

18th September 2017

Submission Re: Draft South-west Commonwealth Marine Reserves Network Management Plan 2017

Introduction

We are a South Coast WA family with a strong interest and connection to this region that is our home. Where we live is immediately onshore of the Bremer Basin of the Albany Canyons area.

Along the South Coast we enjoy many activities including fishing, camping, swimming, surfing, diving, botany, whale and seal and bird watching, bush and coast walking, history, photography and artistic interpretation, in its diverse and beautiful natural environments. We have a family heritage connection to the South Coast, and a long-standing interest and involvement with the ocean, the natural environment and history of our area. Relevant aspects of our backgrounds include professional fishing, research and production of South Coast-specific educational material, regional cartography, education practice, historical research, and provision of environmental services. We also have a lifetime experience of surfing, recreational fishing and other activities along the South Coast, and have recently participated in the annual Citizen Science boat and plane tours to the Bremer Canyon.

Over many years we have observed the richness and diversity, both terrestrial and marine, of this area. We have seen all kinds of marine creatures, and unusual natural phenomena, including strandings of unusual cetaceans, occasional large quantities of krill washed up on the beaches, phytoplankton blooms, giant white sharks, pods of Orca, and huge seasonal aggregations of marine species and seabirds.

As a result of our South Coast experience, research and local knowledge, we have a number of serious concerns about the Commonwealth Marine Reserves.

Global concerns.

The health and ecology of the world's oceans is in crisis; this situation is internationally acknowledged. Current threats include Climate Change, over-fishing, toxic plastic flotsam and jetsam, contamination by PCBs, mercury and other poisons, seismic testing and other acoustic noise pollution, acidification resulting from CO₂ absorption, increasing vessel movements throughout the oceans, collision damage to marine life, radioactive contamination, adverse effects from silt, adverse impacts from coastal and offshore developments, bio-accumulation of toxins in the food chain and associated health impacts to marine species and humans, oil spills, and many other threats.

It is clear that global action must be taken, not only to mitigate these impacts, but to restore the ocean and all of its diverse environments and life-forms to the highest level of ecological health and integrity that we can. Marine sanctuaries and reserves have proven to be vital to the recovery of depleted fish stocks and to bring economic revenue to communities through other ventures such as dive operations.

Commonwealth Marine Reserves.

In principle we support the concept of marine reserves. However, there are some extremely serious omissions and major flaws in the current draft Commonwealth Marine Reserves network that must be addressed.

In the context of the current draft reserves network, the limited extent and location of highly protected zones, the omission of ecologically significant locations, and the potentially harmful aspects inherent to many of the permitted uses within most categories of the reserves, it is probable the proposed reserve system will be ineffective for marine conservation outcomes, and at best be a token effort.

What is the purpose of these marine reserves when they do little or nothing to protect important oceanic ecosystems from serious threats such as petroleum development, including 2 and 3D seismic surveys, and from large scale commercial fishing by super-trawlers?

There are specific risks and threats to marine species' health and habitat, directly resultant from oil and gas exploration and development. Injury, hearing loss, death, loss of resilience, avoidance and alarm behaviours, destruction of habitat, pollution, decompression/destruction of unique conditions that support significant marine ecosystems, leading to their loss- these are all recognised consequences of oil exploration and development.

South West Marine Reserve

In general, for most areas the marine reserves provide little or no additional protection to marine life and environments than what already existed pre- Marine Reserves.
Many of the reserves are in offshore waters well beyond the continental shelf.

South Coast Waters

By International standards, the south coast of WA is a region of very high biodiversity, both land and sea. The marine environment of the waters of the south coast has a unique range of subtropical, temperate and sub-antarctic marine species, with high endemism. It has a large range of habitats, complex coastal dynamics, high quality seawater, and low human impact.
The warm eddies of the Leeuwin current bring a subtropical influence and it is on the migration route of many fish, seabirds, and marine mammals.

