

Coastal and Marine Resource Condition Monitoring – Scoping Project

Final NRM Report – Project 073007

**Part 1 – Knowledge review and gap analysis:
Resource condition monitoring in the Pilbara
and Kimberley regions of Western Australia**

Brett A Human and Justin I McDonald



**Government of Western Australia
Department of Fisheries**

Correct citation:

Human, B. A. and McDonald, J. I. 2009. Knowledge review and gap analysis: Resource condition monitoring in the Pilbara and Kimberley regions of Western Australia. Coastal and Marine Resource Condition Monitoring - Scoping Project. Final NRM Report, Project 073007 - Part 1. Department of Fisheries, Government of Western Australia. 192pp.

Enquiries:

WA Fisheries and Marine Research Laboratories, PO Box 20, North Beach, WA 6920

Tel: +61 8 9203 0111

Email: library@fish.wa.gov.au

Website: www.fish.wa.gov.au

ABN: 55 689 794 771

A complete list of Fisheries Research Reports is available online at **www.fish.wa.gov.au**

This work is copyright. Except as permitted under the Copyright Act 1968, no part of this publication may be reproduced by any process, electronic or otherwise, without specific written permission of the copyright owners. Neither may information be stored electronically in any form whatsoever without such permission.

The Fisheries Research and Development Corporation plans, invests in, and manages fisheries research and development throughout Australia. It is a federal statutory authority jointly funded by the Australian Government and the fishing industry.

Cover image: Cable Beach, Broome. Photo: Brett Human.

© Department of Fisheries, Western Australia. December 2009.

ISSN: 1035 - 4549 ISBN: 1 921258 74 8

Contents

Abbreviations	1
Executive summary.....	2
Key findings	3
Project aims and background	4
This document.....	4
Literature search limitations.....	4
1.0 Introduction	5
2.0 Knowledge review.....	6
2.1 The target regions – what we currently know	7
2.1.1 The Pilbara region.....	7
2.2 The Kimberley region.....	9
2.2.1 The Kimberley and environment.....	9
3.0 Research knowledge review.....	12
3.1 Marine water and sediment quality	12
3.1.1 The Pilbara region.....	12
3.1.2 The Kimberley region.....	13
3.2 Marine primary production.....	13
3.2.1 The Pilbara region.....	13
3.2.2 The Kimberley region.....	13
3.3 Marine vegetation communities	14
3.3.1 Mangroves.....	14
3.3.2 Seagrass meadows and algal beds	14
3.3.3 The Pilbara region.....	14
3.3.4 The Kimberley region.....	15
3.4 Marine invertebrate communities.....	15
3.4.1 The Pilbara region.....	15
3.4.2 The Kimberley region.....	17
3.5 Marine fish species	18
3.5.1 The Pilbara region.....	19
3.5.2 The Kimberley region.....	20
3.6 Marine reptile species.....	21
3.6.1 The Pilbara region.....	21
3.6.2 The Kimberley region.....	21
3.7 Marine mammal species	22
3.7.1 The Pilbara region.....	22
3.7.2 The Kimberley region.....	22
3.8 Analysis and implications of the research knowledge review	23

3.9	Gap analysis.....	24
3.10	Identified major knowledge gaps	24
3.11	Overview of the knowledge gaps	25
3.12	Gap analysis workshops	29
3.12.1	Stakeholder consultation.....	29
3.12.2	Comments and questions from stakeholders	34
3.12.3	Voting process.....	35
3.12.4	Principle vote	35
3.12.5	Survey	39
3.12.6	Stakeholder priority areas for research.....	41
4.0	Monitoring knowledge review.....	42
4.1	Who.....	42
4.2	Quality	43
4.3	When.....	46
4.4	Where.....	46
4.5	What.....	46
5.0	Conclusions	48
6.0	Recommendations	49
7.0	Acknowledgements.....	50
8.0	Reference.....	51
8.1	Literature cited in the research review	51
8.2	Literature cited in the monitoring review.....	54
8.3	Miscellaneous MEST records for the Pilbara and Kimberley regions (with no further details).....	63
8.4	Supporting references for the Pilbara and Kimberley regions.....	66
9.0	Appendices	141

Figures

Figure 1. The Pilbara coastal region as defined in the current review, from 114°50'E to 120°E. This map does not show the terrestrial political boundaries of the Pilbara region..... 7

Figure 2. The Kimberley coastal region as defined in the current review, from 120°E to 129°E (WA/NT border). This map does not show the terrestrial political boundaries of the Kimberley region. 10

Figure 3. Proportion of available literature for each of the study regions. A total of 248 references were available for the review. 23

Figure 4. Research group bias, in terms of number of accessible research articles relevant to the marine and coastal environments, of the Pilbara and Kimberley regions (n = 248). It is important to note that this graph does not represent research effort by the various research groups, rather research published and accessible.....	24
Figure 5. Graphical representation of known research to date sorted by category for Pilbara (115 accessible relevant studies) and Kimberley (133 accessible relevant studies) regions.....	26
Figure 6. Categorisation of the 45 knowledge gaps identified from the accessible literature relevant to the marine and coastal environments of the Pilbara and Kimberley regions.....	27
Figure 7. The span of the knowledge gaps across all of the categories for both of the regions. Many of the knowledge gaps spanned multiple categories for both regions. The legend identifies the theme of the gap impacting on the category. See Table 1 for abbreviations.....	28
Figure 8. Example of principle voting using stickers. Votes for gaps 21 to 30 only are shown here. The forms were identical for each of the workshops albeit for date and location.....	37
Figure 9. Results of the principle vote from the various stakeholder workshops.....	39
Figure 10. The percentage breakdown of the monitoring literature that was examined in this knowledge review. A total of 179 resource condition monitoring documents were examined.....	42
Figure 11. Percentage of monitoring literature examined in this review falling into the various quality ratings defined in Table 5.	45
Figure 12. Comparison of the proportion of different quality ratings between different resource condition monitoring proponents in the Pilbara and Kimberley.....	45
Figure 13. Decadal periods in which the accessible literature records conducted surveys in the Pilbara and Kimberley region. Some of the literature records span multiple decades therefore are counted multiple times.	46
Figure 14. The region in which the monitoring literature has focused.	47
Figure 15. The number of literature records monitoring various marine categories.....	47
Figure 16. Photographs of the Kununurra workshop held at the Kununurra Country Club Plaza Resort on Monday 4 th May, 2009.	145
Figure 17. Photographs of the Broome workshop held at the Mercure Inn, Broome on Wednesday 6 th May, 2009.....	147
Figure 18. Photographs of the Karratha workshop held at the Tambrey Centre, Karratha on Friday 8 th May, 2009.....	149

Tables

Table 1. Impact of each gap on the Pilbara and Kimberley regions and which category they impact upon (see text for details). Abbreviations: P - Pilbara general; PW -Pilbara marine water and sediment quality; PP - Pilbara primary production; PV - Pilbara marine vegetation; PI - Pilbara marine invertebrate communities; PF - Pilbara marine fish species; PR - Pilbara marine reptile species; PM - Pilbara marine mammal species; K - Kimberley general; KW - Kimberley marine water and sediment quality; KP - Kimberley primary production; KV - Kimberley marine vegetation; KI - Kimberley marine invertebrate communities; KF - Kimberley marine fish species; KR - Kimberley marine reptile species; KM - Kimberley marine mammal species.	28
Table 2. Rewording of the knowledge gaps to identify the key message of the knowledge gap for stakeholders, the majority of whom did not have a technical or scientific background. The first column indicates the theme the knowledge gap was classified into, the second column is the knowledge gap number, and the third column is the reworded knowledge gap. The original wording of the knowledge gaps, and the corresponding knowledge gap number, are found in the “Identified major knowledge gaps” section above. * Gap #36 was addressed after the workshops had been conducted.....	30
Table 3. Excerpt from the Broome survey form that was completed by the stakeholders during the course of the presentation and discussion of the knowledge gaps. The forms were identical for each of the workshops albeit for date and location.	36
Table 4. Results of the survey from the various stakeholder workshops.....	40
Table 5. The quality ratings and criteria used to assign ratings to the monitoring literature examined in the knowledge review.....	44

Abbreviations

AIMS - Australian Institute of Marine Science
BRD - bycatch reduction device
CALM - Department of Conservation and Land Management, Government of Western Australia (currently DEC)
CPUE - catch per unit effort
CSIRO - Commonwealth Scientific and Industry Research Organisation
DEC - Department of Environment and Conservation, Government of Western Australia
DEWHA - Department for the Environment, Water, Heritage and the Arts
DoE - Department of Environment, Government of Western Australia (currently DEC)
DoF - WA Department of Fisheries
ECU - Edith Cowen Univeristy
EPA - Environmental Protection Authority
FAO - Food and Agriculture Organisation
FRDC - Fisheries Research and Development Corporation
FRM Act - Fish Resources Management Act 1994
GDP - gross domestic product
ha - hectares
JCU - James Cook University
KLC - Kimberley Land Council
LNG - liquid natural gas
MEST - BlueNet Metadata Entry & Search Tool (MEST) version 1.1
MPRA - Marine Parks and Reserves Authority
MPRSWG - Marine Parks and Reserves Working Group
NDT - northern development taskforce
NRM - natural resource management
NT - Northern Territory
NWMRI - North West Marine Research Inventory
NWSJEMS - North West Shelf Joint Environmental Management Study
RCM - resource condition monitoring
RNE - Register of the National Estate, Australian Heritage Commission
t - tonnes
UQ - University of Queensland
UWA - University of Western Australia
WA - Western Australia
WAM - Western Australian Museum
WAMSI - Western Australian Marine Science Institute
WC Act - wildlife conservation act 1950

Executive summary

This report details extensive literature searches for both research and monitoring programs that have been undertaken in the marine and coastal environments of the Pilbara and Kimberley region of northern Western Australia. The Pilbara and Kimberley region is remote and difficult to access, resulting in very little monitoring effort of the marine and coastal environments in that region.

We currently know very little of the condition of marine and coastal natural resources in the Pilbara and Kimberley, and the purpose of the current literature review is to identify knowledge gaps for the region to prioritise areas for future research. Compounding our lack of knowledge on the state of the natural resource condition, is the burgeoning industrial developments that continue apace, including mineral, oil, and natural gas mining. Some of the largest industrial facilities in Australia are to be found in coastal and marine environments of the Pilbara and Kimberley.

The knowledge review examined the available literature for the region relating to marine and coastal research and monitoring. The project required that knowledge gaps be identified from the categories - general marine*, marine water and sediment quality, marine primary production, marine vegetation communities*, marine invertebrate communities, marine fish species, marine reptile species, and marine mammal species. A discussion of each of these categories, for both the Pilbara and Kimberley regions highlights where research has previously occurred, our state of knowledge, and issues that currently exist.

This literature review uncovered a paucity in monitoring literature for the Pilbara and Kimberley region compared to other marine and coastal regions in Australia. A significant finding in both the research and monitoring literature reviews was the lack of accessibility to the majority of literature in this field. This results from the majority of the research, and most notably, monitoring studies, being carried out by private enterprises, such as industry and consultancies, and these reports not being publicly available. The private sector argues that their studies are publicly available through Environmental Protection Authority (EPA) reports, however, these reports merely summarise the studies with no further details.

From the monitoring literature that was accessible for this study, it was apparent that most monitoring studies were in fact initial surveys or taxonomic surveys. Less than one third of the accessible monitoring literature actually met the requirements of a monitoring study (repeated surveys of established survey sites using a uniform sampling methodology over time), and of these, most only rated fair out of a quality rating system that utilised the categories - excellent, very good, fair, poor, initial survey, taxonomic survey, or inaccessible. From the accessible monitoring literature, most of the monitoring effort has focussed on marine vegetation communities, notably mangroves, and to lesser extents, marine invertebrate communities, and marine fish species.

A total of 46 knowledge gaps were originally identified from the literature review, however, through the course of this project, one of these gaps was addressed. These knowledge gaps were either referred to in the literature, or were inferred by their absence from the literature. The knowledge gaps varied from being highly specific, such as those referring to a particular species, to more general knowledge gaps, such as those referring to large scale oceanographic features. Many of the knowledge gaps also impacted across multiple categories mentioned above, as well as across the Pilbara and Kimberley. The knowledge gaps were categorised into the following themes

* Those categories highlighted with an asterisk are additional to those cited in the project proposal and were added to address the literature focus more thoroughly.

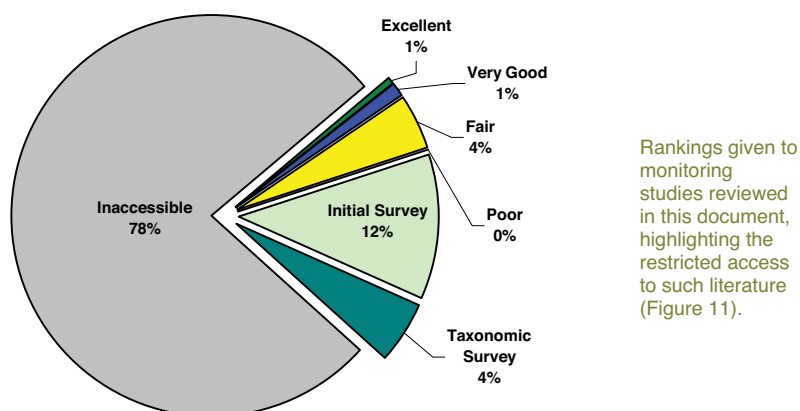
- Endangered/Threatened Habitats, Endangered/Threatened Species, Biodiversity, Ecological/Oceanographic, and Fisheries/Aquaculture. The most number of identified knowledge gaps impacting on a particular region and category was that for marine fish species of the Kimberley.

These knowledge gaps were presented to stakeholders in the form of workshops conducted in Kununurra, Broome and Karratha. The aim of the workshops was to have the stakeholders prioritise the knowledge gaps for future research in the region. It was encouraging that all three stakeholder workshops voted for large-scale knowledge gaps, in two instances voting the same knowledge gap as highest priority, and that they mostly related to those classified as oceanographic and ecological knowledge gaps. The stakeholders were also concerned about fisheries and aquaculture related knowledge gaps.

Kimberley stakeholders identified the need for having a long-term biological time series for the inshore environment of the Kimberley as their highest research priority. Pilbara stakeholders are concerned that no long term management is in place to monitor resource condition in the marine environment. The stakeholder workshops also highlight the concerns of the stakeholders with regards to the knowledge gaps relating to large scale oceanographic features, including oceanic currents and primary production, and how these processes impact on the marine and coastal environments of the region. It is also apparent that there is concern over the rapid increase in recreational fishing in the region. There is concern not only for the impact that the fishers are having on local fish stocks, but also the damage caused by the fishers to coastal habitats when accessing fishing locations. Also apparent is the concern stakeholders have with regards to the potential impacts of climate change and/or environmental degradation to commercial fishing stocks.

Key findings

- The relative amount of research and monitoring effort that has been invested in the marine and coastal environments of the Pilbara and Kimberley region is low compared to elsewhere in Australia.
- Literature relating to research and monitoring of the marine and coastal environments of the Pilbara and Kimberley are largely inaccessible because they have been conducted by private enterprises.



- There is a need for long-term resource condition monitoring of the marine and coastal environments of the Pilbara and Kimberley.
- There was general agreement across stakeholder groups, including government agencies and the general public, that long term resource condition monitoring of the marine and coastal environments of the Pilbara and Kimberley is a high priority.

- There is a paucity of baseline data for resource condition monitoring of the marine and coastal environments of the Pilbara and Kimberley.
- Large knowledge gaps exist both in terms of research and monitoring in the marine and coastal environments of the Pilbara and Kimberley.

Project aims and background

A large coastal and marine resource condition monitoring (RCM) project was developed for the Pilbara and Kimberley regions. Unfortunately this larger project did not eventuate. However to continue with developing our understanding of RCM in this region a smaller scoping study was developed.

This scoping study has three primary aims:

1. Knowledge review and gap analysis - undertake a desktop study of the current coastal and marine resource condition monitoring.
2. Undertake a short field program to inform the development of monitoring protocols in two intertidal environments.
3. Develop a Strategic Framework with recommendations and a suggested approach to inform and guide a future Coastal and Marine RCM Program for the Pilbara and Kimberley Regions.

This document addresses the first aim of the project, thoroughly reviewing research and monitoring literature for the marine and coastal environments of the Pilbara and Kimberley region.

A final report is due to be submitted on the 31st of December 2009 that will incorporate the results of the pilot field program and resource condition indicator development, as well as provide the strategic framework for monitoring in the Pilbara and the Kimberley.

The strategic framework will inform and guide the development of a future surveillance level coastal and marine RCM program for the Pilbara and Kimberley regions of Western Australia

This document

This document seeks to provide a review of our current state of knowledge pertaining to what is currently known about the marine and coastal resources of the Pilbara and Kimberley regions. It then identifies gaps in the literature and incorporates discussion between relevant monitoring and regulatory agencies, stakeholders and presents future research recommendations in the form of a gap analysis.

Literature search limitations

Reference material was compiled from many sources. It is acknowledged upfront that there are limitations with any review in that it can only discuss accessible material. Many studies were unavailable, particularly those contracted by mining companies. As such this report compiles the key findings from the existing accessible literature concerning resource condition monitoring in the Pilbara and Kimberley regions of Western Australia.

1.0 Introduction

Habitat loss and its effects on biodiversity are a growing global concern. Loss of habitat is a major cause of the decline of coastal species. Changes in distribution, such as range extensions or reductions, are also of interest, especially during times of climate change, as they may be indicators of significant ecological changes underway. Some of the existing, imminent, and proposed threats to marine habitat integrity in these areas are in close proximity or adjacent to existing and proposed marine conservation reserves, created to conserve important ecological and social values. If pressures or threats are left unchecked, serious damage or irreversible loss is likely to occur. However, we currently know little about the characteristics of key habitats or how they might respond to any stressors. State-wide, there is a significant lack of monitoring at unimpacted reference sites and a great need for this type of monitoring to gauge natural variability, inform target setting, and differentiate between the effects of human and natural influences. The need for this critical baseline information is growing daily.

The West Australian coastal and marine environment is a vast area with 20,800km of coastline, including islands (Trewin, 2006) and spans both tropical and temperate climates. With the exception of Ningaloo Marine Park, we know almost nothing of the condition of the marine resources of the arid-tropical Pilbara and Kimberley regions, yet the high marine biodiversity and recreational values of these areas are recognised at a national and international level.

The Pilbara is of great strategic and economic importance for the State and Commonwealth. The area supports a wealth of offshore oil and gas resources, for example, the recently approved Gorgon project will target a gas reserve of 40 trillion cubic feet, and is expected to boost Australia's gross domestic product (GDP) by AU\$64.3 billion (<http://www.gorgon.com.au>). The Pilbara has the country's largest export ports, some of which are currently expanding or have proposals to expand. There are also a number of new large-scale LNG and industrial activities proposed throughout the region, most of which will rely on large marine infrastructure to facilitate export. The region also has great tourism potential. It is also an area that supports some of the country's most unique and highly biodiverse marine habitats (e.g. nearshore coral reefs develop due to the limited run-off from the land, and arid-zone tropical mangrove communities are also present) (CALM, 2005; DoE, 2006; NWSJEMS, 2007; DEWHA, 2008; and Wood & Mills, 2008).

The Kimberley is one of the most remote and uninhabited stretches of the Australian coastline. Apart from a few indigenous communities, the only coastal settlements are the small ports of Derby and Wyndham. Despite this remoteness, the remarkable natural beauty of the coastal environment means that commercial tourism operations are already well established, and major development applications by oil and gas industries are currently being planned. Assessment of the potential impact of all of these activities is hampered by the paucity of baseline environmental data for any of the marine communities in the Kimberley. What little is known of these habitats indicates that they tend to be locally very complex and diverse, and frequently not found elsewhere in Western Australia (NWSJEMS, 2007; DEC, 2008; DEWHA, 2008; Fry *et al.*, 2008; NDT, 2008a,b; and Wood & Mil

This document seeks to provide the critical first step for any future marine resource condition monitoring program by identifying our current state of knowledge for the Pilbara and Kimberley regions.

2.0 Knowledge review

The knowledge review is divided into two sections:

The first section reviews our state of knowledge for marine and coastal environments of the Pilbara and Kimberley in terms of research. It was possible to conduct a more thorough knowledge review of research for these regions due to the greater accessibility of research related literature, compared to monitoring related literature, much of which is withheld in the private sector.

The nature of this document is such that it probably will not be read from cover to cover, and that it will be used as a quick reference source for specific details or references for a particular region and/or category. With this in mind, there is duplication found in the following text because many of the issues for a particular category impact both on the Pilbara and the Kimberley. These duplications were included in the text to avoid the need to bounce through the manuscript in order to find the required information.

The second section includes a knowledge review of monitoring programs that have been conducted for the marine and coastal environments of the Pilbara and Kimberley. It was not possible to conduct as thorough review as was possible with the research literature because the majority of the literature relating to monitoring is inaccessible.

The following review has been structured according to the categories below as outlined in the project proposal:

General marine* - this category covers oceanographic, meteorological, and other disciplines not covered by the remaining categories that are relevant to the marine environment;

Marine water and sediment quality - the physical and chemical properties of the water column and sediment;

Marine primary production - oceanic primary production based on planktonic productivity;

Marine vegetation communities* - this category addresses the broader ecological processes of more complex vegetation communities such as seagrass meadows and mangroves, processes that are distinguishable from primary production alone;

Marine invertebrate communities - this category is mostly concerned with more complex communities such as coral reefs and sponge gardens, but also incorporates individual invertebrate species of commercial importance;

Marine fish species - covers fish species that are commercially important and/or have a recognised or potential conservation issue associated with them;

Marine reptile species - all species of turtles, sea snakes and crocodiles are protected and included within this category, this category also includes turtle nesting sites; and

Marine mammal species - all species of whales, dolphins, and the dugong, are protected and included within this category.

* Those categories highlighted with an asterisk are additional to those cited in the project proposal and were added to address the literature focus more thoroughly.

2.1 The target regions – what we currently know

2.1.1 The Pilbara region

The Pilbara and environment

For the purposes of this review, the definition of the Pilbara region follows that of the Department of Industry and Resources (2005a), and Department of Fisheries (2004, 2005), with the southern border of the Pilbara coast located at 114°50'E (just west of Onslow and excludes the Gulf of Exmouth) and the northern border at 120°E (the southern end of Eighty Mile Beach) (Fig. 1). This is a political boundary and is comprised of the northern most section of the Gascoyne Coast bioregion and the southern half of the North Coast bioregion, as defined in Fletcher & Santoro (2007, 2008). It also coincides with the southern part of the federal governments Northwest Shelf Province (DEWHA, 2008).

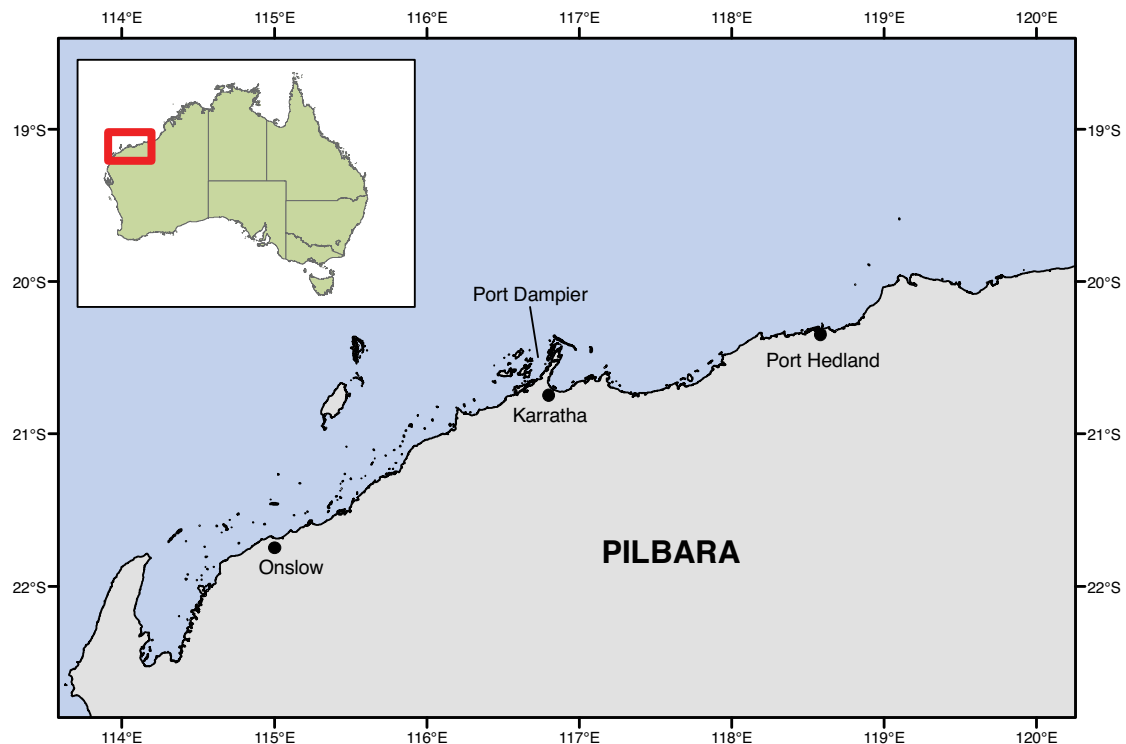


Figure 1. The Pilbara coastal region as defined in the current review, from 114°50'E to 120°E. This map does not show the terrestrial political boundaries of the Pilbara region.

The Pilbara region is unique within Australia in that it is the only marine environment adjacent to an arid tropical terrestrial environment. The flora and fauna of the Pilbara contribute to an Indo-Pacific assemblage of organisms, however, the amount of genetic input from Indonesia on WA marine communities is poorly known due to a lack of understanding of major oceanographic features off the Pilbara (Wood & Mills, 2008). Even though the majority of flora and fauna is widely distributed, there are also many endemic species (DoE, 2006). A compilation of habitat maps, and the classification of biogeomorphic units, for the Pilbara marine and coastal environments was provided by Lyne *et al.* (2006).

In particular, the Dampier Archipelago contains the greatest documented biodiversity in Western Australia, across all groups of fauna and flora, the Glomar Shoals (Dampier Archipelago) have been identified as a key ecological feature, and many coastal sites, islands, and reefs, have

been identified as important areas for breeding, feeding, or resting by threatened or migratory species in the Pilbara (DEWHA, 2008). A proposal to create the Dampier Archipelago Marine Park and Cape Preston Marine Management Area was lodged in 2005 (CALM).

Databases and previous research

The compilation of a metadatabase of research undertaken along the Western Australian coastline from Kalbarri (Gascoyne coast) to the NT border (the North West Marine Research Inventory – NWMRI) highlighted that the Pilbara coast was generally poorly researched (Skewes *et al.*, 2008). That report contains a series of detailed maps plotting marine research effort in the area. MarLIN is a metadatabase hosted by CSIRO, which contains metadata pertaining to habitat types, habitat uses by various species (eg. turtle nesting sites), various floral and faunal surveys, and infrastructure maps (Brodie *et al.*, 2006).

Threats

There are a number of immediate threats from a variety of sources that could impact the Pilbara adversely. For example, industrial expansion is planned for Cape Lambert, near Karratha, and Cape Preston, south of Dampier, which will require dredging (Fletcher & Santoro, 2007), and could lower the water and sediment quality, as well as increase the risk of exotic pest introduction, to those areas. In 2005/06, a large but unspecified number of illegal foreign fishing vessels entered WA waters, including those waters off the Pilbara and Kimberley. These vessels variously target shark fin, beche de mer, trochus shells, and are a major threat to the region. They also have a high potential of introducing and spreading exotic pest species (Fletcher & Santoro, 2007; and Wood & Mills, 2008).

Threats to the Pilbara are not restricted to industrial or commercial activities alone. Boat ownership in the Pilbara region is the highest per capita in Australia (CALM, 2005). Recreational fishing is the primary tourist activity. Currently there are over 650,000 tourists per year in the Pilbara and Kimberley, and the industry is expected to increase by 5-7% per annum through to 2012 (Fletcher & Santoro, 2007). Fishing pressure was estimated to be 201,000 recreational fishing days per year in the Pilbara in 1999/2000, which is expected to increase to an estimated 14 million fishing days per year for the Pilbara and Kimberley by 2012 (DoF, 2004; Williamson *et al.*, 2006). A distribution of recreational fishing pressure was given in Fulton *et al.* (2006).

Current management plans

Fulton *et al.* (2006) presented a management plan for the Pilbara using a multi-parameter ecosystem based model with parameters such as water circulation, primary production, benthic habitats, iconic species (ie. turtles and sharks), fishes and fisheries, and pollution. A number of scenarios were generated based on possible management decisions, and were assessed based on environmental, ecological, fisheries, economic, and social indicators. Compared to temperate communities, there is far less known about tropical marine community health indicators, and current information is insufficient to set marine resource condition targets (Wood & Mills, 2008).

A multi-facet management study of the North West Shelf, corresponding approximately to what has been defined as the Pilbara region in this report, was conducted by the North West Joint Environmental Management Study (NWSJEMS) and resulted in eighteen technical reports (NWSJEMS, 2007; <http://www.marine.csiro.au/nwsjems>). These reports covered topics including reviews of the marine management, legislation, and previous research of the region; data, data access, and databases; oceanographic and ecological modelling; a review of

commercial fishery production; benthic habitats and ecosystem characterisation; pollution; and management strategies and models.

Coastal and marine sites of the Pilbara region have been recommended for listing as marine parks and conservation areas by the Marine Parks and Reserves Selection Working Group (MPRSWG, 1994). This comprehensive document proposed areas from around the entire Western Australian coast as marine parks and reserves. The Montebello Islands and Barrow Island are the only marine reserve areas in the Pilbara region, and have a ten year management plan in place, current until 2017 (DEC & MPRA, 2007a). For several years, the Dampier Archipelago and Cape Preston areas have been proposed as marine parks, although they are yet to be recognised as such. An indicative management plan has been developed for immediate implementation for these areas if they are accepted as marine parks (CALM, 2005).

2.2 The Kimberley region

2.2.1 The Kimberley and environment

For the purposes of this review, the definition of the Kimberley coast follows that of the Department of Industry and Resources (2005b) and Nowara & Newman (2001), with the southern border of the Kimberley coast located at 120°E (the southern end of Eighty Mile Beach) and the northern border at 129°E (the Western Australia - Northern Territory Border) (Fig. 2). This is a political boundary and is approximately comprised of the northern half of the Northern Coast bioregion, as defined in Fletcher & Santoro (2007, 2008). It also coincides with the northern part of the Northwest Shelf Province, and the western part of the Northwest Shelf Transition defined by the federal government (DEWHA, 2008).

Compared to other large marine ecosystems, the Kimberley is thought to have retained its ecological integrity due to limited anthropogenic influences and is seeking national heritage listing. However, the species composition of the flora and fauna of the shallow coastal zone of the Kimberley is poorly surveyed, and the amount of genetic input from Indonesia on WA marine communities is poorly known due to a lack of understanding of major oceanographic features off the Kimberley. Long-term biological time series data are virtually non-existent, particularly for inshore environments (Wood & Mills, 2008).

Waters around Quandong Point (north of Broome), and a number of offshore reefs, shoals, and islands, have been identified as key ecological features, and many coastal sites, islands, and reefs, have been identified as important areas for breeding, feeding, or resting by threatened or migratory species in the Kimberley. Adele Island, which lies approximately 50km north of the Buccaneer Archipelago, is an important nesting site for a number of sea birds including brown boobies, lesser frigate birds, red-footed boobies, masked boobies, and lesser crested terns (DEWHA, 2008).

Databases and previous research

Comparatively little research has been conducted on the marine science of the Kimberley region. A recent WAMSI report (Wood & Mills, 2008) highlighted this fact by stating, “Urgent and immediate investment in research is needed to understand the ocean environment, its considerable and under-exploited biodiversity and to gain a regional knowledge context of ecosystem processes and how they interface with cyclones, climate change, catchment and coastal land-sea processes”. Compared to temperate communities, there is far less known about tropical marine community health indicators, and current information is insufficient to set

marine resource condition targets. Wood & Mills (2008) concluded with three environmental priorities for the Kimberley region, these were 1) conservation of biodiversity, 2) maintenance of ecosystem integrity and, 3) protection of natural heritage.

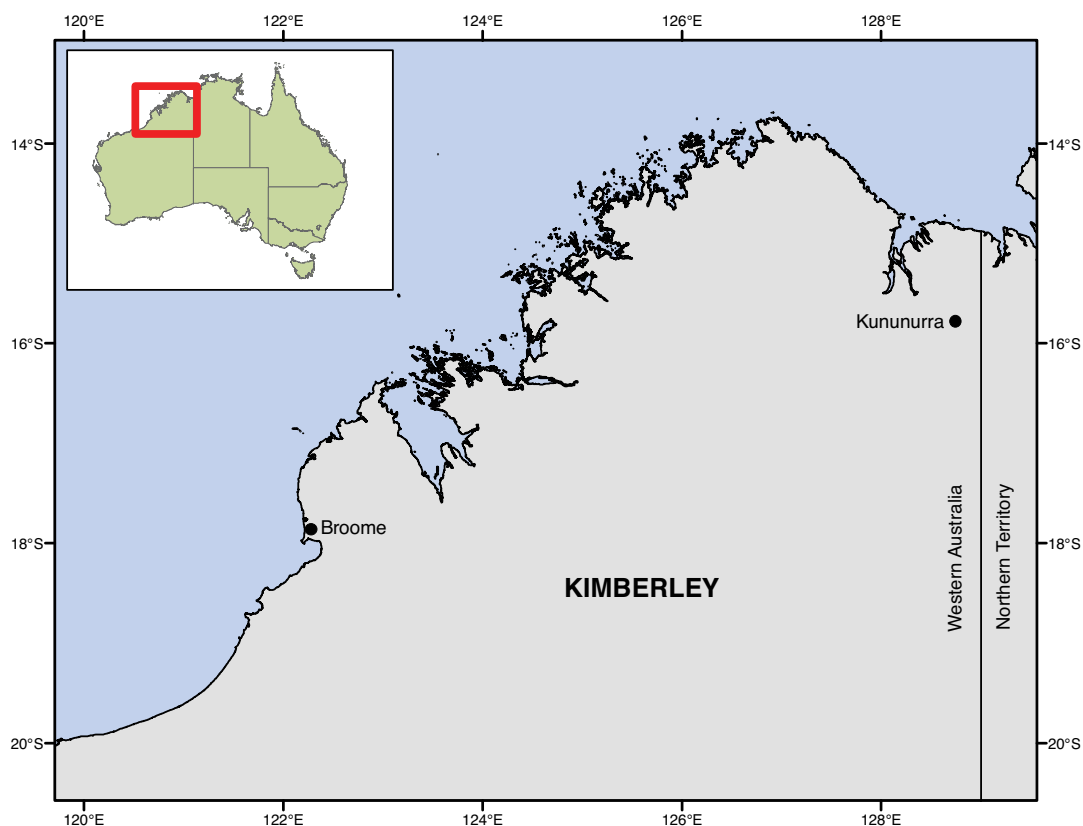


Figure 2. The Kimberley coastal region as defined in the current review, from 120°E to 129°E (WA/ NT border). This map does not show the terrestrial political boundaries of the Kimberley region.

The compilation of a metadatabase of research undertaken along the Western Australian coastline from Kalbarri to the NT border (the North West Marine Research Inventory – NWMRI) highlighted that the Kimberley coast was generally poorly researched and that the extreme north coast was almost completely devoid of data (Skewes *et al.*, 2008). That report contains a series of detailed maps plotting marine research effort in the area. MarLIN is a metadatabase hosted by CSIRO, which contains metadata pertaining to habitat types, habitat uses by various species (eg. turtle nesting sites), various floral and faunal surveys, and infrastructure maps (Brodie *et al.*, 2006).

Recently, surveys to map habitat types in the Kimberley have occurred in response to the proposed development of a natural gas plant for the Browse Basin deposit at various sites (NDT, 2008a,b). DEC (2008) prepared a provisional benthic habitat map for the Anjo Peninsula, approx. 30km west of Cape Londonderry; and Fry *et al.* (2008) and Wilson (2008) independently surveyed Gourdon Bay, Perpendicular Head, and Packer Island, with Fry *et al.* also surveying between Quondong Point and Coulomb Point, located between Broome and Cape Leveque. Environmental attributes of the proposed sites, of which there were eleven, are summarised in the most recent NDT report (2008b).

Threats

The Kimberley is currently being targeted for the development of a natural gas plant for the Browse Basin deposit (NDT, 2008a,b). This development has been identified as having the potential to impact on the existing biodiversity of the region, as well as the role the region plays in supporting the recovery of the humpback whale, which uses the coast and bays of the Kimberley for resting and nursery grounds, among others (DEWHA, 2008; and NDT 2008b). In addition, the infrastructure developed to support the gas hub will lead to increased accessibility to recreational fishers, leading to increased traffic, increased pressure on fish stocks, and a larger ecological footprint.

Aquaculture development is expected to grow rapidly in this region, with significant expansion and development of seacage fish aquaculture. This type of aquaculture can lead to eutrophication and potential escapes of cultured species, which could impact on local genetic stocks (Wood & Mills, 2008). Pearling is a largely benign threat, but is one of the few inshore activities of any scale, with pearling leases covering approx. 186 sq nautical miles (J. Froud, pers. comm.). The Kimberley suffers from the same illegal fishing problems, and recreational fishing pressure as the Pilbara region, mentioned previously.

Current management plans

Two principle documents outline the management needs for the Kimberley. Wood & Mills (2008), under the auspices of WAMSI, provided prioritised recommendations for research and resource management needs, to lay the foundations for a scientifically based management plan for the Kimberley. The key values of the Kimberley marine environment were detailed by DEC (2009), and this document also outlined the management issues concerned, highlighting the need to protect the biodiversity of the region, and monitoring of development proposals.

A more generalised document outlining management needs was provided by DEWHA (2008). All of these reports highlighted the lack, and need for, baseline data for long-term systematic monitoring, however, these documents are not as detailed as the management plans that have been submitted for the Pilbara, and a multi-facet management model is needed for the Kimberley region.

The MPRSWG proposed many marine and coastal areas in the Kimberley region as marine parks and reserves (MPRSWG, 1994). However, the only operational management plan and only marine park in the Kimberley marine and coastal region, is a ten year management plan for the Rowley Shoals Marine Park (DEC & MPRA, 2007b). The Rowley Shoals is a remote coral atoll complex located approximately 300km off of Broome, and the marine park encompasses an area of 21,912ha.

3.0 Research knowledge review

3.1 Marine water and sediment quality

3.1.1 The Pilbara region

Coastal waters of the Pilbara are turbid due to a combination of high tidal ranges and terrestrial runoff from rainwater, peaking during summer months. Cyclones are a prevalent meteorological feature during summer that adds to the turbidity (DEWHA, 2008).

The Pilbara region has some of Australia's largest ports, by area and by volume of vessel traffic (McDonald, 2008). In 2006-07 Dampier received approx. 3400 vessels, which is double the number of vessels that Fremantle port received in the same period, with Port Hedland receiving a quarter of the vessels of Dampier (McDonald, 2008). In 2003 the DoE and CSIRO undertook baseline water quality surveys in and around the Dampier Archipelago and Port Hedland, determined that the dissolved concentrations of a range of heavy metals (e.g. cadmium, copper, and mercury) and organic chemicals (e.g. petroleum hydrocarbons) in coastal waters were generally of very high quality with little or no organic chemical detected in any of the samples and heavy metal levels approaching those in the open ocean (DEWHA, 2008).

The greatest threat identified by CALM (2005) to water quality is discharge of pollutants, including anti-fouling agents, aquaculture feed wastes, sewage, ballast and bilge water, storm water runoff, and accidental spillage of petrochemicals. CALM (2005) identified anti-fouling agent accumulation in areas of high shipping activity as the greatest threat to sediment quality. Wenziker *et al.* (2006) tested for heavy metals and hydrocarbons around Dampier and Port Hedland in 2003. They found the water quality to be very high, and even within major ports, contaminant levels were relatively low. Water and sediment quality within these ports indicate that toxicant concentrations are generally low and within accepted port limits. The exceptions were areas about wharves; ship-turning basins, coastal discharge areas, and some dredge spoil dumpsites (DoE, 2006; and Wenziker *et al.*, 2006).

In 2005 the DoE conducted a marine sediment quality survey (DoE, 2006) to characterise the natural levels of toxicants at five key locations along the NW shelf (Port Hedland, Dampier Archipelago, including the inner harbour of the Port of Dampier, Onslow, Ashburton River mouth, and Exmouth Gulf). Sediment quality was regarded as very good, with only slight elevations of some metals in inner Dampier port. The 2006 DoE publication "Pilbara Coastal Water Quality Survey" examined state waters from Exmouth Gulf to Cape Keraudren. The only identifiable anthropogenic influence was considered to be sediment mobilisation from ships. However the report adds that this would be extremely difficult to manage. As a result turbidity pulses of short duration would occur, however these are expected to disperse by wind and tidal currents.

