

# Blue whales and seismic surveying in Australia



**Blue whale populations were devastated in the last century by commercial whaling, which reduced blue whales from a quarter of a million to just a few hundred animals. Australian waters are home to both the Antarctic blue whale and a smaller subspecies, the pygmy blue whale. Blue whale numbers have increased a little since whaling ended but their recovery has been slow and numbers still remain in the few thousands. This analysis looks at the scale of seismic testing by the offshore oil and gas industry in important blue whale habitat in Australia.**

## Blue whales in Australian waters

Blue whales come to Australian waters to feed in just a few unique locations. There are three main areas: the Perth Canyon (March – May), the Bonney Upwelling off Victoria and South Australia (November – April) and the waters off Kangaroo Island extending into the eastern Great Australian Bight (November – May).

Feeding is also thought to take place elsewhere off the WA coast from Cape Naturaliste northwards and also off Ningaloo Reef as pygmy blue whales migrate northwards (March – August) from Australia to Indonesian waters where they go to give birth to and nurse their young, before returning south (October – December) to feeding grounds in Australian waters.

Blue whales are listed as endangered under Australian federal legislation, the Environment Protection and Biodiversity Conservation Act (EPBC Act).

A recent IFAW analysis (*Seeking Sanctuary: protecting whales in Australia's marine reserves*)

showed that outside of the Perth Canyon feeding grounds, important areas for blue whales have very little high-level protection in the Commonwealth marine reserves network, including no sanctuary protection of any blue whale feeding grounds off Victoria and South Australia. In total only 2% of all biologically important areas for blue whales are included in marine sanctuaries in Australia.

The current review of federal marine reserves by the government represents an opportunity to address this lack of protection.

A revised recovery plan for the blue whale was published for comment back in December 2012 but has yet to be finalised by the government. This recovery plan also offers an opportunity to put in place actions that will better protect blue whales from threats associated with oil and gas exploration, such as underwater noise pollution from seismic surveys.



## Blue whale presence and seismic surveys

Figure 1 maps the overlap between blue whale habitat and seismic surveys in Australian waters.

The blue whale habitat is based on data provided by the Australian Government which defines Biologically Important Areas (BIAs) for these whales.

The seismic surveys represent only those that IFAW is aware of planned for 2014 and 2015 during times of year when blue whales are present in these areas, that is March – August and October – December off the west coast and November – May off the south coast.

As the map demonstrates, two-thirds (67%) of all important areas for blue whales are subjected to seismic testing during times when whales are present. In total 401,000 km<sup>2</sup> of seismic testing is planned in important blue whale habitat. Broken down by region, 93% of feeding grounds in the Bonney Upwelling and Kangaroo Island, 44% of the Great Australian Bight feeding and migration

areas and 69% of the West coast migration path are exposed to seismic blasts.

The combined impact of this sustained noise pollution across these areas and over repeated years is of significant concern.

The government whale data is freely available from the Department of Environment. Seismic survey data is based on Environment Plans for those seismic surveys that have been approved by government regulator NOPSEMA (see below) and consultation information provided to IFAW directly by oil and gas companies and seismic surveying contractors (as of 28 Feb 2015).

As information provided by companies is often scant, usually just stating a planned period over which the survey may take place across a large area, any survey proposed to take place during a location and a time period when blue whales are present is included in the maps.

