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Guidance statement on undertaking seismic surveys in Western Australian waters



Government of **Western Australia**
Department of **Fisheries**

Department of Fisheries
3rd floor SGIO Atrium
168 - 170 St Georges Terrace
PERTH WA 6000
Telephone: (08) 9482 7333
Facsimile: (08) 9482 7389
Website: www.fish.wa.gov.au
ABN: 55 689 771

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Contents

1.0 Introduction	1
1.1 Purpose.....	1
2.0 Legislative Context.....	1
2.1 State	1
2.2 Commonwealth.....	2
3.0 Policy Context.....	3
4.0 Fisheries Management Measures.....	3
4.1 Ecosystem Based Fisheries Management (EBFM).....	3
5.0 Potential Impacts of Seismic Surveys on Fisheries.....	4
5.1 Potential ecological impacts	4
5.2 Potential economic impacts.....	4
5.3 Potential social impacts	5
5.4 Potential biosecurity impacts	5
5.5 Fish Habitat Protection Areas.....	6
6.0 Mitigation Strategies	6
7.0 Responsibilities	8
7.1 Proponent	8
7.2 Department.....	8
8.0 Key contacts.....	8
9.0 Bibliography.....	9
10.0 Appendices	10
Appendix 1a: Boundaries of the bioregions, three nautical mile State waters limit and the 200 nm limit	10
Appendix 1b: Map of Western Australia showing the boundaries of the bioregions and provinces	11
Appendix 2: Spawning period (indicated in red) for some key fisheries species and their bioregional distribution	12
Appendix 3: Range of detection frequencies modified from Clay and Medwin (1977)..	14
Appendix 4: Checklists for seismic survey proposals	15

1.0 Introduction

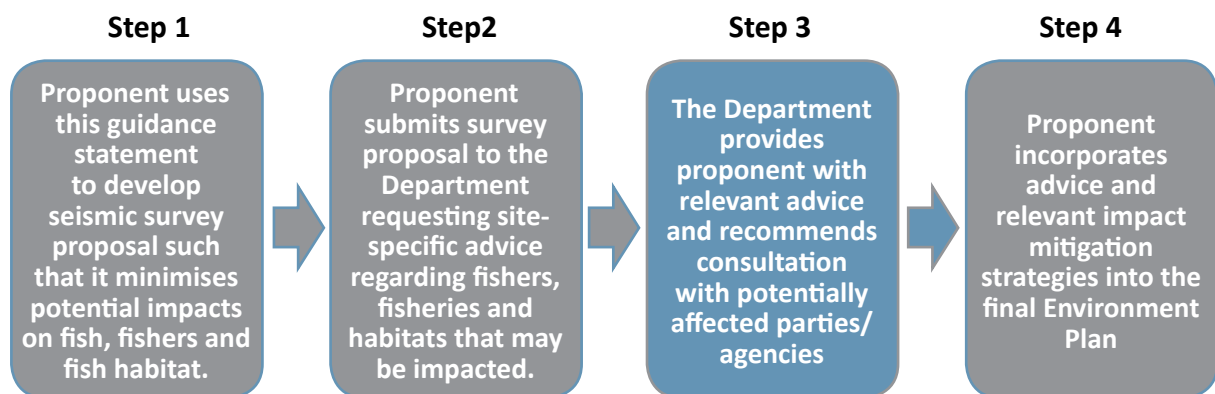
In recent years, there has been an increase in oil and gas development in Western Australia. Seismic surveys are often fundamental to this development in the marine environment, and are used to define and analyse subsurface geological structures.

However, seismic surveys have the potential to affect commercially and recreationally important fish species, their prey and habitats, and the business activities of the fishers who harvest these resources. In line with our legislated responsibilities, the Department of Fisheries WA is committed to ensuring that where possible, seismic surveys cause minimal disturbance to fish and fish habitat.

1.1 Purpose

This guidance statement identifies potential issues of concern associated with seismic surveys on fish and fish habitats, as defined under the *Fish Resources Management Act 1994* (FRMA). It is aimed at giving proponents direction on general standards and protocols designed to avoid or mitigate the potential impacts of seismic surveys on fish. It is expected that proponents will incorporate these standards and protocols when planning and implementing seismic surveys.

This guidance statement also provides proponents with an outline of the information required by the Department to properly assess and provide advice on planned seismic survey activities, in accordance with the process outlined below.