A number of sites have been proposed for port development in the Pilbara. This includes Rosnard Island (between Dampier and Port Hedland), Dixon Island (between Karratha and Wickham), Cape Preston (south of Dampier), as well as a major expansion of the existing port at Port Hedland (see DEWHA (2008) for full listing of proposed and existing ports).

Dumping of waste has occurred in Pilbara waters, including vessels, ammunition, chemical, and other waste, however, this has ceased since 1981 with the introduction of an act regulating sea dumping. A full list of dumpsites is provided in DEWHA (2008).

3.1.2 The Kimberley region

Coastal waters of the Kimberley are turbid due to a combination of high to extreme tidal ranges (up to 11.7m) and terrestrial runoff from rainwater, peaking during summer months. Cyclones are a prevalent meteorological feature during summer that adds to the turbidity (DEHWA, 2008; and Wood & Mills, 2008). Largescale oceanographic dynamics are poorly understood, as are the influences from these features on inshore waters of the Kimberley (Wood & Mills, 2008).

There are various high activity industries in the coastal Kimberley region, including petrochemical, natural gas, and mining industries, with some of these sites expanding, and other sites being proposed for exploitation by these industries (Wood & Mills, 2008).

Dumping of waste has occurred in Kimberley waters, including vessels, ammunition, chemical, and other waste, however, this has ceased since 1981 with the introduction of an act regulating sea dumping. A full list of dump sites is provided by the DEHWA (2008).

3.2 Marine primary production

3.2.1 The Pilbara region

Although studies have been conducted on the phyto- and zooplankton of the Pilbara and Kimberley regions (primarily by CSIRO and AIMS (Heywood *et al.*, 2006)) and these studies are referenced on metadatabases such as MEST, the studies are mostly unpublished, general details and data of the studies are limited, and details and data cannot be accessed directly via metadatabases.

While microbial plankton communities remain poorly studied and plankton sampling is patchy at best, many of the phyto- and zooplankton species are taxonomically well studied, with some of the phytoplankton groups showing high degrees of diversity. The roles that plankton fills in trophic interactions and nutrient cycling are poorly understood, especially in the near shore environment, although available data suggests that carbon cycling is an important role undertaken by planktonic bacteria, and a major source of nutrients for inshore ecosystems comes from bacteria of mudflats. Seasonal primary productivity is virtually unknown and very little sampling or research has been conducted to investigate seasonality. Likewise, the dynamic interactions between plankton and physical oceanography are poorly known, particularly for small scale processes (Heyward *et al.*, 2006; and DEHWA, 2008).

Heyward *et al.* (2006) stated that the most immediate threat to the health of plankton communities in the region, is that of introduced pests from ballast water. However recent research has shown that biofouling of vessels is likely to have greater impact. For example, a recent analysis by McDonald (unpub.) in New Zealand of 244 non-indigenous species, identified that approximately 80% of those invasive species were fouling species, 11% were fouling/ballast species, and only 9% of species were confined to ballast. This pattern is likely to be similar in Western Australian waters.

3.2.2 The Kimberley region

Even less is known of the ecological roles, and interactions with physical oceanography, of the plankton for the Kimberley region, with the DEHWA (2008) acknowledging a “general lack of knowledge regarding the processes that drive biological productivity throughout the North-west Marine Region”.

Immediate threats to the plankton communities of the Kimberley are presumed to be the risk of introduced species from ballast water, as is the case with plankton communities of the Pilbara.

3.3 Marine vegetation communities

3.3.1 Mangroves

Mangroves in the area form small but sometimes complex communities in embayments and on the sheltered shores of many offshore islands. It is rare for mangrove communities to occur in arid conditions, therefore the mangroves of the Pilbara and Kimberley are of great scientific importance. Mangrove communities are protected throughout Western Australia under the Wildlife Conservation Act 1950 (WC Act) and any proposed development near mangroves are subject to an environmental impact assessment (CALM, 2005). Semeniuk (1993) characterised mangroves of the Pilbara and Kimberley as conspicuous and extensive in association with muddy substrates, forming wide forests in some parts of the mainland shore.

Fringing mangroves of the region are typically backed by extensive intertidal flats that are characterised by a rich and diverse fauna of burrowing invertebrates, and are major habitats for migratory birds that use the mud flats as feeding grounds. The functioning of the mangrove ecosystems are strongly linked to these intertidal flats. The whole mangrove system of the region is considered important in order to maintain nutrient cycles and productivity of the coastal zone. These coastal forests are important for many reasons. Aside from providing a unique habitat for a variety of different creatures, the mangroves also help protect the shoreline and act as carbon sinks (Final Guidance No. 1, Guidance Statement for Protection of Tropical Arid Zone Mangroves Along the Pilbara Coastline. April 2001).

There has been extensive loss of mangrove communities in the Pilbara and Kimberley regions due to industrial activities, however those mangrove communities that still exist are in near pristine condition. Physical disturbance from industrial development, trampling from recreational fishers, and four-wheel drive vehicles, have been identified as immediate threats to these mangrove communities. Pollution from various sources is a further potential threat. Management through monitoring and education has been proposed (CALM, 2005).

3.3.2 Seagrass meadows and algal beds

Algal and seagrass beds occur in the Pilbara and Kimberley regions, however, are not as extensive as off the west and south coasts of Western Australia, and are primarily found in shallow habitats such as intertidal zones, lagoons, mangrove swamps, and around islands. Seagrass and algal beds are an important element of the region's ecosystems and they support a diverse fauna including herbivorous fishes, turtles and dugongs (DoE, 2006).

Seagrasses are protected throughout Western Australia under the Wildlife Conservation Act 1950 (WC Act) and managed through the Fish Resources Management Act 1994 (FRM Act). Any proposed developments near seagrasses are subject to an environmental impact assessment (CALM, 2005).

3.3.3 The Pilbara region

The Pilbara coast is exposed compared to the Kimberley coast, therefore does not have as extensive mangrove habitats as that found in the Kimberley, and the mangrove systems tend to be less complex, with 8 species of mangrove occurring in the Pilbara. Although Pilbara

mangrove communities are less complex compared to those in the Kimberley, 80% of the sites in the Pilbara region meet RNE (Register of the National Estate, Australian Heritage Commission) criteria, with fifteen of these sites already listed and a further fourtysix sites nominated for listing, with some of these sites being recognised internationally as significant (Pedretti & Paling, 2000). CALM (2005) identified the biodiversity and ecology of many of the mangrove communities around the Dampier Archipelago to be of international significance.

Around the Dampier Archipelago, seaweeds are most commonly found in less than 10m on limestone platforms, and are dominated by brown algae, although both green and red algae are also present (CLAM, 2005). No immediate threats have been identified and these systems are believed to be in good condition, however potential future threats include physical disturbance, eutrophication, and pollution.

3.3.4 The Kimberley region

The physical characters of the Kimberley coastline provide sheltered habitat, ideal for mangrove communities, resulting in highly complex mangrove systems, with eighteen species of mangrove living there. The number of mangrove communities in the Kimberley account for 72% (261 sites) of mangrove communities in Western Australia. Extensive tall mangrove communities are found in deep embayments and islands along the Kimberley coast, particularly at Carnot Bay, Beagle Bay, and Pender Bay (DEWHA, 2008). Nearly a third of the mangrove community sites in the Kimberley region meet RNE criteria, with twenty of these sites already listed and a further thirtythree sites nominated for listing, with some of these sites being recognised internationally as significant (Pedretti & Paling, 2000).

There are extensive seagrass meadows, algal mats, and around Montgomery Reef in particular, high biomass of coralline algae. All of these habitats contribute to the productive Kimberley coastal waters (DEWHA, 2008). Extensive seagrass meadows are associated with fringing coral reefs in the Kimberley, which are more extensive than that of Ningaloo. However, these reefs and associated seagrass meadows have only been partially mapped, and the ecological interactions within and between these communities are virtually unknown (Wood & Mills, 2008).

3.4 Marine invertebrate communities

Very little biological data or research exists for invertebrates and invertebrate communities for the Pilbara and Kimberley region beyond fisheries data and research. In the remainder of the research knowledge review, references are made to catch statistics and details of specific fisheries. These data come from Fletcher and Santoro (2007) unless otherwise stated.

3.4.1 The Pilbara region

The Pilbara region has a high diversity and abundance of invertebrate species, which is comprised of a tropical assemblage common throughout the Indo-Pacific region, although this has been examined only with limited surveys, and a true biodiversity survey of the invertebrate fauna is lacking. Preliminary surveys indicate that the invertebrate biodiversity of the Dampier Archipelago is greater than that of Ningaloo Marine Park, and it is suspected that the echinoderm assemblage of the Dampier Archipelago may be the most diverse in Western Australia (CALM, 2005). The Pilbara has also been identified as supporting a high diversity of crustaceans (Fulton *et al.*, 2006).

Some areas of the Pilbara have diverse and extensive soft coral and sponge beds, which play a significant role on the structuring and distribution of fish species. Several types of coral reefs characterise the coral communities of the Pilbara, which comprise both turbidity-adapted communities of inshore environments and offshore clear-water coral communities. In the West Pilbara, offshore coral banks and platform reefs are predominant, whereas around the Dampier Archipelago, the Montebellos, the Muirons, and other offshore islands, extensive fringing reefs predominate (DoE, 2006). Corals are protected throughout Western Australia under the WC act, although commercial coral collection is managed through the FRM act (CALM, 2005). Immediate threats identified by CALM (2005) to corals include fishing, and physical degradation brought about through trampling and coral collecting, with other potential threats including eutrophication, exotic pest introduction, and elevation of water temperatures.

However, soft corals are restricted to areas of relatively low turbidity in shallow waters fringing islands and headlands (Fulton *et al.*, 2006). A sponge biodiversity hotspot has been identified between Dampier and Port Hedland (Hooper *et al.*, 2002). The biodiversity here could be a result of high settlement rates of sponge larvae from the water column, leading to minimal larval dispersal and genetic population segregation (DEWHA, 2008).

Both commercial and recreational fishers target a number of invertebrate groups, which include oysters (and pearling), squid, sea cucumbers, shells, crabs, and crayfish, and fishing pressure is considered to be the greatest current threat to invertebrates here.

The Exmouth Gulf Prawn Fishery targets 4 species of prawn using otter trawl, with a total catch in 2006 of 899 tonnes. The CPUE has remained relatively constant since 1989, and the CPUE recorded in 2006 was the lowest since 1969. Bycatch from this fishery is regarded as low, with the fishery implementing bycatch reduction devices (BRD) (Fletcher & Santoro, 2006). Historically, this fishery impacted on shallow sponge habitats, however, this fishery has moved into deeper water since the early 1980's and it is reported that very little impact occurs on sponge habitat currently.

The activity of the Onslow Prawn Fishery is restricted to a relatively small area centred around Onslow and targets western king prawns, brown tiger prawns, endeavour prawns (a multi-species category), and banana prawns, with a total catch in 2006 of 54t (Fletcher & Santoro, 2007). Some of the prawn species are showing a decline, with the remaining species apparently stable. Significant bycatch species of the fishery include blue swimmer crabs, squid, cuttlefish, and mixed finfish.

The Nickol Bay Prawn Fishery operates between Karratha and north of Port Hedland, targets the same prawn species as the Onslow Prawn Fishery, however, is far more productive than that fishery, landing 394t of prawn in 2006 (Fletcher & Santoro, 2007). While some prawn species are showing stable catch trends, other species are increasing. Primary bycatch species of this fishery are blue swimmer crabs, bugs, coral prawns, squid, and mixed finfish.

The Beche-de-mer Fishery extends from Exmouth Gulf to the Northern Territory. Six species are collected by diving and wading, however, sandfish account for 99% of the catch, which in 2006 was 156t (live weight) (Fletcher & Santoro, 2007). CPUE had remained fairly constant through 1998 to 2005, however dropped by nearly 50% in 2006 compared to 2005. Despite the drop in CPUE, preliminary stock assessments suggest that the stock is adequate and the drop in CPUE is attributed to exploratory surveys. There are no bycatch species.

The Pearl Oyster Fishery is unique in that it is the only wild-stock fishery remaining in the

world, of significance. Pearls are collected by scuba divers from the silver-lipped pearl oyster. Activity from this fishery is patchily distributed along the coast, with centres of activity in Exmouth Gulf and around Port Hedland in the Pilbara, with fishing areas existing in the Kimberley (Fletcher & Santoro, 2007). Close to 540,000 oysters were collected for the fishery throughout the Pilbara and Kimberley, with numbers supplemented from oyster hatcheries. Stock assessment of the wild-caught oysters suggest that this is a sustainable fishery. Bycatch is very low due to the nature of the collection method, and bycatch is composed of encrusting organisms on the shell of the oyster, which are removed from the oyster during collection.

Activity in the North Coast Blue Swimmer Crab Fishery is centred from Onslow to Port Hedland, with most activity occurring within Nickol Bay, and employs traps (Fletcher & Santoro, 2007). Landings for 2005/06 was 55t in this fishery (total 896t for entire WA), and preliminary stock assessment extrapolated from the Pilbara Experimental Crab Trap Fishery, combined with monitoring of the North Coast Fishery, suggests that the fishery is currently sustainable, although fishing effort increased in the Pilbara in 2005/06. A negligible amount of fish bycatch exists, and fishers are not permitted to retain fish catch. There is limited recreational effort for blue swimmer crab in this fishery zone, using drop nets, scoop nets, or diving methods, however, this still amounted to an estimated 20t of crab taken recreationally from Nickol Bay alone.

The Gascoyne Coast Blue Swimmer Crab Fishery extends into Exmouth Gulf, although this is restricted to exploratory fishing and commercial viability assessment, resulting in an insignificant catch compared to the Shark Bay component of the fishery (Fletcher & Santoro, 2006).

Pearl production from oysters, and red claw crayfish are cultivated through aquaculture in the area (Fletcher & Santoro, 2006; and CALM, 2005), and there is high potential for the development of prawn, mudcrab, microalgae, artemia, and ornamental aquaculture. Future threats include pollution and habitat loss, of which invertebrates are highly susceptible.

Blue manna crabs, mud crabs caught from mangroves, and crayfish caught from coral reefs, suffer the greatest recreational fishing pressure (Fletcher & Santoro, 2006). Effort around the Dampier Archipelago from recreational fishers amounts to 85,000 fisher days per year from data collected through interviews with the fishers. A recent proposal to establish marine sanctuary zones in the area was abandoned due to opposition from the recreational fishing community. The combination of commercial and recreational fishing activities exerts heavy fishing pressure on those species that are targeted (see CALM (2005) for further details). Species exploited in recreational fisheries prioritised for research were listed by DoF (2005).

3.4.2 The Kimberley region

The Kimberley has extensive tidal sand and mud flats which are key habitats for complex invertebrate communities (DEWHA, 2008), however benthic invertebrate species in the shallow coastal zone remain to be identified and described (Wood & Mills, 2008). Fringing coral reefs in the Kimberley are more extensive than that of Ningaloo, and these fringing coral reefs, along with extensive seagrass meadows, have only been partially mapped. All of these habitats contribute to the productive Kimberley coastal waters (DEWHA, 2008). The ecological interaction of within and between these communities are virtually unknown (Wood & Mills, 2008).

As with the Pilbara region, there are extensive commercial and recreational fisheries for invertebrates. The activity of the Broome Prawn Fishery is restricted to a relatively small area

immediately to the north of Broome and targets king prawns and coral prawns (a multi-species category). In 2006 the total catch was 46t, and analyses suggest that this represents 65% of the stock (Fletcher & Santoro, 2007). There is no recorded bycatch for this fishery.

A total catch of 335t in 2006 was recorded for the Kimberley Prawn Fishery, which fishes a large area from Koolan Island, north of Derby in the Buccaneer Archipelago, to Cape Londonderry, the northern most point of Western Australia. The fishery targets banana prawns, tiger prawns, endeavour prawns and western king prawns (Fletcher & Santoro, 2007). Some of the prawn species are showing a decline, with the remaining species apparently stable. This fishery records a very low bycatch.

The Pearl Oyster Fishery is unique in that it is the only wild-stock fishery remaining in the world, of significance. Scuba divers collect pearls from the silver-lipped pearl oyster. Activity from this fishery is patchily distributed along the coast, with centres of activity along Eighty Mile Beach and Lacepede Island north of Broome in the Kimberley, and also operates in the Pilbara (Fletcher & Santoro, 2007). Close to 540,000 oysters were collected for the fishery throughout the Pilbara and Kimberley, with numbers supplemented from oyster hatcheries. Stock assessment of the wild-caught oysters suggest that this is a sustainable fishery. Bycatch is very low due to the nature of the collection method, and bycatch is composed of encrusting organisms on the shell of the oyster, which are removed from the oyster during collection.

A small, but unspecified amount of activity from the North Coast Blue Swimmer Crab Fishery occurs in the Kimberley (Fletcher & Santoro, 2007). Landings for 2005/06 was 55t in this fishery with data suggesting that the fishery is currently sustainable. A negligible amount of fish bycatch exists, and fishers are not permitted to retain fish catch. There is limited recreational effort for blue swimmer crab in this fishery zone.

The Beche-de-mer Fishery extends from Exmouth Gulf to the Northern Territory. Six species are collected by diving and wading, however, sandfish account for 99% of the catch, which in 2006 was 156t (live weight) (Fletcher & Santoro, 2007). CPUE had remained fairly constant through 1998 to 2005, however dropped by nearly 50% in 2006 compared to 2005. Despite the drop in CPUE, preliminary stock assessments suggest that the stock is adequate and the drop in CPUE is attributed to exploratory surveys. There are no bycatch specA recent aquaculture for black tiger prawns has been established in the Kimberley, near Wyndham, to develop indigenous industry (Fletcher & Santoro, 2007). This type of aquaculture leads to eutrophication, and potential escapes of cultured species could impact on local genetic stocks (Wood & Mills, 2008).

Very little information exists for recreational fishing - target species, areas fished, fishing pressure, and fishing effort. Species exploited in recreational fisheries prioritised for research were listed by DoF (2005).

3.5 Marine fish species

The Pilbara-Kimberley region has a high diversity of fishes, and is comprised of an Indo-West Pacific assemblage, with a number of biodiversity hotspots identified (Sainsbury *et al.*, 1985; Allen & Swainston, 1988; Allen *et al.*, 1997; Hutchins, 2003; Fulton *et al.*, 2006; and DEWHA, 2008). Recently, Newman *et al.* (2004) reported one hundred and seventy species of fishes from sixtysix families in their survey of the Pilbara and Kimberley. Benthic and pelagic fish assemblages are strongly differentiated by depth, which indicate strong habitat associations

between fish species (DEWHA, 2008), and therefore fishes of the region are highly susceptible to habitat disturbance and modification.

A number of threatened fish species are found in the region, notably river sharks, and sawfishes, for which there has been a relatively high level of research activity in recent years, although this has mostly taken place in the Kimberley region (Morgan *et al.*, 2003; Thorburn & Morgan, 2004, Thorburn *et al.*, 2003, 2004a,b; and Whitty *et al.*, 2008). Whale sharks are seasonal visitors, and have a migratory route through Pilbara and Kimberley coastal waters (DEWHA, 2008), however, research effort for whale sharks has been concentrated further south at Ningaloo Reef (DEWHA, 2008). Pipefishes and seahorses are also threatened species occurring within the area and are subject to bycatch from commercial trawling activities in the region (Fletcher & Santoro, 2007). A number of fish species are totally protected under WA legislation, including the potato cod, hump headed maori wrasse, and whale shark (CALM, 2005).

3.5.1 The Pilbara region

The Pilbara has a high diversity of Indo-West Pacific fishes (Sainsbury *et al.*, 1985; Allen & Swainston, 1988; Allen *et al.*, 1997; Hutchins, 2003; and Fulton *et al.*, 2006), and a hotspot of fish biodiversity has been identified between Port Hedland and North West Cape (DEWHA, 2008). A relatively high amount of research effort has occurred around the Dampier Archipelago, which has a tropical assemblage of fishes, with coral and mangrove associated fishes predominating. A total of seven hundred and thirtysix fish species have been identified (Hutchins, 2003), and the north side of Legendre Island is a biodiversity hotspot for the archipelago. The majority of fishes here are broadcast spawners, therefore recruitment of fishes to the archipelago is likely supplemented from elsewhere (CALM, 2005).

Due to the high levels of commercial exploitation of various fish species in the Pilbara, the resource condition of marine fishes is relatively well known compared to other organisms specified under other framework classifications. There are numerous commercial fisheries for fishes in the Pilbara. These fisheries include the Pilbara Demersal Finfish Fishery, the Mackerel Fishery, the WA North Coast Shark Fishery, and the Joint Authority Northern Shark Fishery (Fletcher and Santoro, 2007; and 2008).

Details of these fisheries, including recent catch rates, historic trends, and specifics of the fisheries are provided in Fletcher and Santoro (2007, 2008). Briefly, most of these fisheries are multi-species fisheries, generally targeting a variety of reef fishes and shark species, using a variety of fishing gear. Bycatch ranges between insignificant and 30% of the catch, which is reported to be mostly returned alive for the majority of the fisheries. The exception to this are pipefishes and seahorses, which are caught in trawls and generally dead when landed. This is recorded in skipper log books and reported to DEWHA. Trawl fisheries also have a bycatch of sawfishes, with between 50-75% of individuals returned alive in 2005. Different types of BRD are being tested to reduce future catches of sharks and rays. Fishing effort in the shark fisheries is being directed towards gill-netting which is expected to increase the bycatch of mackerel, but has unknown consequences on the bycatch of protected and endangered species (Fletcher & Santoro, 2007; Stephenson *et al.*, 2008; and Stephenson & Wells, 2008).

Collection of fishes for the aquarium trade is a minor commercial exploitation activity, with activity centred around the Dampier Archipelago. Other commercial uses of fishes in the Dampier Archipelago includes a scuba diving industry based around diver interactions with potato cod and manta rays, and a high potential exists for the development of fish aquaculture (CALM, 2005).

Recreational fishing effort for finfish between Onslow and Broome in 2002 was estimated at 190,000 fisher days, with approximately 320t of fish landed, and an additional 53t of fish were landed by charter operations (Newman *et al.*, 2004). Seventeen species of fishes are targeted by recreational fishers, which are not caught in commercial fisheries. In addition to this, fiftythree fish species are targeted by both commercial and recreational fishers in the Pilbara and the Kimberley (Newman *et al.*, 2004).

Around the Dampier Archipelago, recreational fishing activity is greatest near coral and sub-tidal rocky reefs, the artificial habitat provided by the gas pipeline, and also from the shore. Effort around the Archipelago from recreational fishers amounts to 85,000 fisher days per year from data collected through interviews with the fishers. This is an increase from 50,000 fisher days per year in 1999/2000 (Williamson *et al.*, 2006)

Species exploited in recreational fisheries prioritised for research were listed by DoF (2005). A recent proposal to establish marine sanctuary zones in the area was abandoned due to opposition from the recreational fishing community. The combination of commercial and recreational fishing activities exerts heavy fishing pressure to those species that are targeted (see CALM (2005) for further details).

3.5.2 The Kimberley region

The Kimberley has a high diversity of Indo-West Pacific fishes (Sainsbury *et al.*, 1985; Allen & Swainston, 1988; and Allen *et al.*, 1997). The Kimberley also is one of the few places in the world where globally threatened fresh water sharks and rays, in particular river sharks of the genus *Glyphis* and sawfishes of the family Pristidae, appear to have refuge (Thorburn & Morgan, 2004, Thorburn *et al.*, 2003, 2004a,b; and Whitty *et al.*, 2008). However, many demersal fishes in the shallow coastal zone remain to be identified and described (Wood & Mills, 2008). Newman *et al.* (2004) reported 170 species of fishes from sixtysix families in their survey of the Kimberley and Pilbara. Extensive mangrove, seagrass meadows, algal mats, corals, and coralline algae, all provide key habitats for fishes in the Kimberley region (DEWHA, 2008).

Due to the high levels of commercial exploitation of various fish species in the Kimberley, the resource condition of marine fishes is relatively well known compared to organisms under other framework classifications. Commercial fisheries in the Kimberley region include the Kimberley Gillnet and Barramundi Fishery, the Northern Demersal Scalefish Fishery, the Mackerel Fishery, the Joint Authority Northern Shark Fishery, and the WA North Coast Shark Fishery (Fletcher and Santoro, 2007; and 2008).

Details of these fisheries, including recent catch rates, historic trends, and specifics of the fisheries are provided in Fletcher and Santoro (2007, 2008). Briefly, These fisheries are multi-species fisheries targeting barramundi, threadfin salmon, snapper, emperor, grouper, Spanish mackerel, and sharks. Bycatch in these fisheries are reported as low, but actual figures are unavailable. Significant bycatch species include various species of sharks and rays, including sawfishes (a species group protected since 2005), black jewfish, and tripletail. It is possible that river sharks of the genus *Glyphis* (which are listed as endangered or higher) are caught but misidentified for other whaler sharks. Fishing effort in the shark fisheries is being directed towards gill-netting which is expected to increase the bycatch of mackerel, but has unknown consequences on the bycatch of protected and endangered species

Recreational fishing in the Northern Demersal Scalefish Fishery zone has experienced a recent increase with more charter vessels operating in the zone, with an estimated landing in 2006 of 3t. Recreational fishing effort for finfish between Onslow and Broome in 2002 was estimated at 190,000 fisher days, with approximately 320t of fish landed. An additional 53t of fish were landed by charter operations (Newman *et al.*, 2004). Seventeen species of fishes not caught in commercial fisheries are targeted by recreational fishers. In addition to this, fiftythree fish species are targeted by both commercial and recreational fishers in the Kimberley and the Pilbara (Newman *et al.*, 2004). Species exploited in recreational fisheries prioritised for research were listed by DoF (2005). The recreational catch of sharks and rays has not been assessed and the impact from illegal foreign fishing is unknown.

Aquaculture development is expected to grow rapidly in the Kimberley. Aquaculture for barramundi is expanding in the Kimberley, in an effort to develop indigenous industry, primarily using sea cages and also using ponds (Fletcher & Santoro, 2007). This type of aquaculture leads to eutrophication, and potential escapes of cultured species could impact on local genetic stocks (Wood & Mills, 2008).

3.6 Marine reptile species

3.6.1 The Pilbara region

Loggerhead, green, hawksbill, olive Ridley, flatback, and leatherback sea turtles are known to occur in the Pilbara and Kimberley regions (Márquez, 1990), and the sandy beaches of the Pilbara region are used by green, hawksbill, and loggerhead turtles as nesting sites (threatened species listed as vulnerable, along with the flatback turtle) (CALM, 2005; and DEWHA, 2008).

Rosemary Island off Dampier is a key nesting site for the hawksbill turtle for the Indian Ocean region, and the Malus, Enderby, Eaglehawk, Legendre, and Delambre Islands all provide important turtle aggregating sites. Threats include habitat loss, litter, industrial pollution, and anthropogenic disturbance, particularly to nesting turtles, which includes traditional hunting and egg collection.

The Exmouth Gulf prawn Fishery catches turtles and sea snakes, although there is a very low incidence of mortality, and most animals are returned alive. Both the Onslow and Nickol Bay Prawn Fisheries also catch turtles and sea snakes, although at frequencies that have been deemed to have insignificant impact (Fletcher & Santoro, 2006). The Pilbara Demersal Finfish Fishery catches turtles and sea snakes in trawl gear, which are generally dead when landed. This is recorded in skipper log books and reported to DEWHA. Different types of BRD are being tested to reduce future catches, and semi-rigid grids have lowered the catch rate of turtles from approximately 2.6% to 0.1% (Fletcher & Santoro, 2007; and Stephenson *et al.*, 2008).

3.6.2 The Kimberley region

Extensive mangrove, seagrass meadows, algal mats, corals, and coralline algae, all provide key habitats for turtles in the Kimberley (DEWHA, 2008).

The Joseph Bonaparte Gulf is home to a genetically distinct stock of flatback turtles, which are presumed to be resident there. The Kimberley region provides significant feeding grounds for green, loggerhead, flatback, and olive ridley turtles. There are many sites on the mainland (eg. Eighty Mile Beach is a significant breeding site for flatback turtles), and many of the islands

are utilised for nesting by the turtle species present, some of these representing major sites within the Indian ocean for some species. Many of these locations are also feeding grounds and mating sites (DEWHA, 2008). For example, Barrow Island is a breeding and nesting ground for hawksbill, falcback, green, and to a lesser extent, loggerhead turtles, and the recently approved Gorgon development is a potential threat to these processes.

The only reference to crocodile bycatch in any fishery in the Pilbara and Kimberley region occurs for the Kimberley Gillnet and Barramundi Fishery, which has a low impact on salt water crocodiles (a protected species), which are avoided, or released alive (Fletcher & Santoro, 2007).

3.7 Marine mammal species

3.7.1 The Pilbara region

Marine mammals found in the Pilbara and Kimberley region are composed of whales, dolphins, and dugongs, all of which are protected (CALM, 2005; and DEWHA, 2008). twentyseven whale and dolphin species are recorded from the Pilbara and Kimberley region, and there is a single Sirenian species, the dugong (Jefferson *et al.*, 1993).

The Dampier Archipelago lies along the annual migration route of the humpback whale, which arrive in June and July, and have been known to birth, and suckle calves there, although this usually happens further north. They pass through the archipelago again in early spring as they return to the Antarctic, and Mermaid Sound is a significant resting area for females with calves (CALM, 2005). The Montebello Islands, and bays around the Dampier Archipelago, have resident populations of multiple dolphin species (DEWHA, 2008). Dugongs are known to exist in the Dampier Archipelago, however details on population structure and dynamics, and behaviour are limited, although major population declines have occurred here as elsewhere in the Indo-Pacific (CALM, 2005). All marine mammals in the Dampier Archipelago are threatened by anthropogenic disturbance (including boat collision) and pollution, as well as traditional hunting and commercial fishing bycatch. In addition to these threats, the dugong in particular, is vulnerable to habitat loss primarily through the loss of shallow water seagrasses (CALM, 2005).

The Pilbara Demersal Finfish Fishery catches dolphins in trawl gear, which are generally returned alive. Catch rates reported by skippers during 2005 and 2006 were approximately 2 per 1000 shots. Different types of BRD are being tested to reduce future catches, although acoustic pingers have proven ineffective, some success has been obtained with semi-rigid grids in reducing dolphin bycatch, however the survivability of dolphins exiting through escape hatches is unknown (Fletcher & Santoro, 2007; Stephenson *et al.*, 2008; and Stephenson & Wells, 2008).

3.7.2 The Kimberley region

As for the Pilbara, all marine mammals are protected in the Kimberley region (DEWHA, 2008). Browse Island (150km northwest of the Heyward Islands) is a hotspot of cetacean biodiversity in WA, and extensive mangroves, seagrass meadows, and algal mats provide feeding grounds for dugongs (DEWHA, 2008).

Many species of dolphin, including the Australian snubfin dolphin, use the embayments and estuaries along the Kimberley coast for habitat, particularly Yampi Sound (Buccaneer

Archipelago), and between Kuri Bay and Cambridge Gulf (DEWHA, 2008). From July to November, the Camden Sound (near Kuri Bay) and the Kimberley coast between Cape Leveque and Cape Londonderry, are important calving areas for Western Australian populations of humpback whales (DEWHA, 2008; and NDT 2008b). Pender Bay is also utilised by humpback whales as a resting and aggregating area for mothers and calves (NDT, 2008b).

3.8 Analysis and implications of the research knowledge review

Analysis of pertinent literature was conducted using a systematic search of accessible literature from 1900 to 2009. The search concentrated on studies centred on the coastal and marine environment of the Pilbara and/or Kimberley regions.

Using a combination of library searches, including interrogating online scientific research tools, such as SCIRUS (<http://www.scirus.com/>) and ScienceDirect (<http://www.sciencedirect.com/>); interrogating online metadatabases such as the Western Australian Marine Science Institute BlueNet Metadata Entry and Search Tool (WAMSI iMEST) (<http://mest.ivec.org/geonetwork/srv/en/main.home>) and the WA Department of Environment and Conservation (DEC) Biodiversity Audit of WA (<http://www.dec.wa.gov.au/science-and-research/biological-surveys/a-biodiversity-audit-of-wa.html>); as well as traditional library searches, resulted in over 2000 references concerning material on the coastal and marine systems of the Pilbara and Kimberley.

For the Pilbara region 1013 references were initially collated, however after closer examination only 11% (115) were of direct relevance to the aims of this study. The same pattern was displayed for the Kimberley, with 1131 references, of which 11% (133) were of direct relevance (Fig 3). Much of the excluded literature on the target regions were centred on detailed attributes of the regions geology, with very little or no relevance to the aims of this report.

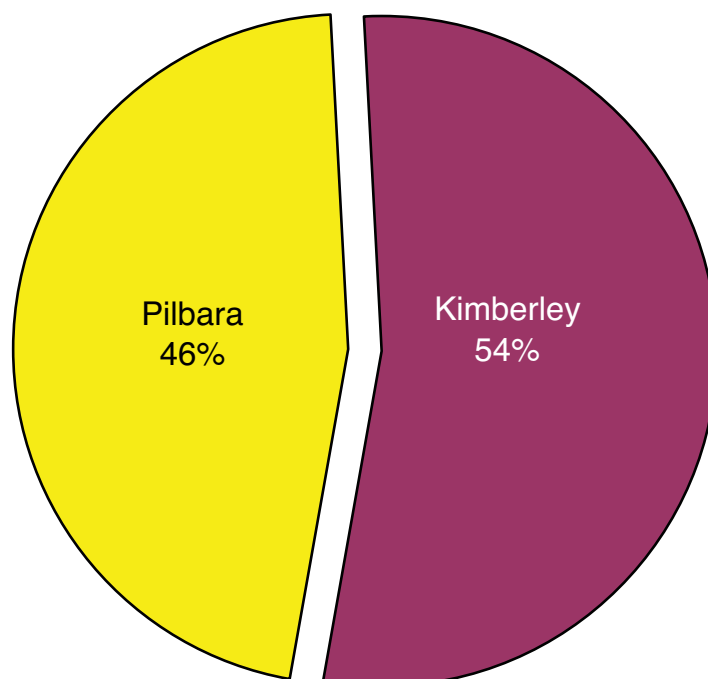


Figure 3. Proportion of available literature for each of the study regions. A total of 248 references were available for the review.

Figure 4 shows that the Departments of the Environment and Conservation and Fisheries have the greatest number of publications from the region, with a considerable number of publications also coming from universities. It must be emphasised that Figure 4 does not represent research effort by the various organisations, as the number of publications often do not equate to research effort. It should also be pointed out that some of the publications from AIMS (Australian Institute of Marine Science) and CSIRO (Commonwealth Scientific and Industrial Research Organisation) are considerable documents encompassing a wide range of research fields, whereas those publications from DEC, DoF, and universities tend to be smaller and more specific in focus.

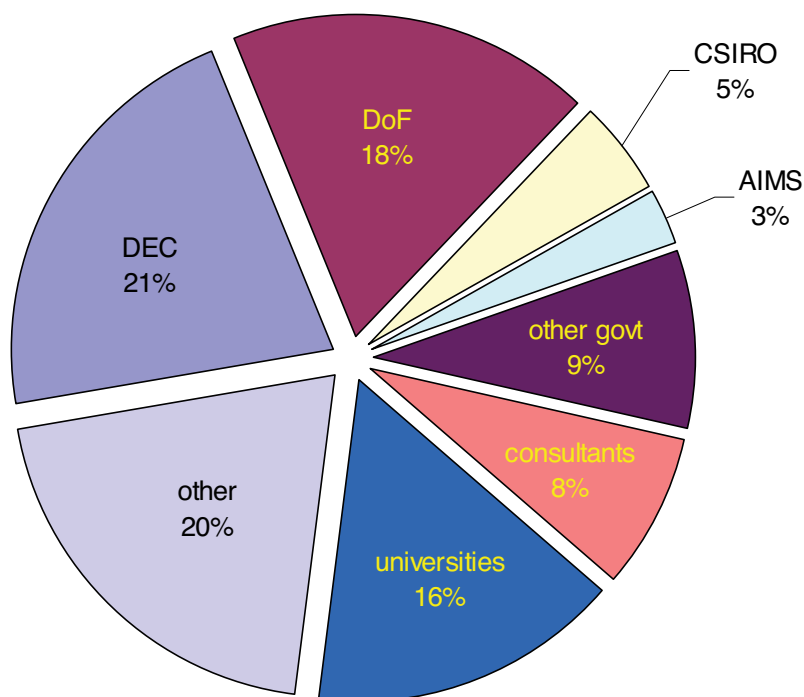


Figure 4. Research group bias, in terms of number of accessible research articles relevant to the marine and coastal environments, of the Pilbara and Kimberley regions (n = 248). It is important to note that this graph does not represent research effort by the various research groups, rather research published and accessible.

3.9 Gap analysis

Gap analysis is an assessment tool enabling a comparison of actual performance with potential performance, ie. where we are now and where we would like to be in terms of our understanding. It provides a foundation for measuring investment of time, money and human resources required to achieve a particular outcome. At its core are two questions: Where are we (current benchmark)? Where do we want to be (goal)? The difference between the two is the GAP.

3.10 Identified major knowledge gaps

Points identified as the major gaps in our knowledge of the target regions based upon the literature review above are given in Appendix 1. Knowledge gaps were placed into themes that became apparent as the list of knowledge gaps were compiled. The themes are:

- Endangered/Threatened Habitats - habitats that are endangered, threatened, susceptible to threats, or are in decline in other parts of the world, such as coral reefs, sea grass beds, and sponge gardens;
- Endangered/Threatened Species - species that are endangered, threatened, susceptible to threats, or are in decline in other parts of the world, including both vertebrate and invertebrate fauna;
- Biodiversity - includes issues related to areas of high biodiversity (biodiversity hotspots), areas of declining biodiversity, areas where the biodiversity is not fully documented, sources of biodiversity, or threats to existing biodiversity;
- Ecological/Oceanographic - largescale ecological and oceanographic issues, such as oceanic currents, trophic dynamics, natural resource condition, and climate change; and
- Fisheries/Aquaculture - issues relating to the commercial and recreational exploitation of various invertebrate and vertebrate species, including the impacts of these activities on habitats and non-target and/or bycatch species.

3.11 Overview of the knowledge gaps

The review was structured into the following categories: general marine, marine water and sediment quality, marine primary production, marine vegetation communities, marine invertebrate communities, marine fish species, marine reptile species, and marine mammal species.

The percentage of literature relevant to the various categories is shown in Figure 5 for the Pilbara and the Kimberley regions respectively. For both the Pilbara and Kimberley, fish accounted for the majority of the literature, between 27-30%. All other categories had equivalent percentages in both regions. Primary production was noticeably a minor component of the literature for both the Pilbara and the Kimberley.

A total of fortysix knowledge gaps were originally identified from the literature search (Appendix 1) and were presented at the stakeholder workshops (see below). However, during the course of the project, one of these gaps, “there have been no stock assessments of target species other than barramundi in the Kimberley Gillnet and Barramundi Fishery (Fletcher & Santoro, 2007)” has since been addressed in Fletcher & Santoro (2008).

The knowledge gaps were either specifically mentioned in a particular reference(s), or were inferred from their absence in the literature. There was considerable bias found in the available literature as to the research that had been conducted in the Pilbara and Kimberley region, both in terms of the research group, and the focus of the research. Further bias was introduced into the knowledge gaps because of the easier access the author had to fisheries related literature, and the senior authors ichthyological background.

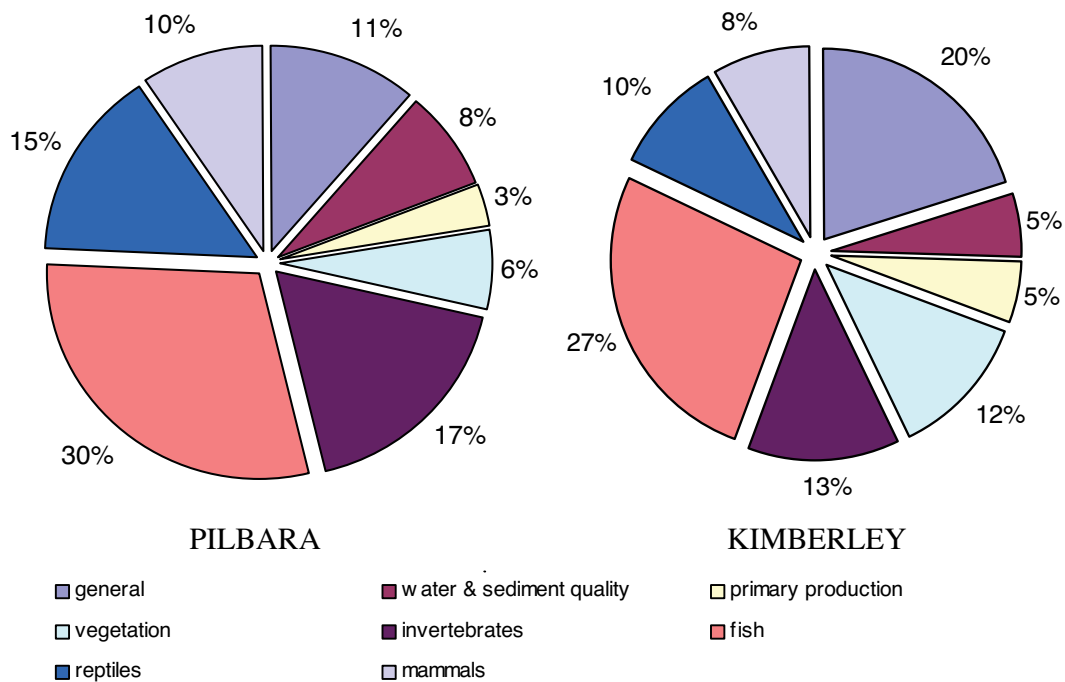


Figure 5. Graphical representation of known research to date sorted by category for Pilbara (115 accessible relevant studies) and Kimberley (133 accessible relevant studies) regions.

