



Geraldton, Dongara, Jurien Bay & Cervantes

Community Information Sessions

Introductions



- We would like to respectfully acknowledge the Southern Yamatji Peoples who are the Traditional Owners and First People of the land on which we stand.
- Safety and Emergency Protocols.
- The Eureka Team.

Purpose of the information session:

To provide initial information to interested persons so that they can determine if they are a 'relevant person' and entitled to consultation under the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations

Agenda



Mike Lonergan

- Intro to Pilot Energy
- Intro to seismic

Matt Smith

- The Regulations
- Consultation requirements

Mike Giles

- The Eureka seismic survey

Jeremy Colman

- Preliminary impacts and risks of this activity

All

- Q&A



Mike Lonergan

Introduction to Pilot Energy

Introduction to Pilot Energy

About Us

- Publicly listed, junior oil & gas exploration & production company
- Exploring for oil & gas to supply domestic market
- Diversifying / transitioning to development of clean energy projects in Western Australia utilizing existing oil and gas tenements & infrastructure (e.g. Cliff Head wells and platform)

Asset Areas

- WA-481-P (conventional oil and gas exploration permit, located in Federal waters, offshore WA) (Pilot 100% interest and operator)
- Cliff Head Oil Field (conventional oil production, located in Federal waters, offshore WA) (Pilot 21.25% interest)

Other

Website

<http://www.pilotenergy.com.au/>

Company size

11-50 employees

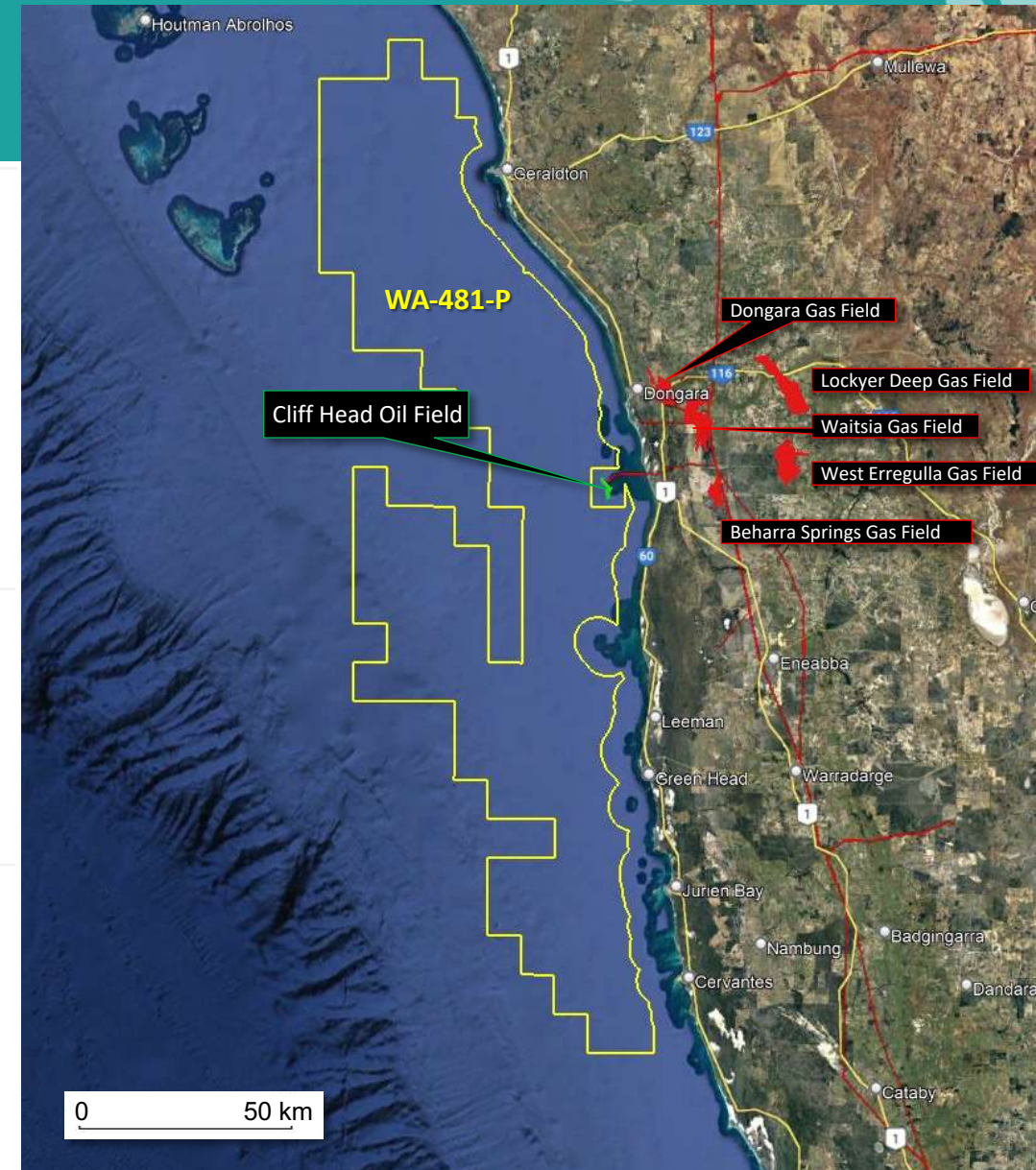
Headquarters

Sydney, New South Wales

Specialties

Energy, Renewables, and hydrogen

ASX : PGY



What is 3D Seismic ?