Omission of the Albany Canyons and Emerging evidence of High Biodiversity and Endemism

On the South coast of WA, aside from a few very limited reserves, the entire area extending from coastal waters to approx. 200km offshore, has been completely omitted from the marine reserves.
This area includes the Albany Canyons region along the edge of the Continental Shelf, which is increasingly recognised to be highly significant to a large range of marine life.
The Albany Canyons area is also believed to have significant oil reserves.

The small marine reserves, including the Bremer Marine Reserve, are inadequate, and provide little or no protection from threats and risks associated with oil and petroleum exploration and development and large scale commercial fishing.

Virtually the entire southern stretch of the Australian continental shelf has been left available to oil and gas exploration and drilling. In addition, pipelines are potentially permitted through the proposed mining and exploration exempt areas.

There is evidence suggesting that the waters offshore of the South Coast of WA (ie: Albany Canyons area, including the recent oil exploration area in the Bremer Basin) is of far greater significance, complexity and biodiversity than has been previously thought.
Although very little research has been conducted, this is supported by historical and anecdotal evidence. Once known as the Southern, or Coast of New Holland Whaling Grounds, very large numbers of whales and seals were hunted here in earlier times.

The Albany Canyons region is the habitat and feeding grounds for many protected species such as Orange Roughy, Sperm whale, many species of seabirds, Little Penguin, Australian Sea lion, NZ Fur Seal and numerous other marine species.

"The Albany Canyons, including 32 canyons along 700 km of continental slope, are believed to be associated with small periodic upwellings that enhance productivity and attract aggregations of marine life. Anecdotal evidence indicates that this area supports fish aggregations that attract large predatory fish, sharks and toothed, deep-diving whales such as the sperm whale". (p.42, DEWHA).

Bremer Basin Ecosystem

Startling new discoveries have been made of a unique marine ecosystem in the Bremer sub-Basin, associated with a hydrocarbon vent which is linked to a mineral-rich up-welling.
A significant pod of Orcas (Killer Whales) is associated with this ecosystem. Ample evidence of this marine ecosystem exists and is supported by anecdotes of old timer Bremer Bay tuna fishermen.
Although Curtin University PHD students are currently undertaking studies of Killer Whale through the Bremer Basin tours currently offered by Naturaliste Charters, much remains unknown. There is an urgent need for intensive, independent, scientific research.
There are fears that the depressurisation of the hydrocarbon reserve as a result of oil or gas extraction will permanently destroy this remarkable phenomena, ecosystem and life source.

The Bremer Reserve will be of little value unless it is significantly extended to encompass the Albany canyons, including the Bremer sub-Basin, and include Sea Lion and NZ Fur seal feeding grounds in offshore waters, as well as Cheyne Island and other Little Penguin feeding grounds, which are also in offshore waters. The creation of a new marine reserve that protects the entire Albany Canyons/Bremer Basin Region, is realistically the only way to maximise the effectiveness of ecological protection via a reserve-based strategy.

Significant Protected Species of the Albany Canyons and Bremer Basin areas.

Sperm Whales

“Key Australian localities include a narrow area only a few miles wide at the edge of the continental shelf, about 20- 30 miles offshore, between Cape Leeuwin and Esperance...” (J.Bannister, p.100, 1968).

In a 2 year aerial survey from 1963-67 in WA from Carnarvon to Esperance, Sperm whale were found to be concentrated in very large numbers in a narrow strip along the continental slope, where the continental shelf itself was narrow (about 40km wide), particularly off Albany and eastwards. Seawards (southward) of that narrow area sperm whales were hardly present.

The south coast WA marine reserves do nothing to ensure protection of the Sperm whale and its habitat.

Appendix 1 (Letter to Tony Burke 2011-12) identifies a pod of up to 40 Orca *feeding on Sperm Whale calves* during January and February in the Bremer Basin area, thus providing recent evidence of Sperm Whales in the area.