The knowledge gaps were categorised into various themes that best characterised the nature of the knowledge gap (Fig. 6). More than a third of the knowledge gaps identified were of a broad scale ecological or oceanographic nature, with fisheries and aquaculture knowledge gaps accounting for nearly a third. It is important to note that the number of knowledge gaps in each category do not represent the research effort needed in each of those categories because some of the knowledge gaps are very specific, whereas other knowledge gaps address large scale, broad focus research. Also, it was possible to identify more specific knowledge gaps, such as gaps #5 and #6, for example that refer to specific issues regarding specific species, when a greater amount of literature was available for a particular field of research. This is in contrast to the majority of the knowledge gaps that identify broadscale oceanographic or ecological issues.

Many of the knowledge gaps identified from the literature search spanned several of the categories and spanned both the Pilbara and Kimberley regions (Table 1). Table 1 also shows that only one of the knowledge gaps (#33) was limited to a single region and category, and that six of the knowledge gaps spanned all of the categories for both regions. Figure 7 illustrates the number of gaps spanning each of the categories for both of the regions.

Most of the knowledge gaps identified here are applicable to both the Kimberley and Pilbara regions, and the broader marine environment, therefore the question arises “to what extent have these knowledge gaps been addressed elsewhere?”. Many of the knowledge gaps identified here have been addressed in the tropical zone of eastern Australia, and provide a useful starting point for bridging the current knowledge gaps. However, assuming that processes are equivalent between the target regions of the current study and other regions is a hazardous practise, as the ecology of species can vary regionally and profoundly, particularly in regards to their reproduction and trophic ecology. For example, females of the commercially exploited gummy shark (*Mustelus antarcticus*) in southern Australia have differing partuition cycles (either one or two years) depending on their geographic location (Walker, 2007), which profoundly effects their population dynamics.

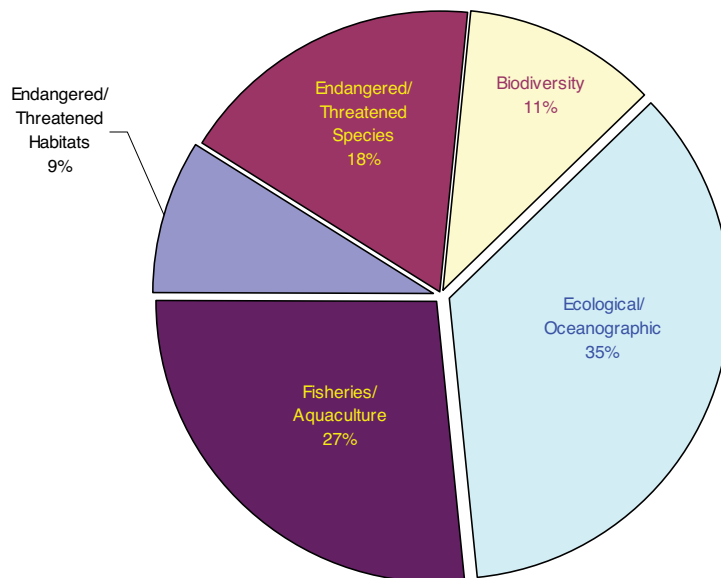


Figure 6. Categorisation of the 45 knowledge gaps identified from the accessible literature relevant to the marine and coastal environments of the Pilbara and Kimberley regions.

During the preparation of this review, it has come to light that some of the knowledge gaps identified here are the focus of some current research projects. For example, the habitat use of threatened freshwater sharks and rays, and other freshwater fishes, is being examined by Murdoch University, the Department of Fisheries is conducting stock assessments for some of the non-target fish species caught in the commercial fisheries of the region, WAMSI is investigating the effects of climate change on fisheries, and a FRDC observer program investigating BRD effectiveness is nearing completion. Therefore, it is acknowledged that some of the knowledge gaps identified here are the focus of current research, although they are not yet published.

This highlights again, the problems of accessing data, or even knowing about research programs that are underway, and the need for better communication between research groups involved in natural resource condition monitoring. There is a critical need to have a centralised natural resource condition metadata base that at least outlines the research that has been conducted, or is underway, and the necessity for those involved in such research to contribute actively to such a metadata base. It should be made a requirement by funding bodies that a minimum of a research outline be submitted to a centralised metadata base for natural resource condition research and monitoring.

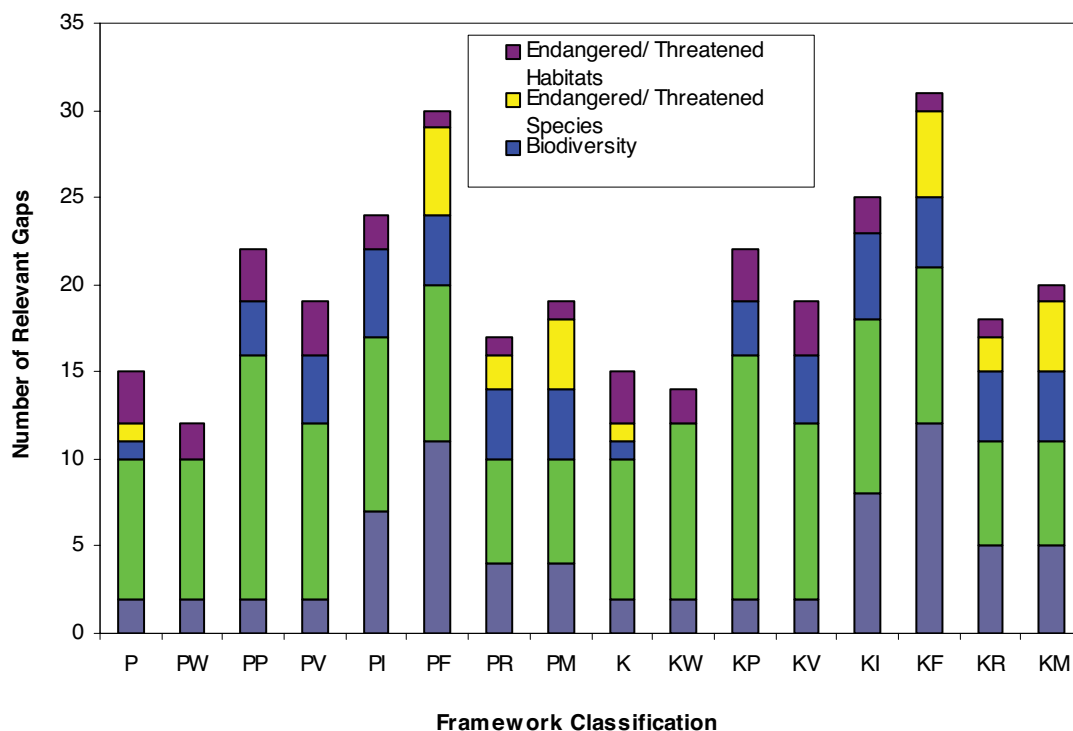


Figure 7. The span of the knowledge gaps across all of the categories for both of the regions. Many of the knowledge gaps spanned multiple categories for both regions. The legend identifies the theme of the gap impacting on the category. See Table 1 for abbreviations.

Table 1. Impact of each gap on the Pilbara and Kimberley regions and which category they impact upon (see text for details). Abbreviations: P - Pilbara general; PW -Pilbara marine water and sediment quality; PP - Pilbara primary production; PV - Pilbara marine vegetation; PI - Pilbara marine invertebrate communities; PF - Pilbara marine fish species; PR - Pilbara marine reptile species; PM - Pilbara marine mammal species; K - Kimberley general; KW - Kimberley marine water and sediment quality; KP - Kimberley primary production; KV - Kimberley marine vegetation; KI - Kimberley marine invertebrate communities; KF - Kimberley marine fish species; KR - Kimberley marine reptile species; KM - Kimberley marine mammal species.

Gap	P	PW	PP	PV	PI	PF	PR	PM	K	KW	KP	KV	KI	KF	KR	KM
1				*								*				
2	*	*	*	*	*				*	*	*	*	*			
3	*		*	*	*	*	*	*	*		*	*	*	*	*	*
4	*	*	*						*	*	*					
5								*								*
6								*								*
7						*								*		
8						*								*		
9	*								*							
10						*								*		
11						*	*	*						*	*	*
12						*	*	*						*	*	*
13			*		*						*		*			
14				*	*	*	*	*				*	*	*	*	*

Table 1. Continued.

Gap	P	PW	PP	PV	PI	PF	PR	PM	K	KW	KP	KV	KI	KF	KR	KM
15	*		*	*	*	*	*	*	*		*	*	*	*	*	*
16				*	*	*	*	*				*	*	*	*	*
17			*	*	*	*	*	*			*	*	*	*	*	*
18			*								*					
19			*	*	*	*					*	*	*	*		
20			*	*	*	*					*	*	*	*		
21			*								*					
22			*								*					
23	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
24	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
26	*		*						*	*	*					
27	*	*	*						*	*	*					
28		*		*	*	*				*		*	*	*		
29			*	*	*						*	*	*			
30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
32	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
33										*						
34					*	*							*	*		
35		*	*	*	*	*	*	*		*	*	*	*	*	*	*
36													*	*	*	*
37					*	*	*	*					*	*	*	*
38						*								*		
39						*								*		
40						*								*		
41	*				*	*			*				*	*		
42					*	*	*	*					*	*	*	*
43					*	*							*	*		
44	*	*	*	*	*	*			*	*	*	*	*	*		
45						*	*	*						*	*	*

3.12 Gap analysis workshops

3.12.1 Stakeholder consultation

The aim of the workshops, was to identify and prioritise future research in the marine and coastal environments of the Pilbara and Kimberley. This was done by presenting stakeholders with the fortysix knowledge gaps (Appendix 1) that were produced from a search of the available literature of marine and coastal research undertaken in the Pilbara and Kimberley region outlined earlier in this report. Knowledge gaps were reworded to identify the key message of the knowledge gap for stakeholders (Table 2), given that a significant number of the stakeholders did not have a scientific or technical background. Where possible, a rhetorical question was included in the reworded gap with the aim of provoking the stakeholder to

consider the implications of their voting for a particular knowledge gap. The stakeholders were then asked to prioritise the knowledge gaps to identify where they considered future research should be conducted.

Stakeholder consultation took place in the form of workshops in the Pilbara and Kimberley region. Dr Amanda Davies, Ms Janine Hatch, and Ms Julie Cammel, from the Institute for Regional Development, School of Earth and Geographical Sciences, University of Western Australia (UWA), were finalising a Rangelands NRM project, Human Uses of the Rangelands Coast, which examined human use of the coastal zones in the Pilbara and Kimberley, and shared the same stakeholders as the current project, therefore these meetings were cohosted between the Department of Fisheries and UWA. Each workshop consisted of one full day, with the UWA presentation in the morning and the DoF presentation in the afternoon. Participants of each workshop are listed in Appendices 2-4.

The stakeholder consultation process took place as a series of three stakeholder workshops during May 2009, in Kununurra, Broome, and Karratha, Western Australia. Prior to the workshops, an information package (Appendix 5) was sent to the stakeholders explaining the purpose of the workshops, the workshop agenda, and a list of the knowledge gaps.

The workshop consisted of briefly referring the stakeholders to the information package and allowing the stakeholders to review the knowledge gaps. A presentation was then given (Appendix 6) to the stakeholders on the background and aims of the larger project. The literature review process that produced the knowledge gaps was explained and the presentation continued through each knowledge gap. During the presentation of the knowledge gaps, each knowledge gap was clarified where necessary. Questions and comments were addressed for each knowledge gap before proceeding to the next knowledge gap.

Table 2. Rewording of the knowledge gaps to identify the key message of the knowledge gap for stakeholders, the majority of whom did not have a technical or scientific background. The first column indicates the theme the knowledge gap was classified into, the second column is the knowledge gap number, and the third column is the reworded knowledge gap. The original wording of the knowledge gaps, and the corresponding knowledge gap number, are found in the “Identified major knowledge gaps” section above. * Gap #36 was addressed after the workshops had been conducted.

Wording for Stakeholder Workshops		
Endangered/ Threatened Habitats	1	There are currently no threats identified for seagrasses. Do we need to review and monitor the status of current threats to seagrasses?
	2	Invertebrates are sensitive to pollution and habitat loss or modification. Should more research be conducted to assess using invertebrates as indicators for such impacts?
	3	Historical overfishing and bad fishing practices have impacted benthic assemblages (eg. coral communities, sponge gardens, seagrass meadows), however the recovery of these habitats are unknown. Should more research be conducted to assess the impacts of historical overfishing and bad fishing practices?
	4	The influence of large scale oceanographic features (eg. effects of large ocean currents) on inshore habitats of the Pilbara and Kimberley are unknown. Should research concentrate on resolving these influences?

Table 2. Continued.

Endangered/ Threatened Species	5	Knowledge of basic biological information is lacking for dugongs. Is understanding the biology of dugongs important?
	6	The survivability of dolphins that have passed through a bycatch reduction device (BRD) escape hatch is unknown. Is survivability of dolphins a priority?
	7	Threatened river sharks (genus <i>Glyphis</i>) are misidentified for whaler sharks in the various fisheries. How often are they actually caught by fisheries?
	8	Threatened fresh water sharks, sawfishes, and rays use different habitats as they grow. At what ages do the freshwater sharks and rays use the various habitats?
	9	Seabird catches are not reported for commercial fisheries and have just begun for recreational charter boat fishing. Is it important to know how many seabirds are being caught in the fisheries?
	10	Pipefishes and seahorses are caught in some commercial fisheries, however the effects of this are unknown. Should this be an area of research priority?
	11	The survivability of bycatch released alive is presumed. Do we need to know what the actual survivability is?
	12	Fishing effort will be directed away from demersal long-lining to pelagic gill-netting in the WA North Coast Shark Fishery and the Joint Authority Northern Shark Fishery. Will this increase the bycatch of threatened species such as river sharks, sawfishes, turtles, and mammals in this fishery?
Biodiversity	13	The biodiversity of the invertebrate fauna in the Pilbara and Kimberley region is poorly known. Do we need a comprehensive biodiversity survey of the invertebrate fauna?
	14	Do biodiversity hotspots in the Pilbara and Kimberley need to be reassessed and verified, or identified?
	15	The amount of genetic input from Indonesia into WA waters unknown. Do we need to assess the amount of genetic input from Indonesia?
	16	Species composition in the shallow coastal zone is poorly surveyed. Do we need a better understanding of the species composition?
	17	There is no baseline data against which to measure or detect introduced species. Do you consider introduced marine pests an area of priority research?

Table 2. Continued.

Ecological/Oceanographic	18	Virtually nothing is known of the ecological significance and interactions of the phytoplankton and zooplankton of the area. How does plankton influence marine ecology in the region?
	19	What are the ecological links between plankton and benthos communities (corals, sponges, seagrasses, etc...)?
	20	What roles do plankton play in food webs and the recycling of nutrients along the coastline?
	21	How does the plankton vary seasonally?
	22	How is the plankton affected by small scale oceanography (eg. tidal currents, waves, etc...)?
	23	A standard set of environmental quality indicators, criteria, and standard monitoring procedures are not currently available. Should these be developed to monitor the environment?
	24	What will be the effects of sea level rise?
	25	What will be the effects of climate change, with particular reference to sea temperature rise?
	26	Water movements are not well understood and have implications for pollution and invasive pest dispersal. Do we need to understand these currents better?
	27	Large scale oceanographic features (currents, etc...) are only partially characterised. Do you think understanding these currents better will provide critical knowledge for understanding our environment?
	28	Initial steps in the food web are poorly known. Is it important to understand these first steps?
	29	The ecology within and between fringing reef and seagrass bed communities are virtually unknown. Would understanding these interactions increase our understanding of the environment?
	30	Long-term monitoring has not occurred for most of the marine environment for the Pilbara and Kimberley. Is long-term monitoring the key to healthy environments?
	31	Health indicators of tropical marine communities are poorly known. Should these be developed?
32	Responses to stress by tropical marine communities are poorly known. Is understanding stress critical in understanding environmental health?	
33	There has been little testing of marine water and sediment quality. Is knowing marine water and sediment quality necessary for monitoring the environment?	
34	There is a lack of information on non-target fishes caught in fisheries. Should non-target catch be monitored?	

Table 2. Continued.

Fisheries/Aquaculture	35	Our knowledge of the environmental impact of aquaculture activities is limited. Does aquaculture significantly impact the whole environment?
	36*	There have been no stock assessments of target species other than barramundi in the Kimberley Gillnet and Barramundi Fishery. Should stock assessments be performed on those other fishes?
	37	Recreational charter fishing is increasing. Should there be more research on the impacts of such fishing?
	38	The occurrence and impact of ghost fishing from discarded fishing gear is unknown. Is ghost fishing a significant environmental impact?
	39	Recreational fishing pressure on Spanish mackerel is high and has not been surveyed since 1999/2000. Should this fishery be surveyed again?
	40	The recreational catch of sharks and rays has not been assessed. Should the recreational catch of sharks and rays be assessed?
	41	Only the primary target species (sandbar/ thick skin shark) has been adequately stock assessed in the WA North Coast and the Joint Authority Northern Shark Fisheries. Should other shark species caught in this fishery be assessed?
	42	The impact of climate change on fisheries is unknown. Should this be a research priority?
	43	The impacts of illegal foreign fishing vessels are unknown. Should more research be done on this problem?
	44	Recreational fishing pressure is increasing but has not been surveyed since 1999/2000. Should there be another survey of recreational fishing?
	45	It is estimated that recreational fishing pressure will be 14 million fishing days per year by 2012 and the impact of this on various habitats is unknown. Are the activities of recreational fishers a threat to the environment?
46	The effectiveness of bycatch reduction devices are mostly unknown. Should we have a better understanding of the effectiveness of these devices?	

3.12.2 Comments and questions from stakeholders

The following section summarises the comments and questions raised by stakeholders relevant to the research literature review. These comments are listed by workshop because each workshop proved to have concerns and issues that were specific to the local area, compared to the overall Pilbara and Kimberley region. The number of comments provided here does not reflect the level of participation or number of attendees for each workshop, it more reflects the unifying issues particular to that workshop

Kununurra

1. A significant geographical and ecological difference between the Kimberley and Pilbara regions is that the Pilbara lacks the large river systems that are present in the Kimberley. The river systems in the Kimberley interact profoundly with the marine and coastal systems there.
2. The Kimberley Land Council (KLC) are currently involved in a turtle and dugong monitoring program at One Arm Point.
3. There is a concern that cetacean migration and biological studies undertaken by industry is not publicly available.
4. There is a concern regarding the influences of mining via ports regarding the loading and off-loading of ore, and the impacts of long-term contaminants from ore dust.
5. What are the impacts of increasing numbers of marine parks?

Broome

1. The Beagle Bay Rangers are well trained and very interested in getting involved in long term monitoring programs.
2. There is an ongoing seagrass monitoring program in Roebuck Bay.
3. There is a perception that effects on habitats such as mangoves, coral communities and seagrass beds can be understood by examining studies from elsewhere in Australia, and overseas.
4. Oysters are bioaccumulators, therefore there is a concern that if pollution levels increase, the oysters will no longer be viable for human consumption.
5. There is a perception that oil and gas companies are addressing the influence of large scale oceanographic features on inshore habitats of the Pilbara and Kimberley (Gap #4).
6. There are concerns over the sustainability of shark fisheries in Western Australia.
7. There are concerns that biodiversity is generally unknown in the Kimberley and Pilbara regions.
8. There is a concern that the Northern Demersal Scale Fish Fishery is increasing the number of fish species in its target catch.
9. There is a concern that mangrove habitats will be significantly affected by increasing sea level.
10. There are concerns over the impact and sustainability of the recreational fishing sector in the Kimberley.
11. The prawn fishery is reliant on rainfall, therefore there are concerns about the impacts that climate change may have on the fishery (Gap #42).

Karratha

1. There is a perception that effects on habitats such as mangroves, coral communities and seagrass beds can be understood by examining studies from elsewhere in Australia, and overseas.

2. Invertebrates are good indicators of water quality (Gap #2).
3. There are concerns regarding the dumping ground in Mermaid Sound regarding the nature of the pollution types that the area is at risk from.
4. There is a concern that fishermen, both commercial and recreational, are being unnecessarily blamed for stock failures.
5. A well developed hydrodynamic model for Mermaid Sound exists, but is held by the private sector and is inaccessible.
6. There is a concern that large numbers of non-target fishes are used for bait by recreational fishers.
7. There is a concern that existing aquaculture has shifted the species composition of the local area and has affected trophic dynamics. It is essential that baselines be established prior to new aquaculture beginning (Gap #35).
8. There is a perception that there are lots of lost trawl nets in the Pilbara and that ghost fishing is a significant issue (Gap #38).
9. Habitat mapping is considered to be a priority activity for the area in response to rapid industrial expansion.

3.12.3 Voting process

Stakeholders were asked to prioritise knowledge gaps through two processes. The first process was through a survey that was undertaken during the presentation of the knowledge gaps. The survey form listed each knowledge gap number (Table 3) and the stakeholder was asked if they considered that particular knowledge gap to be important by placing a Y (yes) or N (no) in the appropriate column. If they considered the knowledge gap to be important, then they were asked to score the importance of the knowledge gap between 1 and 5; with 1 being of minor importance to 5 being of great importance. This process is referred to as 'the survey' throughout the remainder of this report.

The second process was a straight forward voting procedure carried out at the end of the presentation, and is referred to in the remainder of this report as 'the principle vote'. Stakeholders were provided with three stickers each. A form was provided with a list of gap numbers with a large free space beside each gap, and the stakeholders were asked to place their stickers in the blank space next to the gap number to vote for that gap for research priority. Stakeholders were only allowed to place one sticker per knowledge gap, therefore stakeholders had to vote for three different gaps, thereby removing potential bias from multiple voting for a single gap. Furthermore, this process was supervised to ensure that voting was conducted as specified. Stakeholders who did not comply with this requirement (in two instances, both in Broome), had their votes noted but disregarded.

3.12.4 Principle vote

Analysis of 'the principle vote' comprised a simple tallying of the votes for each of the different stakeholder workshops, and ranking of the votes. Votes from the principle vote were tallied immediately after the voting procedure and voting results, including announcement of the top three research priorities voted for by that particular workshop, were provided to the stakeholders before they left the workshop. Each workshop is treated separately here because each workshop produced results that are more relevant to the immediate area surrounding the

towns and regions in which the workshops were conducted, as opposed to the entire Pilbara/ Kimberley region. Figure 8 shows part of the principle voting sheet from the Kununurra workshop as an example of the process.

Table 3. Excerpt from the Broome survey form that was completed by the stakeholders during the course of the presentation and discussion of the knowledge gaps. The forms were identical for each of the workshops albeit for date and location.

Gap importance for BROOME Stakeholder Meeting 6th May

How to use this sheet.

During the presentation, note the importance of each knowledge gap as they are presented (this will help you in making your final vote)

A) In the first column (#) is the gap number.

B) The second column (Important?) is whether or not you think that particular gap is important, answer with a Y (yes) or N (no).

#	Important?	Importance
1		
2		
3		
⋮	⋮	⋮
22		
23		

#	Important?	Importance
24		
25		
26		
⋮	⋮	⋮
45		
46		

C) The third column (Importance) is how important you think a gap on a scale from 1 to 5, 1 is of minor importance, whereas 5 is of great importance. Only use this column if you put a Y in the second column.

Gap Prioritising for KUNUNURRA Stakeholder Meeting 4th May

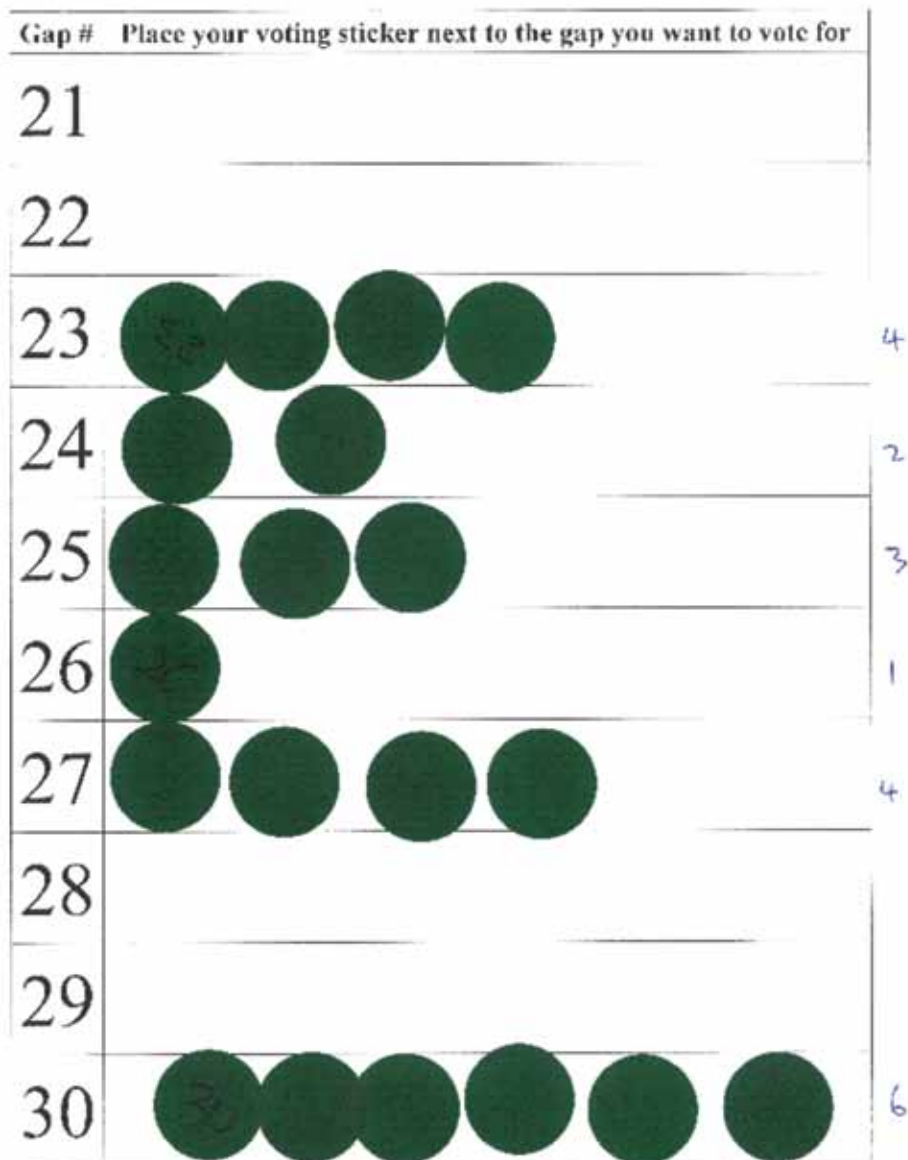


Figure 8. Example of principle voting using stickers. Votes for gaps 21 to 30 only are shown here. The forms were identical for each of the workshops albeit for date and location.

The results of the voting from the principle vote are provided in Figure 9 and summarised here.

In Kununurra:

- 15 voters cast 45 valid votes;
- the knowledge gap given the highest research priority through the principle vote with 6 votes (13%) was Gap #30 (Ecological/Oceanographic) - Long-term monitoring has not occurred for most of the marine environment for the Pilbara and Kimberley. Is long-term monitoring the key to healthy environments? and
- Gaps #23 (A standard set of environmental quality indicators, criteria, and standard monitoring procedures are not currently available. Should these be developed to monitor

the environment?) and #24 (What will be the effects of sea level rise?), both Ecological/Oceanographic both received 4 votes (9%) and were equally the second highest research priority.

In Broome:

- 22 voters cast 64 valid votes
- the voting of two stakeholders had to be disregarded;
- Gap #30 was voted the highest research priority with eleven votes (17%);
- the second research priority was given to Gap #18 (Ecological/ Oceanographic) - Virtually nothing is known of the ecological significance and interactions of the phytoplankton and zooplankton of the area. How does plankton influence marine ecology in the region? with eight votes (13%); and
- the third highest priority for research was Gap #44 (Fisheries/ Aquaculture) - Recreational fishing pressure is increasing but has not been surveyed since 1999/2000. Should there be another survey of recreational fishing? with 7 votes (11%).

In Karratha:

- 11 voters cast 33 valid votes;
- the knowledge gap given the highest research priority through the principle vote with nine votes (27%) was Gap #23 (Ecological/Oceanographic);
- the second research priority was given to Gap #44 (Fisheries/Aquaculture) with 7 votes (21%); and
- the third highest priority for research was Gap #30 (Ecological/Oceanographic) with six votes (18%).

It was encouraging that all three stakeholder groups voted for large-scale knowledge gaps. Evidently, the stakeholders were also concerned about fisheries and aquaculture related knowledge gaps. It was also interesting that both the Kununura and Broome workshops voted Gap #30 as their highest priority for research, whereas Karratha voted for Gap #24 as their highest priority for research. This most likely reflects the different issues faced by the Kimberley and Pilbara regions, respectively.

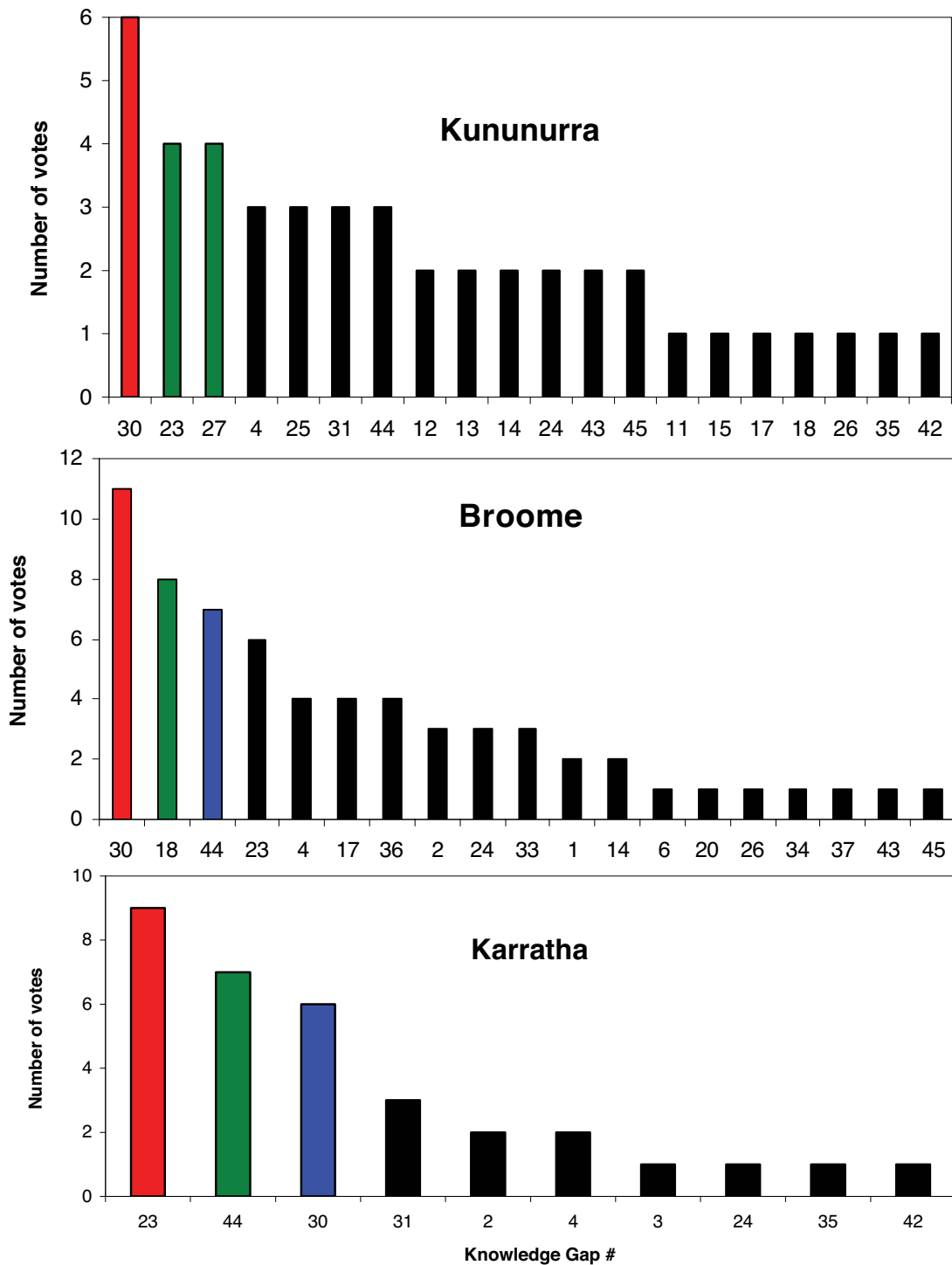


Figure 9. Results of the principle vote from the various stakeholder workshops.

3.12.5 Survey

Votes for the survey were calculated by tallying the scores of the stakeholders for a particular gap, and then averaging the sum of the scores by the number of stakeholders, to give an average score for each gap. The average score was taken to be the vote for that gap. Generally, the gap that was voted as having the highest priority corresponded to that gap that was voted highest priority in the principle vote for each of the workshops, however, there was a lack of correlation between the survey and the principle vote in lesser ranking gaps (Table 4).

The survey from the Kununurra workshop ranked Gaps #30 and #23 (both Ecological/Oceanographic) as having the greatest priority (Table 4), which were ranked 1st and 2nd, respectively, in the principle rank. However, a number of gaps ranked equally for 2nd highest priority in the survey that did not feature prominently in the principle vote. For example, Gap #1 (Endangered/Threatened Habitats) did not receive any votes in the principle vote, however, was ranked equal 2nd in the survey.

Gap #30 (Ecological/Oceanographic) received the highest ranking priority in the survey from Broome (Table 4), which matched with the principle vote for that workshop. However, Gap #2 (Endangered/Threatened Habitats), which only received a ranking of 6th in the principle vote, received a ranking of 2nd in the survey for Broome. Gap #18 (Ecological/Oceanographic), which received a ranking of 2nd highest priority in the principle vote, only received a ranking of 6th in the survey.

In Karratha, Gap #23 (Ecological/Oceanographic) received the highest priority in the survey (Table 4), as it did in the principle vote, and there was a greater correspondence between the three highest priority gaps between the survey and the principle vote for Karratha compared to the other stakeholder workshops. A notable exception is Gap #45 (Fisheries/Aquaculture) which received an equal 3rd highest priority in the survey, but did not receive any votes in the principle vote.

Table 4. Results of the survey from the various stakeholder workshops.

Kununurra			Broome			Karratha		
Gap #	rank	vote	Gap #	rank	vote	Gap #	rank	vote
30	1	3.5	30	1	4.1	23	1	4.3
23	1	3.5	2	2	3.1	30	2	3.8
1	2	3.2	17	3	2.8	44	3	3.7
12	2	3.2	25	3	2.8	45	3	3.7
14	2	3.2	23	4	2.7	4	4	3.2
43	2	3.2	20	5	2.6	13	4	3.2
44	2	3.2	24	5	2.6	32	4	3.2
27	3	3.0	18	6	2.5	16	5	3.0
32	3	3.0	28	7	2.4	31	6	2.9
8	4	2.9	1	8	2.3	37	6	2.9
13	4	2.9	3	8	2.3	2	7	2.8
18	4	2.9	5	8	2.3	35	8	2.4
26	4	2.9	26	8	2.3	27	9	2.2
31	4	2.9	37	8	2.3	25	10	2.1
17	5	2.8	43	8	2.3	40	11	1.9
24	5	2.8	36	9	2.2	33	12	1.8
25	5	2.8	33	10	2.1	34	12	1.8
29	5	2.8	45	11	2.0	14	13	1.6
37	5	2.8	6	12	1.9	3	14	1.4
45	5	2.8	16	12	1.9	12	14	1.4
2	6	2.7	22	12	1.9	18	14	1.4
33	6	2.7	31	12	1.9	24	14	1.4

Table 4. Continued.

Kununurra			Broome			Karratha		
Gap #	rank	vote	Gap #	rank	vote	Gap #	rank	vote
42	6	2.7	44	12	1.9	39	14	1.4
11	7	2.6	27	13	1.8	46	14	1.4
28	7	2.6	21	14	1.7	15	15	1.3
35	7	2.6	13	15	1.6	11	16	1.2
3	8	2.5	14	15	1.6	20	16	1.2
4	8	2.5	4	16	1.5	26	16	1.2
36	8	2.5	32	17	1.4	38	16	1.2
38	8	2.5	15	18	1.3	6	17	1.1
41	8	2.5	19	18	1.3	21	17	1.1
46	8	2.5	29	18	1.3	22	17	1.1
5	9	2.4	41	18	1.3	1	18	1.0
39	9	2.4	42	19	1.2	17	19	0.9
20	10	2.3	8	20	1.1	19	19	0.8
7	11	2.2	12	20	1.1	29	19	0.9
16	11	2.2	39	21	1.0	42	19	0.8
21	11	2.2	7	22	0.9	43	19	0.8
22	11	2.2	35	22	0.9	8	20	0.7
34	11	2.2	40	22	0.9	28	20	0.7
40	11	2.2	10	23	0.8	5	21	0.6
19	12	2.1	34	23	0.8	7	21	0.6
6	13	1.9	38	23	0.8	9	21	0.6
9	14	1.8	46	24	0.6	10	21	0.6
15	15	1.7	11	25	0.5	41	21	0.6
10	16	1.5	9	26	0.4	36	22	0.4

3.12.6 Stakeholder priority areas for research

Conclusions drawn from the stakeholder consultation were not straight forward due to the inconsistency of the voting results between the two voting processes. Generally, knowledge gaps that consisted of broad environmental, spatial and temporal scales were voted as being the highest research priority by the stakeholders in both the Pilbara and Kimberley regions.

From the principle vote, Kimberley stakeholders converged on the need for having a long-term biological time series for the inshore environment of the Kimberley as their highest research priority. The principle vote from Karratha also highlights the concern from stakeholders that no long term management is in place to monitor resource condition in the marine environment.

The results of the principle vote also highlight the concerns of the stakeholders with regards to the knowledge gaps relating to large scale oceanographic features, including oceanic currents and primary production, and how these processes impact on the marine and coastal environments of the region. It is also apparent that there is concern over the rapid increase in recreational fishing in the region. There is concern not only for the impact that the fishers are having on local fish stocks, but also the damage caused by the fishers to coastal habitats when accessing fishing locations. Also apparent is the concern stakeholders have with regards to the potential impacts of climate change and/or environmental degradation to commercial fishing stocks.

4.0 Monitoring knowledge review

For the purposes of this monitoring knowledge review, a monitoring program is defined here as a structured sampling regime with repeated surveys, at consistent intervals appropriate to the nature of the study, of established survey sites using a uniform sampling methodology over a long term time period. Due to the general inaccessibility of resource condition monitoring literature for the region, it was not possible to conduct the knowledge review in the same detail as was possible for the research review. A more generalised approach was used to conduct the monitoring review. This approach utilised a knowledge review matrix (Appendix 7) addressing who conducted the monitoring, the quality of the monitoring, when the monitoring occurred, where the monitoring occurred, and what was monitored.

4.1 Who

Within the knowledge review matrix, the monitoring proponent was generalised into the following categories according to the main agency conducting the work - AIMS, CSIRO, Regulatory Agencies (including DEC and DoF, etc...), Private (industries and consultancies, etc...), Universities (inclusive of all universities and university research groups), WAM, and WAMSI. The specific monitoring document was cited in the reference section.