Oil / gas targets @ 3 km

Sound waves (air) sent into earth by towed source, reflect off rock layers and reflections measured back at surface by “hydrophones” towed at shallow depths of < 10 metres by boat

3D Seismic Data Gathering

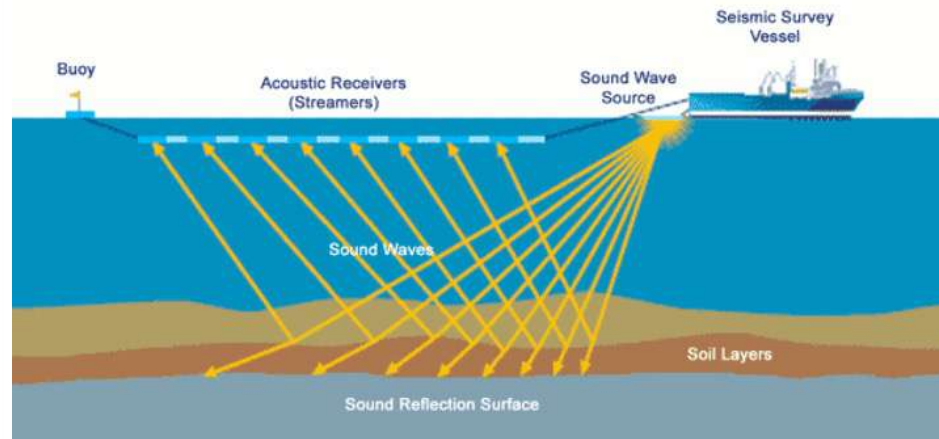
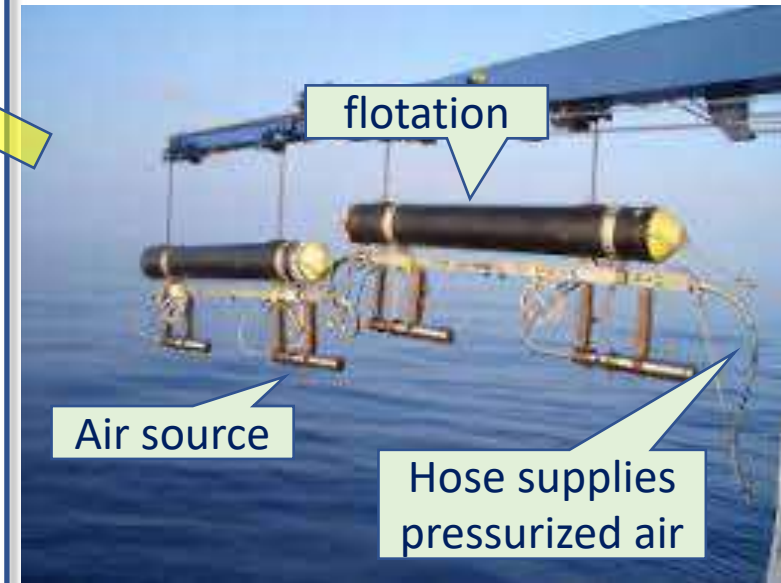
= “Ultrasound of the Earth”