2.0 Legislative Context

2.1 State

The Department manages fish and fish habitat in State waters under the provisions of the FRMA and the *Pearling Act 1990*. Under the FRMA, the definition of ‘fish’ includes all aquatic organisms, excluding marine mammals, birds, amphibians and reptiles, and pearl oysters (which are covered under the *Pearling Act*).

A number of fish species are protected under the *Fish Resources Management Regulations 1995*, Schedule 2. Marine organisms not covered under the FRMA or Pearling Act are protected in State waters under the *Wildlife Conservation Act 1950* by the Department of Environment and Conservation. For the list of protected species visit <http://www.dec.wa.gov.au/management-and-protection/threatened-species/listing-of-species-and-ecological-communities.html>.

The Department manages all fishing within the limits of State waters. However, under the 1995 Offshore Constitutional Settlement (OCS) Agreement between the Department and the Commonwealth Government, the Department is also responsible for managing fisheries in Australian waters out to 200 nautical miles from the Western Australian coast with the exception of:

1. the northern prawn fishery, tuna and tuna-like fish, and deepwater trawling in waters more than 200 metres deep (outside the 200-metre isobath), which is exclusively controlled by the Commonwealth; and
2. shark fishing east of Koolan Island, and demersal longline and demersal gill-netting south of 35 degrees south, which is jointly controlled by the State and the Commonwealth under State law.

The Department of Mines and Petroleum (DMP) is the State's lead agency for resource exploration and developing extractive industries. It has prime responsibility for regulating these industries and ensuring that environmental, safety and health standards are consistent with relevant State legislation, regulations and policies.

DMP's Petroleum and Environment divisions are responsible for assessing petroleum and geothermal proposals. The Petroleum Division is the first point of contact for proponents of petroleum and geothermal activities in State waters.

All proposals with the potential to have a significant environmental impact in State waters also require approval under the *Environmental Protection Act 1986*, administered by the Office of the Environmental Protection Authority.

2.2 Commonwealth

Development proposals with the potential to affect matters of national environmental significance in Commonwealth waters (beyond three nautical miles) must comply with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) administered by the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC). Some fish species are also protected under the EPBC Act.

The National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) was established on 1 January 2012. Its role is to regulate the health and safety, well integrity, and environmental management of offshore petroleum operations in Commonwealth waters, and in coastal waters where functions have been conferred by the States and the Northern Territory. For further information on NOPSEMA, visit <http://www.nopsema.gov.au/>

Operators must submit an Environment Plan to NOPSEMA for assessment and acceptance before beginning any petroleum-related activities in Commonwealth waters; this includes seismic activities.

As part of their Environment Plan submission, operators must demonstrate that they have consulted with 'relevant persons' or organisations whose functions, interests or activities may be affected by the petroleum activity. Operators are also required to address the merits of any objection or claim about the activities made by relevant persons and include copies of full text responses.

The Department considers that it is a 'relevant person' in this context and should be consulted by operators during the consultation and planning phases of their Environment Plan preparation.

3.0 Policy Context

This guidance statement sits within the Department's Aquatic Biodiversity Policy framework. Broadly, the biodiversity policy aims to maintain and/or enhance the resilience of aquatic ecosystems within the context of fisheries management by:

- Minimising habitat loss and degradation as a result of fishing and other activities.
- Preventing the incursion of aquatic pests.
- Ensuring the sustainable use of aquatic resources.
- Considering external factors including social, economic and governance arrangements.
- Promoting a 'whole of government' approach to the management of aquatic resources.
- Encouraging community stewardship and appreciation of fish and their habitats.

4.0 Fisheries Management Measures

4.1 Ecosystem Based Fisheries Management (EBFM)

To facilitate the management of fish in Western Australia's marine and freshwater ecosystems, the Department has adopted an Ecosystem Based Fisheries Management (EBFM) approach (Fletcher *et al.* 2010).

EBFM is an extension of Ecological Sustainable Development (ESD) principles (CoA, 1992), which have been used as the basis of fisheries management for a number of years.

EBFM is defined as 'the assessment and management of all impacts and outcomes related to any commercial, recreational, charter, customary, or "no-take" sector operating within an ecosystem or bioregion' (Fletcher *et al.* 2010).

EBFM assessments can address direct and cumulative impacts on the environment that may occur because of fisheries-related and non-fishing related activities on fish and fish habitat. Seismic activities have the potential to affect the environment, so may need to be considered both separately and in conjunction with other impacts.