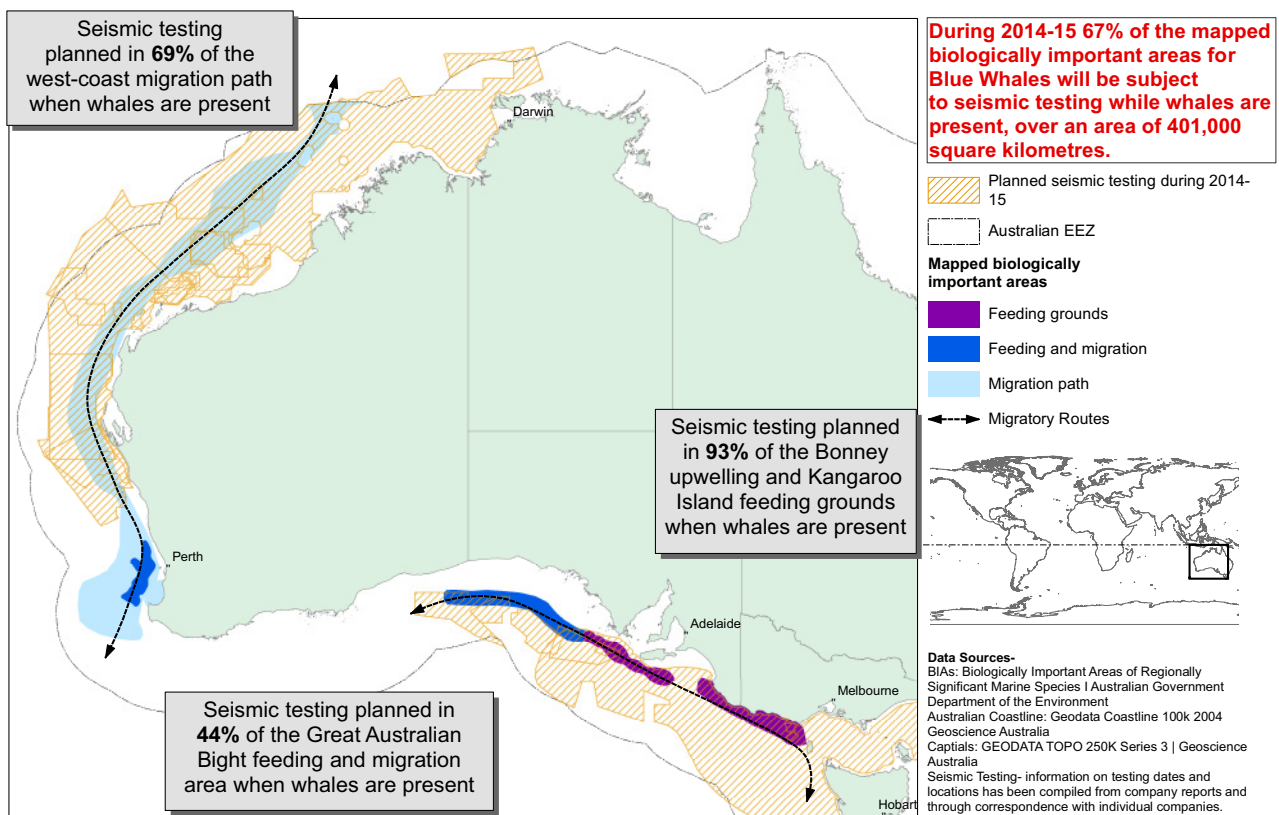


Figure 1. Biologically Important Areas for blue whales and planned seismic surveys for 2014 and 2015.

The map includes the following seismic surveys: 3D Oil 'Flanagan' survey; Bight Petroleum 'Lightning' survey; CGG 'Davros' survey; GX technology/ ION 'Otway Span' survey; Origin 'Crowes Foot' and 'Enterprise' surveys; PGS 'Titan', 'Ceduna' and 'Western GAB' surveys; Polarcus 'Capreolus' and 'Rosemary' surveys; Schlumberger 'Bight MC3D' survey; Shell 'DAB' survey; Spectrum Geo 'Rocket' survey; TGS 'Nerites' survey (for Chevron), 'Canning-Northern Carnarvon' and 'Renaissance' surveys; Woodside 'Babylon', 'Centaurus', 'Fortuna' and 'Lord' seismic surveys.

## Seismic testing and the risks to whales

Seismic testing is used by industry to explore the sea floor for oil and gas deposits. It involves using high-powered arrays of airguns to fire intense blasts of air into the ocean, every 10 seconds, up to 24 hours a day over periods of weeks and months. This introduces extremely high levels of noise into the marine environment, at the same frequencies which blue whales and other species use to communicate.

Like all whales and dolphins, blue whales have a highly refined acoustic sense with which they monitor their surroundings.

Whales use sound to navigate, locate prey and predators, attract mates, and for social interactions. Whales are extremely sensitive to man-made underwater noise pollution, including seismic surveys.

Noise pollution can force whales away from important habitat, reduce feeding, cause stress,

disorient them and inhibit their communication by masking their calls or forcing whales to call louder to be heard. At close range, loud noise can cause temporary or permanent damage to a whale's hearing, which has implications for their entire way of life.<sup>1</sup>

Repeated seismic surveying over time and in similar or adjacent areas in the ocean can lead to cumulative impacts on whales and other marine life.