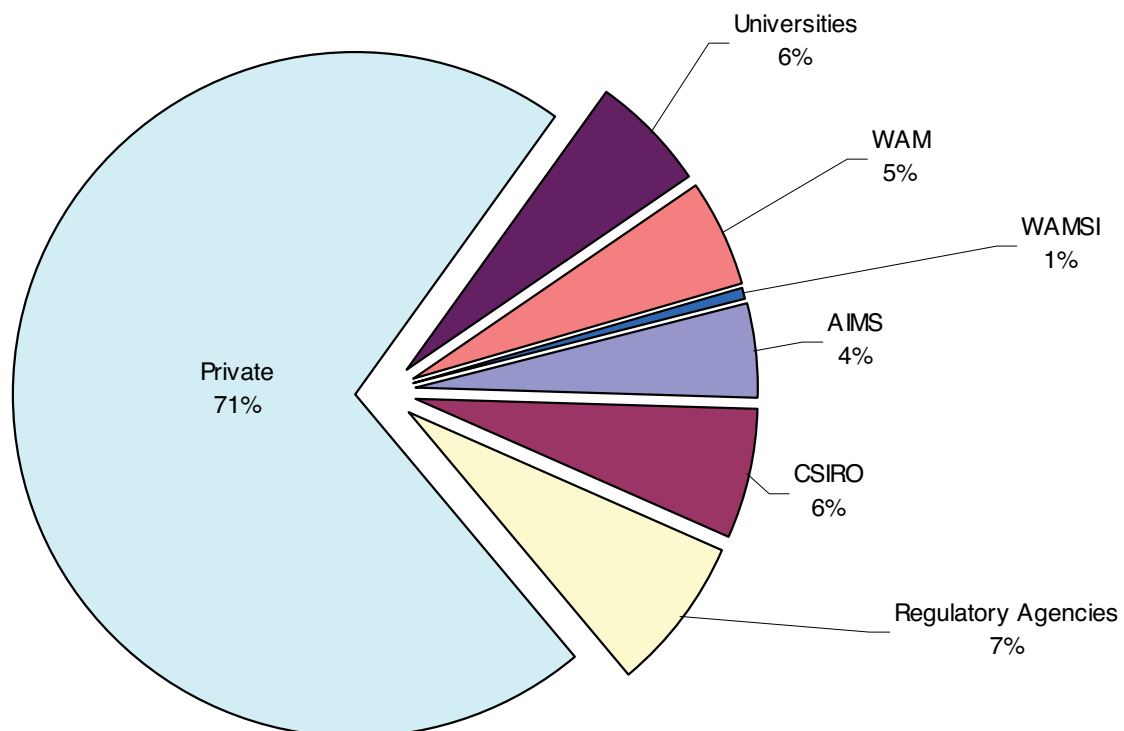


Figure 10. The percentage breakdown of the monitoring literature that was examined in this knowledge review. A total of 179 resource condition monitoring documents were examined.

Of the 179 monitoring documents that were included in the monitoring knowledge review, the majority were produced by the private sector (Fig. 10). Regulatory agencies, CSIRO, universities, WAM, and AIMS contributed approximately equal amounts to the literature available on resource condition monitoring in the Pilbara and Kimberley marine and coastal environments. It is important to remember that Fig. 10 does not equate to the monitoring effort invested from each monitoring proponent, and that the figure is based on the number

of documents from each proponent only. As examples, both DoF and CSIRO have produced documents that are extensive, covering a number of monitoring programs governed by those agencies (State of the Fisheries, and the North West Shelf Joint Environmental Management Study series, respectively).

4.2 Quality

Table 5 shows the quality ratings and the criteria used to assign a quality rating to references examined in the knowledge review of monitoring literature. The criteria were formulated in reference to the definition of a monitoring program used here (see above).

The majority of literature were rated as *inaccessible* Fig. 11. Web-based and library searches of literature titles failed to find those documents. For that literature that was accessible, most fell into the rating of *initial survey*. *Taxonomic surveys* were the next most frequently used rating. Less than one third of the accessible monitoring literature actually met the requirements of a monitoring study (see above), and of these, most only rated *fair*. In nearly all instances the monitoring program detailed in a particular document met the aims of the program, sampling protocols and data were robust, and appropriate analyses were used, however, most monitoring studies suffered from either short-term and/or irregular survey periodicity, hence few monitoring studies achieved the ratings of *very good* or *excellent*. Only one monitoring program that was accessible rated *excellent*, and no monitoring studies that were accessible were rated *poor*.

When the quality ratings were compared between the monitoring proponents (Fig. 12), it was found that the resource condition monitoring literature produced by AIMS (eight literature records) were rated in this review as *inaccessible* (62%), or were rated as *initial surveys* (38%).

The monitoring literature from CSIRO (eleven literature records) were generally accessible (27% *inaccessible*), with 55% of their literature rated as *initial survey*, and the remainder (18%) rated as *fair*.

Monitoring literature produced by regulatory agencies (thirteen literature records) were generally accessible (23% *inaccessible*), with 39% of the literature rated as *initial survey*, 23% rated as *fair*, and 15% rated as *very good*.

The vast majority of Private resource condition monitoring literature (one hundred and twentyeight literature records) is *inaccessible* (95%) and is a source of great concern because private proponents account for over two thirds of the monitoring literature from the Pilbara and Kimberley (Fig. 10). Three percent of the Private literature was rated as *initial survey*, and 2% rated *fair*.

University literature (nine literature records) were mostly *inaccessible* (56%), with surveys classed as *taxonomic*, *initial*, *fair*, or *excellent* accounting for 11% each. The only monitoring program that received an *excellent* rating in this review came from a University proponent. That study investigated movements of humpback whales in Western Australia with a broad data set spanning 40 years and with regular active surveying for nearly a decade.

As may be expected, the majority of literature examined from WAM (nine literature records) were rated as *taxonomic surveys* (89%), with the remaining 11% rated as *initial surveys*.

WAMSI was represented by only a single literature record in this review and was rated as a *initial survey*.

Table 5. The quality ratings and criteria used to assign ratings to the monitoring literature examined in the knowledge review.

Excellent	All-encompassing (within the aims of the program) AND long-term and regularly surveyed at appropriate temporal and spatial scales AND robust and high quality data collection and analyses
Very Good	Encompasses most of the aims of the program AND/OR long-term but irregularly surveyed at appropriate temporal and spatial scales AND/OR high quality data collection and analyses
Fair	Encompasses some of the aims of the program AND/OR short-term AND/OR long-term but irregularly surveyed at appropriate temporal and spatial scales AND/OR data collection and analyses of acceptable standards
Poor	Does not encompass the aims of the program AND/OR short-term or not surveyed at appropriate temporal and spatial scales AND/OR data collection and analyses of unacceptable quality
Initial Survey	Limited spatial and temporal data to establish baseline resource condition
Taxonomic Survey	Taxonomic survey not accounting for natural resource condition
Inaccessible	Access was limited to the title of the document in this review

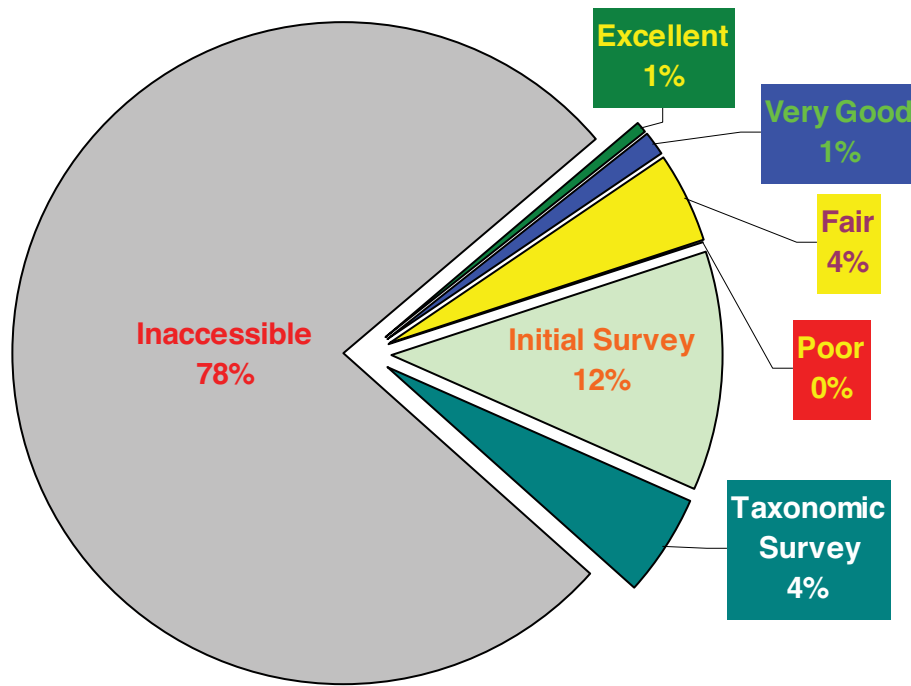


Figure 11. Percentage of monitoring literature examined in this review falling into the various quality ratings defined in Table 5.

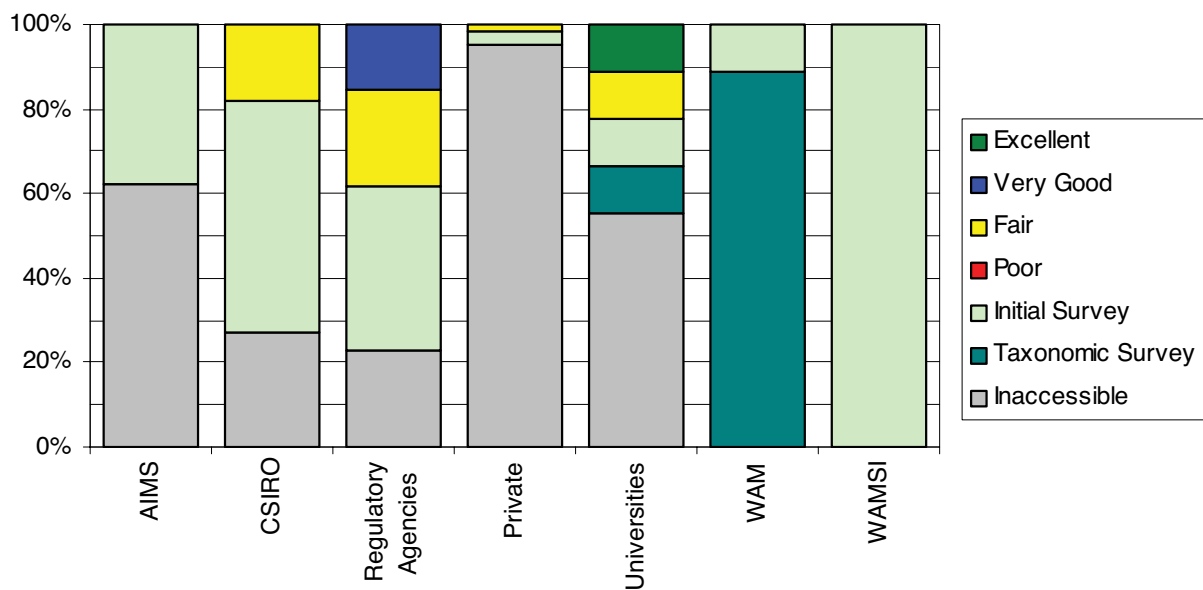


Figure 12. Comparison of the proportion of different quality ratings between different resource condition monitoring proponents in the Pilbara and Kimberley.

4.3 When

Of the literature that was reviewed here, it was not possible to determine when (or if) surveys had been conducted in 112 of the literature records. Where it was possible to identify the periods in which surveys had been undertaken, it became apparent that monitoring activity of any type in the Pilbara and Kimberley region is only recent, with minimal effort (in terms of numbers of monitoring literature) until the 1980's. The majority of effort was conducted in the 1990's (Fig. 13), with the second most activity witnessed in the 1980's, while surprisingly (and somewhat alarmingly) there has been a decline in the 2000's.

There are a limited number of multi-decadal monitoring programs that have occurred in the Pilbara and Kimberley region that are accessible. Of the literature that was accessible in this review, three literature records spanned at least one decade, three literature records spanned at least two decades, and one literature record (State of the Fisheries) spanned over six decades.

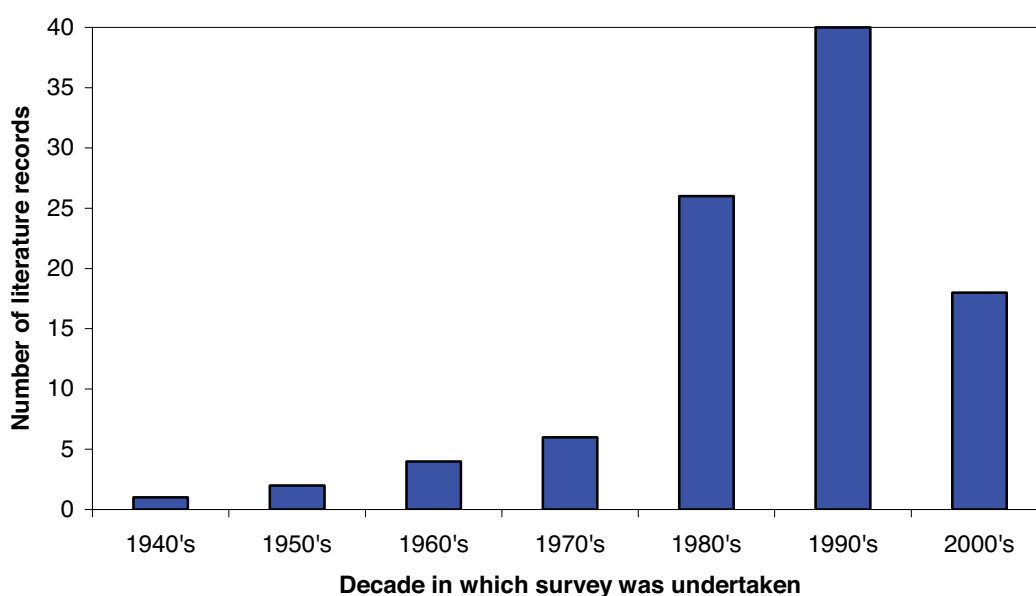


Figure 13. Decadal periods in which the accessible literature records conducted surveys in the Pilbara and Kimberley region. Some of the literature records span multiple decades therefore are counted multiple times.

4.4 Where

The majority of monitoring literature pertains only to the Pilbara region (Fig. 14). This bias is due to the Private sector surveying the North West Shelf and Browse Basin due to natural gas and petroleum deposits occurring there. Very little monitoring literature currently exists for the Kimberley region, and few reports spanned both the Pilbara and Kimberley regions. In some instances when the literature was inaccessible, it was not possible to identify where monitoring had taken place, if any.

4.5 What

Each accessible literature record was reviewed to assess what the target of the monitoring had been. These targets fell into the categories - general marine, marine water and sediment quality,

marine primary production, marine vegetation communities, marine invertebrate communities, marine fish species, marine reptile species, and marine mammal species, as defined previously.

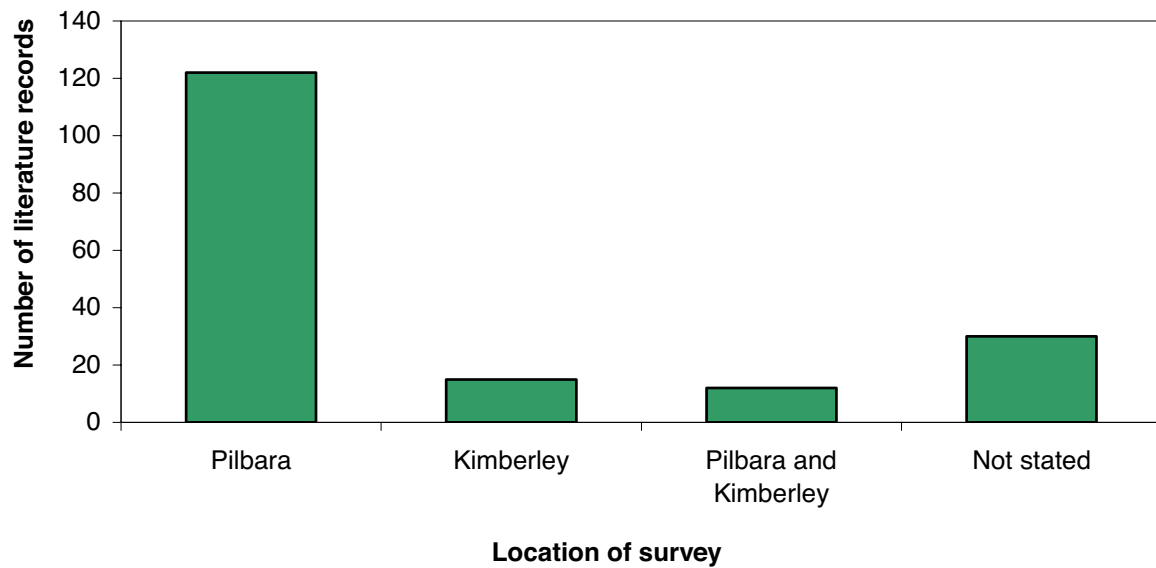


Figure 14. The region in which the monitoring literature has focused.

Figure 15 shows that marine vegetation was the most commonly monitored category, mostly relating to mangrove monitoring, closely followed by marine invertebrate communities, and then marine fishes. A number of literature records included general marine and water and sediment quality measures. Very few literature records that were accessible focused on primary production, marine reptiles or marine mammals.

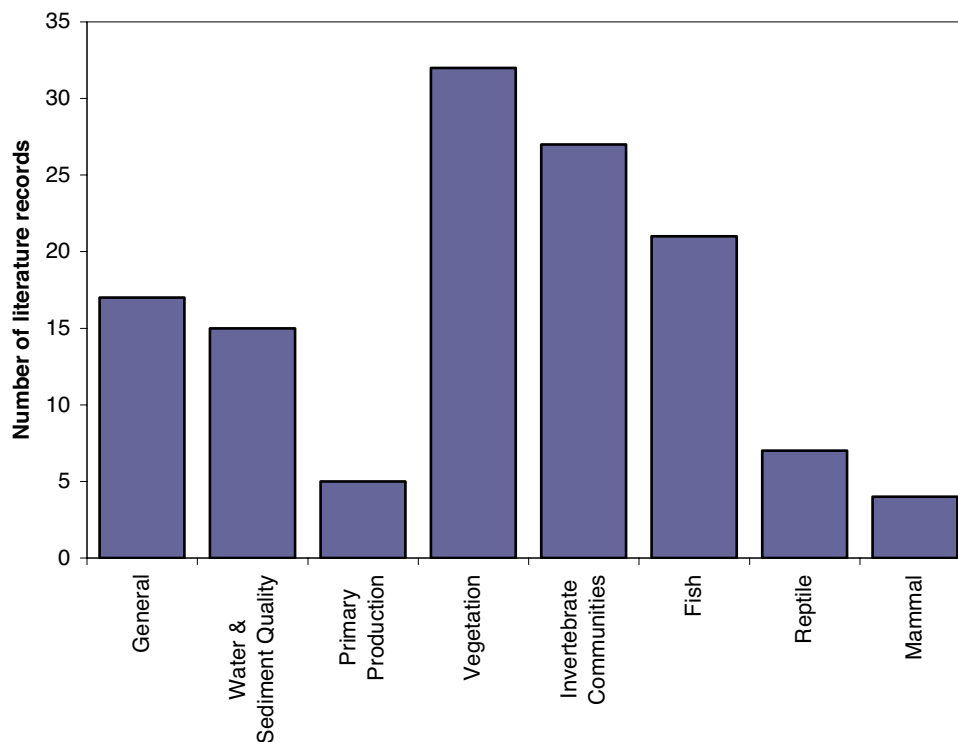


Figure 15. The number of literature records monitoring various marine categories.

5.0 Conclusions

This document provides a review on the current state of our knowledge pertaining to the Pilbara and Kimberley regions of Western Australia. During this review fortyfive clear knowledge gaps were identified. These gaps were then prioritised through discussions and feedback from stakeholder workshops, with a key finding that baseline information of natural resource condition is lacking for the Pilbara and Kimberley region. Another key finding of this report is that a long-term resource condition monitoring program of the marine and coastal environment of the Pilbara and Kimberley, a sentiment reiterated by stakeholders.

It is evident that the majority of the resource condition monitoring of the Pilbara and Kimberley region is conducted by private industries and consultancies with the result that the majority of this work is inaccessible. This presents a significant impediment to progressing our knowledge of the natural resource condition of the region and highlights the need for data sharing, and a mechanism to implement data sharing.

A second strategic framework document to be produced from this project will use the gaps identified in this report, and provide a strategic framework upon which future resource condition monitoring for the Pilbara and Kimberley regions should be based.

6.0 Recommendations

We recommend the following:

- Establishment of a multi-agency natural resource condition monitoring program for the marine and coastal environments of the Pilbara and Kimberley region, as endorsed through stakeholder consultation.
- A dedicated program for the collection of baseline environmental data, as well as floral and faunal checklists of the nearshore environs of the target area is urgently needed.
- Development of a central data repository system at the national level for storing and accessing natural resource condition data and datasets, or at a minimum, a central metadata database for natural resource condition research/ monitoring program outlines and summaries.
- Development and implementation of government legislation at the state and national level to enforce data sharing between all parties involved in natural resource condition monitoring and data collection. This would apply to government agencies, universities and other research centres, consultancies, and all other private or commercial enterprises involved in such activities.
- Funding bodies of natural resource condition research and/or monitoring should enforce a condition of funding that the research program outline and/or summary be submitted to a central metadata database at the commencement of the program.
- A large scale assessment/ reassessment of the marine biodiversity of the target region utilising a diverse team of floral and faunal taxonomists.
- An assessment/ reassessment of recreational fishing in the target region.

7.0 Acknowledgements

My appreciation goes to the DoF librarians, Paul Orange and Vicki Gouteff, for keeping their friendly demeanour during my many requests for very obscure literature.

Thanks are due to Catherine Allday & Mike Dunne from the DoF Karratha office, and Peter Godfrey and Rachel Green from the DoF Broome office, for compiling lists of potential stakeholders and venues for the stakeholder meetings.

The stakeholder meetings were held in collaboration with Amanda Davies and her research team from University of Western Australia and Rangelands NRM. Special thanks to Janine Hatch and Julie Cammel for organising the meetings.

Thankyou to those stakeholders that attended and contributed to the workshops in Kununurra, Broome and Karratha in May, 2009.

8.0 Reference

8.1 Literature cited in the research review

- Allen, G.R. and R. Swainston. 1988. *The Marine Fishes of North-Western Australia. A Field Guide for Anglers and Divers*. Western Australian Museum, Perth. 210pp.
- Allen, G.R., R. Swainston and J. Ruse. 1997. *Marine Fishes of Tropical Australia and South-East Asia. A Field Guide for Anglers and Divers*. Western Australian Museum, Perth. 292pp.
- Brodie, P., M. Fuller, T. Rees and L. Wilkes. 2006. *Data Warehouse and Metadata Holdings Relevant to Australia's North West Shelf*. North West Shelf Joint Environmental Management Study. Technical Report No. 5: 310pp.
- Department of Conservation and Land Management. 2005. *Indicative Management Plan for the Proposed Dampier Archipelago Marine Park and Cape Preston Marine Management Area*. Department of Conservation and Land Management, Government of Western Australia. 145pp.
- Department of Environment and Conservation. 2008. *Preliminary Reconnaissance Survey of Benthic Habitats in the Anjo Peninsula Area, Kimberley Bioregion, Western Australia*. Report to the Northern Development Taskforce Prepared by the Marine Ecosystems Branch. Department of Environment and Conservation, Government of Western Australia. iv+22pp.
- Department of Environment and Conservation. 2009. *Protecting the Kimberley: A synthesis of scientific knowledge to support conservation management in the Kimberley region of Western Australia*. Department of Environment and Conservation, Government of Western Australia. Perth. 48pp.
- Department of Environment and Conservation and Marine Parks and Reserves Authority. 2007a. *Management Plan for the Montebello/Barrow Islands Marine Conservation Reserves 2007-2017*. Department of Environment and Conservation, Government of Western Australia. Perth. Management Plan No. 55, vi + 125pp.
- Department of Environment and Conservation and Marine Parks and Reserves Authority. 2007b. *Rowley Shoals Marine Park Management Plan, 2007-2017*. Department of Environment and Conservation, Government of Western Australia. Perth. Management Plan No. 56, iv + 77pp.
- Department of Environment. 2006. *Pilbara Coastal Water Quality Consultation Outcomes: Environmental Values and Environmental Quality Objectives*. Report from the Department of Environment to the Environmental Protection Authority and the Rangelands NRM Coordinating Group. Department of Environment, Government of Western Australia. Perth. Marine Series Report No.1: 61pp.
- Department of Fisheries. 2004. Proposals for community discussion: A quality future for managing the recreational component of the catch. A five-year draft strategy for managing the recreational component of the catch. Fisheries Management Paper 181:100pp.
- Department of Fisheries. 2005. A five-year management strategy for recreational fishing in the Pilbara/Kimberley region of Western Australia. Fisheries Management Paper 193:80pp.
- Department of Industry and Resources. 2005a. *Pilbara Region. Key Features*. Map produced by the Geological Survey of Western Australia.
- Department of Industry and Resources. 2005b. *Kimberley Region. Key Features*. Map produced by the Geological Survey of Western Australia.
- Department of the Environment, Water, Heritage and the Arts. 2008. *The North-West Marine Bioregional Plan. Bioregional Profile. A description of the ecosystems, conservation values and uses of the North-West marine region*. Commonwealth of Australia, Canberra. 170pp + CD-ROM.

- Fletcher, W.J. and K. Santoro (Eds.). 2007. *State of the Fisheries Report 2006/07*. Department of Fisheries, Western Australia, Perth. 316pp.
- Fletcher, W.J. and K. Santoro (Eds.). 2008. *State of the Fisheries Report 2007/08*. Department of Fisheries, Western Australia, Perth. 308pp.
- Fry, G., G. Heyward, T. Wassenberg, T. Taranto, T. Stieglitz and J. Colquhoun. 2008. *Benthic Habitat Surveys of Potential LNG Hub Locations in the Kimberley Region*. A study commissioned by the Western Australian Marine Science Institution on behalf of the Northern Development Taskforce. A joint CSIRO and AIMS Preliminary report for the Western Australian Marine Science Institute. 61pp.
- Fulton, E., K. Sainsbury, D. McDonald, D. Hayes, V. Lyne, R. Little, M. Fuller, S. Condie, R. Gray, R. Scott, H. Webb, B. Hatfield and M. Martin. 2006. *Management Strategy Evaluation Specification for Australia's North West Shelf*. North West Shelf Joint Environmental Management Study. Technical Report No.15:358pp.
- Henry, GW and JM Lyle (Eds.). 2003. *The National Recreational and Indigenous Fishing Survey. FRDC Project No. 99/158*. Australian Government Department of Agriculture, Fisheries and Forestry, Canberra. 188pp.
- Heywood, A., A. Reville and C. Sherwood. 2006. *Review of Research and Data Relevant to Marine Environmental Management of Australia's North West Shelf*. North West Shelf Joint Environmental Management Study. Technical Report No.1:67pp.
- Hooper, JNA, JA Kennedy and RJ Quinn. 2002. Biodiversity 'hotspots', patterns of richness, endemism, and taxonomic affinities of tropical Australian sponges (Porifera). *Biodiversity and Conservation* 11:851-885.
- Hutchins, J.B. 2003. Checklist of marine fishes of the Dampier Archipelago, Western Australia. In Wells, F.E., D.I. Walker and D.S. Jones (Eds.). *The Marine Flora and Fauna of the Dampier Archipelago, Western Australia*. Western Australian Museum, Perth. 453-478.
- Jefferson, T.A., S. Leatherwood and M.A. Webber. 1993. *Marine Mammals of the World*. FAO species identification guide, Rome. 320pp.
- Lyne, V., M. Fuller, P. Last, A. Butler, M. Martin and R. Scott. 2006. *Ecosystem Characterisation of Australia's North West Shelf*. North West Shelf Joint Environmental Management Study. Report No. 12: 73pp.
- Marine Parks and Reserves Selection Working Group. 1994. *A Representative Marine Reserve System for Western Australia*. Department of Conservation and Land Management, Government of Western Australia. Perth. Report of the Marine Parks and Reserves Selection Working Group, ix + 234pp + maps.
- Márquez, M.R. 1990. *FAO Species Catalogue. Vol. 11. Sea Turtles of the World. An annotated and illustrated catalogue of sea turtle species known to date*. FAO Fisheries Synopsis No.125, Vol.11, 81pp.
- McDonald, JI. 2008. A likelihood analysis of non-indigenous marine species introduction to fifteen ports in Western Australia. *Fisheries Research Report* 182:36pp.
- Morgan, D., H. Gill, M. Allen and M. Maddern. 2003. *Distribution and Biology of Fish in Inland Waters of the Pilbara (Indian Ocean) Drainage Division*. Report to the Natural Heritage Trust. March 2003. Project Number 003026. Murdoch University. Perth. 70pp.
- Newman, S.J., G.C. Young and I.C. Potter. 2004. *Characterisation of the Inshore Fish Assemblages of the Pilbara and Kimberley Coasts*. FRDC Project No. 2000/132. Department of Fisheries. 204pp.
- North West Shelf Joint Environmental Management Study. 2007. *Final Report*. North West Shelf Joint Environmental Management Study. 40pp.
- Northern Development Taskforce. 2008a. *Site Evaluation Report, Part A*. Department of Industry and Resources, Government of Western Australia. 10pp.

- Northern Development Taskforce. 2008b. *Site Evaluation Report, Part B*. Department of Industry and Resources, Government of Western Australia. 63pp.
- Nowara, G.B. and S.J. Newman. 2001. A history of foreign fishing activities and fishery-independent surveys of the demersal finfish resources in the Kimberley region of Western Australia. Fisheries Research Report 125:84pp.
- Pedretti, Y.M. and E.I. Paling. 2000. *WA Mangrove Assessment Project 1999-2000*. Murdoch University. Perth. 83pp.
- Sainsbury, K.J., P.J. Kailola and G.G. Leyland. 1985. *Continental Shelf Fishes of Northern and North-Western Australia. An Illustrated Guide*. CSIRO Division of Fisheries Research. Clouston and Hall and Peter Pownall Fisheries Information Service, Canberra. 375pp
- Semeniuk, V. 1993. The mangrove system of Western Australia 1993: Presidential Address. Journal of the Royal Society of Western Australia 76:99-122.
- Skewes, T., T. Taranto, S. Edgar, T. Van Der Velde, M. Miller and W. Rochester. 2008. *North West Marine Research Inventory*. WAMSI project No. 3.8. Final report draft (Ver. 2). CSIRO Marine and Atmospheric Research. 47pp.
- Stephenson, P.C. and J. Chidlow. 2003. *Bycatch in the Pilbara Trawl Fishery*. Fisheries Western Australia. Research Division. Final Report to the Natural Heritage Trust, 74pp.
- Stephenson, P.C. and S. Wells. 2008. Evaluation of the effectiveness of reducing dolphin catches with pingers and exclusion grids in the Pilbara trawl fishery. Final FRDC report - project 2004/068. Fisheries Research Report 173:44pp.
- Stephenson, P.C., S. Wells and J.A. King. 2008. Evaluation of exclusion grids to reduce the catch of dolphins, turtles, sharks and rays in the Pilbara trawl fishery. DBIF funded project. Fisheries Research Report 171:24pp.
- Thorburn, D., D. Morgan, H. Gill, M. Johnson, H. Wallace-Smith, T. Vigilante, I. Croft and J. Fenton. 2004a. *Biology and Cultural Significance of the Freshwater Sawfish (Pristis microdon) in the Fitzroy River Kimberley, Western Australia*. Report to the Threatened Species Network. Murdoch University, Kimberley Land Council, Kimberley Language Resource Centre. 57pp.
- Thorburn, D.C. and D.L. Morgan. 2004. The northern river shark *Glyphis* sp. C (Carcharhinidae) discovered in Western Australia. Zootaxa 685:1-8.
- Thorburn, D.C., D.L. Morgan, A.J. Rowland and H. Gill. 2004b. *Elasmobranchs in the Fitzroy River, Western Australia*. Report to the Natural Heritage Trust. 30pp.
- Thorburn, D.C., S. Peverell, J.D. Stevens, P.R. Last and A.J. Rowland. 2003. *Status of freshwater and estuarine Elasmobranchs in northern Australia*. Report for the Natural Heritage Trust. Canberra. 75pp.
- Trewin, D. 2006. *2006 Year Book Australia*. Australian Bureau of Statistics, Commonwealth of Australia, Canberra. 776pp.
- Walker, T.I. 2007. Spatial and temporal variation in the reproductive biology of gummy shark *Mustelus antarcticus* (Chondrichthyes: Triakidae) harvested off southern Australia. *Chondrichthyan Special Issue*. Marine and Freshwater Research 58(1):67-97.
- Wenziker, K., K. McAlpine, S. Apte and R. Masini. 2006. *Background Quality for Coastal Marine Waters of the North West Shelf, Western Australia*. North West Shelf Joint Environmental Management Study. Technical Report No.18:50pp.
- Whitty, J.M., N.M. Phillips, D.L. Morgan, J.A. Chaplin, D.C. Thorburn and S.C. Peverell. 2008. *Habitat associations of Freshwater Sawfish (Pristis microdon) and Northern River Sharks (Glyphis sp. C): including genetic analysis of P. microdon across northern Australia*. Centre for Fish & Fisheries Research (Murdoch University) report to the Department of the Environment, Water, Heritage and the Arts, Australian Government. 75pp.

- Williamson, P.C., N.R. Sumner and B.E. Malseed. 2006. A 12-month survey of recreational fishing in the Pilbara region of Western Australia during 1999-2000. Fisheries Research Report 153:61pp.
- Wilson, B. 2008. *Intertidal Habitats of Selected Sites in the Canning Bioregion. Preliminary Field Results May-June 2008*. Report submitted to the Northern Development Taskforce. 77pp.
- Wood, M. and D. Mills. 2008. *A Turning of the Tide: Science for Decisions in the Kimberley-Browse Marine Region*. A Western Australian Marine Science Institution (WAMSI) initiative. WAMSI. Perth. xv + 34pp + appendices.

8.2 Literature cited in the monitoring review

- AGC Woodward-Clyde Pty Ltd, 1991. *Assessment of the Marine Biological Monitoring Programme for the Harriet Oilfield*. Report to Apache Energy; Reference no. H30; Document no. EAA-60-RH-006, Apache Energy Ltd.
- AGC Woodward-Clyde Pty Ltd, 1994. *Maitland Heavy Industry Estate Karratha: Public Environmental Review*. LandCorp and Department of Resources Development.
- Alongi, D., Clough, B., Tirendi, F., Dixon, P., Dalhaus, O. and Goldrick, A., 1997. Mangrove Studies Western Australian Research Activities 1994-1996. In: *Australian Institute of Marine Science Report*. 16-18 pp.
- Althaus, F., K. Woolley, X. He, P. Stephenson and R. Little. 2006. The Spatial Distribution of Commercial Fishery Production on Australia's North West Shelf. North West Shelf Joint Environmental Management Study. NWSJEMS Technical Report No. 10, 122pp.
- Ampolex, 1996. *Australia Region Health Safety and Environment Annual Report*.
- Apache Energy Ltd, 1996. *Agincourt-1 Exploration Well Environmental Appraisal*. Report to Apache Energy Ltd, Reference no. H129; Document no. EAA-00-RI-050, Apache Energy Ltd.
- Apache Energy Ltd, 1997. *Impact of Artificial Lighting on Sea Turtles*. Reference no.183; Document no.EA-00-RI-085/B H183, 25 pp
- Astron Engineering, 1991. Development of South Pepper, North Herald and Chervil Fields. Airlie Island Terminal. In: *First Triennial Environment Review, 1987-1990*. Unpublished Report prepared for Western Mining Corporation Ltd.
- Astron Environmental Pty Ltd, 1994. *Saladin Oilfield Second Triennial Report Vegetation Monitoring 1988 - 1994*. Report for West Australian Petroleum Pty Ltd, 56pp.
- Astron Environmental Pty Ltd, 1995. *Integrated Shearwater Monitoring Program Annual Report*. Report to Apache Energy Ltd; Reference no. H115; Document no. EAA-60-RI-055.
- Berry, P.F. (Ed.) 1986. *Faunal Surveys of The Rowley Shoals, Scott Reef and Seringapatam Reef North-western Australia*. Records of the Western Australian Museum, Supplement No. 25, Perth. 106pp.
- Berry, P.F. (Ed.) 1993. *Marine Faunal Surveys of Ashmore Reef and Cartier Island North-western Australia*. Records of the Western Australian Museum, Supplement No. 44, Perth.
- Berry, P.F. and F.E. Wells (Eds.). 2000. *Survey of the marine fauna of the Montebello Islands, Western Australia and Christmas Island, Indian Ocean. Records of the Western Australian Museum. Supplement 59*. Western Australian Museum, Perth. 127pp.
- BHP Petroleum, Apache Energy Ltd, Murdoch University and EPA, 1993. *Coral Spawning Study*. Report for West Australian Petroleum Pty Ltd, Apache Energy Ltd.
- Bidwell, J.R. and Tsvetnenko, Y., 1995. *The Effect of Three Water Treatment Chemicals on the Growth of the Algae, Isochrysis sp., and Survival of the Tiger Prawn, Penaeus monodon*. Report to West Australian Petroleum Pty Ltd, 18 pp.

- Bidwell, J.R., Tsvetnenko, Y. and J. Gorrie. 1995. *Toxicity of the Water-Soluble Fraction of Wanaea-Cossack Crude Oil to Three Marine Species*. Woodside Offshore Petroleum Pty Ltd, WENV 275.
- Bidwell, J.R., Tsvetnenko, Y., Gorrie, J. and Chegwidan, A., 1994. *Acute Toxicity of the Water-Soluble Fraction of Harriet Crude Oil to Three Marine Species*. Report to Hadson Energy Ltd; Reference no. H11; Document no EA-00-RI-046, Apache Energy Ltd.
- Bowman Bishaw Gorham and UWA Histopathology, 1993. *Thevenard Island Outfall Monitoring*. Report for West Australian Petroleum Pty Ltd.
- Bowman Bishaw Gorham, 1988. *Port Walcott Oil Spill Environmental Investigation*. Report for Robe River Iron Associates.
- Bowman Bishaw Gorham, 1991. *Photographs of Monitored Corals - Leatherback-1 Drilling Program*. Report to Apache Energy Ltd, Reference no. H151; Document no. EAA-61-LD-001, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1992. *Petroleum Exploration in Permit Areas EP 342 and TP/9 Results of a Pre-Drilling Site Survey for the Proposed Loggerhead - 1 Location*. Report to Apache Energy Ltd; Reference no. H50; Document no. EAA-61-RD-006, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1992. *Re-Inspection of the Leatherback - 1 Drill Sites*. Report to Apache Energy Ltd; Reference no. H47; Document no. EAA-61-RD-005, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1993. *Petroleum Exploration in Permit Areas EP 342 and TP/9: Results of Environmental Monitoring of the Loggerhead-1 Drilling Program*. Report to Apache Energy Ltd, Reference no. H53; Document no. EAA-61-RD-007, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1994. *Roller Oilfield Development: Environmental Monitoring; Results of Initial Monitoring Survey during November, 1993 and April 1994*. Report prepared for West Australian Petroleum Pty Ltd.
- Bowman Bishaw Gorham, 1995. *Survey of the Intertidal Habitats of Thevenard Island*. Report to Western Australian Petroleum Pty Ltd, 66 pp.
- Bowman Bishaw Gorham, 1995. *TP/3 Marine Environment Monitoring Program: Triennial Report*. 90 pp.
- Bowman Bishaw Gorham, 1996. *Barrow Island Intertidal Survey*. Report to West Australia Petroleum Pty Ltd, 102 pp.
- Bowman Bishaw Gorham, 1996. *Environmental Baseline Survey of Wandoo B Location*. Report for Mobil Exploration & Producing Australia Pty Ltd.
- Bowman Bishaw Gorham, 1996. *Existing Environment at the Leatherback-2 Well Site*. Report to Apache Energy Ltd, Reference no. H148; Document no. EAA-61-RI-009/B, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1996. *Inspection Surveys of the Mydas-1 and Hawksbill-1 Well Sites*. Report to Apache Energy Ltd; Reference no. H135; Document no. EAA-61-RU-004, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1997. *Eclectus Environmental Baseline Review*. Report for Woodside Offshore Petroleum Pty Ltd; WENV 334.
- Bowman Bishaw Gorham, 1997. *Survey of the Intertidal Shore of the Eastern Side of Barrow Island*. Report for West Australian Petroleum Pty Ltd, 175 pp.
- Bowman Bishaw Gorham, 1997. *Survey of the Intertidal Shore of the Western Side of Barrow Island*. Report for West Australian Petroleum Pty Ltd, 175 pp.
- Bowman Bishaw Gorham, 1998. *Environmental Survey of Two Proposed Exploration Well Sites in EP369 and EP364*. Report for Tap Oil NL, 65 pp.
- Bowman Bishaw Gorham, 1998. *Saladin 15 Drilling Program: Monitoring Surveys*. Report for West Australian Petroleum Pty Ltd, 11 pp.