The Department has adopted a risk-based framework for EBFM (Fletcher 2005, 2010) which assesses the risk of change (over five years) in all ecosystem assets (i.e. species, habitats, protected species and issues) against social and economic impacts, and governance arrangements. Risks are assessed on a bioregional basis, as identified in the Department's annual *State of the Fisheries and Aquatic Resources* Report.

5.0 Potential Impacts of Seismic Surveys on Fisheries

Seismic surveys have the potential to negatively impact on commercially and recreationally important fish species, their prey and habitats, and the business activities of the fishers who harvest them. These impacts can be both direct and indirect, and are considered when assessing stock and ecosystem status under EBFM arrangements.

5.1 Potential ecological impacts

Some fish species are likely to be more susceptible than others due to their physical characteristics (e.g. size, ability to move quickly) and behaviours (e.g. schooling, spawning aggregations). The life-stage (i.e. egg, larvae, juvenile, adult) of a fish is also likely to influence its susceptibility to seismic survey impacts.

Further, the likelihood and severity of these impacts will vary both spatially (e.g. due to fish distribution) and temporally (e.g. due to timing of breeding cycle), and is also dependent on the intensity of the seismic survey (see Appendix 3).

To date, there is limited knowledge about the nature and extent of seismic impacts on various fish species. For this reason, in applying the precautionary principle (Section 4A of the FRMA), the following ecological impacts must be considered when planning seismic surveys:

- Death of all life-stages (eggs, larvae, juveniles and adults) of key fish species, particularly during spawning periods.
- Reduction in egg viability.
- Decrease in growth rate of larvae.
- Short-term changes in fish behaviour through fright response and altered swim direction (e.g. movement deeper) beyond the 'normal' habitats.
- Long-term changes in fish distribution resulting from fish moving out of an area, to areas not experiencing seismic activity.
- Damage to the otolith-macula system of fish, with implications on balance, hearing and depth perception.
- Disruption to communication between fish.
- Disruption of acoustic cues used to locate prey, shelter and habitat.

5.2 Potential economic impacts

Seismic surveys can affect the economic viability of a fishery in the following ways:

1. Reduced catches because of changes in fish behaviour

Fish may avoid areas of seismic activity, and fish schools may disperse or change feeding behaviour patterns, resulting in fewer fish being attracted to baited traps or hooks. This can potentially reduce the availability of commercially valuable species or iconic recreationally targeted species.

2. Disruption of fishing operations

Seismic surveys have the potential to disrupt fishing activities at different levels depending on the dimension of the sound waves. For example, 3-dimensional surveys towing more streamers

are likely to have a greater impact on fishers than 2-dimensional surveys, as fishers may be required to move further away to avoid interaction or remove fishing gear.

Management arrangements for some fisheries allow a fisher to operate in specific locations within the boundary of the fishing grounds for a set amount of time. If forced to move away from fishing grounds to avoid a seismic vessel, they might not be able to return to the fishing grounds for the rest of the season.

3. Long-term impacts

Any reduction in spawning or recruitment success may reduce the yield of a species in subsequent years. This can, in turn, contribute to longer-term impacts due to a reduction in spawning stock for the following year.

4. Cumulative impacts

Consistent with EBFM arrangements, the Department considers the cumulative impacts of proposed developments as part of ongoing fisheries management arrangements. The cumulative effect on a fishery can be both spatial and temporal, and the sum of many small impacts can result in a decline in species abundance.

This means that while the impact of a single seismic survey may be inconsequential, in combination with other factors it could become significant to the sustainability of a fish species, and have potential flow-on effects to other fisheries.

Cumulative impacts can also be considered in an economic context, for example, the impact of reduced catch on fishing-related industries such as processing, transport companies, restaurants and consumers.

5.3 Potential social impacts

Potential social impacts of seismic surveys can include dissatisfaction and/or frustration by affected commercial and recreational fishers who may consider they have sustained unacceptable economic or social loss. Short-term operations are less likely to cause negative social impacts, but perceived impacts as a result of poor communication are likely to create dissatisfaction with resource exploration activity.

5.4 Potential biosecurity impacts

All vessels transiting to State waters, including seismic survey and support vessels, represent a potential vector for invasive marine species and pests via ballast water and biofouling. Marine pests have the potential to negatively affect the marine environment, fishery economics, social and cultural values, human health, and cause unwanted and expensive delays to projects.