Repeated exposure to seismic testing and other ocean noise pollution can lead to increased stress in animals with implications for deteriorating health and reproduction, and can dramatically reduce the distance over which whales can communicate; over the last 70 years, ever increasing man-made noise in the ocean has led to a ten-fold reduction in the distance over which blue whales can communicate.

## Management of offshore oil and gas in Australia

Seismic surveys that risked having a significant impact on endangered whales used to be referred to the Department of Environment for environmental assessment under the EPBC Act.

However, as part of the Coalition Government's "one-stop-shop" for environment approvals, these powers were handed over by Environment Minister, Greg Hunt, to the industry regulator, the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

One of the purported advantages advocated at the time of this "one-stop-shop" being introduced was that it would lead to better assessment of cumulative impacts of offshore petroleum activities. However, as Figure 1 demonstrates, one year on

from NOPSEMA taking on sole responsibility for assessment and approval of seismic surveys, it is difficult to see how the cumulative impact of multiple seismic surveys on blue whales is being taken into account during assessments.

IFAW has sought access to NOPSEMA assessment documents under Freedom of Information but has been refused, so it is impossible to tell if or how cumulative impacts are being addressed.

As part of the NOPSEMA one-stop-shop agreement, there is a review scheduled after the first year of operation, which ended on 28 February 2015. This review is due to begin in March and scheduled to be completed by August.

1. A comprehensive review of the impacts of noise pollution on marine and coastal biodiversity and habitats was conducted by the Convention on Biological Diversity. This offers an overview of the various scientific literature on the subject and can be accessed at: <http://www.cbd.int/doc/meetings/sbstta/sbstta-16/information/sbstta-16-inf-12-en.pdf>

## Case study – whale #98135

In 2011, Australian Government scientists tagged a number of blue whales off the coast of Perth. One of those whales, known as whale #98135, had a tag which continued to transmit the whale's location over a 10-month period, with the whale covering over 10,000 km as it travelled north to Indonesian waters before returning to Australia.

If that whale, or any other whale migrating northwards, took the same route in 2015, it is possible to analyse what the resulting exposure to planned seismic testing would be during its migration through Australian waters to Indonesia.

