



Guidelines for Minimising Acoustic Disturbance to Marine Mammals from Seismic Survey Operations¹

February 2006

The potential exists for seismic survey operations at sea to have an adverse impact on marine mammals (please see the accompanying 'Reference Document' for information about impacts²). These guidelines aim to minimise potential impacts without unduly affecting normal operations. We recommend these guidelines be followed by all seismic vessels operating in New Zealand waters (from the coast to 200 nm)³.

These guidelines have been endorsed by the Petroleum Exploration and Production Association of New Zealand (PEPANZ). For further information on PEPANZ please refer to www.pepanz.org.

The department's primary concern with regard to potential impacts from seismic survey operations rests mostly with the larger cetacean species and a few smaller species for which serious conservation concerns exist. For this reason we have specifically identified 'Species of Concern' for which a strong precautionary approach is recommended. For the purpose of this document 'Species of Concern' means:

- All whales as defined in the Marine Mammal Protection Regulations 1992: *'Whale means all species commonly known as whales; and includes baleen whales, sperm whales, beaked whales, killer whales and pilot whales.'*
- Hector's and Maui's dolphins - on the basis of specific conservation concern for these species.
- Additional species that are recommended for inclusion by the Department of Conservation on a case by case basis as specific concerns arise.

Unless otherwise specified, these guidelines apply to all marine mammal species (including dolphins, seals and Species of Concern).

Appendix 1 identifies areas of ecological importance for marine mammals in New Zealand waters. These areas should be avoided where possible to minimise the likelihood of encountering 'Species of Concern'. Please note that in these areas the Department of Conservation (DOC) may recommend further precautions in addition to those outlined in these guidelines.

Please contact DOC prior to conducting any seismic operations in New Zealand waters. If operating in areas of ecological importance notification should ideally occur at least one month prior to operations being undertaken. Consideration should be given to refraining from operating at night in areas of ecological importance. If such operations are unavoidable, operators are asked to consider using passive acoustic monitoring to 'listen' for marine mammals before operating at night in these areas.

¹ Please reference this document as: Department of Conservation. 2006. Guidelines for minimising acoustic disturbance to marine mammals from seismic survey operations. Department of Conservation, Wellington, New Zealand.

² The accompanying 'Reference document: Guidelines for minimising acoustic disturbance to marine mammals from seismic survey operations' is available from the DOC website - www.doc.govt.nz.

³ Please note that if you are operating in the Territorial Seas (coast - 12 nm) your operation may be subject to controls under the Resource Management Act 1991. Please contact the relevant Regional Council office and Department of Conservation office for advice.

Marine Conservation Unit

Head Office, Conservation House – *Whare Kaupapa Atawhai*, 18-32 Manners St, PO Box 10-420, Wellington 6143, New Zealand

Telephone 04-471 0726, Fax 04-381 3057

In general, operators of seismic vessels undertaking seismic survey operations should seek to use the lowest practicable power levels throughout the survey, and that any unnecessary high frequency operational noise should be minimised where possible.

VISUAL OBSERVATIONS / PRE-START OBSERVATIONS

- A designated marine mammal co-ordinator should be responsible for ensuring that marine mammal observations are carried out as described in these guidelines throughout the duration of seismic survey operations. This co-ordinator should be responsible for briefing all other members of the crew who are to be tasked with making and recording observations of marine mammals during operations. The co-ordinator should be briefed by DOC personnel prior to the survey and should be responsible for returning completed data sheets following survey completion.
- The presence of an independent trained marine mammal observer or someone experienced in marine mammal observations may be requested by DOC for seismic survey operations undertaken in those areas identified as ecologically important (Appendix 1). For such a request, the training/experience requirements will be recommended on a case by case basis, in lieu of a recognised training programme in New Zealand. A list of suitably experienced marine mammal observers is available from DOC.
- Where multiple vessels are to be used during a survey, the marine mammal observer should be located on the source vessel, i.e. the vessel towing the air guns.
- During daylight hours, a visual check (using binoculars from a suitable, high observation platform on the survey vessel that optimally allows for a 360° view) for the presence of marine mammals should be made before the commencement of all operations.
- Observations for all marine mammals should begin at least 30 minutes prior to use of any high energy acoustic source, with particular focus on a 1.5 km radius around the survey vessel for all marine mammals.
- Continual visual observation for all marine mammals using binoculars should be made for all marine mammals during daylight operational hours within the 1.5 km radius from the acoustic source.
- Consideration should be given to the use of passive acoustic monitoring (PAM) during periods when the likelihood of detecting marine mammals is low because of visibility constraints (i.e. at night or in poor weather conditions).
- Cues for the detection of marine mammals at sea are provided in the accompanying reference document.
- An identification guide to whales and dolphins (Baker 1999)⁴ is available to seismic survey operators free of charge on request from DOC. Please contact Steve Smith, Marine Conservation Unit, Department of Conservation (email: marinemammals@doc.govt.nz).

⁴ Baker, A.N. 1999. Whales and Dolphins of New Zealand and Australia: an identification guide. Victoria University Press, Wellington, New Zealand.