Consulting the Department on biosecurity issues should be a priority. Managers should refer to the Department's guidelines on managing marine pests at www.fish.wa.gov.au/biosecurity and pay particular attention to the recommendations in the ballast water and biofouling management sections.

For more information, visit the Commonwealth Marine Pests website www.marinepests.gov.au. The National Biofouling Management Guidance for the Petroleum Production and Exploration Industry document is available on this site, and should be used in developing management actions to prevent marine pest incursions.

5.5 Fish Habitat Protection Areas

Fish and their habitats within a particular area can be covered by special protection and management in Western Australian waters by including them within a Fish Habitat Protection Area (FHPA).

These areas are set aside under section 115 of the FRMA for:

- the conservation and protection of fish, fish breeding areas, fish fossils or the aquatic ecosystem;
- the culture and propagation of fish and experimental purposes related to that culture and propagation; or
- the management of fish and activities relating to the appreciation or observation of fish.

In accordance with SEWPaC seismic survey policy in sanctuary zones (IUCN Ia), Benthic Sanctuary Zones (IUCN 1a) and Recreational Use Zones (IUCN II) in Commonwealth reserves, marine seismic surveys must not be conducted in FHPAs.

6.0 Mitigation Strategies

As described above, the potential impacts to fish from seismic surveys vary both spatially and temporally. For this reason, timely consultation with the Department is necessary during the preparation of Environment Plans to avoid or reduce potential impacts on marine ecosystems and fisheries.

After receiving a written submission, the Department will advise proponents of the relevant fisheries, habitats and issues requiring consideration, and the various user groups they must consult. This information should be used along with the strategies described to avoid or reduce potential impacts of seismic surveys (Table 1).

To help the proponent determine which mitigation strategies are relevant, maps of the Department's bioregions and provinces (Appendix 1a and 1b), spawning periods of key fisheries species (Appendix 2), sound wave detection frequencies for a variety of fauna (Appendix 3), and checklists for proposal development and final Environment Plans (Appendix 4), are all attached to this guidance statement.

Importantly, Table 1 should not be considered exhaustive and will be updated periodically as new information comes to hand. In providing advice to proponents, the Department reserves the right to request further actions beyond those outlined in Table 1, and recommends that where appropriate, proponents do not limit their mitigation strategies to those outlined here.

Table 1. Actions, impacts and mitigation strategies for seismic surveys

Issue	Action required	Potential impact(s)	Mitigation strategies
Individual Finfish Species	Consultation with the Department, the Western Australian Fishing Industry Council (WAFIC), Recfishwest and individual fishers as appropriate	As per section 5 in guidance statement (above)	<ul style="list-style-type: none"> - Avoid key times of year¹ - 'Soft starts' for every event - Avoid restricting movement of fish away from the source of seismic sounds - Minimise the sound intensity and exposure time of surveys - Address specific advice from WAFIC, Recfishwest and individual fishers.
Rock Lobster	Consultation with the Department, WAFIC, Western Rock Lobster Council, Recfishwest and individual fishers as appropriate	As per section 5 in guidance statement (above)	<ul style="list-style-type: none"> - Avoid undertaking surveys in: <ul style="list-style-type: none"> - Key fishing periods (November to May) - Key fishing grounds (between Perth and Kalbarri out to 200m isobath) - Rock Lobster spawning period (between August and February) - Address specific advice from WAFIC, Western Rock Lobster Council, Recfishwest and individual fishers
Biodiversity and Ecosystem Values	Consultation with most recent annual <i>'State of the Fisheries and Aquatic Resources'</i> ² report to document and address all potential impacts to bioregional assets currently at 'high' or 'significant' risk, in line with the Department's EBFM approach	Fish communities and their habitats.	<ul style="list-style-type: none"> - 'Soft starts' for every event - Avoid restricting movement of fish away from the source of seismic sounds - Minimise the sound intensity and exposure time of surveys - Address specific advice from WAFIC, Recfishwest and individual fishers
Economic Impacts	Consultation with the Department, WAFIC, Recfishwest and individual fishers as appropriate	Financial implications	<ul style="list-style-type: none"> - Avoid key fishing areas, spawning times, aggregation areas and peak fishing times - Address specific advice from WAFIC, Recfishwest and individual fishers
Social Impacts	Consultation with the Department, WAFIC and Recfishwest and individual fishers, as appropriate	Social implications	<ul style="list-style-type: none"> - Address specific advice from WAFIC, Recfishwest and individual fishers
Biosecurity	In consultation with the Department, follow up-to-date biofouling and ballast water management protocols	Spread of invasive marine species and pests	<ul style="list-style-type: none"> - see checklist C in Appendix 4

¹ Consult Appendices 1 and 2 to determine timing and location of key finfish species' spawning/aggregation periods.