3D Seismic Surveying - Equipment

**Sound Wave Receivers
("hydrophone streamers")**

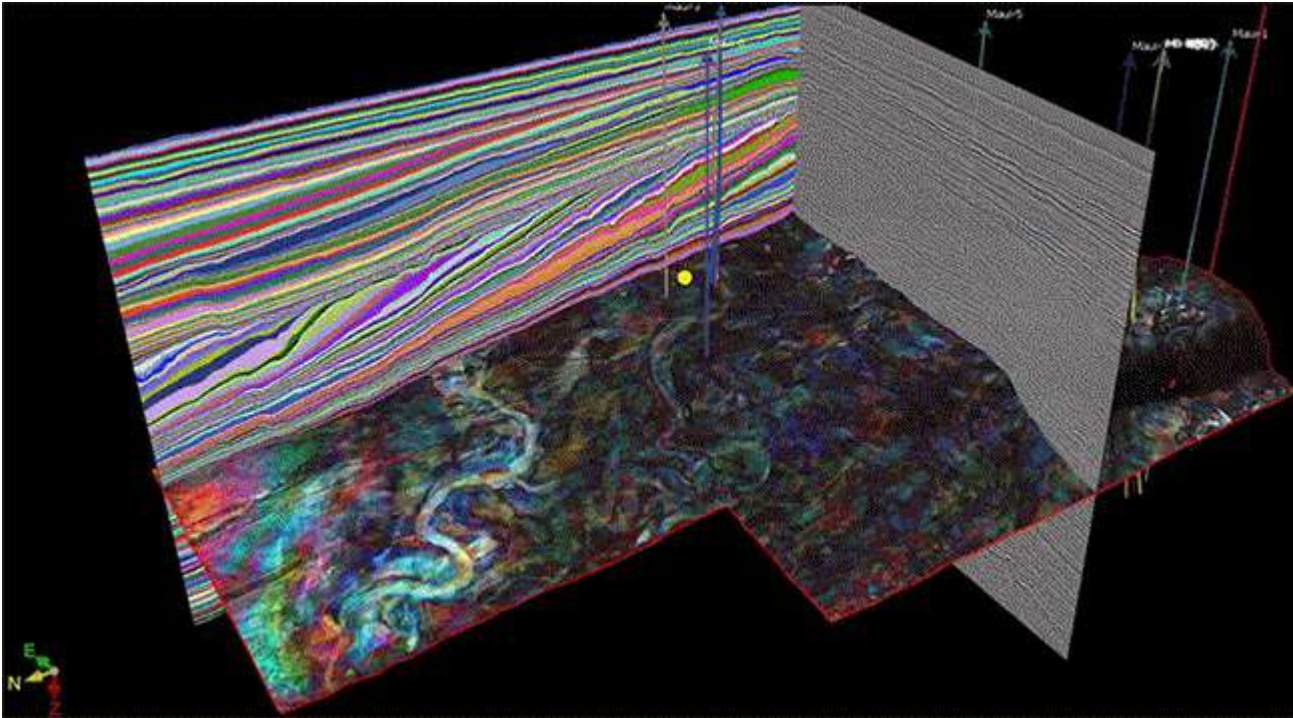


**Sound Wave Source
("airguns")**



Eureka 3D Seismic Survey - Purpose

3D Seismic data is gathered to image the rock layers in the earth to determine optimal locations for deep, oil and gas drilling (at ~ 3000 metres)



3D image of earth after processing of acquired data



Typical 3D acquisition boat configuration

Eureka 3D Seismic Survey - Location





Matt Smith

The Regulations

The Regulations



The Regulations place the burden of proof on Pilot Energy:

Recognises environments are all different

Pilot Energy must do the work to justify it environmental standards

Our propositions are independently scrutinized by Government



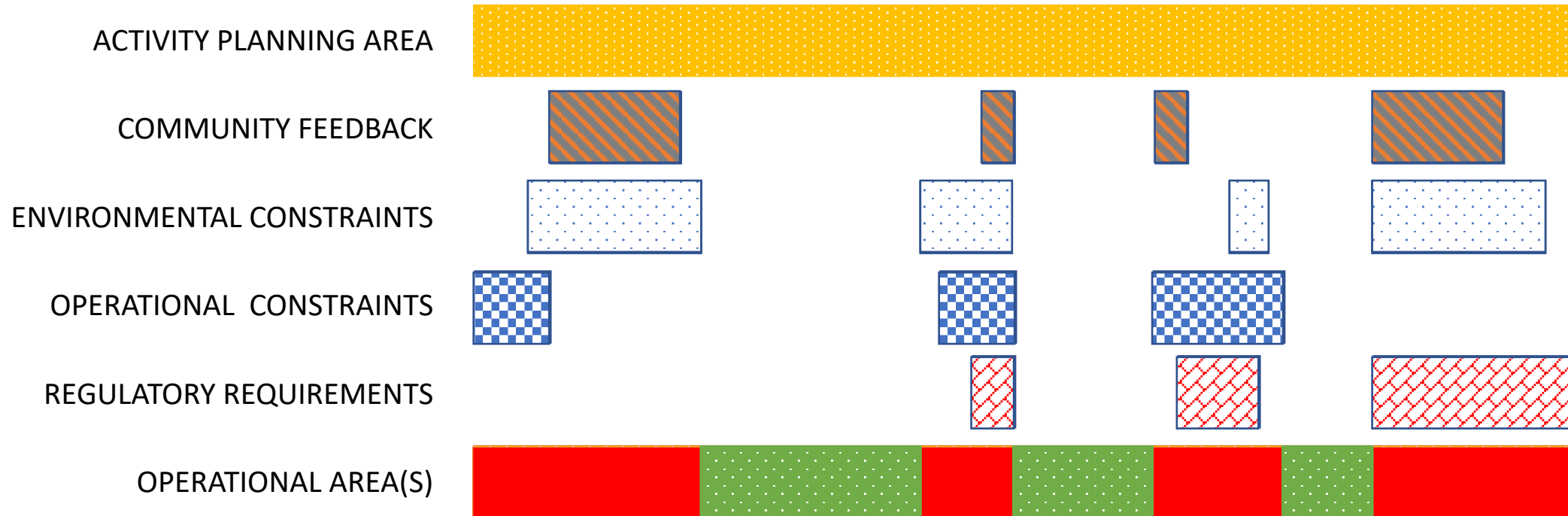
The Regulations have three foundational concepts:

Principles of ecologically sustainable development.

