. GMTOAC highlights that published research, co-authored by Gunditjmara Elders and scientists, shows adult eels travel through areas that overlap with CGG's Operational Area and EMBA, meaning migrating Kooyang are likely to encounter the seismic survey if undertaken in April 2026. GMTOAC also raises concerns regarding CGG's framework for assessing impacts on World Heritage values. They argue that CGG wrongly limits its definition of "direct effects" to the physical boundaries of the property, failing to recognize that Kooyang moving through the marine environment outside the site are essential to the World Heritage values themselves. GMTOAC rejects CGG's categorisation of impacts to Kooyang and Gunditjmara cultural practices as merely "indirect," and notes the EP provides no explanation for its claim that such impacts are "immeasurable." Further, GMTOAC states that CGG has only referenced one of the required Budj Bim management plans and has not demonstrated engagement with the others. They contend that CGG has not shown how the proposed activities align with or avoid contravening the management goals, especially those aimed at restoring healthy Kooyang populations. GMTOAC concludes that CGG's failure to properly account for the cultural, ecological, and World Heritage significance of Kooyang is unacceptable to Gunditjmara, whose stewardship of Budj Bim spans millennia and underpinned the site's World Heritage listing.	based on legal and factual misunderstandings. The World Heritage property is strictly limited to the freshwater Budj Bim wetlands on the lava flow and does not include estuarine, coastal, or oceanic waters. Under UNESCO rules, World Heritage protection applies only within the fixed site boundaries and cannot extend to migratory species outside them. No World Heritage site has ever been interpreted the way GMTOAC suggests. CGG clarifies that the OUV attribute "ecology and life-cycle of kooyang" refers specifically to the parts of the life cycle occurring within the engineered aquaculture systems inside the property, not the entire oceanic migration. International precedents—such as the Monarch Butterfly Reserve, the Yellow Sea Migratory Bird Sanctuaries, and the Wadden Sea, show that impacts outside property boundaries are not considered direct impacts on World Heritage values. Scientifically, the EP uses best-practice criteria, with predicted noise effects on kooyang limited to very small distances (<300 m), and the survey timing (Sept–Dec) avoids overlap with major migration and recruitment periods. No tracking data show a kooyang migration corridor through the survey area, and the contribution of one 60-day survey to cumulative pressures is negligible. Appendix F3 confirms alignment with relevant management plans, which only consider impacts inside the property's boundaries. CGG states it remains open to further Gunditjmara knowledge and evidence, and has updated the EP to consider the provided management plans, but concludes that no credible pathway exists for material impact on kooyang abundance within the Budj Bim wetlands or on the property's Outstanding Universal Value. The EP is therefore lawful, scientifically robust, and compliant with Australia's World Heritage and EPBC Act obligations.	

Annex 3

Underwater Acoustic Sensitive Species

Common Name	Presence	Threatened Category	Migratory Status	Migratory Category	Marine Status	Biologically Important Area	Management Plan Conservation Advice Listing Advice
Fish							
Australian Grayling	Species or species habitat likely to occur within area	Vulnerable				None identified	Conservation Advice *Prototroctes maraena* Australian Grayling (TSSC 2021)
Blue Warehou	Species or species habitat known to occur within area	Conservation Dependent				None identified	Commonwealth Listing Advice *Seriolella brama* Blue Warehou (TSSC 2015)
Orange Roughy, Deep-sea Perch, Red Roughy	Species or species habitat likely to occur within area	Conservation Dependent				None identified	None identified
Sygnathids							
Australian Smooth Pipefish, Smooth Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand	Species or species habitat may occur within area				Listed	None identified	None identified

Common Name	Presence	Threatened Category	Migratory Status	Migratory Category	Marine Status	Biologically Important Area	Management Plan Conservation Advice Listing Advice
Potbelly Seahorse							
Brushtail Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Common Seadragon, Weedy Seadragon	Species or species habitat may occur within area				Listed	None identified	None identified
Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Deepbody Pipefish, Deep-bodied Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Hairy Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Halfbanded Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Javelin Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified

Common Name	Presence	Threatened Category	Migratory Status	Migratory Category	Marine Status	Biologically Important Area	Management Plan Conservation Advice Listing Advice
Knifesnout Pipefish, Knife-snouted Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Leafy Seadragon	Species or species habitat may occur within area				Listed	None identified	None identified
Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Mother-of-pearl Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Port Phillip Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Pugnose Pipefish, Pug-nosed Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Red Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Rhino Pipefish, Macleay's Crested	Species or species habitat may occur within area				Listed	None identified	None identified

Common Name	Presence	Threatened Category	Migratory Status	Migratory Category	Marine Status	Biologically Important Area	Management Plan Conservation Advice Listing Advice
Pipefish, Ring-back Pipefish							
Ringback Pipefish, Ring-backed Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Robust Pipehorse, Robust Spiny Pipehorse	Species or species habitat may occur within area				Listed	None identified	None identified
Sawtooth Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Short-head Seahorse, Short-snouted Seahorse	Species or species habitat may occur within area				Listed	None identified	None identified
Spiny Pipehorse, Australian Spiny Pipehorse	Species or species habitat may occur within area				Listed	None identified	None identified
Spotted Pipefish, Gulf Pipefish, Peacock Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified

Common Name	Presence	Threatened Category	Migratory Status	Migratory Category	Marine Status	Biologically Important Area	Management Plan Conservation Advice Listing Advice
Tucker's Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish	Species or species habitat may occur within area				Listed	None identified	None identified
Sharks							
Grey Nurse Shark	Species or species may occur within area	Critically Endangered	Migratory			None identified	Commonwealth Listing Advice on Carcharias taurus, Grey Nurse Shark (East Coast population) (TSSC 2001). Recovery Plan for the Grey Nurse Shark (Carcharias taurus) (DoE 2014).

Common Name	Presence	Threatened Category	Migratory Status	Migratory Category	Marine Status	Biologically Important Area	Management Plan Conservation Advice Listing Advice
Little Gulper Shark	Species or species habitat likely to occur within area	Conservation Dependent				None identified	Commonwealth Listing Advice on *Centrophorus zeeha* (southern dogfish) (TSSC 2013)
Porbeagle, Mackerel Shark	Species or species habitat likely to occur within area		Migratory			None identified	None identified
School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark	Species or species habitat may occur within area	Conservation Dependent				None identified	Commonwealth Listing Advice on *Galeorhinus galeus* (TSSC 2009a)
Shortfin Mako, Mako Shark	Species or species habitat likely to occur within area		Migratory			None identified	Listing Advice *Isurus oxyrinchus* shortfin mako shark (TSSC 2014).
White Shark, Great White Shark	Foraging, feeding, or related behaviour known to occur within area	Vulnerable	Migratory	Migratory Marine Species		Foraging	Recovery Plan for the White Shark (*Carcharodon carcharias*). (DSEWPaC 2013b)