² Available from the Department of Fisheries website: <http://www.fish.wa.gov.au/Pages/Home.aspx>

7.0 Responsibilities

7.1 Proponent

Seismic survey proponents should use this guidance statement to address key issues of potential concern to the Department and use the Checklists for Seismic Survey Proposals at Appendix 4.

7.2 Department

The Department will use this guidance statement during its assessment of seismic survey proposals. On receiving information from a proponent, the Department will aim to give formal feedback within a reasonable period.

8.0 Key contacts

Department of Fisheries

Head Office

T: (+61) 08 9482 7333

F: (+61) 08 9482 7389

A: 3rd Floor, The Atrium, 168 - 170 St Georges Terrace, Perth WA 6000

P: Locked Bag 39, Cloisters Square WA 6850, Australia

W: www.fish.wa.gov.au

Western Australian Fisheries and Marine Research Laboratories

T: (+61) 08 9203 0111

F: (+61) 08 9203 0199

A: 39 Northside Drive, Hillarys WA 6025, Australia

P: PO Box 20, North Beach WA 6920, Australia

W: www.fish.wa.gov.au

Recfishwest

T: (+61) 08 9246 3366

F: (+61) 08 9246 5955

W: www.recfishwest.org.au

Western Australian Fishing Industry Council Inc. (WAFIC)