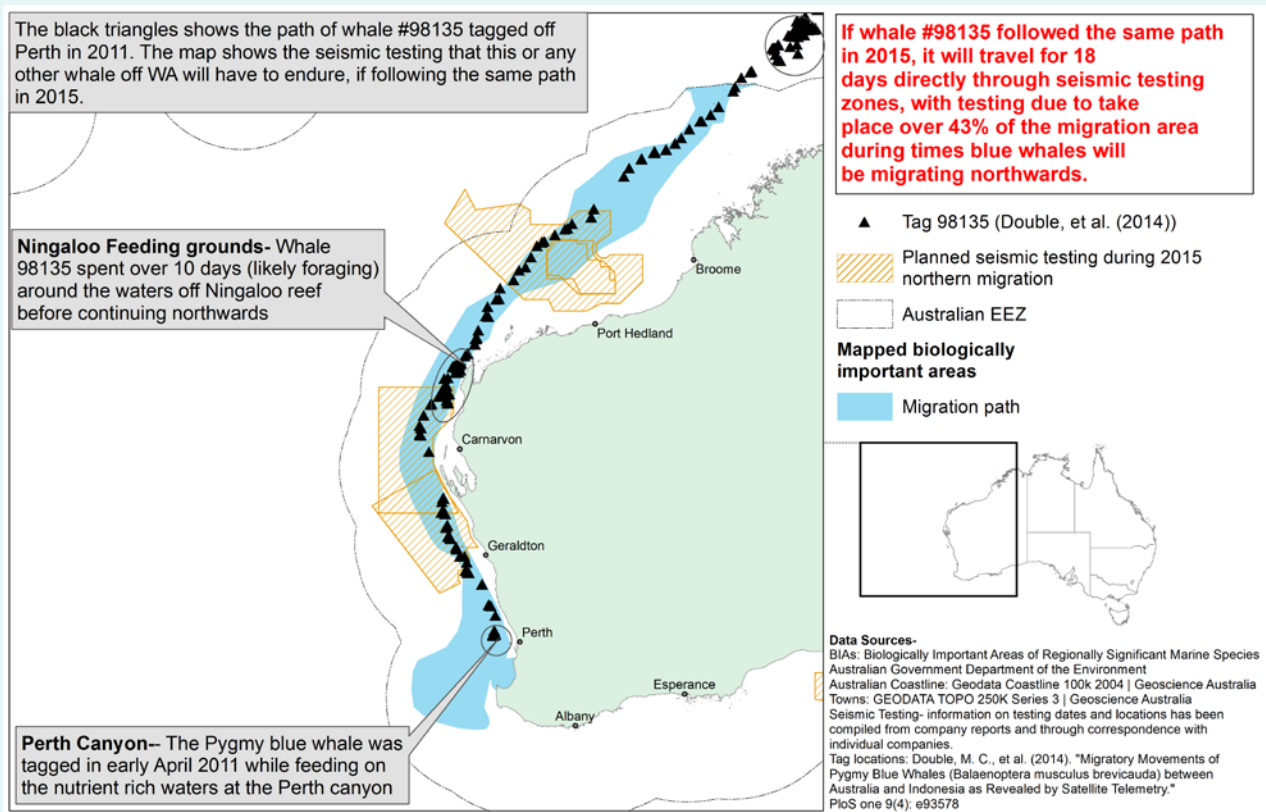


Figure 2. The path of whale #98135, tagged in 2011, overlaid with planned seismic testing off the WA coast during the 2015 northward blue whale migration.

After feeding in the Perth Canyon in April, whale #98135 tracks north over the course of the month, with seismic blasts gradually increasing in volume until it reaches the Houtman Abrolhos Islands off Geraldton.

Here it crosses into the massive Spectrum Geo 'Rocket' survey areas, licensed to test for an average of 17 days each month across the migration period, and stretching from the Houtman Abrolhos Islands all the way up the coast to Ningaloo Reef some 650 km to the north. For 10 days our whale is migrating directly through these survey areas.

Our whale then reaches the Ningaloo Coast, resting and feeding for a further 10 days in the calm waters and feeding grounds here, all the while with a likely audible backdrop from testing to the north and south, as seismic sound travels many kilometres underwater.

Heading north in early May, our whale passes directly through testing areas off the Pilbara coast. It spends an entire week swimming through the massive TGS 'Canning-Northern Carnarvon' testing zone. While in this survey area our whale also passes only a few kilometres to the west of the PGS 'Titan' and Polarcus 'Capreolus' survey areas. Having endured this gauntlet of seismic testing, our whale continues north, crossing into Timorese waters in late May.

By the time our whale leaves the Timor Sea and is beyond any seismic surveying in Australian waters, it will have travelled over 2,000 km for roughly 60 days, negotiating five separate seismic surveys. Within these two months, the whale will spend 18 days swimming directly through seismic testing zones, which cover 43% of the blue whale migration area on the west coast.



## Recommendations

To better protect blue whales from the impacts of seismic surveying, IFAW recommends the following actions:

1. The Australian Government, through oil and gas regulator NOPSEMA, should place a moratorium on any further seismic surveying in Biologically Important Areas for blue whales at times when whales are present in these areas.
2. The Australian Government should refrain from awarding any further leases or releasing any further areas for petroleum exploration that overlap with Biologically Important Areas for blue whales.
3. The Australian Government should use the current marine reserves review process to increase the coverage of Biologically Important Areas for blue whales by highly protected Marine National Park zones, particularly in marine reserves off southern Australia.
4. The Australian Government should use its first-year review of the NOPSEMA “one-stop-shop” assessment and approval process for offshore petroleum to re-examine NOPSEMA’s approach to assessing cumulative impacts of multiple seismic surveys.
5. In the longer-term, the Australian Government and oil and gas industry should support the development of quieter alternatives to seismic airguns to reduce the amount of underwater noise pollution. If necessary, the government should introduce noise limits to incentivise the use of quieter technology.
6. The Australian Government should publish its long-awaited revised blue whale recovery plan as a matter of urgency and include the relevant actions above.



A blue whale fluke © IFAW/R. Leaper