Large pods of Sperm whale were sighted and photographed in March 2015, 2016 and 2017 from the Naturaliste Charter tours.

The full extent, range and details of Sperm Whale presence and activity in the Albany Canyons/Bremer Basin area is largely unknown, and independent scientific research should be conducted.

A television program ‘Inside Natures Giants’ (SBS, 29/7/2012) featured the autopsy and dissection of a dead male sperm whale found stranded at Margate, England. The cause of death was considered to be starvation as a consequence of disorientation resulting from exposure to man made noise.

While seismic testing was not implicated in this case, it has been well documented that disorientation, behavioural consequences and physiological injury and death may all occur as a result of man-made oceanic noise pollution, including seismic and sonar.

Current best practise oil exploration strategies for mitigating adverse impacts for cetaceans eg: Adaptive and Passive Acoustic Monitoring, have serious shortcomings and are not fully effective management procedures for ensuring sperm whale, (or other cetacean species’) safety and protection from harm, and/or resultant death.

Cheyne Island Little Penguin Colony:

Cheyne Island at Cape Riche is the South Coast of WA’s most significant breeding colony of Little Penguin, and is immediately adjacent to the Albany Canyons area.

Smaller colonies of Little Penguins have also been recorded at Doubtful Islands, and other islands to the west.

The Cheyne Island Little Penguin colony is comparable in size to WA’s largest colony at Penguin Island on the West Coast.

As Little Penguins are known open ocean feeders with an extensive foraging range, it is reasonable to assume that the Cheyne and Doubtful Island Little Penguins feed in the waters of the continental shelf, in areas where seismic testing has been proposed.

It is also likely that fish species such as whitebait upon which the Little Penguin predate, will also be adversely affected by seismic testing eg hearing loss, alarm and avoidance responses.

Penguins themselves are thought to be sensitive to impacts resulting from seismic testing. Seismic Testing has been implicated in Penguin deaths in New Zealand (2011).

There has been little research on south coast WA Little Penguins, including the Cheyne and Doubtful Island colonies.

Recent mass deaths of Little Penguin of the West Coast population, have been attributed to starvation resulting from rising sea temperatures thought to be a result of Climate Change (February 28, 2012 Murdoch Uni. media release).

It is also thought that Climate Change is responsible for Little Penguins moving further south, eg: a member of the Penguin Island colony was recently found at Augusta.

Dead tagged penguins from Penguin Island have also been found as far south and east as the Donnelly River.

Therefore, it can be assumed that Cheyne Island, and other south-coast locations, as well as the surrounding and offshore waters, may be of increasing importance for the future survival of the Little Penguin in Western Australia.

Australian Sea Lions and New Zealand Fur seals.

The Australian Sea Lion is listed as a Threatened species under the EPBC Act. There are a number of breeding and haul out sites along the coast immediately adjacent to the Albany Canyons/Bremer Basin area. Australian Sea Lion and NZ Fur Seals are known to feed in the waters of the continental shelf, and there is a high likelihood of adverse impacts to both species by any Seismic Survey, and also any further oil exploration and developments, as well as adverse impacts from large scale commercial fishing.

Significant South Coast Haul out and breeding sites include:

Islands of the Recherche Archipelago;

A number of islands off King George's sound;

Glasse Island, a haul out and breeding site for Australian Sea-lions;

Doubtful Island, a breeding site for both New Zealand Fur Seals and Australian Sea lions;

Bald Island, haul out sites for New Zealand Fur Seal and Australian Sea-lions;

Haul off Rock, west of Cape Riche is an important breeding site for Australian Sea Lion and NZ Fur-seal. (DEC).

Australian Sea Lion.