T: (+61) 08 9432 7777

F: (+61) 08 9432 7700

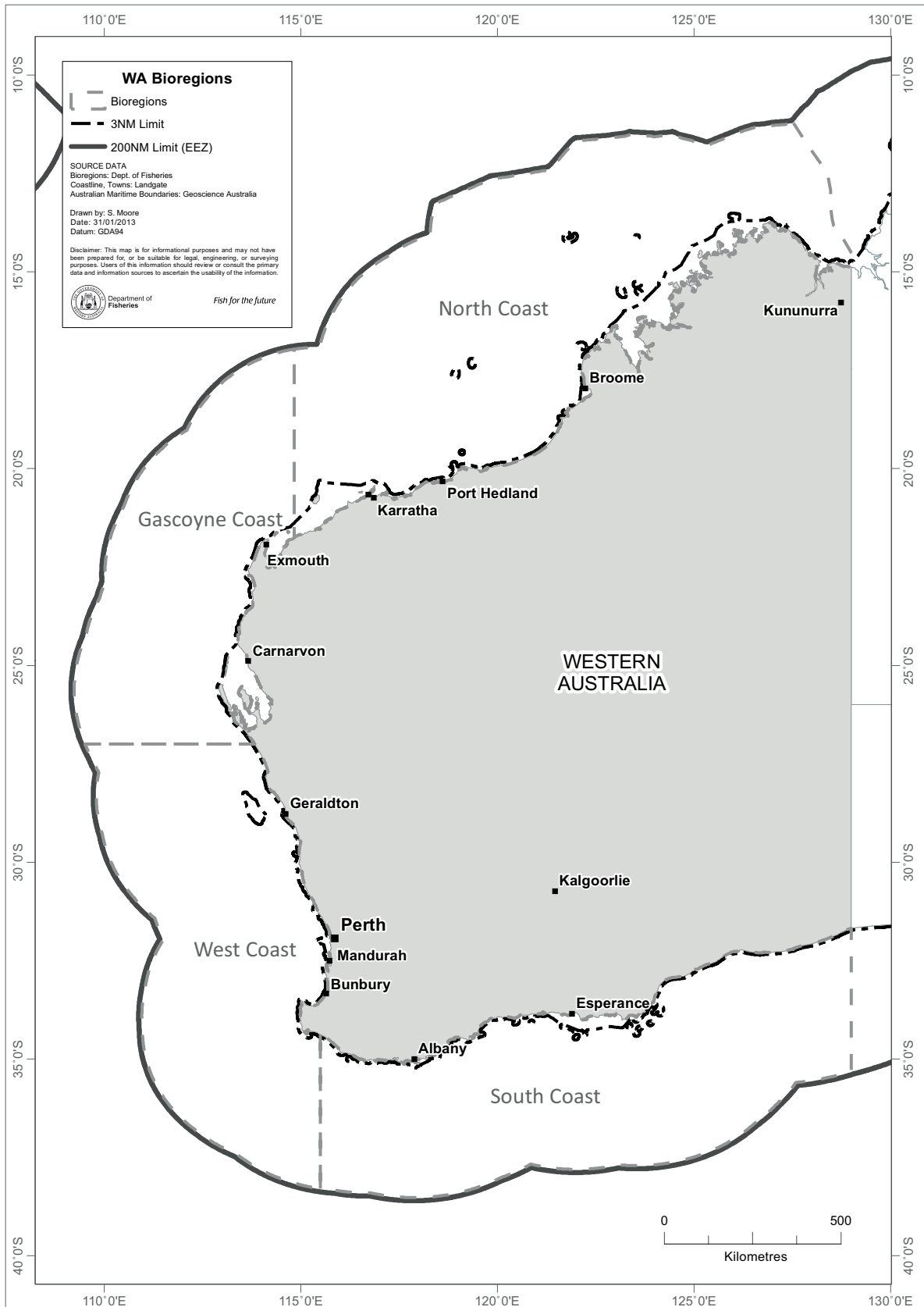
W: www.wafic.org.au

9.0 Bibliography

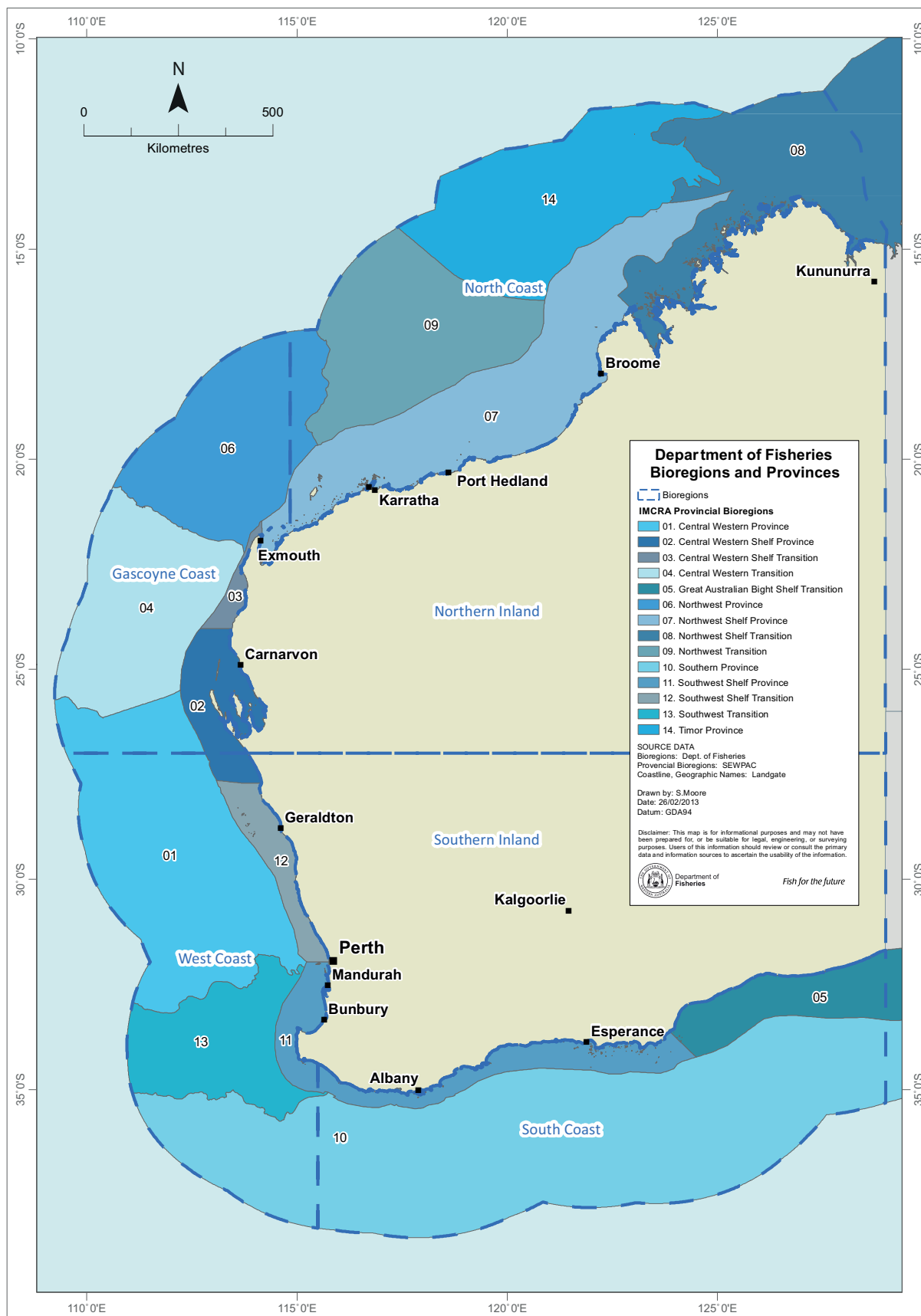
- Clay, C.S. and Medwin, H. (1977) *Acoustical oceanography: Principles and Applications*. Wiley Interscience, New York, 544pp.
- Commonwealth of Australia (CoA) (1992). *National Strategy for Ecologically Sustainable Development*. AGPS, Canberra.
- Department of Fisheries (2011) *State of the Fisheries and Aquatic Resources Report 2010/11*. Fletcher, W.J. and Santoro, K. (eds). Department of Fisheries, Western Australia.
- Department of Mines and Petroleum (DMP) (WA) *Seismic guidance statement, outlining the potential conflict, standards and protocols for seismic survey activity and the rock lobster fishery* <http://www.dmp.wa.gov.au/documents/ENV-PEB-175.pdf>
- Food and Agriculture Organization of the United Nations. (2005) *Review of the State of World Marine Fishery resources*. Technical paper No. 457. FAO: Rome.
- Fletcher, W.J., Chesson, J., Sainsbury, K.J., Hundloe, T.J. and Fisher, M. (2005.) *A flexible and practical framework for reporting on ecologically sustainable development for wild capture fisheries*. *Fisheries Research*, 71: 175-183.
- Fletcher, W.J., Shaw, J., Metcalf, S.J. and Gaughan, D.J. (2010) *Ecosystem Based Fisheries Management – An efficient planning tool for fisheries management agencies*. *Marine Policy*, 34: 1226-1238.
- International Association of Geophysical Contractors (IAGC) (2002) *Marine seismic operations. An overview*. <http://www.iagc.org/files/306/>
- SEWPaC guidelines describing potential significant impacts (including from seismic surveys) on issues of national environmental significance: <http://www.environment.gov.au/epbc/publications/pubs/nes-guidelines.pdf>
- SEWPaC policies and guidelines describing potential impacts of seismic surveys on individual organisms or groups (e.g. Western rock lobster, whales): <http://www.environment.gov.au/epbc/publications/seismic.html>