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DELAYED STARTS

- Discharge of any acoustic source should not commence if a marine mammal is sighted within an 'Observation Zone'. Observation Zone means:
 - For Species of Concern: 1.5 km horizontal radius from the acoustic source, and;
 - For all other marine mammals: 200 m horizontal radius from the acoustic source.
- If marine mammals are detected within either of the Observation Zones the start up of the acoustic source should be delayed until they are observed to have moved outside of the zone limits, or have not been seen within these zones for 30 minutes.

SOFT STARTS

- Prior to undertaking seismic survey operations (e.g. at the start of a line) the output of the source array should be 'ramped up' gradually, starting with firing only one airgun. The whole array should not be fired without a full soft start. Soft starts should be used for every start-up or in the event that the acoustic source has been shut down, even if no marine mammals have been seen. The only exception to this is when the acoustic source has been shut down for no longer than 20 minutes.
- The soft start procedure involves a gradual increase in the number of air-guns fired over a 20 minute period prior to commencement of a line, and serves to deter marine mammals from entering the operational area and give marine mammals the chance to leave the vicinity before the maximum output of the array has been reached. To minimise acoustic impact on the environment a soft start should take no longer than 45 minutes to complete.
- Visual observations should be maintained continuously during soft starts to detect the presence of marine mammals within 1.5 km of the vessel.
- Special care should be taken to detect the presence of marine mammals, in inshore coastal areas during soft starts. Ideally all soft starts should occur at least 1.5 km offshore to minimise the likelihood of animals being 'trapped' between the acoustic source and the shore without an appropriate escape route.
- If a marine mammal or marine mammals are sighted within an Observation Zone during the soft start procedure, the acoustic source should be shut down. Re-commencement of soft start procedures should take place after 30 minutes has lapsed since the last sighting of the marine mammal within the relevant Observation Zone.

ONGOING OBSERVATIONS / STOP WORK PROCEDURES

- Every marine mammal observed (both Species of Concern and all other species of marine mammal – including seals) should be monitored and their behaviour recorded while they remain within 1.5 km of the acoustic source regardless of whether the source is firing or not.
- A seismic vessel should shut down the acoustic source if any group of Species of Concern containing cow-calf pairs are detected within 1.5 km of the survey vessel while survey work is occurring at full power. Operations should not recommence until the group has been seen to move outside the 1.5 km range, or has not been seen within this range for 30 minutes.

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- For all other instances where Species of Concern are detected while the acoustic source is operating at full power, a shut down distance of 1 km should be applied. The acoustic source should remain shut down until the Species of Concern have moved outside the 1 km radius, or has not been seen within this range for 30 minutes, after which operations can recommence.
- There should be continued discharge of the acoustic source during line turns/changes. Discharge of only a limited number of air-guns in the acoustic array is thought to be sufficient to deter marine mammals from entering the operational area during turns and line changes.

RECORDING & REPORTING

- All observations should be recorded on the appropriate DOC recording form (Observer Reporting Form - Appendix 2).
- Records should be kept of all species of marine mammal (including seals) detected within 1.5 km of the seismic vessel.
- Records should be kept of all watches made for marine mammals on the appended recording form, regardless of the presence/absence of marine mammals (Effort Reporting Form - Appendix 2).
- At the completion of the survey, copies of all recording forms should be returned to:

The Manager – Marine Conservation Unit
 Department of Conservation,
 PO Box 10-420
 Wellington 6143
 New Zealand.

- We would appreciate it if completed recording forms could be returned to the above address no later than 20 working days following survey completion.
- The Department advises that it may like to use data supplied from seismic surveys and shall be responsible for maintaining an ongoing database of records submitted.
- These guidelines will be reviewed as and when required based on operational experience and/or as new information becomes available regarding the impacts of seismic survey operations on marine mammals.
- If you have any comments, questions or suggestions for improvements on these guidelines please contact:

Steve Smith
 Marine Conservation Unit
 Department of Conservation
 PO Box 10-420
 Wellington 6143
 New Zealand

Telephone: 64 4 471 3062
 Email marinemammals@doc.govt.nz

**For a summary of recommended actions outlined in these guidelines
 please refer to Appendix 3.**

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Appendix 1

Areas of 'Permanent' Ecological Importance

Description of Area	Latitude range	Species of concern
Kaipara Harbour – New Plymouth	36°30'S - 39°4'S	Maui's dolphin
Kahurangi Point – Jackson Head Oamaru – Port Underwood Long Point – Chaslands Mistake	40°46'S - 43°58'S 41°21'S - 45°07'S 46°15'S – 46°38'S	Hector's dolphin
Kaikoura	42°210'S – 42°50'S	Sperm whales Beaked whales
Hauraki Gulf	36°00'S – 37°00'S	Bryde's whales
Bay of Plenty East Coast Northland Chatham Rise	36°45'S - 37°45'S 34°40'S - 35°50'S 43°00'S - 44°25'S	Beaked whales
Southern New Zealand	45°45'S – 52°40'S	NZ sea lions & southern right whales

Please note: The majority of marine mammal sightings that contribute to the information presented above have been relatively coastal. However, limited data is available with regard to offshore distributions. For this reason the offshore boundaries of the Areas of Ecological Importance have not been specified and we ask that precautions be taken throughout the extension of the EEZ.