"Australian Sea-lions feed on a wide variety of prey, including cephalopods, fish, sharks, rock lobsters and sea birds (Gales & Cheal 1992; Ling 1992). Radio transmitter and time-depth recorder studies of Australian Sea-lions at Seal Bay found that nursing females were benthic feeders on the continental shelf approximately 20–30 km offshore, in depths less than 150 m (Costa et al. 1988, 1990). While at sea, females and juveniles dive almost continually through the day and night. Young sea lions (approximately 7–18 months old) have been recorded foraging in depths up to 60 m and range up to 10 km from their birth colony (Fowler & Costa 2004 cited in Campbell 2005). Less is known about males' feeding behaviour, but they are recorded to dive deeper. (Gales 2008)." (Species Profile and Threats Database DSEWPC).

"All breeding colonies of the Australian sea lion are considered significant for the conservation of the species as it is known to have a low reproductive rate and a restricted capacity to form new colonies. Their limited capacity to form new breeding colonies is because females tend to return to the colony where they were born to reproduce". (DEWHA).

Smaller populations are highly vulnerable to extinction especially in the context of loss to fisheries bycatch and the high site fidelity of females (Goldsworthy et al. 2010;.Species Profile and Threats Database DSEWPC).

Studies and anecdotal evidence show that due to the proximity of known significant Sea Lion and NZ Fur seal colonies, it is highly likely that both species will be present in the Albany Canyons/Bremer Basin areas during any oil and gas development and likely to be at risk of hearing damage. Additionally, avoidance and other behavioural changes can potentially have serious negative consequences, particularly for Australian Sea Lions as it is known that female Sea Lions return to their birthplace to breed and do not readily form new colonies.

As DEWHA have clearly stated, all breeding colonies of the Australian Sea Lion are considered significant for the conservation of the species. The marine reserves plan therefore should ensure the conservation of this threatened species by protecting a key south coast habitat- the Albany Canyons/Bremer Basin area.

New Zealand Fur Seals

New Zealand Fur Seals are known to feed in the waters of the continental shelf, feeding on cephalopods, schooling fish etc, and have been observed to breed between late November and January (within the proposed Arcadia seismic test period).

New Zealand fur seals are acknowledged have extremely acute hearing.

"Threats to the species include oil spills, entanglement in rubbish and nets, and competition with people for resources. Hundreds of New Zealand fur seals in the Archipelago of the Recherche had to be rescued and the oil removed from their fur in an operation lasting several weeks after the wreck of the *Sanko Harvest* on 14 February 1991" (Species Profile and Threats Database DSEWPC).

New Zealand Fur Seals are still recovering from being hunted to the brink of extinction 150 years ago.

Leafy Seadragon:

The Leafy Seadragon, which occurs in waters immediately adjacent to the Albany Canyons, is categorised as Near Threatened due to a lack of adequate data. Known risks to Leafy Seadragon include loss of habitat and pollution.

Southern Right Whales.

All of the bays and beaches along the south coast are the breeding places of Southern Right Whales. Marine reserves need to ensure protection from oil development and its many associated threats to the survival of this protected species.

Killer Whales

A significant pod of Orcas (Killer Whales) is associated with the Albany Canyons/Bremer Basin ecosystem. Ample evidence exists and is supported by anecdotes of old timer Bremer Bay tuna fishermen. (See Appendix 1). Through plane and boat trips we have seen them for ourselves in 2014 and 2015.

It is thought that the yellow diatoms present on some of the orca coming to the Bremer Canyons, is an indication some have come up from Antarctica, however much remains unknown about the different groups aggregating annually.

As long-lived animals at the top of the food chain, Orcas are especially vulnerable to bio-accumulation of pollutants such as PCBs and the impacts on reproductive and general health (Lazarus, p.147-9). Marine reserves should aim to protect known Orca feeding and (possible) breeding areas such as the Albany Canyons and Bremer sub-Basin area.

Other Cetaceans

Many species of cetaceans have been recorded and observed along the south coast, including Pilot Whale in great numbers, Grays Beaked Whale, Blue, and Pygmy Blue Whales, and Dolphins.