- Burns, K., Furnas, M., King, B. and Heggie, D., 1996. Fates of materials in the discharge water from offshore petroleum production of the North-West Shelf. In: *Western Australian Research Activities 1994-1996*. AIMS Report, Australian Institute of Marine Science, Townsville, 44-45 pp.
- Carr, B.L.N. and Paling, E., 1996. *Pilbara Mangrove Study, Volume 2A Introduction, Site Lists and Site Information, Mangrove Site Database*. NEDP Report no. 18, Institute for Environmental Science Murdoch University & Conservation Council of WA, Murdoch University.
- Carr, B., Livesey, N. and Paling, E., 1996. *Pilbara Mangrove Study, Volume 1*. NEDP Report No. 18, Institute for Environmental Science Murdoch University & Conservation Council of WA, Murdoch University, 102 pp.
- Carr, B., Livesey, N. and Paling, E., 1996. *Pilbara Mangrove Study, Volume 2B Introduction, Site Criteria Lists, Selected Site Information and Maps*. NEDP Report no. 18, Institute for Environmental Science Murdoch University & Conservation Council of WA, Murdoch University.
- Carr, W., 1988. Environmental Impact Assessments of three offshore oilfields, Western Australia. In: *The North West Shelf, Australia: Proceedings of Petroleum Exploration Society, Australia Symposium*. Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, Perth, pp. 625-32.
- Carter, D., Maxwell, J.G. and Bowtell, C., 1983. *North West Shelf Crustacean Survey Report*. Report to the Australian Fisheries Service by K.F.V. Fisheries Pty Ltd.
- Chappell, J., 1982. *Some Effects of Cyclonic Waves and Tidal Currents on the Coast and Continental Shelf near Dampier, Western Australia*. Australian National University, Canberra.
- Chegwidden, A., Fisher, S.J., Alexander, R., and Kagi, R.I., 1993. The fate of hydrocarbons associated with drilling from the North Rankin 'A' gas and condensate platform, Western Australia. *APEA Journal*: 386-94.
- Chittleborough, R.G., 1983. *The Dampier Archipelago Marine Study: A Progress Report*. Bulletin 141, Department of Conservation & Environment, Western Australia, 12 pp.
- Coffey & Partners, 1996. *Stage 1 Environmental Audit Airlie Island WA: Western Mining Corporation*. Report E9002/1-AC for Western Mining Corporation Ltd, Novus West Australia Pty Ltd.
- Corteen, L., 1998. *Varanus Island Turtle Monitoring Program 1997/98 Report*. EA-60- RI-082 H205, Apache Energy Ltd, 63 pp.
- CSIRO Division Marine Research, 1991. *North West Shelf Development Project Benthic Samples from Cossack Field*. Report for Woodside Offshore Petroleum Pty Ltd; WENV 0168.
- CSIRO Division of Fisheries and Oceanography (1968). Oceanographical observations in the Indian Ocean in 1964. H.M.A.S. Diamantina cruise Dm5/64. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 40.
- CSIRO, 1992. *North West Shelf Development Project Benthic Samples From North Rankin A Field*. Report for Woodside Offshore Petroleum Pty Ltd.
- Dames & Moore, 1990. *Consultative Environmental Review Harriet Gas Project*. Report to Apache Energy Ltd, Reference no. H25; Document no. EAA-60-RI-012, Apache Energy Ltd.
- Dampier Salt, 1973. *Removal of Marine Species from Dampier Salt Ponds*. 6 pp.
- Dampier Salt, 2003. *2002 Annual Environmental Report*. Dampier Salt Ltd, 48pp + appendices.
- Deegan, P.M., 1992. *Montebello and Lowendal Islands, Summary Report of Marine Resources*. Report for Western Australia Department of Conservation and Land Management, Perth, 16 pp.
- Department of Environment and Conservation. 2008. Preliminary Reconnaissance Survey of Benthic Habitats in the Anjo Peninsula Area, Kimberley Bioregion, Western Australia. Report to the Northern Development Taskforce Prepared by the Marine Ecosystems Branch. Department of Environment

- and Conservation, Government of Western Australia. iv+22pp.
- Department of Minerals and Energy, 1997. *Environmental Compliance Audit of Wandoo B Production Facility*. Mobil Exploration & Producing Australia Pty Ltd.
- Dinara Pty Ltd, Butler, W. H. and Butler, MA., 1987. *Harriet Field Development Varanus Island - Annual Environmental Report*. Report to Apache Energy Ltd, Reference no. H13; Document no. EAA-60-RI-008.
- Ecos Consulting Pty Ltd, 1996. *Marine Monitoring of Dredging Operations in Mermaid Sound, WA*. Report to Woodside Offshore Petroleum Pty Ltd, WENV 293.
- Environmental Protection Authority. 2007. *State of the Environment Report: Western Australia 2007*. Department of Environment and Conservation. Perth, Western Australia. xv + 312pp.
- Fandry, C., A. Revill, K. Wenziker, K. McAlpine, S. Apte, R. Masini and K. Hillman. 2006. *Contaminants on Australia's North West Shelf: Sources, Impacts, Pathways and Effects*. North West Shelf Joint Environmental Management Study. NWSJEMS Technical Report No. 13, 46pp.
- Fisher, S., 1996. In: *Chemical Analysis of Petroleum Hydrocarbons and Heavy Metals in Sediments Collected in October 1996 from the Sea Floor Adjacent to the Lynx 1A Well*. Woodside Offshore Petroleum Pty Ltd.
- Fletcher, W.J. and K. Santoro (Eds.). 2008. *State of the Fisheries Report 2007/08*. Department of Fisheries, Western Australia, Perth. 308pp. (And other State of the Fisheries Reports)
- Forde, M. J., 1985. *Technical Report on Suspended matter in Mermaid Sound, Dampier Archipelago Marine Study*. Department of Conservation and Environment, 102 pp.
- Fry, G., G. Heyward, T. Wassenberg, T. Taranto, T. Stieglitz and J. Colquhoun. 2008. *Benthic Habitat Surveys of Potential LNG Hub Locations in the Kimberley Region*. A study commissioned by the Western Australian Marine Science Institution on behalf of the Northern Development Taskforce. A joint CSIRO and AIMS Preliminary report for the Western Australian Marine Science Institute. 61pp.
- Furnas, M. and Steinberg C., 1995. *Environmental and Oceanographic Measurements at Scott Reef, Western Australia*. Report for Woodside Offshore Petroleum Pty Ltd, 32 pp.
- Furnas, M. and Steinberg C., 1996. *Environmental and Oceanographic Measurements at Scott Reef, Mermaid Reef and Broome, Western Australia: September 1994 to October 1995*. Report for Woodside Offshore Petroleum Pty Ltd, 185 pp.
- Furnas, M. and Steinberg. C., 1997. *Environmental and oceanographic monitoring at oceanic coral reefs on the North-West Shelf. Western Australian Research Activities 1994-1996*. Australian Institute of Marine Science Report.
- Geotech, 1995. *A Summary of the Chemical Analysis of Sediments Collected from Withnell Bay between September 1987 and July 1995 Following a Discharge of Oil Contaminated Water from the Woodside Onshore Treatment Plant, Burrup Peninsula, North -Western Australia*. Report for Woodside Offshore Petroleum Pty Ltd; WENV 286.
- Geotech, 1997. *Analysis of sea-floor sediments collected in April 1997 (Eclectus)*. Report for Bowman Bishaw Gorham.
- Geotech, 1998. *Chemical Analysis of Rock Oyster and Sediments Collected in February 1998 from the Intertidal Zone Near to the Terminal Tank Area, Barrow Island*. West Australian Petroleum Pty Ltd, 28 pp.
- Gordon, D.M., 1987. *Disturbance to Mangroves in the Tropical- arid Western Australia: Hypersalinity and Restricted Tidal Exchange as Factors Leading to Mortality*. In. Technical Series 12, Environmental Protection Authority.
- Gordon, D.M., Bougher, A.R., LeProvost, M.I., and Bradley, J.S., 1995. *Use of models for detecting and monitoring change in a mangrove ecosystem in northwestern Australia*. *Environmental International*, 21(5): 605-18.

- Hadson Energy Ltd, 1990. *Harriet Field Development Fifth Annual Environmental Report - June 1990*. Report to Apache Energy Ltd; Reference no. H27; Document no. EAA-60-RI-017, Apache Energy Ltd.
- Hadson Energy Ltd, 1990. *Harriet Field Development Varanus Island - Annual Environmental Report*. Report to Apache Energy Ltd; Reference no. H21; Document no. EAA-60-RI-015, Apache Energy Ltd.
- Hadson Energy Ltd, 1991. *Harriet Field Development Varanus Island - Second Triennial Environmental Report*. Report to Apache Energy Ltd; Reference no. H35; Document no. EAA-60-RI-016, Apache Energy Ltd.
- Hadson Energy Ltd, 1991. *Tanami # 1 Environmental Report*. Report to Apache Energy Ltd; Reference no. H44; Document no. EAA-60-RD-002, Apache Energy Ltd.
- Hadson Energy Ltd, 1992. *Harriet Oilfield Marine Biological Monitoring Programme - Second Triennial Review from June 1989 to June 1991*. Report to Apache Energy Ltd; Reference no. H48; Document no. EAA-60-RH-007, Apache Energy Ltd.
- Hadson Energy Ltd, 1994. *Seventh Environmental Report - October 1991 to December 1993*. Report to Apache Energy Ltd; Reference no. H88; Document no. EAA-60-RI-037, Apache Energy Ltd.
- Hallegraeff, G.M., and Jeffrey, S.W., 1984. Tropical phytoplankton species and pigments of continental shelf waters of north and north west Australia. *Marine Ecology Progress Series*, 20: 59-74.
- Hanley, R., 1993. *Wanaea Baseline Study: Report on the Benthic Invertebrate Survey of Wanaea Oil Field*. Report for Woodside Offshore Petroleum Pty Ltd; Marine Ecology Technical Report 94/1.
- Heyward, A., Halford, A., Smith, L. and Williams, D.M., 1997. Coral reefs of north west Australia: baseline monitoring of an oceanic reef ecosystem. In: H.A. Lessios and I.G. Macintyre (eds.) *Proceedings of the 8th International Coral Reef Symposium* Vol. 1. Smithsonian Tropical Research Institute, Panama., Panama, June, 1996. 289-284 pp.
- Heyward, A., Smith, L., Halford, A. and Field, S., 1997. Monitoring and Benthic Dynamics in Western Australian Coral Reefs. In: *Western Australian Research Activities 1994-1996*. Australian Institute of Marine Science Report, 9-11 pp.
- Hick, P. and Caccetta, M., 1997. Spectral Measurements of Illumination Sources at Varanus Island: A study of the Possible Effects of the East Spar Facility Lights on Turtles. In. Report for Apache Energy Limited, Apache Energy Limited, 14 pp.
- Holdway, D., Tindall, C. and Heggie, D., 1995. *Produced Formation Water Discharge to Seawater from Harriet 'A' Production Platform, NW Shelf, 1995*. unpublished report.
- Hutchins, J.B. 2003. Checklist of marine fishes of the Dampier Archipelago, Western Australia. In Wells, FE, DI Walker and DS Jones (Eds.). *The Marine Flora and Fauna of the Dampier Archipelago, Western Australia*. Western Australian Museum, Perth. 453-478.
- Jenner, K.C.S., M.N.M. Jenner and K.A. McCabe. 2001. Geographical and temporal movements of Humpback Whales in Western Australian waters. *APPEA Journal*:749-765.
- Johnson, D.B. and Stoddart, J.A., 1988. *Report on Surveys of the Distribution, Abundance and Impact of Acanthaster planci on Reefs Within the Dampier Archipelago (Western Australia)*. Australian Institute of Marine Science Report, 15pp.
- Jones, D.S. (Ed.) 2004. *Marine Biodiversity of the Dampier Archipelago Western Australia 1998-2002. Report on the Results of the Western Australian Museum/Woodside Energy Ltd. Partnership*. Records of the Western Australian Museum Supplement No. 66, Perth. 401pp.
- Kinhill Pty Ltd, 1998. *Marine Biological Monitoring and Reporting Program Thevenard Island (WAPET)*. Report for West Australian Petroleum Pty Ltd.
- LeProvost Dames & Moore, 1991. *Chemical and Ecological Monitoring of Mermaid Sound Triennial Report 1988 - 1991*. For Woodside Offshore Petroleum Pty Ltd.

- LeProvost Dames & Moore, 1994. *Chemical and Ecological Monitoring of Mermaid Sound 1991 -1993 Triennial Review*. For Woodside Offshore Petroleum Pty Ltd.
- LeProvost Dames & Moore, 1994. *Harriet Oil & Gas Development, Eastern Bay Seafloor Survey, Varanus Island*. Report to Hadson Energy Ltd; LDM Ref: 19989-010- 367 (R516), 8 pp.
- LeProvost Dames & Moore, 1994. *Harriet Oil and Gas Fields Development Marine Management and Monitoring Programme*. Report to Apache Energy Ltd; reference no. H110; document no. EAA-60-RI-050/B.
- LeProvost Dames & Moore, 1994. *Wanaea Prospect, Calcarenite Ridges 1 & 4 Seafloor Video Analysis*. Report for Woodside Offshore Petroleum Pty Ltd, LeProvost Dames & Moore.
- LeProvost Dames & Moore, 1995. *1994 LPG Jetty and Ship-Turning Basin Dredging Programme Marine Monitoring Program*. Unpublished Report No. R551 for Woodside Offshore Petroleum Pty Ltd, LeProvost Dames & Moore, 53 pp.
- LeProvost Dames & Moore, 1996. *Agincourt Marine Habitat Survey August 1996*. Report to Apache Energy Ltd; reference no. H143; document no. EAA-60-RH-017/B.
- LeProvost Dames & Moore, 1996. *Chemical and Ecological Monitoring of Mermaid Sound Annual Report 1996*. Report for Woodside Offshore Petroleum Pty Ltd.
- LeProvost Dames & Moore, 1997. *Letter Report: Mangrove monitoring at North East Creek*. Report for Woodside Offshore Petroleum Pty Ltd.
- LeProvost Environmental Consultants, 1990. *Hadson Energy Ltd. Harriet Field Development. Fifth Annual Environmental Report June 1990*. Report to Hadson Energy Ltd, LEC Ref J147, Apache Energy Ltd.
- LeProvost Environmental Consultants, 1990. *Harriet Oilfield Marine Biological Monitoring Programme - Coral and Rocky Shore Fauna Monitoring to June 1990*. Report to Apache Energy Ltd; reference no. H28; document no. EAA-60-RH-005.
- LeProvost Environmental Consultants, 1990. *Saladin Oilfield Development Marine Biological Monitoring Programme Second Annual Report*. Report for West Australian Petroleum Pty Ltd, 66 pp.
- LeProvost Environmental Consultants, 1992. *Harriet Oilfield Marine Biological Monitoring Programme - second Triennial Review June 1989 - June 1991*. Report to Hadson Energy; Report R361, Apache Energy Ltd, Perth.
- LeProvost Environmental Consultants, 1993. *Harriet - Marine Management and Monitoring Programme - 7th Annual Report June 9-August 92*. Report to Apache Energy Ltd; reference no. H78; document no. EAA-60-RH-015.
- LeProvost, Semeniuk & Chalmer, 1980. *Fauna and Flora Survey of Western Lease No. 5976^H*. Dampier Salt (Operations), Dampier, WA.
- LeProvost, Semeniuk & Chalmer, 1980. *Marine Biological Monitoring Programme Burrup Peninsula, Western Australia: Phase One*. Report for Woodside Petroleum Development Pty Ltd.
- LeProvost, Semeniuk & Chalmer, 1986. *Harriet Oilfield Marine Biological Monitoring Programme*. Report to Apache Energy Ltd; reference no. H9; Document no. EAA-60-RH-001.
- LeProvost, Semeniuk & Chalmer, 1987. *Harriet - Marine Biological Monitoring Programme - Coral & Rocky Shore Fauna Monitoring to June 1987*. Report to Apache Energy Ltd; ref: no. H64; document no. EAA-60-RH013.
- LeProvost, Semeniuk & Chalmer, 1987. *Harriet Oilfield development. Mangrove monitoring surveys, Progress Report June 1987*. Report to Bond Corporation Pty Ltd; LSC Report No R178.
- LeProvost, Semeniuk & Chalmer, 1987. *Port Hedland Port Development 1984-86 Environmental Monitoring Programme Final Report*. Report for Mt Newman Mining Co. Pty Ltd; volume 1 text - 187/81.

- LeProvost, Semeniuk & Chalmer, 1989. *Harriet Field Development. Fourth Annual Environmental Report June 1989*. Report for Bond Energy Resources Ltd Petroleum Division; H18 document no. EAA-60-RI-011.
- LeProvost, Semeniuk & Chalmer, 1989. *South Pepper - North Herald Oilfield Marine Monitoring Program. Baseline Survey and First Annual Report*. Report for Western Mining Corporation Ltd.
- LeProvost, Semeniuk & Chalmer, 1989. *The Mangroves of the Lowendal Islands and Monte Bello Island - Harriet Oilfield Development Results of a Survey Late November 1989*. Report to Apache Energy Ltd; ref. no. H1; document no. EAA-60-RV-001.
- LeProvost, Semeniuk & Chalmer, 1990. *Harriet - Results of Hydrocarbon Sampling, Baseline Sediment & Supplemental Oyster Surveys - June 1989*. Report to Apache Energy Ltd; ref. no. H65; document no. EAA-60-RH-014.
- LeProvost, Semeniuk & Chalmer, 1990. *Harriet Oilfield Marine Biological Monitoring Programme - Coral and Rocky Shore Fauna Monitoring to June 1989*. Report to Apache Energy Ltd; ref. no. H20; document no. EAA-60-RH-004.
- LeProvost, Semeniuk & Chalmer, 1996. *Harriet Oilfield - Marine Biological Monitoring Programme Environmental Description, Establishment of Baseline and Collection of First Data Set*.
- LeProvost, Semeniuk & Chalmer, *Marine Biological Monitoring Programme Burrup Peninsula, Western Australia: Phase Two*. Report for Woodside Petroleum Development Pty Ltd.
- Lyne, V., M. Fuller, P.R. Last, A. Butler, M. Martin and R. Scott. 2006. *Ecosystem Characterisation of Australia's North West Shelf*. North West Shelf Joint Environmental Management Study. NWSJEMS Technical Report No. 12, 73pp.
- Meagher and Le Provost. 1979. *Marine Environment of Dampier Archipelago*. Woodside Petroleum Development Pty. Ltd. 202pp.
- Mobil Exploration & Producing Australia Pty Ltd, 1997. *Border-1 Environmental Closeout Report*.
- Mobil Exploration & Producing Australia Pty Ltd, 1997. *Cherring-1 Environmental Closeout Report, WA202P (R1)*.
- Mobil Exploration & Producing Australia Pty Ltd, 1997. *Effects of Wandoo Crude and Wonnich Condensate on Gametes and Larvae of the Coral Acropora millepora*.
- Mobil Exploration & Producing Australia Pty Ltd, 1998. *Environmental Monitoring of Sediment Characteristics at Wandoo*.
- Morgan, D.L., H. Gill, M. Allen and M. Maddern. 2003. *Distribution and Biology of Fish in Inland Waters of the Pilbara (Indian Ocean) Drainage Division*. Report to the Natural Heritage Trust. March 2003. Project Number 003026. Murdoch University. Perth. 70pp.
- Murdoch, R., 1994. *Review of the Seventh Annual Environmental Report by WMC of the Production Licence Area TL/2*. Report for Western Mining Corporation; CAR-TL/2- 24, Novus West Australia Pty Ltd.
- Newman, S.J., G.C. Young and I.C. Potter. 2004. *Characterisation of the Inshore Fish Assemblages of the Pilbara and Kimberley Coasts*. FRDC Project No. 2000/132. Department of Fisheries. 204pp.
- NIW, 1994. *Review of the Second Triennial Report on Environmental Management by Western Mining Corporation of the Production Licence TL/2*. CAR-GEN-305,0, Novus West Australia Pty Ltd.
- Northern Development Taskforce. 2008. *Site Evaluation Report, Part A*. Department of Industry and Resources, Government of Western Australia. 10pp.
- Northern Development Taskforce. 2008. *Site Evaluation Report, Part B*. Department of Industry and Resources, Government of Western Australia. 63pp.
- Novus West Australia Pty Ltd, 1990. *Production Licence TL/2 Marine Monitoring Programme Triennial Report*. CAR-GEN-58,0, Novus West Australia Pty Ltd.

- Novus West Australia Pty Ltd, 1992. Fifth Environmental Report Airlie Project Monte Bello and Lowendal Islands. In: *Summary Report of Marine Resources and Bibliography*. CAR-TL/2-61,0; Novus West Australia Pty Ltd.
- Nowara, G.B. and S.J. Newman. 2001. A history of foreign fishing activities and fishery-independent surveys of the demersal finfish resources in the Kimberley region of Western Australia. Fisheries Research Report 125:84pp.
- NSR Environmental Consultants, 1995. *Wandoo Full Field Development Public Environmental Review*. Report for Mobil Exploration & Producing Australia Pty Ltd.
- Oliver, G.A., and Fisher, S.J., 1999. The persistence and effect of non-water based drilling fluids on Australia's North West Shelf, progress findings from three seabed surveys. *APPEA Journal*.
- Oliver, G., 1995. *Environmental report on the impact of disposal of ballast water by ships loading LPG and condensate*. Report for Woodside Offshore Petroleum Pty Ltd; WENV 258.
- Paling, E.I., 1996. *Mangrove Processes in the Port Hedland Harbour and Surrounds: Tidal Creek Erosion and Mangrove Health from September 1993 to March 1995*. Marine and Freshwater Research Laboratory, Environmental Science, Murdoch University. Report No. MAFRA 96/8. Unpublished report to Halpern Glick Maunsell Pty Ltd. BHP Iron Ore, 39 pp.
- Paling, E.I., G. Humphreys and I. McCardle. 2003. The effect of a harbour development on mangroves in northwestern Australia. *Wetlands Ecology and Management* 54:281-290.
- Pedretti, Y.M. and E.I. Paling. 2000. WA Mangrove Assessment Project 1999-2000. Murdoch University. Perth. 83pp.
- Phatak, A. and Palmer, M., 1998. *Effect of Drilling at North Rankin A on Benthic Fauna and Sediment Chemistry*. Woodside Offshore Petroleum Pty Ltd.
- Racal, 1994. *Reconnaissance Survey for The Extensions to the Port of Dampier Mermaid Strait Regional Survey Area Port Approach Routes Dixon Survey Area & Proposed Jetty Location Cape Lambert*. A2242.
- Reitsema, T., 1997. *Imposex in Morula granulata as Bioindicator of Turbidity Contamination in Dampier Archipelago*. Draft Report, 23 pp.
- Robertson, A., 1993. *Study of the Impact of Pilbara Coastal Development on Arid Zone Mangroves Stage 1*. AIMS, 41 pp.
- Simpson, C.J. and Grey, K.A., 1989. *Survey of Crown-of-Thorns Starfish and Coral Communities in the Dampier Archipelago, Western Australia*. Environmental Protection Authority, Technical Series No.25, 23 pp.
- Sinclair and Knight, 1992. *5th Annual Marine Monitoring Report for TL/2*. Report for Western Mining Corporation; CAR-TL/2-224, Novus West Australia Pty Ltd.
- Sinclair and Knight, 1993. *Annual Report of Environmental Management of Oilfield Operations on Thevenard Island January 1993*. CAR-GEN-143,0, Novus West Australia Pty Ltd.
- Sinclair and Knight, 1994. *Airlie Project Production Licence TL/2 Triennial Environmental Report 1991-1993*. CAR-TL/2-113,2800, Novus West Australia Pty Ltd.
- Sinclair and Knight, 1994. *Seventh Annual Environmental Report for Production Licence TL/2*. CAR-TL/2-121, Novus West Australia Pty Ltd.
- Sinclair and Knight, 1994. *Wedge-Tailed Shearwater and Oyster Monitoring*. Report for Western Mining Corporation; CAR-TL/2-223, CARGEN-260,0, Novus West Australia Pty Ltd.
- Sinclair Knight Merz, 1995. *Eighth annual Environmental Report for Production Licence TL/2*. CAR-TL/2-162, Novus West Australia Pty Ltd.
- Sinclair Knight Merz, 1996. *East Spar Gas Field Long Term Environmental Monitoring: Pre Production*

- Survey*. Report for Apache Energy Limited.
- Sinclair Knight Merz, 1997. *Airlie Island Marine Survey: Tenth Annual Report for Production Licence TL/2*. CAR-TL/2-233, Novus West Australia Pty Ltd.
- Sinclair Knight Merz, 1997. *East Spar Biological Monitoring: Post Commissioning Survey*. Report for Apache Energy; 054 EA-00-RI-078/B, 48 pp.
- Stoddard, J. and Johnson, D.B., 1988. *Report on Surveys of the Distribution, Abundance and Impact of Acanthaster planci on Reefs within the Dampier Archipelago, Western Australia*. Australian Institute of Marine Science.
- V & C Semeniuk Research Group, 1988. *The Mangroves of the Lowendal Islands and Montebello Islands*. Harriet Oilfield development triennial report, October 1988, 65 pp.
- V & C Semeniuk Research Group, 1989. *The Mangroves of the Lowendal Islands and Monte Bello Islands: Results of Surveys December 1988 and June 1989*. Annual Report, June 1989, Apache Energy Ltd.
- V & C Semeniuk Research Group, 1989. *The Mangroves of the Lowendal Islands and Monte Bello Islands: Results of Surveys Late November 1989. December 1989*. Apache Energy Ltd.
- V & C Semeniuk Research Group, 1992. *The Mangroves of the Lowendal Islands and Monte Bello Islands - Annual Report: Results of Survey December 1991 & June 1992* Report to Apache Energy Ltd; Reference no. H76; Document no. EAA-60-RV-012, Apache Energy Ltd.
- V & C Semeniuk Research Group, 1993. *The Mangroves of the Lowendal Islands and Monte Bello Islands - Annual Report: Results of Surveys, December 1992 & June 1993*. Report to Apache Energy Ltd; Reference no. H79; Document no. EAA-60-RV-013, Apache Energy Ltd.
- V & C Semeniuk Research Group, 1995. *The Mangroves of the Lowendal Islands and Monte Bello Islands June 1995*. Report to Apache Energy Ltd; Reference no. H116; Document no. EAA-60-RI-056, Apache Energy Ltd.
- Walker, D.I. (Ed.) 1997. *Marine Biological Survey of the Central Kimberley Coast, Western Australia*. University of Western Australia, Perth. 95pp.
- Walker, D.I., F.E. Wells and J.R. Hanley. 1996. *Survey of the Marine Biota of the Eastern Kimberley, Western Australia*. Marine Biological Survey of the Eastern Kimberley, Western Australia. University of Western Australia, Western Australian Museum, and Museum and Art Gallery of the Northern Territory. Perth. 84pp.
- Wells, F.E. and G.R. Allen. 2005. *Marine biodiversity on offshore coral reefs in north-western Australia. The Beagle, Records of the Museums and Art Galleries of the Northern Territory Supplement 1:43-50*.
- Wenziker, K., K. McAlpine, S. Apte and R. Masini. 2006. *Background Quality for Coastal Marine Waters of the North West Shelf, Western Australia*. North West Shelf Joint Environmental Management Study. NWSJEMS Technical Report No.18, 50pp.
- West Australian Petroleum Pty Ltd, 1990. *Barrow Island Oil Field Environmental Review 1963-1988*. Report by West Australian Petroleum Pty Ltd.
- West Australian Petroleum Pty Ltd, 1991. *Barrow Island Oil Field Environmental Review Update 1989 - 1991*. 70 pp.
- West Australian Petroleum Pty Ltd, 1996. *Barrow Island Oilfield: Environmental Review 1992-1996*. 75 pp.
- West Australian Petroleum Pty Ltd, 1997. *Barrow Island Annual Environmental Review Report 1997*.
- West Australian Petroleum Pty Ltd, 1997. *Thevenard Island Third Triennial Environmental Report 1995-1997*. 220 pp.
- Western Mining Corporation, 1990. *TP/7 and TL/2 Five Year Offshore Drilling Program Consultative*

- Environmental Review*. CAR-TL/2-12, Novus West Australia Pty Ltd.
- Western Mining Corporation, 1992. *Airlie Project: Fifth Environmental Report*.
- Western Mining Corporation, 1994. *Airlie Project Second Triennial 1993 Report*.
- Western Mining Corporation, 1995. *Eighth Annual Environmental Report for Production Licence TL/2*.
- Western Mining Corporation, 1996. *Airlie Island Annual Marine Survey*. CAR-TL/2- 184, Novus West Australia Pty Ltd.
- Western Mining Corporation, 1996. *East Spar Long Term Monitoring*. Western Mining Corporation, 1996. *Environmental Audit Airlie Island- Stage 1*. CARTL/ 2-173, Novus West Australia Pty Ltd.
- Whitelaw, A.W., In review. *Condition changes and length weight relationships for 21 species of fish from the families; Lutjanidae, Nemipteridae, Carangidae, Lethrinidae, Synodontidae, Balistidae, Haemulidae and Mullidae, from the North West Shelf of Australia*. CSIRO Divisional Report.
- Wilson, B. 2008. Intertidal Habitats of Selected Sites in the Canning Bioregion. Preliminary Field Results May-June 2008. Report submitted to the Northern Development Taskforce. 77pp.
- Woodside Offshore Petroleum Pty Ltd, 1996. *Annual Report on Environmental Investigations and Monitoring September 1996*. WENV 317.
- Woodside Offshore Petroleum Pty Ltd, 1997. *Biannual Report on Environmental Monitoring January to June 1997*.
- Woodside Petroleum Development Pty Ltd, 1989. *The Effects of Dredge Spoil on the Sedimentology and Biology of No Name Bay 1988 -1989*. WENV 0132.
- Young, P.C., and Sainsbury, K.J., 1985. CSIRO's North West Shelf program indicates changes in fish populations. *Australian Fisheries*, 44(3): 16-20.
- Young, P.C., Leis, J.M., and Hausfeld, H.F., 1986. Seasonal and spatial distribution of fish larvae in waters over the North West Continental Shelf of Western Australia. *Marine Ecology Progress Series*, 31(3): 209-22.

8.3 Miscellaneous MEST records for the Pilbara and Kimberley regions (with no further details)

- A preliminary population estimate of the Group IV breeding stock of humpback whales off Western Australia – Curt Jenner, Centre for Whale Research
- Acute sedimentation causes size-specific mortality and asexual budding in the mushroom coral, *Fungia fungites* – UWA manager
- Aerial survey of beaches between Onslow to Port Hedland for marine turtle nesting 2004 - DEC
- Aerial survey of the distribution and abundance of dugongs and associated macrovertebrate fauna - Pilbara coastal and offshore region, Western Australia – DEC
- Age-Structured Stock Assessment Modelling of Major Finfish Species – DoF
- An inland occurrence of mangroves – DEC
- Analysis of stable isotope ratios to investigate stock structure of red emperor and rankin cod in northern Western Australia – DEC
- Anna Plains benthic invertebrate and bird mapping 1999 (ANNABIM-99) – DEC
- Assets of the marine and coastal environment of the Dampier Archipelago, Western Australia: A Register – Jim Stoddard
- Background quality of marine sediments of the Pilbara coast – DEC

Background quality of the coastal marine waters of the North West Shelf, Western Australia. - WA Dept of Environment and Conservation

Background quality of the coastal marine waters off the west Kimberley coast. - DEC

Benthic habitats of Cockatoo Island – Jim Stoddard

Benthic habitats of Irvine Island – Jim Stoddard

Benthic habitats of Koolan Island – Jim Stoddard

Benthic marine biophysical attributes of selected sites in the West Kimberley – DEC

Biodiversity ‘hotspots’, patterns of richness and endemism, and taxonomic affinities of tropical Australian sponges (Porifera) – John Hooper Qld Museum

Browsing of mangroves by green turtles in Western Australia – K. Pendoley, Pendoley Environmental

Comparative distribution of macromolloscs and macrocrustaceans in a north-western Australian mangrove system – Clay Bryce WAM

Cyanobacterial mats: a possible nitrogen source to arid coastal mangroves – DEC

Daily and Seasonal Cycles of Sand Temperatures on Sea Turtle Nesting Beaches in Western Australia – Gerald Kuchling, UWA

Developing a broadscale habitat map of the Montebello/Barrow islands and the Dampier Archipelago/ Cape Preston regions – KB DEC

Effects of the bloom-forming alga *Trichodesmium erythraeum* on the pearl oyster *Pinctada maxima* – CSIRO

Evolutionary genetics of barramundi (*Lates calcarifer*) in the Australian region Marshall, Carina Rynn Ecremen. , Jan 2005 – THESIS

Fish species compositions over reefs and soft substrates in north-western Australia – Mike Travers – Murdoch

Historical datasets of dugong observations in the Kimberley region of Western Australia – Dave Holley, ECU

Ichthys Gas Field Development - Coral and other benthic primary producer (BPP) assemblages. – Greg Oliver, INPEX Browse Ltd

Ichthys Gas Field Development - Marine Turtle Studies. – Greg Oliver, INPEX Browse Ltd.

Identification and evaluation of sites for the development of large-scale, land-based marine aquaculture in Western Australia – DoF

Macroalgal habitats of Cockatoo Island reef flat – Jim Stoddard

Mangrove Studies in the Pilbara and Kimberley Regions – AIMS

Marine protected areas and dugong conservation along Australia’s Indian ocean coast – A.R. Preen – JCU

Marine turtle conservation and Gorgon gas development, Barrow Island, Western Australia – DEC

Marine turtle conservation and management in northern Australia – DEWHA

Marine wildlife distribution in the proposed Montebello/Barrow Island and Dampier Archipelago/Cape Preston marine conservation reserves – DEC

Monitoring Marine Turtle Nesting in the Dampier Archipelago Region - DEC

Monitoring of Western Australia’s Pearl Oyster Fishery – DoF

Mother-of-pearl shell (*Pinctada maxima*): Stock evaluation for management and future harvesting in Western Australia – DoF

Movements, recapture patterns and factors affecting the return rate of Carcharhinid and other sharks tagged off northern Australia - CSIRO

North Turtle Island, Pilbara Region, Western Australia: seabird islands, No. 240 - WA Dept of Environment and Conservation

Pilbara Sea Turtle program monitoring and tagging. - WA Dept of Environment and Conservation

Population Ecology of *Crocodylus porosus* (Schneider 1801) in the Kimberley Region of Western Australia. – W.R. Kay UQ

Population genetics of southeast Asian and Western Pacific turtles, *Chelonia mydas* - DEC

Progress report on establishing turtle nesting activity in North Western Australia – DEC

Protected Marine Species of the Gorgon Gas Development EIS/ERMP-Technical appendix C6 – Jeremy Fitzpatrick, RPS Environment

Recreational fishing trends - Rowley Shoals Marine Park - DEC

Regional Recreational Creel Surveys – DoF

Restricted marine Biological Survey of the Garden Bottom of Beagle Bay, Kimberley, Western Australia. – Clay Bryce WAM

Review of research and data relevant to the marine and terrestrial environment of Dampier – Jim Stoddard

Sea Turtles and the Environmental Management of Industrial Activities in North West Western Australia Pendoley@newton.dialix.com.au / Kellie Lee Pendoley , Jan 2005 – THESIS

Seagrass Watch: Roebuck Bay Community Seagrass Monitoring Project) – Danielle Bain, Seagrass Watch

Selection of mangrove stands for conservation in the Pilbara region of Western Australia - Dept of Environment and Conservation

Shell collecting activities, Kimberley Pilbara regions - Dept of Environment and Conservation

Size, sex and geographic variation in the diet of the tiger shark, *Galeocerdo cuvier*, from Western Australian waters – DoF (Dan G)

Sources of carbon supporting benthic fauna of Roebuck Bay and Eighty Mile Beach – UWA

Spatial variation of the intertidal sediments and macrozoo-benthic assemblages along Eighty Mile Beach, North-western Australia – DEC

Status and distribution of dugongs in Western Australia - DEC

Tagging Study of Flatback Turtles at Mundabullangana Station. – DEC

Tagging Study of Green Turtles at Barrow Island Marine Park/Barrow Island Marine Management Area. – DEC

Tagging Study of Hawksbill Turtles at Rosemary Island in the Dampier Archipelago - DEC

The biology of four tuskfish species (*Choerodon*: Labridae) in Western Australia d.fairclough@murdoch.edu.au / David Fairclough , Jan 2005 - THESIS

The distribution and abundance of dugongs and other megavertebrates in Western Australian coastal waters. – DEC

The Kimberley Coast Irrawaddy/Australian snubfin dolphin – Deborah Thiele, Deakin University

The status of the salt-water crocodile in the Glenelg, Prince Regent and Ord River Systems, Kimberley, Western Australia. – DEC

Turtle Track Monitoring by the West Pilbara Community Turtle Program (WPCTP) - Marissa Speirs WA Dept of Environment and Conservation

Video survey of the off-shore marine benthic habitats of the West Kimberley – Ray Masini - DEC

Western Australian marine turtle review - DEC

8.4 Supporting references for the Pilbara and Kimberley regions

- Aboriginal Sites Department, 1979. *Dampier Archipelago Liquefied Natural Gas Project, King Bay Area: Survey for Aboriginal Sites*. Accession no. 904251, Western Australia Museum.
- Aerial Surveys Australia, 1998. *Photograph of Airlie Island*. Novus West Australia Pty. Ltd.
- AGC Woodward-Clyde Pty Ltd, 1991. *Production Licence TL/2 Marine Monitoring Programme. Fourth Annual Report*. CAR-TL/2-40, Novus West Australia Pty Ltd.
- AGC Woodward-Clyde Pty Ltd, 1992. *EP341 and EP364. Offshore Permit-Wide Drilling Programme*. Report to Command Petroleum.
- AGC Woodward-Clyde Pty Ltd, 1993. *Desk-Top Test of the Oil Spill Contingency Plan for Permit Area EP 342*. Report to Apache Energy Ltd, Reference no. H71; Document no. EAA-61-RF-004, Apache Energy Ltd.
- Agostini, D. M., 1983. Development of the North Rankin Field, North West Shelf, Australia. *APEA Journal*, **23**: 164-69.
- AGSO Cartographer Services, 1996. Offshore Resource Map, Argo (map). Australian Geological Survey Organisation, Dept of Primary Industries and Energy, Canberra.
- AGSO Cartographic Services Unit, 1996. Offshore Resource Map, Rowley Shoals (map). 1:1,000,000. Australian Geological Survey Organisation, Department of Primary Industries and Energy, Canberra.
- AGSO Cartographic Services, 1994. Offshore Resource Map, Exmouth (map). 1:1,000,000 at 33°S. Australian Geological Survey Organisation, Dept of Primary Industries and Energy, Canberra.
- Airey, D. W., and Fahey, M., 1991. Cyclic response of calcareous soil from the North West Shelf of Australia. *Geotechnique*, **41**(1): 101-21.
- Alexander, B., Kagi, R., and Woodhouse, G., 1980. Origin of the Windalia Oil, Barrow Island, Western Australia. *APEA Journal*, **20**: 250-256.
- Alexander, R. and Hunter, G. A., 1986. *Geochemical Evaluation of Sholl, Onslow, Flinders Shoal Cores, Gorgon, Saladin and West Tryal Rocks Oils*. Report to West Australian Petroleum Pty Ltd.
- Allen, G. A., Pearce, L. G. G., and Gardner, W. E., 1978. A regional interpretation of the Browse Basin. *APEA Journal*, **18**(1): 23-33.
- Allen, G. A., Pearce, L. G. G., and Gardner, W. E., 1979. Browse Basin: regional interpretation. *Oil & Gas Journal*, **77**(10): 200-219.
- Allen, G. R. and Russell, B. C., 1986. Part VII Fishes. In: *Faunal Survey of The Rowley Shoals, Scott Reef and Seringapatam Reef, North Western Australia*. P. F. Berry, ed., Supplement 25.
- Allen, G. R., 1976. Two new species of damselfishes (Pomacentridae) from Western Australia. *Records of the Western Australian Museum*, **4**(2): 133-44.
- Allen, G. R., 1992. A new species of cardinalfish (Apogonidae) from northern Australia. *Records of the Western Australian Museum*, **15**(4): 697-701.
- Allen, G. R., 1992. A new species of damselfish (genus *Pomacentrus*) from northwestern Australia. *Records of the Western Australian Museum*, **15**(4): 691-95
- Allen, G. R., 1992. Part VIII Fishes. In: *Survey of the Aquatic Fauna of the Kimberley Islands and Reefs, Western Australia*. G. J. Morgan, ed., Unpublished Report, Western Australian Museum, Perth, 62-74 pp.
- Allen, G. R., 1993. Fishes. In: *Survey of the Marine Fauna and Habitats of the Montebello Islands, August 1993*. P. F. Berry, ed., Report to the Department of Conservation and Land Management, Western Australian Museum, Perth, 85-87pp.
- Allen, G. R., 1993. Part 7. Fishes of Ashmore Reef and Cartier Island. In: *Marine Faunal Survey of Ashmore Reef and Cartier Island North Western Australia*.