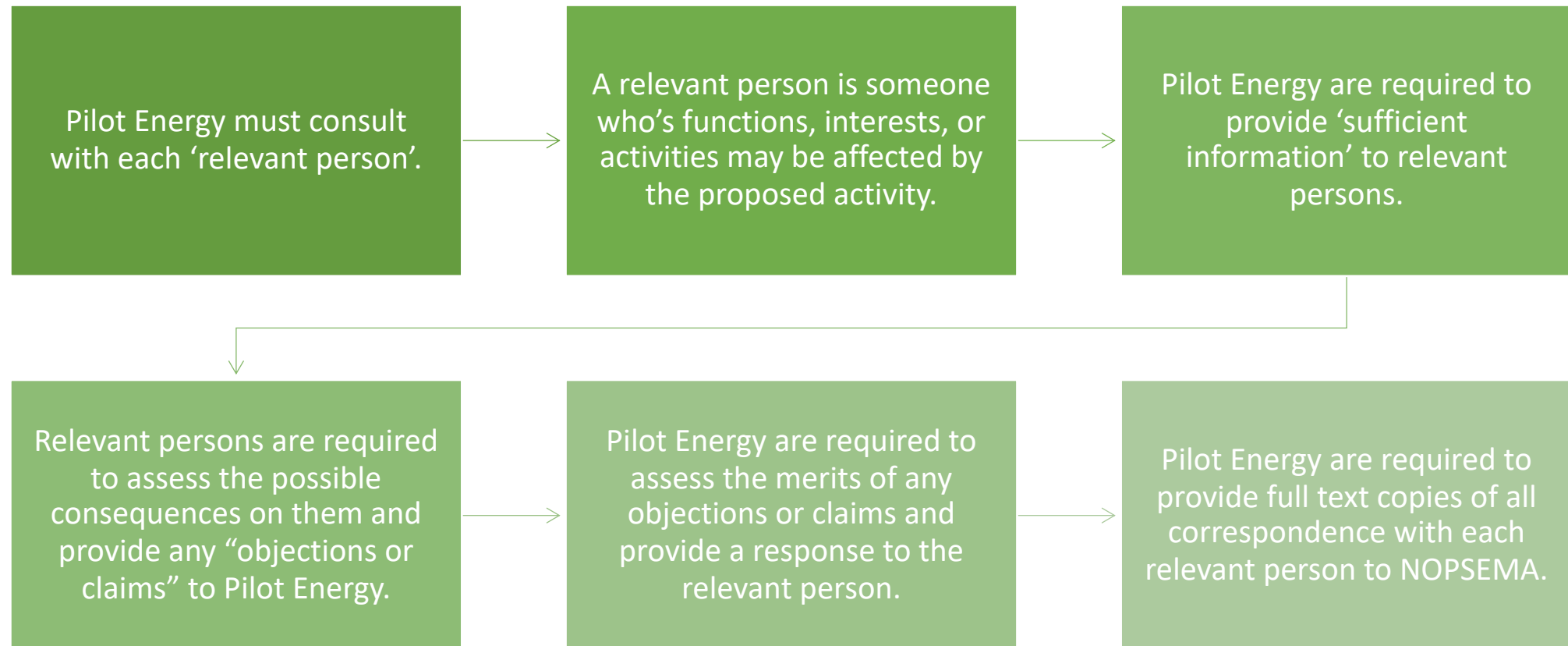
Environmental impacts and risks must be of an acceptable level.

Environmental impacts and risks must be managed to as low as reasonably practicable.