Cephalopods (Squid, cuttlefish and octopus).

Cephalopods feed in the waters of the continental shelf and are themselves an important food source for many other species. Spanish research into mass deaths of squid, cuttlefish and octopus has shown that the low frequency sound from seismic testing destroys the organs of these keystone species, (Environment and Conservation Organisations of NZ, ECO, 26, Apr, 2011). Studies have demonstrated that Cephalopods are sensitive to low frequency sound vibrations.

In experiments on Fish and Squid, as noise levels were increased, alarm and avoidance behaviours increased.

Cephalopods are a vital component of the diet of Australian Sea Lions, NZ fur seals, Sperm whales and other cetaceans including dolphins, Little Penguins, and many other marine species, all present in the Albany Canyons area.

A number of species of Cephalopods are also recognised as an important, sustainable food source for humans, and some species are considered to be relatively resilient to commercial fishing, when appropriately fished.

Fish species.

Scientific research of fish species exposed to underwater anthropogenic noise, in tests involving a single air gun, showed that the fish were impacted by hearing damage, and alarm responses and avoidance behaviours were observed in both fish and squid as noise levels were increased.

It can be predicted that testing for oil and gas eg 2 and 3D seismic testing will adversely impact many species of fish vital to other marine species, as well as to human fisheries.

Bird Species.

South coastal waters are home to many sea birds including endangered Albatross and Shearwater species and Little Penguin (see above).

The Fitzgerald Biosphere Region and Fitzgerald River National Park.

Immediately on shore of the Albany Canyons/Bremer Basin area is The Fitzgerald Biosphere Region, which includes the Fitzgerald River National Park. This is an internationally renowned region of high endemism and biodiversity. The FRNP attracts International and National tourists to the region, and is an important place for local and regional recreation. Many scientists visit to study its unique values. In addition to the terrestrial flora and fauna, whale watching and the pristine appearance of the coastal waters and landscapes, as well as recreational and therapeutic opportunities, provide an outstanding attraction for tourism. Boat and plane tours to the Bremer Canyon are bringing increased tourism into the local communities.

If the adjacent waters are exposed to oil and gas development, these landscape and other values will be undermined by all the threats and risks of oil development, and the proposed small Bremer reserve will be unable to provide any meaningful habitat or marine species protection or conservation. Its existence in fact will be irrelevant.

It would also compromise or contravene the concept of the UNESCO Biosphere reserves.

Recent Oil Disasters in less treacherous waters.

The “Deepwater Horizon” oil disaster (2010) occurred while drilling an exploratory well in the relatively accessible and usually calm waters of the Gulf of Mexico. This resulted in human deaths and injuries, massive environmental damage, widespread economic and social impacts, all of which continue to this day. In Australian waters, the tragedy of the 2009 Montara oil spill in the Timor Sea, and the impacts resulting from the toxic clean-up operation, have reportedly killed by poisoning more than 25 fishermen. It continues to devastate the fisheries, seaweed farming and coastal communities of West Timor and other parts of Indonesia. Aside from Environmental impacts, damages have been estimated at \$1.7 Billion in lost earnings (ABC radio, July 28th 2012).

Indigenous Significance

Noongars, the Indigenous people of the South West of WA, believe the offshore waters beyond the horizon is the dwelling place of the spirits of the dead. This place is known by various names, including Karakup, and ‘Noitch poodjah piama.’

The local Noongars also believe in various “jannocks” or “channuks” (spirits), some of whom come from the sea.

In general, all marine life has significance to Aboriginal culture.

The Sea and its creatures helped Noongars survive. The Dolphins used to bring the Fish in to the beaches along the Coast for the Noongar Peoples.

The Ancestors of Noongar People were part of the Whaling and Sealing and Fishing crews who worked in these Waters in the past.