- Allen, G. R., 1995. A new species of cardinalfish (Apogon: Apogonidae) from northwestern Australia. *Records of the Western Australian Museum*, **17**: 177-80.
- Allen, G. R., 1996. New records of reef and shore fishes from north-western Australia. *Records of the Western Australian Museum*, **18**: 109-12.
- Allen, G. R., and Morrison, S. M., 1996. A new species of cardinalfishes (Apogonidae) from northern Australia. *Records of the Western Australian Museum*, **17**: 439-42.
- Alongi, D.M., Tirendi, F., and Clough, B.F. 2000. Below-ground decomposition of organic matter in forests of the mangroves *Rhizophora stylosa* and *Avicennia marina* along. *Aquatic Botany* 68(2):97-122.
- AMOSC, 1994. *Marine Oil Spills Action Plan*. Report to Apache Energy Ltd; H94 Document no. EAA-60-RF-003, Apache Energy Ltd.
- Ampolex, 1992. *Environmental Guidelines for Offshore Activities in Australia*.
- Ampolex, 1992. *Wandoo Project Report*.
- Ampolex, 1992. *Wandoo WA-202-P EPS*.
- Ampolex, 1994. *Austin-1 Environmental Management Plan*.
- Ampolex, 1994. *Cycad Exploration Well Environmental Appraisal*.
- Ampolex, 1994. *Cycad Exploration Well Environmental Management Plan*.
- Ampolex, 1994. *Introduction to the Montebello Island Environment*. MENV 052, 7pp.
- Ampolex, 1994. *Leanne Shallow Water Marine Seismic Survey Environmental Management Plan 1995*.
- Ampolex, 1994. *Melinda Seismic Survey Environmental Management Plan and Addendum to The EMP*.
- Ampolex, 1994. *Wandoo Proposed Development Plan*.
- Ampolex, 1995. *Drilling of Exploration Well Wonnich-1 Near Montebello Islands*. Consultative Environmental Review.
- Ampolex, 1995. *Response To Public Submissions on Wonnich CER*.
- Ampolex, 1995. *Toobada-1 Exploration Well Environmental Management Plan*.
- Ampolex, 1995. *Wonnich Environmental Management Strategy*.
- Ampolex, 1996. *Ampolex 1995 Australian Emissions Inventory: Production and Drilling*.
- Ampolex, 1996. *Andromeda Environmental Management Plan*.
- Ampolex, 1996. *Athena Environmental Management Plan*.
- Ampolex, 1996. *Austin Closeout Report*.
- Ampolex, 1996. *Cycad Close Out Report*.
- Ampolex, 1996. *Dispersion Efficiency Testing of Wandoo Crude Oil*. MENV080, Occupational Hygiene Environment and Chemistry Centre.
- Ampolex, 1996. *Environmental Audit: Operational Manual*.
- Ampolex, 1996. *Environmental Management Manual For Seismic Surveys*.
- Ampolex, 1996. *Environmental Management Plan for Cherring - 1, WA 202-P(R1)*.
- Ampolex, 1996. *Environmental Management Plan For Drilling of Rattlepod-1 WA-234-P*.
- Ampolex, 1996. *Environmental Management Plan For Drilling of Woollybutt-1 WA-234-P*.
- Ampolex, 1996. *Environmental Management Plan For Drilling the Border Structure: EP-400*.
- Ampolex, 1996. *Environmental Management Plan for Pegasus 3D Marine Seismic Survey WA-248-P*.

- Ampolex, 1996. *Environmental Management Plan for Wandoo South - 1, WA WA-14-L.*
- Ampolex, 1996. *Environmental Management Plan Pro forma For Seismic Surveys: Offshore.*
- Ampolex, 1996. *Lisa Seismic programme WA-256-P Environmental Management Plan.*
- Ampolex, 1996. *Melinda Seismic Survey Closeout Report.*
- Ampolex, 1996. *Pegasus Marine Seismic Survey WA-248-P Environmental Management Plan.*
- Ampolex, 1996. *Proforma Environmental Management Plan For Seismic Surveys: Onshore.*
- Ampolex, 1996. *Recycling and Disposal of Waste Material - Approval of Facilities; Operational Manual.*
- Ampolex, 1996. *Routine Waste Discharges from the Hakyuru VII: Quantification and Evaluation of Environmental Effects.*
- Ampolex, 1996. *Southern Montebello's Marine Seismic EMP.*
- Ampolex, 1996. *Wandoo B Environmental Management Plan.*
- Ampolex, 1996. *Wandoo South Environmental Management Plan.*
- Ampolex, 1996. *Waste Inventory; Operational Manual.*
- Ampolex, 1996. *Wonnich Closeout Report.*
and Aerial Surveillance.
- Anderson, C. A., 1996. Pearling Today. (Autumn): 44-48.
- Anderson, P. K., 1979. Dugong behaviour: Observations, extrapolations, and speculations. In: *The Dugong: Proceedings of a Seminar & Workshop*. March, H., ed., pp. 91-111.
- Andrewartha, J. R., 1988. *Explanatory Notes on NWS Model Domain Preparation for Goodwyn Current Modelling.* Report to Woodside Offshore Petroleum Pty Ltd, 20 pp.
- Andrews, J. C., 1977. Eddy structure and the West Australian Current. *Deep Sea Research*, **24**: 1133-48.
- Andrews, J. C., 1983. Ring structure in the poleward boundary current off Western Australia in summer. *Australian Journal of Marine and Freshwater Research*, **34**: 547- 61.
- Andrews, J. C., 1992. Tigers, kings & bananas. *Western Fisheries*, **Winter**: 11-16.
- Anon, 1970. Dampier Archipelago: bathymetric/navigational (map).
- Anon, 1976. *East Mermaid No. 1 Western Australia 30 P Rowley Basin Western Australia, Australia.* Shell Development (Aust.) Pty. Ltd. Well Completion Report.
- Anon, 1977. Exmouth plateau: bids from eight consortia. *Offshore Engineering*, **8**: 10.
- Anon, 1977. Go-ahead given to North West Shelf. *Offshore Engineering*, **9**: 10.
- Anon, 1977. Light switches from red to amber on North Rankin [Development of the North Rankin Field Off Australia]. *Offshore Engineering*, **10**: 32-33.
- Anon, 1977. Western Australia North West Shelf development. *Offshore Engineering*, **7**: 11.
- Anon, 1978. Funds for NW Shelf Outlined. *Lloyd's List*, **3**.
- Anon, 1978. *North West Shelf Development: Environmental Review and Management Programme.* Report for Woodside Petroleum Development Pty Ltd.
- Anon, 1978. Offshore Oil - The Search Continues. *Lloyd's List*, **6**.
- Anon, 1979. Computer to aid exploration. In: *International Underwater Systems Design*. 1, 39 pp.
- Anon, 1982. Domestic Gas Supplies on Schedule. *Offshore Engineering*, **4**: 37.
- Anon, 1983. CSIRO finds scampi and carid prawns on N.W. Shelf. *Australian Fisheries*, **42(3)**: 13.

- Anon, 1983. Exploratory fishing of Spanish mackerel off WA. *Fins*, **16**(1): 3-8.
- Anon, 1983. High-risk construction work completed: NW Shelf ahead of schedule. *Offshore Engineering*: 16.
- Anon, 1984. *Port Hedland Port Development Notice of Intent*.
- Anon, 1987. *N.W. Shelf Project Grows*. Confederation Report, 18 pp.
- Anon, 1988. *Dampier Archipelago*.
- Anon, 1988. Export phase of NWS (North West Shelf) gas project on schedule. *Marine Engineering Review*: 19.
- Anon, 1988. The Moss Rosenberg spherical tank concept, with modifications, was chosen for the Australian North West Shelf project LNG carriers. A steam propulsion plant was also specified. North West Shelf LNG new buildings progress. *Marine Engineering Review*: 20-21.
- Anon, 1989. Green light for Goodwyn A. *Marine Engineering Review*: 24-25.
- Anon, 1990. Development of More Efficient Traps for the North West Shelf Fishery. In: *FIRDC Final Report . 1987/85*, CSIRO Marine Division, 201 pp.
- Anon, 1992. Petroleum in Western Australia. In: *HOLL.-SHIPBUILD*. 11, 34-35 pp.
- Anon, 1992. *Port Hedland Coastal Plan: For Public Comment*. Western Australian Department of Planning and Urban Development.
- Anon, 1992. Tropical lobsters under threat. *Western Fisheries*, **Autumn**: 8.
- Anon, 1993. North West Shelf Program points the way for increased use of 3-D seismic gas oil exploration tool. *Petroleum Gazette*, **28**(1): 31-35.
- Anon, 1996. Montebello or bust. *Oil and Gas News*, **June**: 19-22.
- Anon, 1996. North West Shelf LNG expansion proposed. *Oil & Gas Journal*, **94**(44):25.
- Anon, 1997. *Definition of Drilling Fluids*. Department of Minerals and Energy.
- Anon, 1997. Seismic surveys and humpback whales. *Exploration and Production*, **13**:10-12.
- Anon., 1980. Port Hedland Coastal Areas Map - 1st ed. Stingray Creek (map).
- Anon., 1992. *Drupella cornus: a synopsis*. Turner, S. T., Ed., 3/92, Department of Conservation and Land Management, CALM, pp. 104.
- Apache Energy Ltd *Spill Modelling Systems-Descriptions and Verification*. Appendix 5.
- Apache Energy Ltd, 1995. *Environmental Management of Proposed Seismic Program EP 342, TP/9,WA-247-P*. 17 pp.
- Apache Energy Ltd, 1995. *Environmental Management of Proposed Seismic Program TLI, 5 & 6*. Apache Energy Ltd; Reference no. H111; Document no. EAA-60-RI-049, Apache Energy Ltd.
- Apache Energy Ltd, 1995. *Integrating Technology, Science and Management in the Marine Environment - Submission for Award for Environmental Excellence*. Report to Apache Energy Ltd, Reference no.H126; Document no. EAA-00-RI-045, Apache Energy Ltd.
- Apache Energy Ltd, 1996. *Agincourt Pipeline Bundle Shoreline Crossing Management Plan*. Report to Apache Energy Ltd, Reference no. H147; Document no. EAA-60-RI-064/B, Apache Energy Ltd.
- Apache Energy Ltd, 1996. *Annual Report Licence TL/1, 5 & 6 Harriet Field 1/10/94 -30/9/95*. Report to Apache Energy Ltd, Reference no. H125; Document no. EAA-00-RI-043, Apache Energy Ltd.
- Apache Energy Ltd, 1996. *Appraisal Drilling Program for Wonnich Field (Supplementary Information)*. Report to Apache Energy Ltd, Reference no. H130; Document no. EAA-00-RI-051, Apache Energy Ltd.

- Apache Energy Ltd, 1996. *Harriet Field Licence TL/1, 5 & 6 Annual Report*. Report to Apache Energy Ltd, Reference no.H145; Document no. EAA-60-RI-063/B, Apache Energy Ltd.
- Apache Energy Ltd, 1996. *Monitoring Well Installation and Groundwater Sampling -Varanus Island*. Report to Apache Energy Ltd, Reference no.H131; Document no. EAA-IO-EI-001, Apache Energy Ltd.
- Apache Energy Ltd, 1996. *Ridley-1 Exploration Well - Environmental Appraisal*. Report to Apache Energy Ltd; Reference no.H136; Document no. EAA-61-RI-008, Apache Energy Ltd.
- Apache Energy Ltd, 1996. *Wonnich Field Consultative Environmental Review*. Report to Apache Energy Ltd; Reference no.H121; Document no. EAA-50-RI-001, Apache Energy Ltd.
- Apache Energy Ltd, 1996. *Wonnich Gas Development CER - EPA Assessment 1040*. Report to Apache Energy Ltd, Reference no. H140; Document no. EAA-00-RI-061/B, Apache Energy Ltd.
- Apache Energy Ltd, 1997. *Environmental Management of Proposed Cash Seismic Programme TL/1, 5 & 6*. Apache Energy Ltd; Reference no. H152, Apache Energy Ltd.
- Apache Energy Ltd, 1997. *Ocean circulation in the regions of Barrow Island, Varanus Island and the Montebello Islands on the Australian North West Shelf: Validation of the GEMS 3D Coastal Ocean Model (GCOM3D)*. Reference no. H167; Document no EA-00-RI-077/B, Apache Energy Ltd.
- Apache Energy Ltd, 1997. *Tanami-1 Development Well Workover Management Plan*. Report to Apache Energy Ltd; Reference no.H150; Document no. TF-53-RI-001/B, Apache Energy Ltd.
- Apache Energy Ltd, 1998. *Varanus Island Environmental Management and Monitoring Review 1991 - 1997*. Apache Energy Ltd, Perth.
- Apache Energy Ltd, Undated. *Shallow Marine Habitats Surrounding Barrow Island, Lowendal Islands and Montebello Islands (map)*. 1:80,000. Apache Energy Ltd.
- APEA, 1998. *Environmental Protection Act 1986 Licence 6284: Annual Report Licence TL/1,5 and 6 Harriet Field*. CAR-HARRIET-38, Novus West Australia Pty Ltd.
- APPEA, 1996. *Code of Environmental Practice*. Australian Petroleum Production and Exploration Association Ltd, Canberra, 82 pp.
- APPEA, 1997. *Potential Arrangements for Multiple Use Management in the Montebello Islands Barrow Island Region: A Petroleum Industry Perspective*. 80pp.
- APPEA, 1998. *Framework for the Environmental Management of Offshore Discharge of Drilling Fluid on Cuttings*. Issues Paper, Working Draft Only, Australian Petroleum Production and Exploration Association, Ltd. (APPEA), 27 pp.
- APPEA, 1998. *Potential Future Petroleum Developments: Project Details and Current Status*. ISSN: 1326-5121, 20 pp.
- Applied Science Associates, 1994. *User's Manual for MUDMAP Version 2.0.*, Applied Science Associates, Narragansett, RI.
- Apthorpe, M. C., 1979. Depositional history of the Upper Cretaceous of the North West Shelf, based on Foraminifera. *APEA Journal*, **19** (1): 74-89.
- Apthorpe, M. C., 1981. Tertiary depositional history of the North West Shelf, Western Australia. In: *Geological. Society Australia 5th Australian Geological Convention*. Report for Woodside Offshore Petroleum Pty Ltd, pp. 12.
- Apthorpe, M. C., Garstone, J. and Turner, G., 1988. Depositional setting and regional geology of North Rankin A foundation sediments. In: *Engineering for calcareous sediments*. Ewell, R. M., Andrews, D. C.& Khorshid, M. S., eds, A.A. Balkema, Rotterdam.
- Apthorpe, M., 1998. *North West Shelf Gas Project Second Trunkline Survey: Foraminifera in Sea-Floor Sediments*. Report for Woodside Energy Ltd, Apthorpe Palaeontology Pty Ltd, Trigg.

- Western Australia, 29 pp.
- Aquaculture Advisory Council, 1994. *Aquaculture: Development Strategies for the Industry in Western Australia*. Department of Resources Management.
- Arditto, P. A., 1993. Depositional sequence model for the Post-Barrow group Neocomian succession, Barrow and Exmouth sub-basin, Western Australia. *APPEA Journal*, **1**: 151-60.
- Ashby, E., and Cotton, B. C., 1934. New species of chitons from Broome, Western Australia. *Journal Royal Society of Western Australia*, **20**: 213-19.
- Astron Engineering, 1990. Development of South Pepper, North Herald and Chervil Fields. In: *Report on Airlie Island Wedge-tailed Shearwater Monitoring*. Unpublished Report prepared for Western Mining Corporation Ltd.
- Astron Engineering, 1990. TP/7 and TL/2. Five Year Offshore Drilling Programme. In: *Consultative Environmental Review for Western Mining Corporation Limited Petroleum Division (Australasia)*. Report for Western Mining Corporation Limited.
- Astron Engineering, 1996. *Integrated Shearwater Monitoring Program - Annual Report*. Report to Apache Energy Ltd; Reference no. H142; Document no. EAA-00-RI-059/B.
- Astron Environmental Pty Ltd, 1995. *Rehabilitation of an Oil Affected Area of Shearwater Colony on Varanus Island*. Report to Apache Energy Ltd; Reference no. H122; Document no. EAA-00-RI-040.
- Astron Environmental Pty Ltd, 1995. *Silver Gull Management at the Lowendal Islands in Relation to Oil Field Operations*. Report to Apache Energy Ltd; Reference no. H105; Document no. EAA-60-RI-045, Apache Energy Ltd.
- Astron Environmental Pty Ltd, 1997. *Integrated Shearwater Monitoring Program First Triennial Report 1997*. Report to Apache Energy Ltd, BHP (Petroleum) and Novus Petroleum Western Australia Pty Ltd, Reference no.161; Document no. EA-00-RI-070/B; Apache Energy Ltd, 51 pp.
- Atherton, G., 1989. Beyond the Flame: The Story of Australia's North West Shelf Natural Gas Project. Government and Public Affairs Division, Woodside Offshore Petroleum WA, Perth, 135 pp.
- Australian Admiralty Publications, 1970. Dampier Archipelago (map). 1:150 000. Hydrographic Service R.A.N. Australian Admiralty Publications, 1970. Exmouth Gulf and Approaches (map). 1:150,000. Royal Australian Navy, Hydrographic Service, New South Wales.
- Australian Admiralty Publications, 1970. Port Hedland to Port Walcott (map). 1:15,000. Hydrographic Service R.A.N.
- Australian Admiralty Publications, 1986. Bedout Islet to Port Hedland (map). 1:150,000. Hydrographic Service, R.A.N., Wollongong, NSW.
- Australian Admiralty Publications, 1992. Montebello Islands (map). Hydrographic
- Australian Admiralty Publications, 1993. Barrow to Onslow (map). 1:25,000. Hydrographic Service, R.A.N., Wollongong, NSW.
- Australian Admiralty Publications, 1994. Rosemary Island to Barrow Island (map). 1:150,000. Hydrographic Service, Royal Australian Navy.
- Australian and New Zealand Environment Conservation Council, 1996. *Environmental Assessment of the Sea Disposal of Dredged and Excavated Material: Draft Guidelines*. 109 pp.
- Australian and New Zealand Environmental Conservation Council, 1997. *ANZECC Interim Sediment Quality Guidelines*. Prepared for the Environmental Research Institute.
- Australian Hydrographic Service, 1975. Australian National Tide Tables 1974. Australian Government Publishing Service.
- Australian Institute of Marine Science & Australian Geological Survey Organisation, 1994. *Preliminary*

- Results of Oceanographic and Geochemical Measurements made in the Vicinity of the Harriet 'A' Production Platform.* Report to Apache Energy Ltd; Reference no. H108; Document no. EAA-60-RI-043, Apache Energy Ltd.
- Australian Institute of Marine Science, 1993. *User's Manual for OILMAP Version 3.0.* Report to Apache Energy Ltd, Reference no. H139; Document no. EAA-00-RG-007, Apache Energy Ltd.
- Australian Institute of Marine Science, 1997. *Western Australian Research Activities 1994-1996.* Australian Institute of Marine Science Report, AIMS, Townsville, 47pp.
- Australian Institute of Petroleum Ltd, 1991. *Marine Oil Spills Action Plan (MOSAP) Manual: Region 8 - Northern West Australia.* AIP, Melbourne, Australia.
- Australian National Parks & Wildlife Service, 1989. *Ashmore Reef National Nature Reserve: Plan of Management.* Australian National Parks & Wildlife Service, Australian Government Publishing Service, Canberra, 65 pp.
- Australian Occidental Pty Ltd, 1982. *The Climate of the North West Shelf Area.* Report to Apache Energy Ltd; Reference no. H1; Document no. EAA-00-RI-001, Apache Energy Ltd.
- Australian Quarantine Inspection Service, 1997. *Australian Ballast Water Management Strategy.* AQIS, Canberra, ACT.
- Baines, P. G., 1981. Satellite observations of internal waves on the Australian Northwest shelf. *Australian Journal of Marine and Freshwater Research*, **32**: 457-63.
- Baird, R. A., and Philp, R. P., 1988. Hydrocarbon potential of the upper Jurassic/Lower Cretaceous of the Australian NW Shelf. *Journal of Petroleum Geology*, **11**(2): 125-39.
- Baker, A. N., and Marsh, L. M., 1976. The rediscovery of *Halityle regularis* Fisher (Echinodermata: Asteroidea). *Records of the Western Australian Museum*, **4**(2): 107-16.
- Bambrick, S., 1978. Development of Australia's North West Shelf gas reserves. *Resources Policy*, **4**(4): 279-86.
- Barber, P. M., 1982. Palaeotectonic evolution and hydrocarbon genesis of the central Exmouth Plateau. *APEA Journal*, **22**(1): 131-44.
- Barber, P. M., 1988. The Exmouth Plateau deep water frontier: a case history. In: *The North West Shelf, Australia.* Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, pp. 173-88.
- Barker, G., and Vincent, P., 1988. Geological and reservoir engineering considerations for the North Rankin Gas Recycling Project. *APEA Journal*, **28** (1): 54-66.
- Barrington Partners, 1986. Pilbara Tourism Development Plan. In: *The Western Australian Tourism Commission.* Barrington Partners, 7 pp.
- Barter, T. P., Maron, P. and Willis, I. A., 1982. Results of Exploration, Browse Basin, Northwest Shelf, Western Australia . In: *Transactions of the Third Circum-Pacific Energy and Mineral Resources Conference.* pp. 105-15.
- Batteen, M. L., and Rutherford, M. J., 1990. Modeling studies of eddies in the Leeuwin Current: The role of thermal forcing. *Journal of Physical Oceanography*, **20**(9): 1484-520.
- Batteen, M. L., Rutherford, M. J., and Bayler, E. J., 1992. A numerical study of wind and thermal-forcing effects on the ocean circulation off Western Australia. *Journal of Physical Oceanography*, **22**(12): 1406-33.
- Baxter, K., Smith, P. L., and Hill, K. C., 1996. Flexural isostatic forward and reverse modelling of basin evolution; application to the North West Shelf. *Geological Society of Australia Journal*, **41**: 24.
- Bayler, E. J., 1991. Seasonal wind and ocean thermal forcing influences on the generation of the Leeuwin Current and its eddies. Masters Thesis, U.S. Naval Postgraduate School, 209 pp.

- Beattie, W. A., and de Lacey Low, M., 1980. Australia's North-West Challenge. Kimberley Publishing Co., Melbourne, 183 pp.
- Bein, J., and Taylor, M. L., 1981. The Eyre Sub-basin: recent exploration results. *Australian Petroleum Exploration Association Journal*, **21**: 91-98.
- Berggren, M., 1997. The Shrimps from the Reefs off the Kimberley, Western Australia. In: *Marine Biological Survey of the Central Kimberley Coast, Western Australia*. D. I. Walker, 10, 86-90 pp.
- Bergquist, P. R., and Kelly-Borges, M., 1995. Systematics and biogeography of the Genus *Ianthella* (Demospongiae: Verongida: Ianthellidae) in the South-West Pacific. *The Beagle*, **12**: 151-76.
- Berry, P. and Marsh, L. M., 1985. Scott Reef and the Rowley Shoals, shelf-edge atolls off north western Australia. In: *Proceedings of the Fifth International Coral Reef Congress*. 6, pp. 317-22.
- Berry, P. F., 1982. *Report on a preliminary survey of the Fauna of the Rowley Shoals by the Western Australian Museum in July 1982*. Western Australian Museum.
- Berry, P. F., 1993. *Brachyuran crabs and palinurid lobsters. Survey of the marine fauna and habitats of the Montebello Islands, August 1993*. P. F. Berry, ed., Report to the Department of Conservation and Land Management, Western Australian Museum, Perth, WA, 35-65 pp.
- Berry, P. F., 1993. *Management and Conservation Survey of the marine fauna and habitats of the Montebello Islands, August 1993*. P. F. Berry, ed., Report to the Department of Conservation and Land Management, Western Australian Museum, Perth, WA, 16-22 pp.
- Berry, P. F., 1993. *Survey of the Marine Fauna and Habitats of the Montebello Islands, August 1993*. Report to the Department of Conservation and Land Management, Western Australian Museum, Perth.
- Beston, N., 1986. Reservoir geological modelling of the North Rankin Field, north west Australia. *APEA Journal*, **26**(1): 375-88.
- Bhatia, M R., Thomas, M., and Boirie, J. M., 1984. Depositional framework and diagenesis of the late Permian gas reservoirs of the Bonaparte Basin . *APEA Journal*, **21**: 299-313.
- BHP and Astron Engineering, 1995. *TP/6 Transition zone 2D Seismic Program Serrurier Island Post-Survey Terrestrial Environmental Report*. CAR-GEN-507, Novus West Australia Pty Ltd.
- BHP Iron Ore, 1991. *Port Hedland Operations: Environmental Management Plan - L2/69*. DEP Accession no. 960859.
- BHP Petroleum Laboratory, 1992. *Analysis of Weathered Leatherback Crude Oil*. Report to Apache Energy Ltd, Reference no. H68; Document no. EAA-61-RF-002, Apache Energy Ltd.
- BHP Petroleum Laboratory, 1992. *Dispersability and Weathering of Saladin and Barrow Island Crude Oils*. Report to West Australian Petroleum Pty Ltd, 33 pp.
- BHP Petroleum Laboratory, 1993. *Characterisation of Weathered Barrow Island Crude Oil: Chemical Class Distribution*. Report to West Australian Petroleum Pty Ltd.
- BHP Petroleum Laboratory, 1993. *Characterisation of Weathered Saladin Crude Oil: Chemical Class Distribution*. Report to West Australian Petroleum Pty Ltd.
- BHP Petroleum, 1996. *Assessment of Oil Spill Risk from Exploration Related Oil Spills in TP/6, Western Australia*.
- BHP Petroleum, 1997. *Griffin Venture Shutdown: Safety, Health and Environment Management Plan*.
- Binnie International, 1979. *Report on Cooling Water Study for North West Shelf*. Environmental Impact Study.
- Bint, A. N. and Helby, R., 1988. Upper Triassic Polynofacies and Environmental Interpretations for the Rankin Trend, Northern Carnarvon Basin, W.A. In: *The North West Shelf Australia*. Purcell, P. G. &

- Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, Perth, pp. 591-98.
- Bint, A. N., 1988. Gas Fields of the Browse Basin. In: *The North West Shelf Australia*.
- Blaber, S. J. M., 1984. The Inshore Fisheries of the Dampier Region of North West Australia (Abstract). In: *CSIRO Division of Fisheries Research, Second Divisional Research Seminar*. CSIRO, Cronulla, NSW.
- Blaber, S. J. M., 1986. Feeding selectivity of a guild of piscivorous fish in mangrove areas on north-west Australia. *Australian Journal of Marine and Freshwater Research*, **37**: 329-36.
- Blaber, S. J. M., Young, J. W., and Dunning, M. C., 1985. Community structure and zoogeographic affinities of the coastal fishes of the Dampier region of north-western Australia. *Australian Journal of Marine and Freshwater Research*, **36**(2): 247-66.
- Black, R., and Johnson, M. S., 1994. Growth rates in outbreak populations of the corallivorous gastropod *Drupella cornus* (Roding 1798) at Ningaloo Reef, Western Australia. *Coral Reefs*, **13**(3): 145-50.
- Blackwell, M. & A., 1985. *Vegetation monitoring of the rehabilitation areas, Burrup Peninsula*. Report for Woodside Offshore Petroleum Pty Ltd.
- Blevin, J. E., and Williamson, P. E., 1993. Triassic to early Cretaceous exploration targets in the Beagle sub-basin, North West Shelf, Australia. *American Association of Petroleum Geologists and Society of Economic Paleontologists and Mineralogists*: 77.
- Blevin, J. E., Colwell, J. B., Edwards, D. S., Foster, C. B., Jones, P. J., Kennard, J. M., Nicholl, R. S., O'Brien, G. W., Shergold, J. H., Summons, R. E., and Wilson, D. J., 1996. Integrated studies of the Petrel Sub-basin (Bonaparte Basin), defining the Palaeozoic foundations of the North West Shelf. *Geological Society Australia Journal*, **41**: 39.
- BMR Cartographic Services, 1990. Offshore Resource Map, Cuvier (map). 1:1,000,000. Bureau of Mineral Resources, Geology and Geophysics, Canberra.
- Boehme, R. S., Lorenzo, J. M., Tandon, K., Pyne, D. A., O'Brien, G. W., and Marshall, J., 1995. Pliocene stratigraphic response to lithosphere flexure on the Australian North West Shelf. *Geological Society of America*, **27**(6): 392.
- Bond Corporation Pty Ltd, 1985. *Harriet Field Extension, Supplementary Notice of Intent*. Harriet Oilfield Development.
- Bond Corporation Pty Ltd, 1986. *Harriet Field Development. Varanus Island*. Annual Environmental Report.
- Bond Corporation Pty Ltd, 1995. *Application for Field Status - Harriet Central and West Fields*. Report to Apache Energy Ltd; Reference no. H6; Document no. EAA-60-RI-005, Apache Energy Ltd.
- Borland, F. M., Church, J. A., Forbes, A. M. G., Godfrey, J. S., Huyer, A. and Smith, R. L. W. N. J., 1988. *Current-Meter Data from the Leeuwin Current Interdisciplinary Experiment*. Report 198, CSIRO Division of Marine Research, Hobart, 31 pp.
- Boutakoff, N., 1963. Geology of the offshore areas of north-western Australia. *APEA Journal*, **3**: 10-18.
- Bowen, B. K., 1991. *The Pearling Industry in Western Australia. Summary Report*. Fisheries Department of Western Australia, Perth.
- Bowman Bishaw Gorham, 1987. *Petroleum exploration in permit areas EP342 and TP/9 Rowley Shelf, Western Australia*. Consultative Environmental Review prepared for Lasmo Oil (Australia) Ltd., 200 pp.
- Bowman Bishaw Gorham, 1989. *Proposed Coral Coast Marine Resort*. Notice of Intent to Dept of Marine and Harbours.
- Bowman Bishaw Gorham, 1990. *Consultative Environmental Review*. CAR-GEN-86,0, Novus West Australia Pty Ltd.

- Bowman Bishaw Gorham, 1990. *Petroleum Exploration in Permit Areas EP 342 and TP/9 Rowley Shelf*. Report to Apache Energy Ltd, Reference no. H23; Document no. EAA-61-RI-003, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1990. *Petroleum Exploration Permit Areas EP 342 and TP/9 Rowley Shelf*. Report to Apache Energy Ltd; Reference no. H24; Document no. EAA-61-RI-004, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1990. *Prediction of Oil Spill Envelopes for the Proposed Exploration Wells, Exmouth Gulf Region*. Report to Apache Energy Ltd; Reference no. H22; Document no. EAA-61-RF-004, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1990. *Proposal to Conduct Seismic Exploration within an Area of Ningaloo Marine Park*. Report to Apache Energy Ltd; Reference no. H59; Document no. EAA-61-RU-002, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1990. *Proposal to Conduct Seismic Exploration within an Area of Ningaloo Marine Park: Environmental Review*. Report to Lasmo Oil (Australia) Limited, 26 pp.
- Bowman Bishaw Gorham, 1991. *Oil Residue Beaching During Flow Testing of Leatherback-1 Exploration Well*. Report to Apache Energy Ltd, Reference no. H38; Document no. EAA-61-RF-001, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1991. *Oil Residue beaching during flow testing of Leatherback-1 exploration well: Environmental review*. Report to Apache Energy Ltd, Reference no. H038; Document no EA-61-RI-001, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1991. *Petroleum Exploration in Permit Areas EP 342 and TP/9 - Results of Post-Drilling Environmental Surveys for the Caretta-1 & Leatherback Drilling Program*. Report to Apache Energy Ltd, Reference no. H41; Document no. EAA-61-RD-001, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1991. *Petroleum Exploration in Permit Areas EP 342 and TP/9: Results of Pre-Drilling Site Surveys*. Report to Apache Energy Ltd, Reference no. H33; Document no. EAA-61-RD-004, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1992. *Petroleum Exploration in Permit Areas EP 342 and TP/9 Results of a Pre-Drilling Site Survey for the Proposed Loggerhead - 1 Location*. Report to Apache Energy Ltd; Reference no. H50; Document no. EAA-61-RD-006, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1993. *Proposed Replacement of Flow Lines from Saladin A and B Marine Biology Study*. Report prepared for West Australian Petroleum Pty Ltd.
- Bowman Bishaw Gorham, 1993. *Proposed Roller A Gas Pipeline*. West Australian Petroleum Pty Ltd.
- Bowman Bishaw Gorham, 1993. *Proposed Seismic Program Observation & Locker Islands, Env. Assessment*. Report to Apache Energy Ltd, Reference no. H60; Document no. EAA-61-RU-003, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1993. *Roller Marine Biological Monitoring Program*. Report prepared for West Australian Petroleum Pty Ltd.
- Bowman Bishaw Gorham, 1994. *Dampier Port Authority Environment Management Plan*. Bowman Bishaw Gorham Report no RI1137, Prepared for Dampier Port Authority.
- Bowman Bishaw Gorham, 1994. *Dugong 2 Mapping*. Report prepared for West Australian Petroleum Pty Ltd.
- Bowman Bishaw Gorham, 1994. *Loggerhead-1 - Wellsite Re-inspection*. Report to Apache Energy Ltd; Reference no. H101; Document no. EAA-61-RI-006, Apache Energy Ltd.
- Bowman Bishaw Gorham, 1994. *Point Murat Wharf Tidal Current Tracking*. Report prepared for West Australian Petroleum Pty Ltd.
- Bowman Bishaw Gorham, 1994. *Surface Water Currents Studies at Point Murat Pier*. Report prepared for West Australian Petroleum Pty Ltd, 45 pp.

- Bowman Bishaw Gorham, 1995. *A Natural Resource Atlas for the North West Shelf*, 91-111 pp.
- Bowman Bishaw Gorham, 1995. *North West Shelf Environmental Resource Atlas Report*. Report for BHP Petroleum Pty Ltd, 88 pp.
- Bowman Bishaw Gorham, 1995. North West Shelf Resource Map (map). 1:250,000. Bowman Bishaw Gorham for BHP.
- Bradshaw, M., Yeates, A. N., Beynon, R. M., Brakel, A. T., Langford, R. P., Totterdell, J. M. and Yeung, M., 1988. Palaeogeographic evolution of the North West Shelf region. In: *The North West Shelf Australia: Proceedings of Petroleum Exploration Society*.
- Branford, J. R., 1984. Taiwanese fisheries in the north - monitoring and benefits for Australia. *Australian Fisheries*, **43**(2): 14-19.
- Bray, N. A., Huatala, S., Chongg, J., and Pariwono, J., 1996. Large-scale sea level, thermocline, and wind variations in the Indonesian throughflow region. *Journal of Geophysical Research*, **101**(C5): 12,239-12254.
- Bray, N. A., Wijffels, S. E., Chong, J. C., Fieux, M., Hautala, S., Meyers, G., and Morawitz, W. M. L., 1997. Characteristics of the Indo-Pacific throughflow in the eastern Indian Ocean. *Geophysical Research Letters*, **24**(21): 2569-72.
- Bremner, H. A. Olley J. N., Statham, J. A., and Vail, A. M. A., 1988. Nucleotide catabolism: influence on the storage life of tropical species of fish from the North West Shelf of Australia. *Journal of Food Science*, **53**(1): 6-11 .
- Bremner, H. A., 1985. CSIRO food researchers look at scampi. *Australian Fisheries*, **44**(3): 39.
- Bremner, H. A., 1986. Chill storage trials on three scampi species. In: *Proceedings of CSIRO-DSIR Workshop on Fish Technology*.
- Bremner, H. A., Statham, J. A. and Sykes, S. J., 1985. Tropical Species From the North West Shelf of Australia: Sensory Assessment and Acceptability of Fish Stored on Ice. In: *Spoilage of tropical fish and product development*. A. Reilly, ed., FAO Fish Report 17; Supplement FIIU/R317, 41-53 pp.
- Bridgewater, P. 1983. Variation in the mangal along the west coastline of Australia. Ecology of the wet dry tropics: proceedings of a joint symposium with the Australian Mammal Society in association with the Darwin Institute of Technology held at Darwin.
- Bridgewater, P. B., 1989. *Comments on Representations Concerning Ashmore Reef National Nature Reserve: Plan of Management Released for Public Comment*. Australian National Parks & Wildlife Service, Australian Government Publishing Service, Canberra, 159 pp.
- Brikke, I., 1982. Geochemical interpretation of some oils and condensates from the Dampier sub-basin of Western Australia. *APEA Journal*, **22** (1): 179-87.
- Broadbridge, L. W., and Hanstrum, B. N., 1998. The relationship between tropical cyclones near Western Australia and the Southern Oscillation Index. *Australian Meteorological Magazine*, **47**(3): 183-89.
- Broderick, D. Moritz C., Miller, J. D., Guinea, M., Prince, R. I. I., and Limpus, C. J., 1994. Genetic studies of the Hawksbill turtle *Eretmochelys imbricata*: evidence for multiple stocks in Australian waters. *Pacific Conservation Biology*, **1**: 123-33.
- Brodie Hall, L. C., 1972. *A Report on a Proposal for Marine Environmental Studies off the West Coast of Australia*. Report by Western Australian State Committee of CSIRO, 70 pp.
- Brown Copeland & Co, 1985. *The Australian North West Shelf Gas Project: A National Economic Cost Benefit Analysis*. Brown, Copeland & Co. Ltd, Christchurch New Zealand, 145 pp.
- Brown, B. J., 1992. *Prediction of Near and Far Field Oil Spill Trajectories, Griffin Location*. Steedman Science & Engineering Report No. R549; Prepared for BHP Petroleum Pty Ltd, Steedman Science & Engineering.

- Brown, C. M., 1979. Bonaparte Gulf Basin Explanatory Notes and Stratigraphic Correlations . In: Record 1979/52 (unpublished), Bureau of Mineral Resources Geology and Geophysics.
- Brown, C. M., 1980. Bonaparte Gulf Basin. Stratigraphic Correlation between Sedimentary Basins of the ESCAP region. In: *ESCAP Atlas of Stratigraphy II: Economic and Social Commission for Asia and the Pacific*, Mineral Resources Development Series. pp. 42-51.
- Brown, S. A., Boserio, I. M., Jackson, K. S. and Spence, K. W., 1984. The geological evolution of the Canning Basin-implications for petroleum exploration . In: *The Canning Basin: Proceedings of the Geological Society of Australia/ Petroleum Exploration Society of Australia Symposium*. Purcell, P. G., ed., pp. 85-96.
- Bruce, A. J., 1985. Notes on some Indo-Pacific Pontoniinae, XLII. *Miopontonia yongei* gen. nov., sp. nov., from the Australian North West Shelf (Decapoda, Caridea). *Crustaceana*, **48**(2): 167-78.
- Bruce, A. J., 1988. Two new palaemonid shrimps (Crustacea: Decapoda) from the Australian North West Shelf. *Journal of Natural History*, **22**(5): 1263-76.
- Bruce, N. L., 1992. A new genus of hemibranchiate sphaeromatid isopod crustacean from tropical Western Australia. *Journal of Natural History*, **26**(6): 1263-72.
- Brunskill, G. J., Orpin, A. R., Zagorskis, I., Pfitzner, J., Woolfe, K. J. and Elison, J., 1998. *Geochemistry and Particle Size of Surface Sediments of Exmouth Gulf, North West Shelf, Australia*. Draft manuscript, Australian Institute of Marine Science, Townsville.
- Brunswick Oil N.L., 1982. *Adele Island No. 1 Well Completion Report*. Bureau of Mineral Resources, Australia, File 82/1319 (unpublished).
- Buchan, S. J. and Stroud, S. A., 1993. *Review of Oceanography of North West Shelf and Timor Sea Regions Pertaining to the Environmental Impact of the Offshore Oil and Gas Industry*. Steedman Science & Engineering Report no. R644, Steedman Science and Engineering, Jolimount, WA.
- Buchan, S. J., 1992. *Preliminary Environmental Design Criteria Leatherback and Chelonia Locations*. Prepared for LASMO Oil (Australia) Ltd; Steedman Report No. R543, Apache Energy Ltd. Reference no. H49; Document no. EAA-61-RI-005; Steedman Science & Engineering.
- Buchanan, A. S., 1973. *Algae in the Ponds of the Dampier Salt Works*. Unpublished report, 7 pp.
- Bufler, R. T., 1994. Geologic history of the eastern Argo abyssal plain based on ODP drilling and seismic data,. In: *AGSO Journal of Australian Geology & Geophysics: Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 157-64. 22
- Bulleid, N. C., 1984. The hydrology of the North West Shelf. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. CSIRO Division of Fisheries Research, Cronulla, pp. 8-9.
- Burbidge, A. A. and Prince, R. I. T., 1972. *The Fauna, Flora and Planned Usage of the Dampier Archipelago*. Report no 11, Department of Fisheries and Fauna, WA, Perth, 27 pp.
- Burbidge, A. A., 1989. Australian and New Zealand Islands: Nature Conservation Values and Management. In: *Proceedings of a Technical Workshop, Barrow Island, Western Australia*. CALM Occasional Paper 2/89, Department of Conservation and Land Management.
- Burdett, J. W., Parry, I. C., and Willmott, S. P., 1970. Evaluation of the Windalia Sand, Barrow Island, an empirical approach. *APEA Journal*, **10**(1): 9-96.
- Bureau of Marine Resources, 1980. *BMR 1970-1973 marine surveys (Carnarvon Basin). TP/7 and TL/2 Patricia and Patricia Extension Marine Seismic Survey. Final Survey Report- Volume 1 Text*. Report for Novus West Australia Pty Ltd; CAR-GEN-1,0.
- Bureau of Meteorology, 1972. *Climatic Survey: North West Region 6, Western Australia*. Bureau of Meteorology.
- Bureau of Meteorology, 1994. *Wind Climatology for Harriet Field Oil Spill Contingency Plan*. Report to Apache Energy Ltd, Reference no. H97; Document no. EAA-60-RF-00.