Activity Planning Process



The Consultation Process



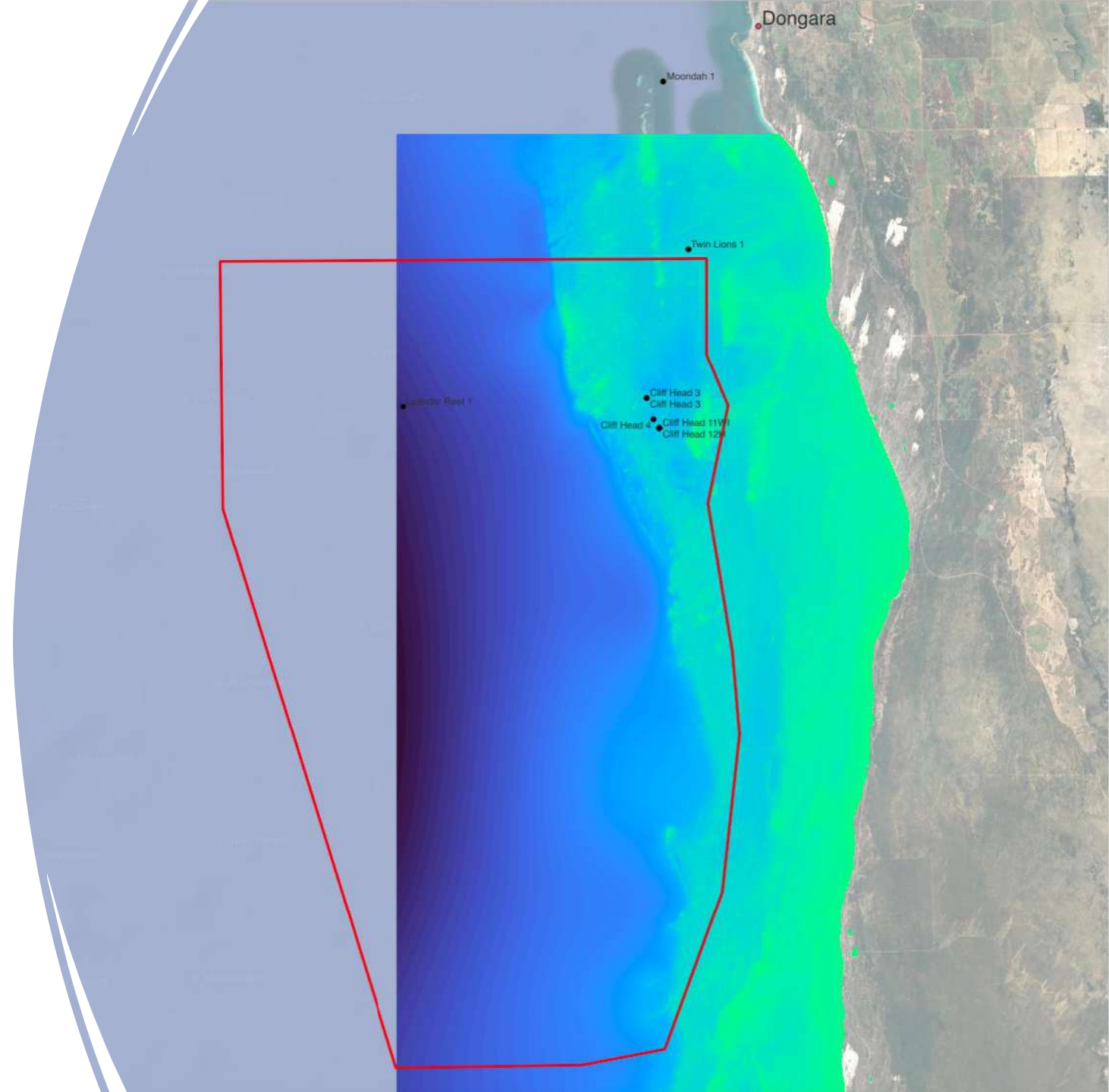


Mike Giles

The Eureka Activity

Eureka Proposed Operations

- The proposed survey area is indicated on the map to the right.
- Current planning basis is for 14-21 days of acquisition in a 20-30 day period.
- Water depths of the survey area are between 10 and 50m.
- Operations may differ in deeper and shallower waters.

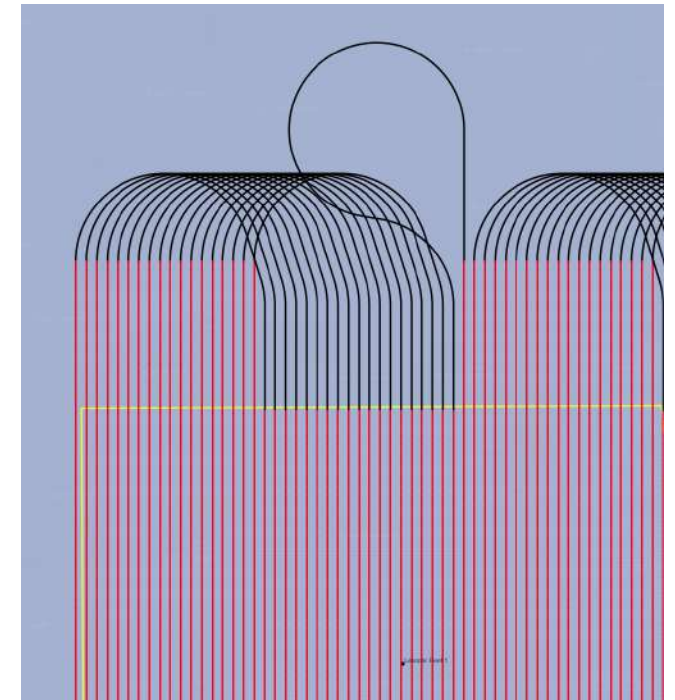
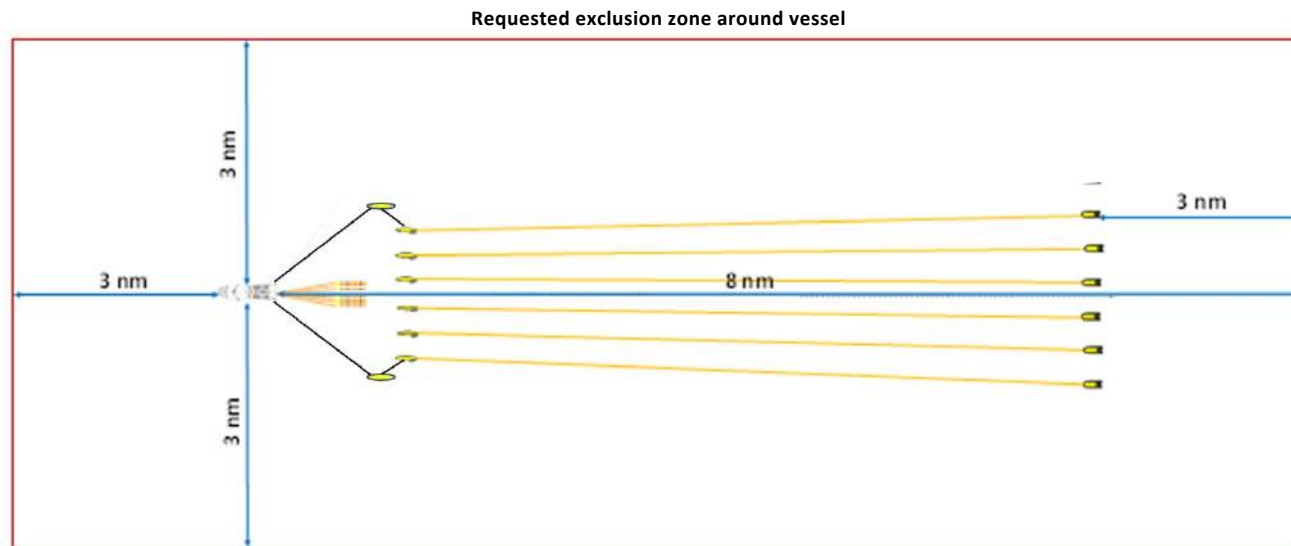