The waters, reefs and coastline of Cheyne Bay are immortalised in a Noongar creation story “Norm and Cubine”, recorded by Ethel Hassel circa 1880. There are many other documented stories and oral traditions and histories which identify and emphasise the importance to Noongar culture and spirituality, of the coastline, waters and marine life of the South Coast region.

More than just Museums

The current plan is, in effect, a “museum” type approach, where small areas of a range of habitat and ecosystems are preserved.

How can this offer real protection, when the marine reserves proposal fails to provide protection from serious threats to the health and survival of the oceans’ ecosystems, ie: petroleum exploration and development, and large scale commercial fishing?

Although the proposal contains a small area exempt from oil and gas development offshore of the Naturalist/ Leeuwin area, and another proposed within the Bremer Marine Park, these areas are still far too small, and incidentally are an anomaly in terms of the plan’s stated objectives.

The proposed small “museum” type reserve areas and adjacent coastline and waters of the south coast will be at risk of being polluted and possibly devastated if nothing is done to protect the continental shelf marine environments. Ocean pollution knows no boundaries.

Meaningful Marine Reserves.

Short term social and economic objectives should not take priority over the long term ecological benefits and conservation outcomes of creating meaningful reserves.

If the Albany Canyons and Bremer Basin were included in a marine reserve, potentially environmentally harmful economic activities such as commercial fishing, may prove to be sustainable in identified areas of such a reserve, provided that sufficient research and understanding of the complexity of this marine environment is undertaken.

When local, regional and global factors are taken into consideration, the consequences of what may seem manageable today, may prove disastrous to the social and economic climate of the future. Numerous historical events have shown this to be the case.

Finite fossil fuels

The last 150 years or so of human history have been characterised by an ever -increasing dependence on energy and products resulting from the exploitation of the earth’s finite resources of fossil fuel. Although this has undoubtedly contributed to an increased pace of technological development and human population growth, and has provided many benefits for much of the human race, it is also directly and/or indirectly responsible for most of the serious environmental problems currently being experienced globally.

Although the exact timeframe is unknown, and despite the relatively short history of fossil fuel exploitation, sometime in the not too distant future at current usage rates, the world’s fossil fuel reserves are going to run out.

People throughout the world have already developed and are further developing valuable knowledge, strategies and technologies that are helping resolve aspects of these problems. However, as of today, in

general, the world's leaders have not been able or willing to resource or implement any effective or comprehensive solutions to this fundamental global crisis.

In view of this, further exploration and consequent exploitation of fossil fuel reserves is unwise, unsustainable, and will only add to the existing problems. It cannot be considered in any way to be a solution to what is one of the world's largest problems, and it is hard to see how it will benefit Australia in any way except for short term economic gain, especially in regard to the future.

History has shown, that given sufficient motivation and commitment, it is possible for the governments and citizens of the world to make profound actions and changes, in response to serious imperatives.

Conclusions and recommendations.