Areas of 'Seasonal' Ecological Importance

Description of Area	Latitude range	Species of concern	Season of concern
East Coast / Hawkes Bay Cook Strait Otago Southland / Stewart Is	37°30'S – 39°40'S 41°00'S - 41°35'S 45°20'S - 46°05'S 46°40'S – 47°15'S	Southern right whales	May – Oct (for all identified areas)
Central New Zealand East & West Coasts North Island	40°50'S - 42°45'S 35°00'S – 38°00'S	Humpback whales	May – Aug Sept - Dec

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Appendix 2

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Observer Reporting Form
Seismic Vessel / Marine Mammal Interactions

Please complete one of these forms each time a marine mammal or group of marine mammals is encountered

Observers name:	Contact phone:
Name of vessel:	
Name of Company conducting survey:	
Date:	Time:
Location (Lat/Long):	
Distance/Direction of Marine Mammals from vessel when first observed:	
Species (if known – see key provided. Please note: if you are uncertain of species ID please indicate by recording ‘unknown’, or by indicating more than 1 species if appropriate i.e. Brydes and minke whales are especially hard to distinguish from one another):	
Approximate length of adults:	Body colour:
*Baleen visible (Yes/no):	Baleen colour:
Estimate of total number of individuals present:	
Number of calves & their approx. length:	
Shape of blow (for whales only – bushy, tall, V shape etc.):	
Direction/speed of travel of marine mammals:	
Initial behaviour of marine mammals (travelling, milling, breaching, feeding, bow riding etc):	
Observed reaction of marine mammals to your vessel (changed direction of travel - attracted to vessel, moved away from vessel; increased speed of travel, spyhopping, tail lobbing, bow-riding, breaching etc.):	
Activity being undertaken by vessel at time of initial observation: # airguns firing (where applicable): volume of airguns (where applicable): Frequency (Hz – where applicable): Intensity (dB – where applicable): Interval (s – where applicable): Streamer length: Source Depth:	
Subsequent action taken by vessel:	
Minimum distance from animals to airguns:	
Sea state (calm, slight. choppy, rough):	Wind (Beaufort & Direction):
Water temperature/depth:	
Additional comments:	

* Baleen is the sieve structure in the mouth of some species of filter feeding whales

Please return completed forms to:

The Manager
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Appendix 3:

Summary of recommended actions when marine mammals are present during seismic survey operations:

Species	Pre-Start Observations	Delayed Starts	Stop work during soft starts	Stop Work during full operations	Recording and Reporting
Species of concern	<ul style="list-style-type: none"> - At least 30 minutes of pre-start observations. - Focus on 1.5 km radius for both reporting purposes and to gauge need for delayed start. 	<ul style="list-style-type: none"> - Delay start if closer than 1.5 km from acoustic source. - Recommence operations when animals move outside this zone, or haven't been seen for 30 minutes. 	<ul style="list-style-type: none"> - Shut down if animals move into the 1.5 km radius. - Recommence operations when animals move outside this zone, or haven't been seen for 30 minutes. 	<ul style="list-style-type: none"> - Shut down if animals move into the 1 km radius of the acoustic source. - Recommence operations when animals move outside this zone, or haven't been seen for 30 minutes. 	<ul style="list-style-type: none"> - All observations within the 1.5 km radius recorded and reported on forms provided.
Species of concern accompanied by calves	<ul style="list-style-type: none"> - At least 30 minutes of pre-start observations. - Focus on 1.5 km radius for both reporting purposes and to gauge need for delayed start. 	<ul style="list-style-type: none"> - Delay start if closer than 1.5 km from acoustic source. - Recommence operations when animals move outside this zone, or haven't been seen for 30 minutes. 	<ul style="list-style-type: none"> - Shut down if animals move into the 1.5 km radius. - Recommence operations when animals move outside this zone, or haven't been seen for 30 minutes. 	<ul style="list-style-type: none"> - Shut down if animals move into the 1.5 km radius of the acoustic source. - Recommence operations when animals move outside this zone, or haven't been seen for 30 minutes. 	<ul style="list-style-type: none"> - All observations within the 1.5 km radius recorded and reported on forms provided.
All other marine mammal species	<ul style="list-style-type: none"> - At least 30 minutes of pre-start observations - Focus on 1.5 km radius for reporting purposes only. - Focus on 200 m to gauge the need for delayed start 	<ul style="list-style-type: none"> - Delay start if closer than 200 m from acoustic source. - Recommence operations when animals move outside this zone, or haven't been seen for 30 minutes. 	<ul style="list-style-type: none"> - No action recommended if animals move within the 200 m radius once soft start has already commenced. 	<ul style="list-style-type: none"> - No action recommended if animals move into vicinity of acoustic source once full power has been reached. 	<ul style="list-style-type: none"> - All observations within the 1.5 km radius recorded and reported on forms provided.

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