10.0 Appendices

Appendix 1a: Boundaries of the bioregions, three nautical mile State waters limit and the 200 nm limit.




Appendix 1b: Map of Western Australia showing the boundaries of the bioregions and provinces




Appendix 2: Spawning period (indicated in red) for some key fisheries species and their bioregional distribution¹

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Bioregion
Blacktip shark (<i>Carcharhinus tilstoni</i> and <i>C. limbatus</i>)													North Coast
Goldband snapper (<i>Pristipomoides multidens</i>)													North Coast
Rankin cod (<i>Epinephelus multinotatus</i>)													North Coast
Red Emperor (<i>Lutjanus sebae</i>)													North Coast
Sandbar shark (<i>Carcharhinus plumbeus</i>)													North Coast
Spanish mackerel (<i>Scomberomorus commerson</i>)													North Coast
Pink snapper (<i>Pagrus auratus</i>)													North Coast (rare)
Baldchin groper (<i>Choerodon rubescens</i>)													Gascoyne
Blacktip shark (<i>Carcharhinus tilstoni</i> and <i>C. limbatus</i>)													Gascoyne
Crystal (snow) crab (<i>Chaceon</i> spp.)													Gascoyne
Goldband snapper (<i>Pristipomoides multidens</i>)													Gascoyne
King George whiting (<i>Sillaginodes punctata</i>)													Gascoyne
Pink snapper (<i>Pagrus auratus</i>)													Gascoyne
Rankin cod (<i>Epinephelus multinotatus</i>)													Gascoyne
Red Emperor (<i>Lutjanus sebae</i>)													Gascoyne
Sandbar shark (<i>Carcharhinus plumbeus</i>)													Gascoyne
Spanish mackerel (<i>Scomberomorus commerson</i>)													Gascoyne

 = spawning period

¹ An example, for operators to consider when evaluating ecologically, recreationally and commercially important species and spawning or other sensitivities within their area of operation. This is a non-exhaustive list of species and the Department will add or subtract from this list, as appropriate.