Deeper Water Operations

The survey would be acquired using a towed streamer vessel

Seismic vessel would be towing 6 streamers, each streamer being 6km in length, with a separation of 100m between each streamer (total width 500m)

Vessel traverses the area on a race-track design at a speed of approx. 4knots



Racetrack example

Shallow Water Operations

The survey would be acquired using a nodal technique.

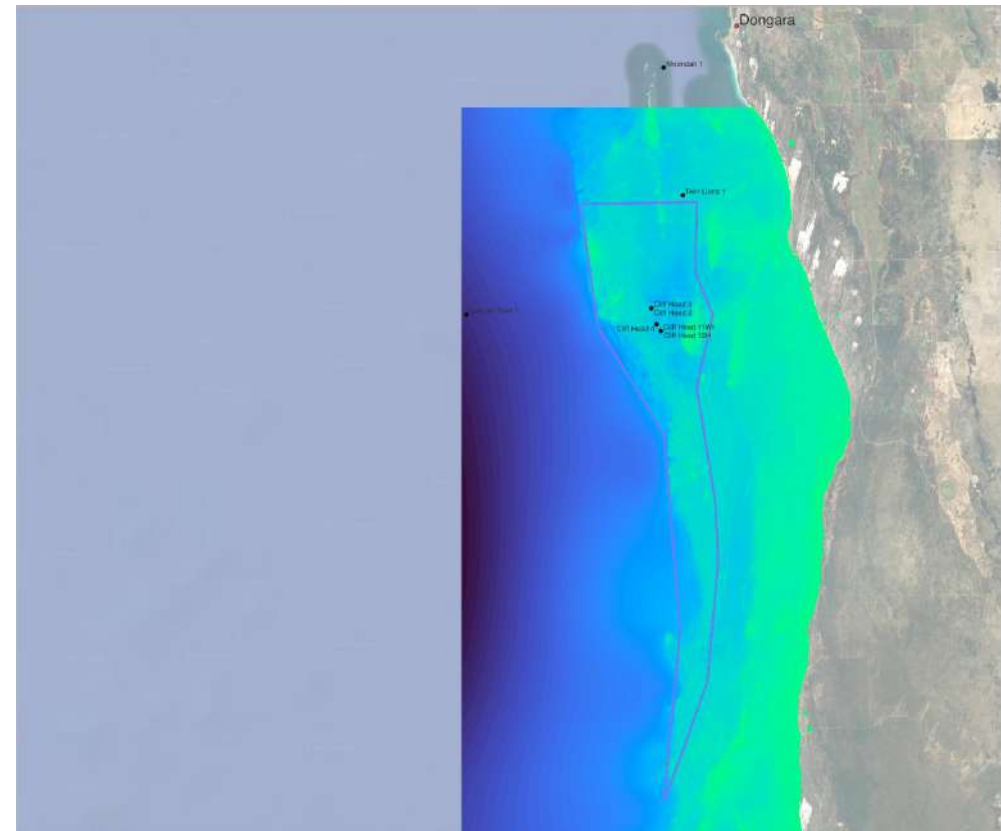
Small nodes would be lowered to the sea floor (“node of a rope”) on a pre-defined grid for the duration of the survey, and then recovered upon completion.

A separate source vessel is used to generate the signal to be recorded by the nodes.