- We strongly support the principle of comprehensive, meaningful Commonwealth Marine Reserves.
- On the south coast of WA, the current reserves fail to provide meaningful protection or conservation of important ecosystems in key areas.
- Inadequate protection is provided for the highly significant Albany Canyons/Bremer Basin area. The Bremer Marine Park was already too small therefore it is unacceptable that part of the proposed sanctuary has been designated as IUCN V1 special purpose zone "trawling". The proposed IUCN 11 National Park area of the Bremer Marine Park is far too small and should be expanded, and in addition to its exclusion from Oil and Gas development, pipelines should also be banned. The proposed designated IUCN V1 special purpose zone "trawling" should be re-made IUCN 11, with trawling banned.
- The current marine reserves provide no protection for Sperm Whale in the waters of the continental shelf, which is their habitat.
- There is no habitat protection for the known seasonal population(s) of Orca.
- As DEWHA have clearly stated, *all breeding colonies of the Australian Sea Lion are considered significant for the conservation of the species*. The marine reserves therefore should ensure the conservation of this threatened species by protecting a key south coast habitat- the Albany Canyons/ Bremer Basin area.
- The Little Penguins habitat is not protected, ie: the waters of the continental shelf in the Albany Canyons /Bremer Basin area. it can be assumed that Cheyne Island and its surrounding and offshore waters, may be of increasing importance for the future survival of the Little Penguin in Western Australia.
- The failure of the Marine Reserves to protect the Albany Canyons, offshore of the Fitzgerald Biosphere Region (and including the Fitzgerald River National Park), compromises or contravenes the concept of the UNESCO's Biosphere Reserves.
- The Bremer Reserve will be of little value unless it is significantly extended to encompass the Albany canyons, including the Bremer sub-Basin, and include Sea Lion and NZ Fur seal feeding grounds in offshore waters, the feeding grounds of the south coast Little Penguins, Orca, Sperm Whale and many other marine species' feeding grounds.
- The creation of a new marine reserve that protects the entire Albany Canyons/Bremer Basin Region, is realistically the only way to maximise the effectiveness of ecological protection.
- The marine reserves fail to protect the vast majority of the waters of the south west from the potential, direct impacts resulting from the development of a petroleum industry, and if a petroleum industry is developed, will further contribute to the crisis of global warming.

Please contact us if you would like any further information,

Yours Sincerely

Mark Jeffery and Vivienne Hillyer

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References Include but are not confined to the following:

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Appendix 1, Letter to Tony Burke.

[http://www.google.com.au/search?q=bremer+basin+orca&rls=com.microsoft:en-au&ie=UTF-8&oe=UTF-8&startIndex=&startPage=1&redir_esc=&ei=0SDjT6f4KsiziQfXu5iMDw](http://www.google.com.au/url?sa=t&rct=j&q=bremer+basin+orca&source=web&cd=1&ved=0CFEQjAA&url=http%3A%2F%2Fwww.environment.gov.au%2Fcoasts%2Fmbp%2Fsouth-west%2Fconsultation%2Fsubmissions%2Fpubs%2F0098blueofficeproductions.docx&ei=HCPjT6XhI4yXiAfvwbSqCg&usg=AFQjCNGN7d-Xi0RWAE3LAqCeZmakESfTDA)

Dear Minister Burke,

For the past 6 years I have been part of a joint CSIRO/Japanese study on bluefin tuna which has seen me spend 3-4 weeks at sea each year between Albany and Esperance in the months of January and February.

During this time we cover a minimum of 650 nautical miles, towing 8 lures and two towed underwater video cameras.

Each year 90% of the survey varies but one transect remains the same. A line from Bremer bay out into the Bremer sub-basin.

Each year we encounter a 30 strong pod of killer whales which are feeding actively on both baitfish and sperm whale calves.

With our towed camera system, we have identified an enormous congregation of commercially important dusky whaler sharks swimming in amongst the killer whale pod.

The area is of major interest to the oil and gas industry (Enovation Resources) who will be conducting a 3d seismic survey in 2012 and sinking a well in 2013.

Our group (Marine Information and Research Group .. MIRG) is not necessarily opposed to the oil and gas industry but we are concerned the upcoming high power seismic work will be devastating to what we believe is a seasonal pulse of water column life.

Unbelievably, the area falls outside of the Federal marine sanctuary zone. A substantial hydro-carbon "seep" has been located in the Bremer sub-basin through a 2d seismic survey conducted in late 2009-2010.

The seep indicates the presence of a large deposit of oil and gas.

Cold water seeps are sometimes recognized as being areas of high productivity .. as is the case with the Bremer Sub-basin. The right bathymetrical conditions and an upwelling of cold nutrient rich waters combine to form the basis of the seasonal water column eco-system.

Intensive research is desperately needed in the Bremer canyon so we can fully understand the dynamic of this amazing ecosystem and also provide valuable information to future oil and gas explorers.

Sincerely

Dave Riggs

Please count this as a submission to the South West bioregional marine plan