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Bioregion
Blacktip shark (<i>Carcharhinus tilstoni</i> and <i>C. limbatus</i>)													West Coast (Midwest - north)
Goldband snapper (<i>Pristipomoides multidens</i>)													West Coast (Midwest - north)
Rankin cod (<i>Epinephelus multinotatus</i>)													West Coast (Midwest - north)
Red Emperor (<i>Lutjanus sebae</i>)													West Coast (Midwest - north)
Baldchin groper (<i>Choerodon rubescens</i>)													West Coast
Champagne (spiny) crab (<i>Hypothalassia acerba</i>)													West Coast
Crystal (snow) crab (<i>Chaceon</i> spp.)													West Coast
King George whiting (<i>Sillaginodes punctata</i>)													West Coast
Pink snapper (<i>Pagrus auratus</i>)													West Coast
Sandbar shark (<i>Carcharhinus plumbeus</i>)													West Coast
Spanish mackerel (<i>Scomberomorus commerson</i>)													West Coast
West Australian dhufish (<i>Glaucosoma hebraicum</i>)													West Coast
Western rock lobster (<i>Panulirus cygnus</i>)													West Coast
West Australian dhufish (<i>Glaucosoma hebraicum</i>)													South Coast
Champagne (spiny) crab (<i>Hypothalassia acerba</i>)													South Coast
Crystal (snow) crab (<i>Chaceon</i> spp.)													South Coast
King George whiting (<i>Sillaginodes punctata</i>)													South Coast
Pink snapper (<i>Pagrus auratus</i>)													South Coast
Sandbar shark (<i>Carcharhinus plumbeus</i>)													South Coast

 = spawning period

Appendix 3: Range of detection frequencies modified from Clay and Medwin (1977).

Group	Average size of individuals in group	Detection frequency range
Whales and sharks	2 – 6m	3 – 250Hz
Large nekton ¹ and largest plankton	0.2 – 2m	10 – 2500Hz
Small nekton and large plankton	2 – 20cm	100Hz – 250kHz
General plankton	20 μ – 20mm	100kHz – 250kHz

¹ nekton includes all 'free swimming' organisms that can move independent of ocean currents

Appendix 4: Checklists for seismic survey proposals

Items from all checklists below should appear in a proponent's final Environmental Plan.

Checklist A: The following items should be provided to the Department of Fisheries before submission of a final proposal to ensure the correct information regarding fishing activity, key fish species and stakeholders requiring consultation is provided:

- Proponent details – Contact name, Company details, Address, Contact numbers, email address, Petroleum Exploration Permit ID.
- Specific start and finish date of the seismic survey, source intensity, sound exposure level and mitigation measures.
- A map outlining permit zones, the total operational survey area (including turn-around zones), and boundary coordinates (latitude and longitude; GDA 94 or WGS84).

Checklist B: After receiving the above information, the Department of Fisheries will provide to the proponent within a reasonable timeframe, the following information, which may be required to develop and implement mitigation strategies in accordance with Table 1 above:

- Bioregion and provinces of activity.
- Nearby marine conservation areas, Fish Habitat Protection Areas and other sensitive areas requiring consideration.
- Key fish species spawning/aggregation activities in the area at the time of the proposed seismic activity.
- Stakeholder agencies or individuals requiring consultation.

Checklist C: In their final environmental management plans, proponents must also indicate a requirement for operators to provide:

- Vessel details, including the name and type of vessel(s) used.
- Evidence that sediment and ballast water has, or will be, managed to prevent introduced marine pests (IMP) entering and moving within WA. Alternatively, a maintained ballast water management plan and record book should be provided.
- Ship's log entries showing operational history since last antifouling coating (AFC) application or IMP inspection, or a maintained biofouling management plan and record book.
- The most recent in-water cleaning OR dry dock/slip report, and IMP inspection report.
- Evidence of either an active marine growth prevention system or a suitable manual treatment regime (e.g. chlorine dioxide, Rydlyme™) for internal seawater pipeworks.
- The most recent AFC application certificate OR original receipts or invoices stating the coating type, the volume purchased, vessel name and date of application.

For the most up to date information on biosecurity, see here: http://www.fish.wa.gov.au/Documents/biosecurity/introduced_marine_pests_management_guidelines.pdf