Example Node

Size – 200x200x80mm

Deployment - “Node on a Rope”





Jeremy Colman

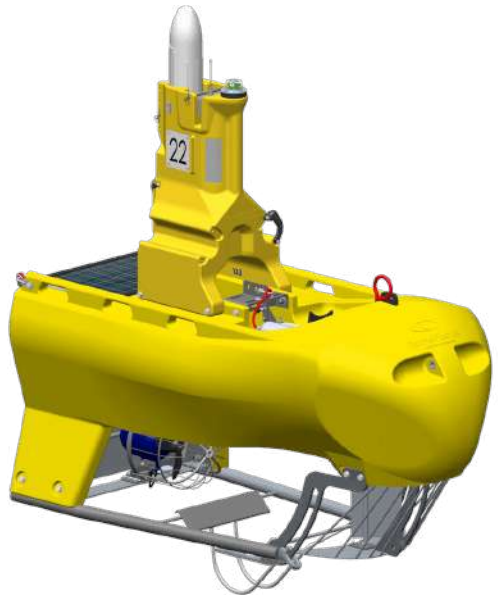
Preliminary Impacts & Risks

Assessment of Planned Impacts

- Interactions with other marine users from presence of vessels and towed seismic array
- Disturbance to benthic habitats from placement and retrieval of nodes
- Acoustic emissions:
 - seismic source
 - vessel noise
- Routine emissions & discharges:
 - waste water
 - sewage, foodscraps
 - lighting



Assessment of Unplanned Risks



- Hydrocarbon spills
- Deck spills
- Loss of waste overboard
- Interactions with marine fauna
- Loss or grounding of equipment
- Invasive marine species

Underwater Noise - Effects

- Elevated underwater noise can effect marine fauna:
 - By causing direct physical effects, including injury or hearing impairment:
 - temporary (temporary threshold shift – TTS), or
 - permanent (PTS)
 - Through disturbance leading to behavioural changes or displacement from important areas
 - By masking or interfering with other biologically important sounds:
 - vocal communication, echolocation
 - signals and sounds produced by predators or prey



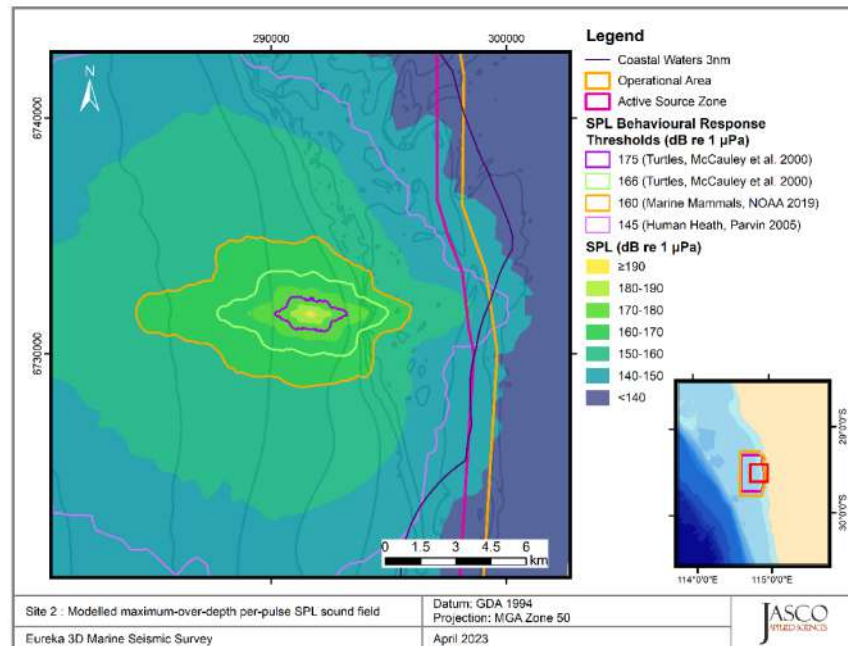
Receptors

- Noise emitted from the seismic source has the potential to impact a range of receptor groups:
 - Plankton (including fish eggs & larvae)
 - Benthic invertebrates (crustaceans, molluscs)
 - Fishes and elasmobranchs (sharks & rays)
 - Fish spawning
 - Marine mammals (whales, dolphins, sea lions)
 - Commercial & recreational fisheries
 - Tourism and recreation (diving, snorkelling, spearfishing)

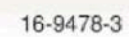


Noise Modelling Study

Relevant hearing group	Effect criteria	Metric associated with longest distance to criteria	$R_{\max}$ (km)
Fish: No swim bladder	Recoverable injury	PK	0.15
	TTS	SEL _{24h}	4.06
Fish: Swim bladder not involved in hearing and Swim bladder involved in hearing	Recoverable injury	PK	0.27
	TTS	SEL _{24h}	4.06
Fish eggs, and larvae (relevant to plankton)	Injury	PK	0.27