- Bureau of Mineral Resources, 1988. Australia's petroleum potential: petroleum in Australia, the first century. *APEA Journal*: 48-90.
- Bureau of Transport and Communications Economics, 1989. *Transport of Hydrocarbons in the Oil and Gas industry*. Information Paper 31, Australian Government Publishing Service, Canberra.
- Burger, D., 1994. Palynology of Mesozoic dredge samples from the North West Shelf. In. *AGSO Journal of Australian Geology & Geophysics: Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 89-100.
- Burns, K. A., and Codi, S., 1998. Non-volatile hydrocarbon chemistry studies around a production platform on Australia's North West Shelf. *APPEA Journal*: 626-36.
- Burrage, D. and Steinberg, C., 1994. *North West Shelf Satellite Oceanography Study (NOWSOC)*. Australian Institute of Marine Science, Townsville.
- Burrage, D., Massel, S., Steinberg, C. and Skirving, W., 1996. Detecting surface and internal wave signatures on the northwest Australian Shelf using ERS1 & 2 Active Microwave Instrumentation (AMI). In: *Proceedings of the First Australian ERS Symposium*. Kingwell, J., ed., CSIRO Office of Space Science and Applications, Earth Observation Centre, Canberra, pp. 11-26.
- Burrage, D., Steinberg, C., Massel, S., Skirving, W. and Furnas, M., 1996. *Internal Waves Detected on the North West Shelf: Western Australian Research Activities 1994-1996*. AIMS Report, Australian Institute of Marine Science, Townsville, 39-43pp.
- Butler, W. H., 1989. Management of Barrow Island. *Australia and New Zealand Island: Nature Conservation Values and Management*, occasional papers (2/89): 193-99.
- Cairns, S. D., 1998. *Azooxanthellate scleractinia* (Cnidaria: Anthozoa) of Western Australia. *Records of the WA Museum*, **18**: 361-417.
- Caldwell, R. A., 1976. Holocene gypsum deposits of the Bullara Sunkland, Carnarvon Basin, Western Australia. Ph.D. Thesis, University of Western Australia.
- CALM, 1998. *New Horizons: The Way Ahead in Marine Conservation and Management*. Western Australia Department of Conservation and Land Management, Perth, WA, 20 pp.
- Camkin, J. K., 1992. Review of Fisheries on the Australian North West Shelf. B.Sc. thesis, Australian Maritime College.
- Campbell, I. R., and Smith, D. N., 1982. Gorgon I - Southern most Rankin Platform gas discovery. *APEA Journal*, **22**(1): 102-11.
- Campbell, I. R., Tait, A. M., and Reiser, R. F., 1984. Barrow Island oilfield revisited. *APEA Journal*, **24**(1): 289-98.
- Campbell, J. D., 1994. Late Triassic brachiopods from a dredge haul on the slope below Rowley Terrace, Northwest Australia. In. *AGSO Journal of Australian Geology & Geophysics. Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 135-36.
- Campbell, R. A., 1994. *CSIRO North West Shelf Research and Commercial Database Holdings*. CSIRO Division of Fisheries Report, CSIRO Marine Laboratories, Hobart, 87pp.
- Candler, J. E., Rushing, J. H., Leuterma, A. J. J., and MI Drilling fluids Co., 1993. Synthetic-based mud system offer environmental benefits over traditional mud systems. *Society of Petroleum Engineers*, **SPE 25993**: 15.
- Cappo, M., Alongi, D. M., Williams, D. M. and Duke, N., 1998. *A Review and Synthesis of Australian Fisheries Habitat Research*. Australian Institute of Marine Science, Townsville.
- Caputi, N., Fletcher, W. J., Pearce, A., and Chubb, C. F., 1996. Effect of the Leeuwin Current on the recruitment of fish and invertebrates along the Western Australian Coast. *Australian Journal of Marine and Freshwater Research*, **47**: 147-55.

- Carpenter, S. M., 1977. Further studies of plankton ecosystems in the eastern Indian Ocean IV. Numerical treatment of site-species data. *Australian Journal of Marine and Freshwater Research*, **28**: 585-91.
- Carrigy, M. A., and Fairbridge, R. W., 1954. Recent sedimentation, physiography and structure of the continental shelves of Western Australia. *Journal of the Royal Society of Western Australia*, **38**: 65-95.
- Carter, D., Maxwell, G. H., and Bowtell, C., 1983. 'Cautious optimism' over potential scampi fishery on NW Shelf. *Australian Fisheries*, **42**(11): 2-12.
- Carter, D., 1985. *North West Shelf Scampi Resource Status Report*. Report to K.F.V. Fisheries (QLD) Pty Ltd, 12 pp.
- Carter, D., 1990. Finding the right market for North West Shelf products. *Australian Fisheries*, **49** (6): 31-32.
- Carter, J. P., Johnson, I. W., Fahey, M., Chapman, G. A., Novello, E. A. and Kaggawa W. S., 1988. Triaxial testing of North Rankin calcarenite. In: *Engineering for calcareous sediments*. Jewell, R. J. & Khorshid, M. S., 2, pp. 515-53.
- Carter, J. P., Kaggawa, W. S., Johnston, I. W., Novello, E. A., Fahey, M. and Chapman, G. A., 1988. Triaxial testing of North Rankin calcarenite. In: *Engineering for Calcareous Sediments*. Jewell, R. J. & Khorshid, M. S., 2, International Society for Soil Mechanics and Foundation Engineering, pp. 515-30.
- Challinor, A., 1970. The Geology of the Offshore Canning Basin, Western Australia. *APEA Journal*, **10**(2): 78-90.
- Chalmer, P. N., 1979. *The Growth of Marine Fouling on a Proposed Platform Offshore from Dampier, Western Australia, Phase 1*. unidentified report.
- Chalmer, P. N., 1979. *The Growth of Marine Fouling on a Proposed Platform Offshore from Dampier, Western Australia, Phase 2*. unidentified report.
- Chalmers, C. E. and Woods, P. J., 1987. *Broome Coastal Management Plan*. Environmental Protection Authority Report, 252 pp.
- Chaproniere, G. C. H., 1981. Late Oligocene to Early Miocene planktic foraminifera from Ashmore Reef No. 1 well, northwest Australia. *Alcheringa*, **5**: 103-31.
- Cheesman, J. M., Herendeen, L. B., and Clough, B. F., In press. Photosynthesis and photoprotection in mangroves under field conditions in arid Western Australia. *Photosynthesis Research*.
- Chegwidden, A., 1994. *Disposal of Drilling Wastes from the Tanami-3 Well*. Report to Apache Energy Ltd, Reference no. H98; Document no. EAA-60-RD-004.
- Chen, S. C., Chen, C. H., Chi, T. N., Fan, K. C., Liu, D. C. and Tsay, R. Y., 1979. *Demersal Fish Resources Investigation on Trawl Grounds off the North West Coast of Australia*. Cruise Report, Bulletin of the Tawan. Fish. Res. Inst., Keelung, 31 pp.
- Chidi Ibe, A., and Kullenberge, G., 1995. Quality assurance/quality control (QA/QC) regime in marine pollution monitoring programmes: The GIPME perspective. *Marine Pollution Bulletin*, **31**(4-12): 209-13.
- Chittleborough R.G. and Hamon, B. V., 1972. A Statement on the need for Marine Environmental Studies off the Western Coast of Australia . In: *A Report on a Proposal for Marine Environmental Studies Off the Western Coast of Australia*. 5-11 pp.
- Chittleborough, R. G., 1953. Aerial Observations on the humpback whale (*Megaptera nodosa*), with notes on other species. *Australian Journal of Marine and Freshwater Research*, **4**(2): 219-26.
- Chittleborough, R. G., 1965. Dynamics of two populations of the humpback whale *Megaptera novaeangliae* (Borowski). *Australian Journal of Marine and Freshwater Research*, **16**(1): 33-128.
- Chittleborough, R. G., 1981. Marine systems of Dampier Archipelago. In: *Papers presented to a*

- workshop convened by the Department of Conservation and Environment at the Department of Botany, University of WA. Bulletin 109, 35 pp.
- Choi, D. R., and Stagg, H. M. J., 1987. Heatflow and petroleum maturation history of the Queensland Trough and Exmouth Plateau. *Yearbook of the Bureau of Mineral Resources, Geology and Geophysics*. ed. G. M. Baldon.
- Church, J. A., and Craig, P. D., 1998. Australian Shelf seas: diversity and complexity. *The Sea*, **11**(33): 933-64.
- Church, J. A., Cresswell, G. R. and Godfrey, J. S., 1989. The Leeuwin Current. In: *Poleward Flow along Eastern Ocean Boundaries*. S. Neshyba, C. N. K. Mooers and R. L. Smith, ed., Springer-Verlag, New York, pp. 230-254.
- Clifton, P. M., 1974. Tidal Flat Sedimentation and Pleistocene Geology, the Bay of Rest, Exmouth Gulf, Western Australia: B.Sc. Honours Thesis. University of Western Australia.
- Clough Engineering Limited, 1995. *Geophysical survey report: West Intercourse Island and Mermaid Sound, Dampier, Western Australia*. Report for Department of Resources Development.
- Clough, B. F., Dixon, P., and Dalhaus, O., In press. Elementary relationships for estimating biomass of multistem mangrove trees. *Australian Journal of Botany*.
- CMPS & F Pty Ltd, 1996. *Varanus Island Natural Gas Facility and Associated Operations*. Report to Apache Energy Ltd; Reference no. H146; Document no. EAA-00-RI-062.
- Cobby, G., 1998. *Regulating the Environmental Aspects of Drilling Operations Offshore (Western Australia)*. Department of Minerals and Energy, 17 pp.
- Cobby, G., 1999. Western Australia government decision-making criteria involved in the regulation of drilling fluids offshore. *APPEA Journal*.
- Cockbain, A. E., 1989. The North West Shelf. *APEA Journal*, **29**(1): 529-45.
- Coffey & Partners International, 1995. *East Spar Proposed Gas Facility Site, Varanus Island Soil and Groundwater Contamination Assessment*. Mobil Exploration & Producing Australia Pty Ltd, Apache Energy Ltd.
- Coffey & Partners, 1998. *Airlie Island - Oil Storage Facility TL/2 Soil and Water Quality Monitoring*. Novus West Australia Pty Ltd.
- Cohen, B., 1997. Impacts on marine benthos? PhD thesis. University of Western Australia.
- Colborn, J. G., 1971. Thermal Structure of the Indian Ocean. University Press of Hawaii.
- Colborn, J. G., 1971. *Thermal Structure Dynamics in the Upper 500 Meters of the Indian Ocean*. NUC TP 266, U. S. Naval Undersea Research and Development Center, San Diego, 99 pp.
- Coleman, F., 1972. *Frequencies, tracks and intensities of tropical cyclones in the Australian region - November 1909 to June 1969*. Australian Bureau of Meteorology, Melbourne, 42 pp.
- Collins, L. B., 1967. Sedimentation in a hypersaline basin: Lharidon Bight, Shark Bay, WA. BSc Hons thesis, Dept of Geology, University of Western Australia.
- Colwell, J. B., and von Stackelberg, U., 1981. Sedimentological studies of Cainozoic sediments from the Exmouth and Wallaby plateaux, off north western Australia. *BMR Journal of Australian Geology & Geophysics*, **6**: 43-50.
- Colwell, J. B., Roehl, U., van Rad, U., and Kristan-Tollmann, E., 1994. Mesozoic sedimentary and volcanoclastic rocks dredged from the northern Exmouth Plateau and Rowley Terrace, offshore north west Australia. In: *AGSO Journal of Australian Geology & Geophysics: Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 11-42.
- Colwell, J. B., Stagg, H. M. J., Symonds, P. A., Willcox, J. B., and O'Brien, G. W., 1995. Crustal

- structure of the North West Shelf (Australia) and its implications for petroleum exploration. *American Association of Petroleum Geologists and Society of Economic Paleontologists and Mineralogists*, **4**: 18.
- Colwell, J. B., Symonds, P. A., and Crawford, A. J., 1994. The nature of the Wallaby (Cuvier) Plateau and other igneous provinces of the West Australian margin. *AGSO Journal of Australian Geology & Geophysics: Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 137-56.
- Command Petroleum Holdings NL, 1992. EP341 and EP364 Offshore Permit-wide Drilling Programme. In: *Consultative Environmental Review*.
- Compagnie Generale de Geophysique, 1965. *Timor Sea Aeromagnetic Survey*. Report for Arco Ltd and Australian Aquitaine Petroleum Pty. Ltd (unpublished).
- Condie, S., Reid, J., Walker, S. and Craig, P., 1998. *Fine Scale Modelling of the North West Shelf Circulation under Cyclone Conditions*. unpublished report OMR-106/109, CSIRO Division of Marine Research, Hobart.
- Condie, S.A. and Andrewartha, J.R. 2008. Circulation and connectivity on the Australian North West Shelf. *Continental Shelf Research* 28(14):1724-1739.
- Condit, D. D., 1935. Oil possibilities in the north west district, Western Australia. *Economic Geology*, **30**(8): 860-878.
- Condit, D. D., Raggatt, H. G., and Rudd, E. A., 1936. Geology of the North West Basin, Western Australia. *American Association of Petroleum Geologists Bulletin*, **20** (8): 1028-1 070.
- Condon, M. A., 1954. *Progress Report on the Stratigraphy and Structure of the Carnarvon Basin, Western Australia*. Report 15, Bureau of Mineral Resources, Australia.
- Condon, M. A., 1965. The Geology of the Carnarvon Basin, Western Australia, Part 1: Pre-Permian Stratigraphy. In: *Transport of Hydrocarbons in the Oil and Gas industry*. Bulletin 77, Bureau of Mineral Resources, Australia.
- Condon, M. A., 1967. In: *The Geology of the Carnarvon Basin, Western Australia, Part 2: Permian Stratigraphy*. Bulletin 77, Bureau of Mineral Resources, Australia.
- Condon, M. A., 1968. The Geology of the Carnarvon Basin, Western Australia, Part 3: Post-Permian Stratigraphy; Structure; Economic Geology. In. Bulletin 77, Bureau of Mineral Resources, Australia.
- Condon, M. A., Johnstone, D., Pritchard, C. E. and Johnstone, M. H., 1956. *The Giralia and Marilla Anticlines, North West Division, Western Australia*. Bulletin 75, Bureau of Mineral Resources, Australia.
- Considine, M. L., 1985. Small fry or big fish on the North West Shelf. *Ecos*, **44**: 23-28
- Cook, A. C. and Kantsler, A. J., 1980. *The Maturation History of the Epicontinental Basins of Western Australia*. Technical Bulletin 3; CCOP/SOPAC, United Nations ESCAP, 171-195 pp.
- Cook, A. C., Smyth, M., and Vos, R. G., 1985. Source potential of Upper Triassic fluvio-deltaic systems of the Exmouth Plateau. *APEA Journal*, **25** (1): 204-15.
- Cook, S., 1985. *A Comparison of Sandstones from the Northwest Shelf of Australia and from the Kekneo Area of West Timor, Indonesia*. Geological Research in Southeast Asia, Report 34, University of London.
- Coshell, L., Brown, J., and Warren, J., 1994. X-ray computed tomography (CT) applied in routine core analysis: examples from New Guinea and the North West Shelf, Australia. *American Association of Petroleum Geologists Bulletin*, **78**(7): 1138.
- CRA Development WA, 1979. *Research and Development for the Production of Beta Carotene at Lake MacLeod*. 1-23 pp.
- Crabb, D. J., Recent major dredging projects in Australia. In: *1st Australasian Port and Harbour Engineering Conference*. pp. 103-7.

- Craig, P. D., 1987. Numerical Modelling of Internal Tides. In: *Numerical Modelling - Application to Marine Systems*. B. J. Noye, ed., North-Holland Elsevier, Amsterdam, pp. 107-22.
- Craig, P. D., 1987. Solutions for internal tidal generation over coastal topography. *Journal of Marine Research*, **45**: 83-105.
- Craig, P. D., 1988. A numerical model study of internal tides on the Australian North West Shelf. *Journal of Marine Research*, **46**: 59-76.
- Craig, P. D., Phillips, H. E. and Andrewartha, J. R., 1992. *Wanaea Current Modelling - the Influence of Stratification*. Report for Steedman Science and Engineering; No. OMR-47/61, CSIRO, Hobart, 34 pp.
- Crank, K., 1977. Petroleum Exploration in Western Australia in 1977. *Geological Survey of Western Australia*: 28-36.
- Crank, Keith, 1973. Geology of Barrow Island oilfield. *The APEA Journal*, **13**(1): 49-57.
- Crawford, A. J., and von Rad, U., 1994. The petrology, geochemistry and implications of basalts dredged from the Rowley Terrace Scott Plateau and Exmouth Plateau margins, northwestern Australia. In: *AGSO Journal of Australian Geology & Geophysics: Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 43-54.
- Creagh, S., 1985. *Review of Literature Concerning Blue-Green Algae of the Genus Trichodesmium (Order Nostocales: Family Oscillatoriaceae)*. Western Australia Dept of Conservation and Environment, Perth, 33 pp.
- Cresswell, G. R., 1977. The trapping of two drifting buoys by an ocean eddy. *Deep Sea Research*, **24**: 1203-9.
- Cresswell, G. R., 1981. *Satellite drifters North West of Australia*. CSIRO Annual Report 84, 123-125 pp.
- Cresswell, G. R., 1991. The Leeuwin Current: observations and recent models. *Journal of the Royal Society of Western Australia*, **74**: 1-14.
- Cresswell, G. R., and Golding, T. J., 1980. Observations of a south-flowing current in the south eastern Indian Ocean. *Deep Sea Research*, **27**(A): 449-66.
- Cresswell, G. R., and Peterson, J. L., 1993. The Leeuwin Current of South of Western Australia. *Australian Journal of Marine and Freshwater Research*, **44**(3): 285-303.
- Cresswell, G. R., Boland, F. M., Peterson, J. L., and Wells, G. S., 1989. Continental Shelf currents near the Abrolhos Islands, Western Australia. *Australian Journal of Marine and Freshwater Research*, **40**(2): 113-28.
- Cresswell, G. R., Frische, A., Peterson, J., and Quadfasel, D., 1993. Circulation in the Timor Sea. *Journal of Geophysical Research*, **98**(8): 14379-89.
- Crossland, C. J. and Wells, F. E., 1985. *A Selected Bibliography of Marine and Estuarine Studies (other than Physical Oceanography) in Western Australia*. Report 160; Reprint 1445, CSIRO Marine Laboratories, Hobart, 45 pp.
- Crossland, C. J., 1984. Seasonal variations in the rates of calcification and productivity in the coral *Acropora formosa* on a high-latitude reef. *Marine Ecology Progress Series*, **15**: 135-40.
- Crostella, A., 1976. Browse Basin. In: *Economic Geology of Australia and New Guinea: Part 3, Petroleum*, Australian Institute of Mineral Metalology Monograph. R. B. Leslie, H. J. Evans and C. L. Knight, eds, pp. 194-99.
- Crostella, A., and Barter, T., 1980. Triassic-Jurassic depositional history of the Dampier and Beagle sub-basins, North West Shelf of Australia. *APEA Journal*, **20**: 25-33.
- Crostella, A., and Chaney, M. A., 1978. The petroleum geology of the outer Dampier sub-basin. *APEA Journal*, **14** (1): 13-22.
- CSIRO Division Marine Research, 1991. *North West Shelf Development Project Benthic Samples from*

- Cossack Field*. Report for Woodside Offshore Petroleum Pty Ltd; WENV 0168.
- CSIRO Division of Fisheries and Oceanography (1962). Oceanographical observations in the Indian Ocean in 1959. H.M.A.S. Diamantina cruises Dm1/59 and Dm2/59. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 1.
- CSIRO Division of Fisheries and Oceanography (1962). Oceanographical observations in the Indian Ocean in 1960. H.M.A.S. Diamantina cruise Dm3/60. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 4.
- CSIRO Division of Fisheries and Oceanography (1963). Oceanographical observations in the Indian Ocean in 1960. H.M.A.S. Diamantina cruise Dm2/60. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 3.
- CSIRO Division of Fisheries and Oceanography (1963). Oceanographical observations in the Indian Ocean in 1961. H.M.A.S. Diamantina cruise Dm2/61. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 9.
- CSIRO Division of Fisheries and Oceanography (1964). Oceanographical observations in the Indian Ocean in 1961. H.M.A.S. Diamantina cruise Dm3/61. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 11.
- CSIRO Division of Fisheries and Oceanography (1964). Oceanographical observations in the Indian Ocean in 1962. H.M.A.S. Diamantina cruise Dm1/62. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 14.
- CSIRO Division of Fisheries and Oceanography (1965). Oceanographical observations in the Indian Ocean in 1963. H.M.A.S. Gascoyne cruise G1/63. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 21.
- CSIRO Division of Fisheries and Oceanography (1965). Oceanographical observations in the Indian Ocean in 1963. H.M.A.S. Diamantina cruise Dm1/63. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 23.
- CSIRO Division of Fisheries and Oceanography (1965). Oceanographical observations in the Indian Ocean in 1963. H.M.A.S. Diamantina cruise Dm2/63. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 24.
- CSIRO Division of Fisheries and Oceanography (1965). Oceanographical observations in the Indian Ocean in 1963. H.M.A.S. Diamantina cruise Dm3/63. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 25.
- CSIRO Division of Fisheries and Oceanography (1966). Oceanographical observations in the Indian Ocean in 1962. H.M.A.S. Gascoyne cruise G4/62. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 17.
- CSIRO Division of Fisheries and Oceanography (1967). Oceanographical observations in the Indian Ocean in 1962. H.M.A.S. Diamantina cruise Dm4/62. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 20.
- CSIRO Division of Fisheries and Oceanography (1968). Oceanographical observations in the Indian Ocean in 1964. H.M.A.S. Diamantina cruise Dm5/64. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 40.
- CSIRO Division of Fisheries Research, 1984. 2nd Divisional Research Seminar. In. CSIRO Marine Laboratories, 1993. *North West Shelf Development Project Benthic Samples from Goodwyn A Platform Area*. Report for Woodside Offshore Petroleum Pty Ltd; WENV 231.
- CSIRO, 1990. Analysis of Taiwanese Gill Net Data. Final report to the Fishing Industry Research and Development Council.
- CSIRO, 1992. *The Fisheries Biology of Deepwater Crustacea and Finfish on the Continental Slope of*

- Western Australia*. Final Report to the Fisheries Research And Development Corporation (FRDC Project 1988/74), CSIRO Division of Fisheries, Hobart.
- Curtin University *Toxicity of Harriet and Wonnich Crude oil*. Report to Apache Energy Ltd, Reference no. H118; Document no. EAA-00-RI-046.
- Curtin University *Toxicity of the Water-soluble Fraction of Stag 6H Crude Oil to 3 Marine Species*. Report to Apache Energy Ltd, Reference no. H149; Document no. EAA-62-RI-001/B, Apache Energy Ltd.
- Curtin University, 1993. *Ecotoxicology Symposium: Ecotoxicology and Protection of the Marine Environment with Emphasis on Western Australia*. Evans, L. H., edited by, Curtin University Ecotoxicology Program, Curtin University of Technology.
- Curtin University, 1994. *Ecotoxicology Workshop: Proceedings*. Evans, L. H., edited by Curtin University of Technology, Perth.
- Curtin University, 1997. Program & Abstract Proceedings. In: *Eighth International Symposium on Toxicity Assessment*. Perth.
- Dall, W., 1956. Western Australian prawn survey, Peel Inlet and Exmouth Gulf. *Fisheries Newsletter Australia*, **15**(6): 11-15.
- Dames & Moore, 1990. *Consultative Environmental Review*. Report for Hadson Energy Ltd, Apache Energy Ltd.
- Dampier Salt, 1981. *Status Report on the Biology of Lake MacLeod - 1981*. 116 pp.
- Dampier Salt, 1992. *Report on the Biology and Aquaculture of Milkfish *Chanos chanos* (Forsskal) at Dampier Salt 1990-1992*.
- Dampier Salt, 1996. *A Study of Marine Species in Dampier Solar Salt Field*. Dampier Salt Ltd, 18 pp.
- Dampier Salt, 1996. *Culture Report- Halophilic Algae*. 1-9 pp.
- Dampier Salt, 1996. *Milkfish Aquaculture at Dampier Salt Ltd*. Dampier Salt Ltd, 18pp.
- Davidson, J. K., 1983. Tethys and Pacific stratigraphic evidence for an expanding earth. In: *Expanding Earth Symposium, University of Tasmania*. S. W. Carey, pp. 191-97.
- Davie, P. J. F., and Turner, P. A., 1994. A new species and a new record of *Hepatoporus* from north western Australia (Crustacea:Decapoda:Xanthidae). *Memoirs of the Queensland Museum*, **37**(1): 83-86.
- Davis, T. L. O., 1984. Deepwater survey of crustacean resources (e.g. scampi & prawns) off the North West Shelf [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. CSIRO Division of Fisheries Research, NSW, pp. 18.
- Davis, T. L. O., and Ward, T. J. (CSIRO Division of Fisheries Research), 1984. CSIRO finds two new scampi grounds off the North West Shelf. *Australian Fisheries*, **43**(8): 41-47.
- Davis, T. L. O., and West, G. J., 1992. Growth and mortality of *Lutjanus vittus* (Quoy and Gaimard) from the North West Shelf of Australia. *Fisheries Bulletin*, **90**(2): 395- 404.
- Davis, T. L. O., and West, G. J., 1993. Maturation, reproductive seasonality, fecundity, and spawning frequency in *Lutjanus vittus* (Quoy and Gaimard) from the North West Shelf of Australia. *Fishery Bulletin*, **91**: 224-36.
- Davy, R., Brakel, T. and Muhling, P. C., 1979. The Value of B-GA-RB Diagrams in Determining Depositional Conditions in Proterozoic Rocks in the North West of Western Australia. In: *Western Australia Geological Survey Annual Report 1978*. 80- 85pp.
- de Boer, R. and Collins, L. B., 1988. Petrology and diagenesis of the Flag Sandstone, Harriet Field, Barrow Sub-basin. In: *The North West Shelf Australia: Proceedings of Petroleum Exploration Society, Australia Symposium, Perth, 1988*. Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, pp. 225-36.

- Dedman, R., 1988. Petroleum in Western Australia, production and development, 1987. *Oil & Gas Australia*: 19-25.
- Deegan, P. M., 1992. *Montebello and Lowendal Islands, Bibliography*. Report for Western Australia Department of Conservation and Land Management, Perth, 11pp.
- Delfos, E. and Dedman, R., 1988. The petroleum potential of the Peedamullah Shelf. In: *The North West Shelf, Australia: Proceedings of Petroleum Exploration Society, Australia Symposium*. Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, pp. 147-46.
- Demaison, G. J. and Shibaoka, M., Contribution to the study of hydrocarbon generation from hydrogen-poor kerogen. In: *Ninth World Petroleum Congress*. 2, pp. 195-97.
- Denman, P. D., and van de Graaff, W. J. E., 1982. Quobba, WA (map). 1:250 000. Geological Survey of Western Australia.
- Department of Conservation and Environment, 1982. *Management Proposals for the Monte Bello Islands*. Unpublished management paper.
- Department of Conservation and Environment, 1987. *A State Conservation Strategy for Western Australia. A Sense of Direction*. Bulletin 270, Dept. of Conservation and Environment, 19 pp.
- Department of Conservation and Land Management, 1990. *The Dampier Archipelago: Islands In The Sun*. Western Australia Department of Conservation and Land Management, Como, WA, 4 pp.
- Department of Conservation and Land Management, 1991. *Environmental Protection Authority Report February 1987 Wesminco Oil Pty Ltd WA-149-P. Offshore Oil Production*. Report for Novus West Australia Pty Ltd; Novus West Australia Pty Ltd.
- Department of Conservation and Land Management, 1992. *TP/7 and TL/2 Patricia and Patricia Extension Marine Seismic Survey Final Survey Report- Volume 2 Enclosures*. Report for Novus West Australia Pty Ltd; CAR-WA-192-P-7,54 .
- Department of Conservation and Land Management, 1993. *Histopathology of North West Shelf Oysters*. Report prepared for West Australian Petroleum Pty Ltd.
- Department of Conservation and Land Management, 1997. *Environmental Guidelines and Procedures in Relation to CALM Advice on the Marine Aspects of Aquaculture and Pearling Proposals in Western Australia*. Guidelines and Procedure Series No.1.
- Department of Conservation and Land Management, undated. *Environmental Protection Authority Report July 1985 Environmental Protection Act Licence Number 3078 Airlie Island Terminal*. Report for Novus West Australia Pty Ltd; CAR-TL/2-1006,0.
- Department of Environmental Protection, 1997. *Guidelines for Aquaculture Proposals*. Perth.
- Department of Fisheries and Fauna, 1970. *Station listing and trawling results of exploratory fishing surveys for prawns in the waters of the north of Western Australia in the years 1968, 1969 and 1970*.
- Department of Land Administration, 1998. Resource Development Projects (map). 1:300,000. Department of Resources and Development, Midland, Perth, WA.
- Department of Northern Development and Western Australia and Department of Industrial Development, 1974. *The Pilbara Study: Report on the Industrial Development of the Pilbara*. AGPS, Canberra.
- Department of Resource Development, 1980. *North West Gas; Its Effect on the Shire of Roebourne*. Department of Resource Development, Govt. of Western Australia, Perth.
- Department of Resources Development, 1998. Oil and Gas Site Projects Western Australia (map). 1:3,000,000. Department of Resources Development, Perth, WA.
- Department of Resources Development, 1998. *Western Australian Oil & Gas Review-April 1998*. Department of Resources Development, Govt. of Western Australia, Perth, 110 pp.

- Dews, G., Sainsbury, K., Whitelaw, W., and Moran, M., 1988. CSIRO goes fish trapping on NW shelf. *Australian Fisheries*, September: 28-29.
- Dickins, J. M., Roberts, J. and Veevers, J. J., 1972. Permian and Mesozoic Geology of the North Eastern Part of the Bonaparte Gulf Basin. In: *Geological Papers 1969*. Bulletin 125, Bureau of Mineral Resources, Australia, 75-102 pp.
- Dinara Pty Ltd, 1994. *Annual Environmental Report - Varanus Island Terminal Development*. Report to Apache Energy Ltd; Reference no. H87; Document no. EAA-60-RI-036.
- Dix, G. R., 1989. High-energy, inner shelf carbonate facies along a tide-dominated nonrimmed margin, north western Australia. *Marine Geology*, 89: 347-62.
- DNV Consultancy Services, 1996. *Wonnich - East and Wonnich - Flank Oil Spill Risk Assessment (Addendum)*. Report to Apache Energy Ltd; Reference no. H134; Document no. WO-00-EF-002.
- DNV Technica A1386, 1996. *Wonnich-East and Wonnich-Flank Oil Spill Risk Assessment*. Report to Apache Energy Ltd; Reference no. H120; Document no. EAA-00-RI-039.
- DNV Technica, 1996. *Wonnich-East and Wonnich-Flank Oil Spill Risk Assessment*.
- Doherty, P. J., and McIlwain, J. L., 1996. Monitoring larval fluxes through the surf zones of Australian coral reefs. *Australian Journal of Marine and Freshwater Research*, 47: 383-90.
- Dolby, J. H., and Balme, B. E., 1976. Triassic palynology of the Carnarvon Basin, Western Australia: Review of Palaeobotany and Palynology. 22: 105-68.
- Donaldson, B., Eliot, I. and Kay, R. C., 1995. *Final Report of the Review of Coastal Management in Western Australia: A Report to the Minister for Planning*. Coastal Management Review Committee, Perth, WA.
- Done, T., Done, C., and Thompson, C., 1997. The Rowley Shoals - coral for keeps. *Landscape*, 1(28-34).
- Driscoll, P., 1996. *A Report on the Issues Affecting the Use of the Dampier Archipelago*. Fisheries Management Paper No 90, Western Australia Fisheries Department, 48 pp.
- Drummond, B. J., Etheridge, M. A., Davies, P. J., and Middleton, M. F., 1988. Halfgraben model for the structural evolution of the Fitzroy Trough, Canning Basin, and implications for resource exploration. *The APEA Journal*, 28(1): 76-86.
- Duke, N. C., Burns, K. A., and Dalhaus, O., 1998. Effects of oils and dispersed-oils on mangrove seedlings in planthouse experiments: a preliminary assessment of results two months after oil treatment. *APPEA Journal*: 631-36.
- Duke, N. C., Ellison, J. C., and Burns, K. A., 1998. Surveys of oil spill incidents affecting mangrove habitat in Australia: a preliminary assessment of incidents, impact on mangrove, and recovery of deforested areas. *APPEA Journal*: 646-54.
- Dybdahl, R. and Pas, D. A., 1985. *An Investigation of Mortality of the Pearl Oyster, Pinctada maxima, in Western Australia*. Report 71, Fisheries Department of Western Australia, 78 pp.
- Dybdahl, R. and Rose, R. A., 1986. The Pearl Oyster Fishery in Western Australia . In: *Torres Strait Fisheries Seminar*. A. K. Haines, G. C. Williams & C. Coates, Australian Government Publishing Service, Canberra, 122-32 pp.
- Easton, A. K., 1970. *The Tides of the Continent of Australia*. Research Report 37, Horace Lamb Centre for Oceanographic Research, Flinders University, South Australia, 326 pp.
- Edgerly, D. W., and Crist, R. P., 1974. Salt and diapiric anomalies in the south east Bonaparte Gulf Basin. *APEA Journal*, 14(1): 85-94.
- Edmonson, M., 1997. Fusion of ancient geology and modern technology. *Exploration and Production*, 13: 6-9.

- EDR Hydrosearch, 1997. *Report on the Operational Safety and Technical Inspection of MV 'Western Legend' Conducted by IAS Marine/EDR Hydrosearch at Dampier Public Wharf*. CAR-GEN-515, Novus West Australia Pty Ltd.
- EDS and Stuart Sims, 1998. *Interim Seismic Supervision Report: for a 3d Marine Survey West of Barrow Island Offshore WA on Behalf of a Multi-Client Consortium*. CAR-GEN-524, Novus West Australia Pty Ltd.
- Edwards, R. R. C., 1983. The Taiwanese pair trawler fishery in tropical Australian waters. *Fisheries Research*, **2**: 47-60.
- Ellis, G. K., 1988. Diagenesis of the Talisman -I Reservoir Sequence. In: *The North West Shelf, Australia: Proceedings of Petroleum Exploration Society, Australia Symposium*. Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, pp. 237-50.
- Ellis, G. K., and Phillips, S. E., 1992. Diagenetic stratification in the Talisman Field, North West Shelf, Australia. *American Association of Petroleum Geologists Bulletin*, **76**(7): 1099.
- Environment & Resource Technology Ltd, 1994. *Assessment of the Sediment-Phase Toxicity of Eight Drilling Chemicals to the Sediment-Dwelling Amphipods Corophium volutator*. Report ERT 93/072, ERT Ltd, Edinburgh, 23 pp.
- Environment and Resource Technology, 1994. *Assessment of the toxicity of product 940510 to marine alga Skeletonema costatum*. Study No. 044-3-1, Orkney Water Test Centre Ltd, Edinburgh, 10 pp.
- Environmental Protection Authority, 1975. *Conservation Reserves for Western Australia. Systems 4, 8, 9, 10, 11, 12*. EPA, WA State Government Publisher, Perth.
- Environmental Protection Authority, 1979. *North West Shelf Development Project: Woodside Petroleum Development Pty Ltd*. Report and Recommendations of the EPA, EPA, Perth.
- Environmental Protection Authority, 1985. *Bond Oil Pty Ltd Harriet Oilfield Development*. Report and Recommendation of the EPA, Bulletin 211, EPA, Perth, 20pp.
- Environmental Protection Authority, 1985. *Harriet Oilfield Development: Apache Energy Ltd*. Report and Recommendations of the EPA, EPA, Perth.
- Environmental Protection Authority, 1985. *Wesminco Oil Pty Ltd WA-149-P Offshore Oil Production*. Report and Recommendations of the EPA, Bulletin 210, EPA, Department of Conservation and Environment, Perth, 15 pp.
- Environmental Protection Authority, 1986. *Proposed Exploration Drilling on the Cody, Spider and Cassidy Projects, Exmouth Gulf, Western Australia*. EPA, Perth.
- Environmental Protection Authority, 1987. *Saladin Oilfield Development*. In: *Report and Recommendations of the EPA*. Bulletin 293, EPA, Perth, 17 pp.
- Environmental Protection Authority, 1989. *Roller No.1 Oil Exploration Permit TP/3 Part 1*. Report for WAPET Pty Ltd; Bulletin 415, EPA, Perth, 18 pp.
- Environmental Protection Authority, 1990. *Dampier Solar Salt Field Enhancement*. Report for Dampier Salt (Operations) Pty Ltd; Bulletin 448, EPA, Perth, 16 pp.
- Environmental Protection Authority, 1990. *Harriet Gas Field Pipeline*. In: *Report & Recommendations of the EPA*. Bulletin 473, EPA, Perth, 6 pp.
- Environmental Protection Authority, 1990. *The Environmental Impact of Organotin Anti-Fouling Paints in Western Australia*. In: *Report and Recommendations of the EPA*. Bulletin 447, EPA, Perth, 13 pp.
- Environmental Protection Authority, 1990. *Tubrigi Gas Field Development*. Report for Doral Resources NL; Bulletin 446, EPA, Perth, 15 pp.
- Environmental Protection Authority, 1991. *Environmental Protection Act Licence Number 3078 Airlie Island Terminal*. CAR-TL/2-1007,0, Novus West Australia Pty Ltd.

- Environmental Protection Authority, 1991. *Environmental Protection Act Licence Number 3078- Amendment to Conditions of Licence- Airlie Project at 21st May 1993*. CAR-TL/2-1007, Novus West Australia Pty Ltd.
- Environmental Protection Authority, 1991. Exploration Drilling Program in TP/3 Part 1 and Roller Oilfield, Offshore Onslow. In: *Report & Recommendations of the EPA*. Bulletin 732, EPA, Perth, 27 pp.
- Environmental Protection Authority, 1991. *Leslie Salt Project, Expansion of Ponds, Port Hedland*. Report for Leslie Salt; Bulletin 506, EPA, Perth, 18 pp.
- Environmental Protection Authority, 1991. *Petroleum Exploration in Permit Areas EP 342 and TP/9. Rowley Shelf Western Australia September 1990*. CAR-GEN-65,0, Novus West Australia Pty Ltd.
- Environmental Protection Authority, 1991. Proposal Offshore Petroleum Exploration Drilling in EP325, North West Shelf. In: *Report & Recommendations of the EPA*. Report for Minora Resources NL; Bulletin 546, EPA, Perth, 5 pp.
- Environmental Protection Authority, 1991. Proposed Offshore Petroleum Exploration Drilling in EP 325, North West Shelf. In: *Report & Recommendations of the EPA*. Report for Apache Energy Ltd; Minora Resources NL; Bulletin 546, EPA, Perth, 5 pp.
- Environmental Protection Authority, 1992. *Proposed Exploration Drilling in EPs341 and 364 Offshore Onslow*. Report for Command Petroleum Holdings NL; Bulletin 654, EPA, Perth, 8 pp.
- Environmental Protection Authority, 1992. *State of the Environment Report*. Government of Western Australia, Perth.
- Environmental Protection Authority, 1994. *Amendment to Condition of Licence Airlie Project - Airlie Island, Vicksburg, Environmental Protection Act 1986 Licence Number 3078*. CAR- TL/2-1031,0, Novus West Australia Pty Ltd.
- Environmental Protection Authority, 1994. *Environmental Protection Act 1986 Licence 5241- Airlie Project*. CAR-TL/2-1040, Novus West Australia Pty Ltd.
- Environmental Protection Authority, 1994. *Exploration Drilling in EP TP/3 Part 1 and Roller Oilfield, offshore Onslow*. Report for West Australian Petroleum Pty Ltd; Bulletin 732, EPA, Perth, 28 pp.
- Environmental Protection Authority, 1995. *East Spar offshore Gas Field Development (Varanus Island, North West Shelf)*. Report for Western Mining Co; Bulletin 787, EPA, Perth, 35 pp.
- Environmental Protection Authority, 1995. *Proposed Offshore Petroleum Exploration Drilling in EP TP/7 and TL/2, North West Shelf*. Report for Western Mining Corporation Ltd, EPA, Perth.
- Environmental Protection Authority, 1995. *Wonnich 1 Petroleum Exploration Well near Montebello Islands*. Report for Ampolex Ltd; Bulletin 780, EPA, Perth, 35pp.
- Environmental Protection Authority, 1997. *Appraisal Drilling Programme for Wonnich Field South-West of the Montebello Islands*. Report for Apache Energy Ltd; Bulletin 853, EPA, Perth, 60 pp.
- Environmental Protection Authority, 1997. Boodarie Resource Processing Estate, Port Hedland, Western Australia. In: *Report & Recommendations of the EPA*. Bulletin 874, EPA, Perth.
- Environmental Protection Authority, 1997. *Maitland Heavy Industrial Estate, Karratha*. Report for LandCorp and Department of Resources Development; Bulletin 855, EPA, Perth, 61 pp.
- Environmental Protection Authority, 1997. *Wonnich Gas Development, South West of the Montebello Islands*. Report for Apache Energy Ltd; Bulletin 856, EPA, Perth, 36 pp.
- Environmental Protection Authority, 1998. *Aquaexport Marine Shell Project*. Report for Le Mer Marketing and Consultancy Pty Ltd; Bulletin 886, EPA, Perth, 14 pp.
- Environmental Protection Authority, 1998. *Guide for the Assessment of Environmental Factors. Benthic Primary Producer Habitat*. No. 29 (Draft), EPA, Perth.