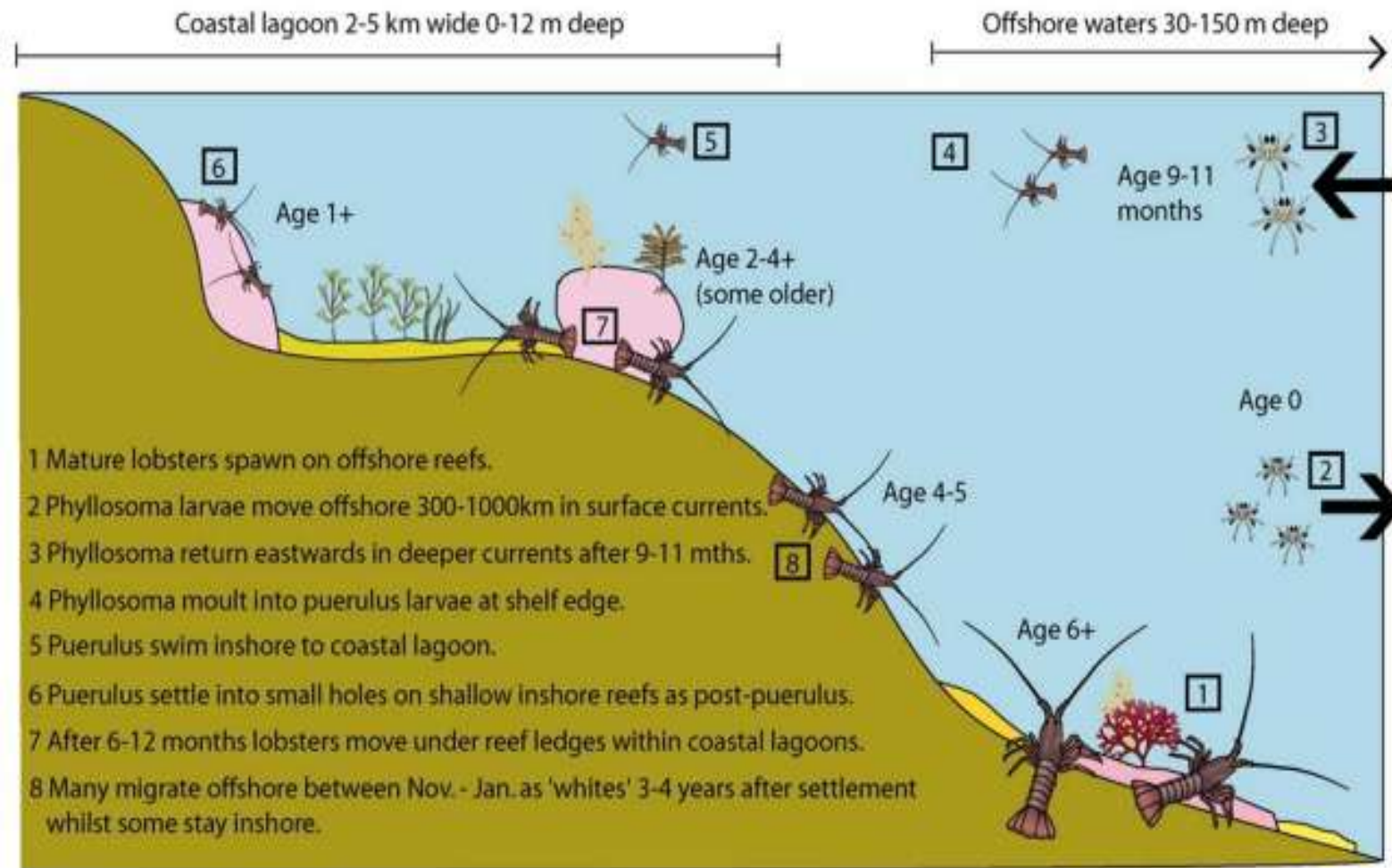
- Numerical modelling to derive underwater sound levels to predict potential impacts on key receptors, including marine mammals, fish, benthic invertebrates, sponges, coral, and plankton
- Received sound levels estimated at six sites, to account for variable coastal features and water depth
- Considered both sound pressure and particle motion metrics
- Outputs compared to internationally accepted sound exposure thresholds for different receptors



Sensitivity ^a	January ^a
	February ^a
	March ^a
	April ^a
	May ^a
	June ^a
	July ^a
	August ^a
	September ^a
	October ^a
	November ^a
	December ^a
^a	



WRL – Peak Periods



- Spawning – Oct to Jan
- Whites migration – Dec to Feb
- Puerelus settlement – Sept to Feb
- Peak fishing – Dec to May

Fish Spawning Assessment

- Spatial and temporal assessment of potential overlap between survey and spawning in eight key commercial indicator species

Species	Spawning period	Principal depth range (m)
WA dhufish	Oct-May (Dec-Mar peak)	3 - 200
Snapper (Mid-west/Kalbarri)	May-Nov (Jun-Aug peak)	1 - 200
Redthroat emperor	Oct-Feb (Dec-Feb peak)	5 - 50
Baldchin groper	Aug-Jan (Oct-Dec peak)	20 - 100
Hapuku	June-Sep (Jul-Aug peak)	115 - 500
Blue-eye trevalla	Nov-May	250 - 650
Eightbar grouper	Oct-Feb (Nov-Jan peak)	105 - 480
Bass groper	Mar-Jun	50 - 1000

Management Actions



- Include implementing internationally-recognised controls:
 - Designing survey to limit impacts in environmentally sensitive areas
 - Avoiding particularly important periods (e.g. migration, fishing season, breeding) for sound-sensitive marine species
 - Deploying marine fauna observers to ensure sound emissions are stopped if marine mammals are detected within a certain range
 - Implementing exclusion zones to protect environmental features
 - Reducing duration of survey or changing the way it's conducted to limit acoustic energy emitted into the marine environment
 - Effectively communicating with other marine users prior to, during, and after survey