- Environmental Protection Authority, 1998. *Second Offshore Trunkline and DOMGAS Debottlenecking, North West Shelf*. Report for Woodside Offshore Petroleum Pty Ltd; Bulletin 893, EPA, Perth, 35 pp.
- ERM Mitchell McCotter, 1997. *Review of Environmental Issues Related to the Low Toxicity Based Muds and Synthetic Drilling Fluids*. WENV 313, Woodside Offshore Petroleum Pty Ltd.
- Etheridge, M. A., Symonds, P. A., and Powell, T. G., 1988. Application of the detachment model for continental extension to hydrocarbon exploration in extensional basins. *APEA Journal*, **28**: 167-87.
- Evans, A. J., Fogerty, A. C., and Sainsbury, K. J., 1986. The fatty acid composition of fish from the North West Shelf of Australia. *CSIRO Food Research Quarterly*, **46**(2): 40-45.
- Evans, D. R., 1992. The Western Deep Water Trawl and the North West Slope Trawl Fisheries. In: *The Fisheries Biology of Deepwater Crustacea and Finfish on the Continental Slope of Western Australia*. Report to FIRDC: Project 1988/74, CSIRO, 19-27 pp.
- Evans, J. L., and Allan, R. J., 1992. El Niño/Southern Oscillation modification to the structure of the monsoon and tropical cyclone activity in the Australasian region. *International Journal of Climatology*, **12**(6): 611-23.
- Evans, L. H., Spickett, J. T., Bidwell, J. R., Ripplingale, R. J., and Brown, H. L., 1994. Application of ecotoxicology to environmental management in the Australian Offshore oil and gas industry. *APEA Journal*, **1**: 809-19.
- Evans, L. H., Tsvetnenko, Y. B. and Gorrie, J., 1996. *Toxicity of Produced Formation Water to Three Marine Species*. Report to Ampolex Ltd; Report no: 19129; MENV 085, Curtin University of Technology, WA, 18 pp.
- Exon, N. F. (Assoc. Editor), 1994. Thematic issue: Geology of the outer North West Shelf, Australia. *AGSO Journal of Australian Geology & Geophysics*, **15**(1): 1-190.
- Exon, N. F. and Willcox, J. B., 1980. *The Exmouth Plateau*. Bulletin 199, Bureau of Mineral Resources, Australia.
- Exon, N. F., 1994. An introduction to the geology of the outer margin of Australia's North West Shelf. In. *AGSO Journal of Australian Geology & Geophysics: Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 3-10.
- Exon, N. F., and Cowell, J. B., 1994. Geological history of the outer North West Shelf of Australia; a synthesis. In. *AGSO Journal of Australian Geology & Geophysics: Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 177-90.
- Exon, N. F., von Rad, U., and von Stackelberg, U., 1982. The geological development of the passive margins of the Exmouth Plateau off north west Australia. *Marine Geology*, **47**: 131-52.
- Exon, N. G. and Williamson, P. E., 1987. Crustal structure, stratigraphic framework, and reassessment of the resource potential of the Exmouth Plateau. In: *Yearbook of the Bureau of Minerals Resources, Geology and Geophysics*. G. M. Baldon, ed., Canberra.
- Exon, N. G., and Willcox, J. B., 1978. Geology and petroleum potential of Exmouth Plateau area, off Western Australia. *American Association of Petroleum Geologists Bulletin*, **62**: 40-72.
- Fairbridge, R. W., 1953. The Sahul Shelf, Northern Australia, its structure and geological relationships. *Journal of the Royal Society of Western Australia*, **37**: 1-33.
- Fairbridge, R. W., 1955. Some bathymetric and geotectonic features of the eastern part of the Indian Ocean. *Deep Sea Research*, **2**: 161-71.
- Falvey, D. A., 1974. The development of continental margins in plate tectonic theory. *APPEA Journal*, **14**: 95-106.
- Falvey, D. A., and Middleton, M. F., 1981. Passive continental margins: evidence for a pre-breakup deep crustal metamorphic subsidence mechanism: Colloquium on geology of continental margins

- (C3). *Oceanologica Acta* 4, **supplement**: 103-14.
- Falvey, D. A., and Mutter, J. C., 1981. Regional plate tectonics and the evolution of Australia's passive continental margins. *B.M.R Journal of Australian Geology & Geophysics*, **6**: 1-29.
- Fandry, C. B. and Hart, W., 1988. *Goodwyn Current Modelling: 3-D Model Assessment*. Report to Woodside Offshore Petroleum Pty Ltd.
- Fandry, C. B., and Steedman, R. K., 1989. An investigation of tropical cyclone generated circulation on the North West Shelf of Australia using a three-dimensional model. *Deutsche Hydrographische Zeitschrift*, **42**: 307-41.
- Fandry, C. B., and Steedman, R. K., 1994. Modelling the dynamics of the transient, barotropic response of continental shelf waters to tropical cyclones. *Continental Shelf Research*, **14**(15): 1723-50.
- Fandry, C. B., Leslie, L. M., and Steedman, R. K., 1984. Kelvin-type coastal surges generated by tropical cyclones. *Journal of Physical Oceanography*, **14**: 582-93.
- Fetherstone, W. E., 1997. On the use of the geoid in geophysics; a case study over the North West Shelf of Australia. *Exploration Geophysics*, **28**(1-2): 52-57.
- Fieux, M., and Molcard, R., 1996. Geostrophic transport of the Pacific-Indian oceans throughflow. *Journal of Geophysical Research*, **101**(C5): 12421-32.
- Fieux, M., Andrie, C., Charriaud, E., Ilahude, A. G., Molcard, R., and Swallow, J. C., 1996. Hydrological and chlorofluoromethane measurements of the Indonesian throughflow entering the Indian Ocean. *Journal of Geophysical Research*, **101**(35): 12433-54.
- Fieux, M., Andrie, C., Delecluse, P., Ilahude, A. G., Kartavtseff, A., Mantsi, F., Molcard, R., and Swallow, J. C., 1994. Measurement within the Pacific Indian oceans throughflow region. *Deep Sea Research*, **41**(7): 1091-130.
- Fisheries Department of Western Australia, 1997. *Assessment of Applications for Authorization for Aquaculture and Pearling in Coastal Waters of Western Australia*. Ministerial Policy Guideline No. 8, Fisheries Western Australia, Perth, 1-11 pp.
- Fisheries Department of Western Australia, 1997. Pearl Oyster Fishery. In: *Western Australian Pearling Act 1990*. Ministerial Policy Guidelines, FDWA, Perth, 1-25pp.
- Flood, P. G., 1992. Management of oil drilling in Australian Waters. *Marine Pollution Bulletin*, **25** (5-8): 143-46.
- Forman, D. J., and Wales, D. W., 1981. Geological evolution of the Canning Basin, Western Australia. *Bureau of Mineral Resources Australia, Bulletin* **210**: 89.
- Forrest, J. T. and Horstman, E. L., 1986. The Northwest Shelf of Australia -Geologic review of a potential major petroleum province of the future . In: *Future petroleum provinces of the world*. Halbouty, M. T., 40, American Association of Petroleum Geologists Memoirs, pp. 457-85.
- Forrest, J. T., and Horstman, E. L., 1984. Australia's North West Shelf booms. *American Association of Petroleum Geologists Explorer*, **April**: 22-24.
- Foster, C. B., O'Brien, G. W., and Watson, S. T., 1986. Hydrocarbon source potential of the Goldwyer Formation, Barbwire Terrace, Canning Basin, Western Australia. *The APEA Journal*, **26**(1): 142-55.
- Foster, W. F., 1995. *1995 Melinda Seismic Survey EP-41 & EP-395 Carnarvon Basin, Western Australia Field Operations Report, June 19 - July 24 1995*. Report for Ampolex Limited; MENV 011, 70 pp.
- Fowler, J., 1995. *Management of the Northern Demersal Scalefish Fishery*. Management paper 79, Western Australia Fisheries Department, 26 pp.
- Francis, A., 1995. *Biology Project 301/302 Report*. Report to Apache Energy Ltd; Apache Energy Ltd.

- Fraser, A. J., 1953. The fisheries of Western Australia. *Fisheries Research Bulletin*, **4**.
- Fraser, B. and Driscoll, P., 1996. *Pearling and Aquaculture in the Dampier Archipelago: Existing and Proposed Operations, a Report for Public Comment*. Western Australia Fisheries Department Management Paper: 92, 31 pp.
- Fraser, I., 1990. Offshore petroleum outlook - Australia. In: *Proceedings of the First 1990 Pacific/Asia Offshore Mechanics Symposium*. Chung, J. S. & Kaneko, K., eds, 1, International Society of Offshore and Polar Engineers, pp. 1-10.
- Furnas, M. J., and Mitchell, A. W., 1998. Biological and chemical oceanographic processes in shallow North West Shelf waters surrounding the Harriet A production platform. *The APPEA Journal*, **38**: 655-64.
- Furnas, M., Burns, K. and Heggie, D., 1995. *Preliminary Results of Oceanographical and Geochemical Measurements Made in the vicinity of Harriet A Production Platform, September, 1994*. unpublished report, Apache Energy Corporation Apache Energy Ltd, Perth.
- Furnas, M., Mitchell, A. and Burns, K., 1996. Biological, chemical and physical oceanographic studies on the outer North-West Shelf. In: *Western Australian Research Activities 1994-1996*. Australian Institute of Marine Science Report, Townsville, 46-47 pp.
- Garvey, J. R., 1992. Changes in catch rates of prawns and scampi in the North West Slope Trawl Fishery. In: *Australian Marine Sciences Association Annual Conference*. Perth, pp. 33.
- Garvey, J. R., Wadley, V. A. and Phillips, B. F., 1992. Estimation of the relative abundance of commercial crustaceans from the North West Slope Trawl Fishery using Commercial Catch and Effort Data. In: *The Fisheries Biology of Deepwater Crustacea and Finfish on the Continental Slope of Western Australia*. S. F. Rainer, ed., Final report to FRDC: Project 1988/74, CSIRO, 131-155 pp.
- Gentilli, J., 1972. Ocean-atmosphere reactions on the western Australian coast. In: *A report on a proposal for marine environmental studies off the western coast of Australia*. 17-37 pp.
- Geofound Pty Ltd, 1994. *Geophysical Interpretation Report on the Port of Dampier Reconnaissance Geophysical Survey*. Report for the Department of Resources Development. Geofound Pty Ltd, 1994. *Geophysical Interpretation Report on the Port of Dampier Reconnaissance Geophysical Survey*. Report for Department of Resources Development.
- George, P., 1968. A Preliminary Report on the General Distribution and Variation in Abundance of the Planktonic Polychaetes of the Indian Ocean. *Bulletin of National Institute of Sciences of India*, **38**: 718-26.
- George, R. W., 1966. Marine crayfish or spiny lobsters of Australia. *Fisheries Newsletter, Australia*, **25**(5): 223-24.
- George, R. W., 1966. Tropical spiny lobsters, *Panulirus* spp, of Western Australia (and the Indo-West Pacific). *Journal of the Royal Society of Western Australia*, **51**(2): 33-38.
- George, R. W., 1974. Coral reefs and rock lobster ecology in the Indo West Pacific region. In: *Proceedings of the Second International Coral Reef Symposium*. 1, pp. 321- 25.
- George, R. W., 1983. New finds of deepwater 'Lobster' on the North West Shelf. *Fins*, **16**(1): 16-21.
- George, R. W., and Clark, M., 1972. Two new species of pebble crab (Oxystomatae; Leucosiidae) from Western Australia. *Records of the Western Australian Museum*, **4**(3): 303-9.
- George, R. W., and Griffin, D. J. G., 1972. The shovel-nosed lobsters of Australia. *Australian Natural History*, **17**(7): 227-31.
- George, R. W., and Griffin, D. J. G., 1972. Two shovel-nosed lobsters of the genus *Scyllarides* (Decapoda, Scyllaridae) new to Australia. *Crustaceana*, **24**(1): 144-47.
- George, R. W., and Holthuis, L. B., 1972. A revision of the Indo-west Pacific spiny lobsters of the *Panulirus japonicus* group. *Zoologische Verhandelingen*, **72**: 3-36.

- George, R. W., and Jones, D. S., 1983. Notes on the crab fauna of Mangrove Bay, North West Cape, Western Australia. *Western Australian Naturalist*, **15**(8): 169-75.
- George, R. W., and Knott, M. E., 1967. The Ocypode ghost crabs of Western Australia. *Journal of the Royal Society of Western Australia*, **48**(1): 15-21.
- Geotech, 1994. *Harriet-1 crude oil properties and predicted behaviour of spills*. Hadson Energy Ltd, Reference no. H094 Document no EA-60-RF-002, Apache Energy Ltd.
- Geotech, 1994. *Harriet-1 Crude Oil Properties and Predicted Behaviours of Spills*. Report to Apache Energy Ltd, Reference no. H138; Document no. EAA-60-RI-061, Apache Energy Ltd.
- Geotech, 1995. *GC Results for Harriet Oil and Varanus Island Oil in Groundwater*. Report to Apache Energy Ltd; Reference no. H123; Document no. EAA-00-RI-041, Apache Energy Ltd.
- Geotech, 1995. *GC-MS Results for Harriet Oil and Oil in Groundwater*. Report to Apache Energy Ltd, Reference no. H124; Document no. EAA-00-RI-042, Apache Energy Ltd.
- Geotech, 1995. *Oil Characterisation Study Barrow Island*. Report for West Australian Petroleum Pty Ltd.
- Geotech, 1995. *Oil Characterisation Study Thevenard Island*. Report for West Australian Petroleum Pty Ltd.
- Geotech, 1995. *Wonnich-1 Crude Oil Properties and Predicted Behaviour of Spills*. Report to Apache Energy Ltd; Reference no. H127; Document no. EAA-00-RI-049, Apache Energy Ltd.
- Geotech, 1996. *GC and GC-MS Analyses on Water Soluble Fractions Harriet-1 & Wonnich-1*. Report to Apache Energy Ltd; Reference no. H137; Document no. EAA-60-RG-002, Apache Energy Ltd.
- Geotech, 1996. *Stag-6 Crude Oil Propensity to Form an Emulsion and Evaporation Behaviour*. Report to Apache Energy Ltd; Reference no. H128; Document no. EAA-00-RI-047, Apache Energy Ltd.
- Geotechnical Services Pty Ltd, 1994. *Harriet-1 Crude Oil Properties and Predicted Behaviour of Spills*. Report to Apache Energy Ltd; Reference no. H93; Document no. EAA-60-RF-002, Apache Energy Ltd.
- Global Environmental Modelling Services, 1996. *Oil Spill Prediction and Response Management System Developed by Applied Science Associates, Global Environmental Modelling Services, and the Australian Institute of Marine Sciences. System Description and Verification*. Report to Apache Energy, Apache Energy Ltd.
- Godfrey, J. S., 1989. A Sverdrup model of the depth-integrated flow for the world ocean allowing for island circulations. *Geophysical and Astrophysical Fluid Dynamics*, **45**: 89-112.
- Godfrey, J. S., and Ridgway, K. R., 1985. The large-scale environment of the polewardflowing Leeuwin Current, Western Australia: Longshore steric height gradients, wind stresses and geostrophic flow. *Journal of Physical Oceanography*, **15**: 481-95.
- Godfrey, J. S., and Weaver, A. J., 1990. Is the Leeuwin Current driven by Pacific heating and winds? *Progress in Oceanography*.
- Golding, T. J., and Symonds, G., 1978. Some surface circulation features off Western Australia during 1973-1976. *Australian Journal of Marine and Freshwater Research*, **29**: 187-91.
- Goldstein, B. A., 1989. Waxing, warning in stratigraphy: play concepts, prospectivity in Canning Basin. *Oil and Gas Journal*, **18**(Sept): 104-6.
- Goldsworthy Mining Ltd, 1984. *Goldsworthy Extension Project: Notice of Intent: Environmental Aspects at Mimingarra Mine site and Finucane Island Port Facility near Port Hedland, Western Australia*.
- Gopala, R, Krishna, K. S., Pillipenki, A. I., Subrahmanyam, V., Dracheva, V. I., and Exon, N. F., 1994. Tectonic and sedimentary history of the Argo Abyssal plain, eastern Indian Ocean. In. *AGSO Journal of Australian Geology & Geophysics: Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 165-76.

- Gopalakrishnan, K., and Brinton, E., 1968. Preliminary observations on the distribution of Euphausiacea from the International Indian Ocean Expedition. *Bulletin of National Institute of Sciences of India*, **38**: 594-611.
- Gordon, D. M., 1983. A Preliminary Study of Mangroves of the Dampier Archipelago, Western Australia. In: *Environmental Note*. Note 141, The Department of Conservation and Environment.
- Gorman, T., 1992. Research updates. *Professional Fisherman*, **14**(4): 19-20.
- Gorter, J. D., 1978. Triassic environments in the Canning Basin, Western Australia. *BMR Journal of Australian Geology and Geophysics*, **3**(1): 25-33.
- Grant-Mackie, J. A., 1994. Mesozoic Bivalvia from Clerke and Mermaid canyons, Northwest Australian continental slope. In. *AGSO Journal of Australian Geology & Geophysics: Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 119-25.
- Greig, M. A., 1974. *The Estimation of Surface Currents from Ships' Set*. CSIRO Report 54, CSIRO, 15 pp.
- Griffiths G.W., Wills, D. J., and Meiring, W. J., 1994. North West Shelf gets extensive pipeline, plant management system. *Oil and Gas Journal*, **92**(1): 42-45.
- Griffiths, R. W., and Pearce, A. F., 1985. Satellite images of an unstable warm eddy derived from the Leeuwin Current. *Deep Sea Research*, **32**(11): 1371-80.
- Groundwater Technology, 1995. Hydrogeological Investigation & Groundwater Monitoring Apache Energy Lease Area Varanus Island, Western Australia. In. Reference no. H113; Document no. EAA-60-RI-052, Apache Energy Limited.
- Gunn, J. S., 1984. The reproductive biology of two trevallies, *Carangoides equula* and *C. malabaricus*, from the North West Shelf [abstract]. In: *Conference Proceedings, Second Divisional Research Seminar*. CSIRO Division of Fisheries Research, NSW, pp. 16.
- Gunn, P. J., 1988. Bonaparte Basin: evolution and structural framework. In: *The North West Shelf, Australia: Proceedings of Petroleum Exploration Society, Australia Symposium*. Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, pp. 275-86.
- Hadson Energy Ltd ((I Stejskal, I.V.)), 1993. *EP 342 Drilling Programme Site Information*. Report to Apache Energy Ltd; Reference no. H69; Document no. EAA-61-RD-008, Apache Energy Ltd.
- Hadson Energy Ltd ((I.V. Stejskal)), 1993. *SGL Pipeline Inspection Report*. Report to Apache Energy Ltd; Reference no. H70; Document no. EAA-60-RX-006, Apache Energy Ltd.
- Hadson Energy Ltd, 1985. *Harriet Oilfield Development Supplementary Notice of Intent - Extension*. Report to Apache Energy Ltd; Reference no. H8; Document no. EAA-60-RI-018, Apache Energy Ltd.
- Hadson Energy Ltd, 1991. *Tanami # 1 Drilling Programme Photographic Summary*. Report to Apache Energy Ltd; Reference no. H45; Document no. EAA-60-RD-003, Apache Energy Ltd.
- Hadson Energy Ltd, 1993. *Banksia Environmental Awards for 1993*. Report to Apache Energy Ltd; Reference no. H52; Document no. EAA-60-RG-001, Apache Energy Ltd.
- Hadson Energy Ltd, 1993. *Environmental Guidelines - Bentu Block, Central Sumatra, Indonesia*. Report to Apache Energy Ltd; Reference no. H57; Document no. EI-64-RI-001, Apache Energy Ltd.
- Hadson Energy Ltd, 1993. *Environmental Management Programme for Varanus Island, Lowendal Group*. Report to Apache Energy Ltd; Reference no. H56; Document no. EAA-60-RI-014, Apache Energy Ltd.
- Hadson Energy Ltd, 1993. *Onshore Sales Gas Line - Pipeline Inspection - General Visual Environmental Survey*. Report to Apache Energy Ltd; Reference no. H54; Document no. EAA-60-RX-003, Apache Energy Ltd.
- Hadson Energy Ltd, 1993. *The Onshore Gas Pipeline: A Success Story in Construction and Rehabilitation. (DOMEWA Environmental Awards)*. Report to Apache Energy Ltd; Reference no. H55; Document no. EAA-60-RX-004, Apache Energy Ltd.

- Hadson Energy Ltd, 1994. *Bay Cable Seismic Survey, Lowendal Islands, Environmental Close-out Rep.* Report to Apache Energy Ltd; Reference no. H90; Document no. EAA-60-RU-003, Apache Energy Ltd.
- Hadson Energy Ltd, 1994. *Belinda Exploration Well - Environmental Appraisal.* Report to Apache Energy Ltd; Reference no. H95; Document no. EAA-60-RI-039, Apache Energy Ltd.
- Hadson Energy Ltd, 1994. *Proposal Application - Drilling on Varanus Island.* Report to Apache Energy Ltd; Reference no. H89; Document no. EAA-60-RD-007, Apache Energy Ltd.
- Hadson Energy Pty Ltd, 1990. *Harriet Gas Platform.* Consultative Environmental Review, Apache Energy Ltd.
- Hall, G. P. D., 1972. North, Northwest and West coast of Australia from the west entrance of Endeavour Strait to Cape Leeuwin. *Australia Pilot*, **6 ed.**
- Hall, M., 1987. Basin evolution in the northern Browse Basin, offshore from north west Australia. In: Record 1987/51, Bureau of Mineral Resources (Australia), 125-130 pp.
- Hallegraeff, G. M. and Jeffrey, S. W., 1986. Tropical phytoplankton species and pigments of north and north-west Australia. In: *Australian Marine Sciences Association.* AMSA, Hobart.
- Hallegraeff, G. M., 1984. Coccolithophorids (calcareous nanoplankton) from Australian waters. *Botanica Marina*, **27(6)**: 229-47.
- Hallegraeff, G. M., 1984. Phytoplankton pigments and species of the North West Shelf [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar.* CSIRO Division of Fisheries Research, Cronulla, NSW, pp. 10.
- Hallegraeff, G. M., 1992. Harmful algal blooms in the Australian region. *Marine Pollution Bulletin*, **25(5)**: 186-90.
- Hallegraeff, G. M., 1994. Species of the diatom genus *Pseudonitzschia* in Australian waters. *Botanica Marina*, **37(5)**: 397-411.
- Halpern Glick Maunsell Pty Ltd, 1996. Port Hedland Dust Management Programme. In: BHP Iron Ore Pty Ltd, 60 pp.
- Halpern Glick Maunsell Pty Ltd, 1997. Port of Dampier Development Strategy and Capacity Study. In: 5, T4207, Dampier Port Authority.
- Halse, J. W., and Hayes, J. D., 1971. The geological and structural framework of the offshore Kimberley Block (Browse Basin) area Western Australia. *APEA Journal*, **11(1)**: 64-70.
- Hamilton, L. J., 1997. *Bibliography of Wind-Wave Data and Publications for the Coastal Regions of Australia.* DSTO-GD-0116, DSTO Aeronautical and Maritime Research Laboratory, Melbourne, 288 pp.
- Hamilton, L. J., 1997. Methods to obtain representative surface wave spectra, illustrated for two ports of north-western Australia. *Marine and Freshwater Research*, **48(1)**: 43-57.
- Hammersley Iron, 1985. *Marine Life of the Dampier Archipelago.*
- Hammond, I., Bell, R. W. and Samaraweera, M. K. S. A., 1997. *Mitigation of Environmental Constraints to the Rehabilitation of Defunct Roads and other Construction Sites at Western Australian Petroleum Pty. Ltd. (WAPET) Operations, Thevenard Island, Western Australia.* Murdoch University report to West Australian Petroleum Pty Ltd, 29 pp.
- Hamon, B. V., 1966. Continental shelf waves and the effect of atmospheric pressure and wind stress on sea level. *Journal of Geophysical Research*, **71(12)**: 2883-93.
- Hamon, B. V., 1972. Geopotential Topographies and Currents off West Australia, 1965-69. In: Technical Paper 32, CSIRO, 1-11 pp.
- Hanamura, Y., 1994. A new species of *Pasiphaea savingy* (Crustacea, Caridea, Pasiphaeidae) from north-western Australian waters. *The Beagle*, **11**: 167-73.

- Hancock, D. A., Jones, H. E. and Field, R. A., 1979. *Oil Spills and the Western Australian Marine Environment*. Bulletin 71, Department of Conservation and Environment, 12 pp.
- Hanley, J. R., 1992. *Part VII: Polychaete Worms Survey of the Aquatic Fauna of the Kimberley Islands and Reefs Western Australia*. G. J. Morgan, Ed., Report of the Western Australian Museum Kimberley Island and Reef Expedition August 1991, Western Australian Museum, Perth, 23-29 pp.
- Hanley, R. 1995. Mangrove Flora: distribution of species and habitat descriptions. In: Wells, FE, Hanley R and Walker, DI (Eds.). *Marine Biological survey of the southern Kimberley, Western Australia*. Western Australian Museum, Perth, W.A.
- Harris, E. J., 1980. The production geology of the North Rankin . In: *Gas Field: Proceedings of the 2nd Circum-Pacific Energy and Mineral Resources Conference*.
- Harris, P. T., Baker, E. K. and Cole, A. R., 1991. *Physical Sedimentology of the Australian Continental Shelf*. Ocean Sciences Institute Report No. 51, Ocean Sciences Institute, University of Sydney.
- Harris, P., Hay, P., Jenkins, C., Jones, C., O'Donnell, J. and Tomczak, M., 1991. *Australian Research on the Physical Sciences of the Oceans*. Ocean Sciences Institute Report 48/91, Ocean Sciences Institute, University of Sydney, Sydney, 98pp.
- Hass C. G., and Jones D. S., (in press). Marine introductions to Western Australia, with a focus on crustaceans. *Australian Geographical Studies*.
- Hastings, P. A., 1990. Southern Oscillation influences on tropical cyclone activity in the Australasian/ South-West Pacific region. *International Journal of Climatology*, **10**(3): 291-98.
- Haston, R. V., and Farrelly, J. J., 1993. Regional significance of the Arquebus-I Well, Browse Basin, North West Shelf, Australia. *APEA Journal*, **33**(1): 28-38.
- Hatcher, B. G., 1991. Coral Reefs in the Leeuwin Current: an ecological prospective. The Leeuwin Current, an influence on the coastal climate and marine life of Western Australia. *Journal of the Royal Society of Western Australia*, **74**: 115-28.
- Haynes, T. H., 1912. *Mother-O'Pearl Shell Culture*. Report to the Montebello Shell Syndicate Ltd, London, Unpublished.
- Heald, D. I. and Walker, M. H., 1982. *Taiyo Maru 71 Demersal Trawling Cruise in Western Australian Coastal Waters South of 21°S July-September, 1979*. Western Australia Dept. of Fisheries and Wildlife Report, 51 pp.
- Hearn, C. J., and Holloway, P. E., 1990. A three-dimensional barotropic model of the response of the Australian North West Shelf to tropical cyclones. *Journal of Physical Oceanography*, **20**(1): 60-80.
- Heath, R. S., and Apthorpe, M. C., 1984. New formation names for the Late Cretaceous and Tertiary sequence of the southern North West Shelf. *Geological Survey of Western Australia, Record 1984/7*: 35.
- Heitz, A., Fisher, S. J., Masiello, G. and Jones, D., 1993. *Total Hydrocarbon Content in Sediments in the Vicinity of the Goodwyn Gas and Condensate Platform*. Report for Woodside Offshore Petroleum Pty Ltd; WENV 245.
- Hembree, D., 1973. *Algae Report on Dampier Salt Ponds*. 1-12 pp.
- Hembree, D., 1973. *Propagation of Algae Feeding Fish*. 1-12 pp.
- Hensley, D. A., and Allen, G. R., 1977. A new species of *Abudefduf* (Pisces: Promacentridae) from the Indo-Australian Archipelago. *Records of the Western Australian Museum*, **6**(1): 107-18.
- Hewitt, M. A., 1996. Trapeziid and Eumedonid Crabs. In: *Marine Biological Survey of the Muiron Islands and the Eastern Shore of Exmouth Gulf, Western Australia*. J. B. Hutchins, S. M. Slacksmith, C. W. Bryce, S. M. Morrison & M. A. Hewitt, eds, G012/94. Prepared by the WA Museum for Ocean Rescue 2000 Program, Western Australian Museum, Perth, 54-63 pp.

- Hewitt, M. A., 1997. Crustaceans: Non-Caridean Decapods. In: *Marine Biological Survey of the Central Kimberley Coast, Western Australia*. D. I. Walker, 7, 58-66pp.
- Heyward, A. J., Reville, A. T. and Sherwood, C. R., 2006. *Review of research and data relevant to marine environmental management of Australia's North West Shelf*. NWSJEMS Technical Report No. 1. CSIRO Marine and Atmospheric Research, Hobart.
- Heyward, A., Smith, L., and Rees, M., 1997. Coral recruitment in the Lowendal and Montebello Island area in Autumn 1997. *Australian Institute of Marine Science*: 6. HGS, 1989. *Jacqueline Marine Seismic Data Acquisition Agreement*. Report for Novus West Australia Pty; CAR-GEN-1029,0, Novus West Australia Pty Ltd.
- Hick, P. and Caccetta, M., 1998. *An Assessment of the Facility Lights on the Oil Drilling Rig 'Ron Tappmeyer' and the Potential for Mis-Orientation of Turtles*. CSIRO Minesite Rehabilitation Research Program, Apache Energy Ltd, 25 pp.
- Higgins Wood & Associates, 1995. *Pilbara/Gascoyne Islands Ecotourism Management Strategy for Pilbara Development Commission*. 1, Higgins Wood & Associates.
- Hillis, R. R., 1990. Post-Permian subsistence and tectonics, Vulcan Sub-Basin, north west shelf, Australia. In: *Proceedings of the Pacific Rim Congress 90*. 2, pp. 203-11.
- Hillis, R. R., and Mildren, S. D., 1996. The contemporary stress field of the Australian North West Shelf. II. Implications for hydrocarbon exploration and production. *Geological Society of Australia Journal*, **41**: 194.
- Hillis, R. R., and Williams, A. F., 1993. The stress field of the North West Shelf and wellbore stability. *APEA Journal*, **33**(1): 373-85.
- Hinz, K., Biersdorf, H., Exon, N. F., Roeser, H. A., Stagg, H. M. J., and von Stackelberg, U., 1978. Geoscientific investigations from the Scott Plateau off north west Australia to the Java Trench. *BMR Journal of Australian Geology & Geophysics*, **3**: 319-40.
- Hocking, R. M. and van de Graaff, W. J. E., 1978. *Cretaceous stratigraphy and sedimentology, northeastern margin of the Carnarvon Basin, Western Australia*. Western Australia Geological Survey Annual Report 1977, 36-41 pp.
- Hocking, R. M., 1985. Revised Stratigraphic Nomenclature in the Carnarvon Basin, W.A. In: Geological Survey of Western Australia; Record 1985/5. Hocking, R. M., 1988. Regional Geology of the Northern Carnarvon Basin. In: *The North West Shelf, Australia: Proceedings of Petroleum Exploration Society, Australia Symposium*. Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, pp. 97-114.
- Hocking, R. M., 1992. Jurassic deposition in the southern and central North West Shelf, Western Australia. *Geological Society of Western Australia, Record 1992/7*: 101.
- Hocking, R. M., Carnarvon Basin. In: *The geology and mineral resources of Western Australia. Geological Survey of Western Australia, Memoir 3*. Hocking, R. M., The Tumblagooda Sandstone, Western Australia. *Geological Survey of Western Australia*.
- Hocking, R. M., Moors, H. T., and van de Graaff, W. J. E., 1987. Geology of the Carnarvon Basin, WA. *Geological Survey of Western Australia, Bulletin 133*: 289.
- Hocking, R. M., Voon, J. K. and Collins, L., 1988. Stratigraphy and sedimentology of the Basal Winning Group Northern Carnarvon Basin. In: *The North West Shelf, Australia: Proceedings of Petroleum Exploration Society, Australia Symposium*.
- Hogan, J., 1948. Meteorology of the Indian Ocean area between Western Australia and India. *Australian Bureau of Meteorology Bulletin*, **40**: 88.
- Holdway, D., and Heggie, D. T., 1998. Tracking produced formation water discharge from a petroleum produced platform to the North West Shelf. *APPEA Journal*: 665-80.

- Holland, G. J., 1980. An analytic model of the wind and pressure profiles in hurricanes. *Monthly Weather Review*, **108**: 1212-18.
- Holland, G. J., 1981. On the quality of the Australian tropical cyclone data base. *Australian Meteorological Magazine*, **29**: 169-81.
- Holloway, P. E., 1982. *Tides on the North-West Shelf*. Dept of Civil Engineering, Environmental Dynamics Report ED-82-029, University of Western Australia.
- Holloway, P. E., 1983. Internal tides on the Australian North-West Shelf: A Preliminary investigation. *Journal of Physical Oceanography*, **13**(8): 1357-70.
- Holloway, P. E., 1983. Tides on the Australian north west shelf. *Australian Journal of Marine and Freshwater Research*, **34**(1): 213-30.
- Holloway, P. E., 1983. Tropical cyclone effects in shallow seas. In: *Proceedings of the Inaugural Great Barrier Reef Conference*. Carter, R. M., Sammarco, P. W. & Stark, K. P., eds, pp. 441-46 .
- Holloway, P. E., 1984. On the semidiurnal internal tide at a shelf-break region on the Australian North West Shelf. *Journal of Physical Oceanography*, **14**(11): 1787-99.
- Holloway, P. E., 1985. A comparison of semidiurnal internal tides from different bathymetric locations on the Australian North West shelf. *Journal of Physical Oceanography*, **15**(3): 240-251.
- Holloway, P. E., 1987. Internal hydraulic jumps and solitons at a shelf break region on the Australian North West Shelf. *Journal of Geophysical Research*, **92**(C5): 5405-16.
- Holloway, P. E., 1988. Climatology of internal tides at a shelf break location on the Australian North West Shelf. *Journal of Marine and Freshwater Research*, **39**(1): 1-18.
- Holloway, P. E., 1994. Observations of internal tide propagation on the Australian North West Shelf. *Journal of Physical Oceanography*, **24**(8): 1706-16.
- Holloway, P. E., 1995. Leeuwin Current observations on the Australian North West Shelf, May-June 1993. *Deep Sea Research*. **42**(3): 285-305.
- Holloway, P. E., 1996. A field investigation of water exchange between a small coastal embayment and adjacent shelf. In: *Mixing in Estuaries and Coastal Seas*. C. Pattiaratchi, ed., American Geophysical Union, Washington, D.C., pp. 145-58.
- Holloway, P. E., 1996. Numerical model of internal tides with application to the Australian North West Shelf. *Journal of Physical Oceanography*, **26**: 21-37.
- Holloway, P. E., and Nye, H. C., 1985. Leeuwin Current and wind distributions on the southern part of the Australian North West shelf between January 1982 and July 1983. *Australian Journal of Marine and Freshwater Research*, **36**(2): 123-37.
- Holloway, P. E., Barnes, I., Webster, I. and Imberger, J., 1982. *Dynamics of the North-West Shelf: Report on a One Year Study to September 1981*. Environmental Dynamics Report ED-81-008, Dept of Civil Engineering, University of Western Australia.
- Holloway, P. E., Barnes, I., Webster, I. and Imberger, J., 1982. *Dynamics of the North-West Shelf: Research Activities*. Dept of Civil Engineering, University of WA, 12 pp.
- Holloway, P. E., Humphries, S. E., Atkinson, M., and Imberger, J., 1985. Mechanisms for nitrogen supply to the Australian North West Shelf. *Australian Journal of Marine and Freshwater Research*, **36**(6): 753-64.
- Honey, F. and Chittleborough, R. G., 1980. Mangroves. In: CSIRO Division of Land Resources, 32 pp.
- Hooper, J. N. A. and Levi, C., 1994. Biogeography of Indo-West Pacific Sponges: Microcionidae, Raspailiidae, Axellidae. In: *Sponges in Time and Space*. R. W. M. Soest, T. M. G. van Kempen and J.-C. van Braekman, eds, pp. 191-212.

- Hooper, J. N. A., 1991. Revision of the Family Raspailiidae (Porifera: Demospongiae), with description of Australian species. *Invertebrate Taxonomy*, **5**: 1179-418.
- Hooper, J., 1984 *Sigmaxinella soelae* and *Desmacella ithystella*: two new Desmacellid sponges (Porifera, Axinella, Desmacellidae) from the northwest shelf of Western Australia, with a revision of the family Desmacellidae. *Northern Territory Museum of Arts and Sciences Monograph Series*, No. 2: 58pp
- Horstman, E. L., 1984. Source rocks in the Canning Basin: a review. In: *The Canning Basin, W.A.: Proceedings of the Geological Society of Australia/ Petroleum Exploration Society of Australia Symposium, Perth*. Purcell, P. G., pp. 85-96.
- Hovland, M, Croker, P. F., and Martin, M., 1994. Fault-associated seabed mounds (carbonate knolls?) off western Ireland and North-west Australia . *Marine and Petroleum Geology*, **11**(2): 232-46.
- Howell E.A., and Ramsden, C. R. T., 1987. A shallow water Telesis seismic survey, offshore WA. *Exploration Geophysics*, **18**(1/2): 99-103.
- Howell, E. A., 1987. The Harriet oilfield case history. *Exploration Geophysics*, **18**(1/2): 95-98.
- Hubbert, G. D., 1993. Oil spill trajectory modelling with a fully three-dimensional ocean model. In: *Proceedings of the 11th Australasian Coastal and Ocean Engineering Conference*.
- Hubbert, G. D., Smith, B. L., and Martin, J., 1994. Environmental studies for a permit wide drilling program in a sensitive marine environment. *APEA Journal*: 672-81.
- Humphrey, G. F., and Kerr, J. D., 1969. Seasonal variations in the Indian Ocean along 110°E III. Chlorophylls *a* and *c*. *Australian Journal of Marine and Freshwater Research*, **20**: 55-64.
- Humphreys, W. F., 1996. *Legendre Island - Issues Pertinent to Subterranean Fauna*. Report for Woodside Offshore Petroleum Pty Ltd; WENV 332, Western Australian Museum.
- Hutchins, B., Marsh, L. M., and Slack-Smith, S. M., eds, 1978. The Marine Fauna and Flora of the Dampier Archipelago. Western Australian Museum, Perth, WA.
- Hutchins, J. B., 1978. The Report of a Reef Fish Survey conducted in the Dampier Archipelago during August, 1978. In: *The Marine Fauna and Flora of the Dampier Archipelago*. J. B. Hutchins, L. M. Marsh & S. M. Slacksmith, eds, Unpublished report submitted to Meagher and LeProvost, Western Australia Museum, Perth, 1-51 pp.
- Hutchins, J. B., 1995. Fishes. In: *Marine Biological Survey of the Southern Kimberley, Western Australia*. F. E. Wells, J. R. Hanley & D. I. Walker, eds, Western Australian Museum, Perth, 137-149 pp.
- Hutchins, J. B., 1995. Which nor-west snapper? *Western Fisheries*, **May**: 24.
- Hutchins, J. B., Undated. *The Report of a Reef Fish Survey conducted in the Dampier Archipelago during August, 1978*. Unidentified Report.
- Hutchins, J. B., Williams, D. McB., Newman, S. J., Cappo, M., and Speare, P., 1995. New records of fishes for the Rowley Shoals and Scott/Serringapatam reefs, off north western Australia. *Records of the Western Australian Museum*, **17**(1): 119-23.
- Hynd, J. S., 1955. A revision of the Australian pearl-shells, genus *Pinctada* (Lamellibranchia), **6**: 98-137.
- Imberger, J. and Holloway, P. E., 1982. *Dynamics of the North-West Shelf: Progress Report and Proposal for Future Studies*. Environmental Dynamics Report ED-81-006, Dept of Civil Engineering, University of WA.
- Ingram, E. N., and Shields, W. S., 1970. Island drilling operations offshore Carnarvon Basin. *APEA Journal*, **10**(1): 97-99.
- Interim Biogeographic Regionalisation for Australia (IBRA, Ver.6.1; Australian Government Department of the Environment, Water, Heritage and the Arts)

- Iredale, T., 1914. Report on mollusca collected at the Monte Bello Islands. *Proceedings of the Zoological Society London*, **11**: 665-75.
- Jackson, George D., and Wadley, V. A., 1998. Age, Growth and reproduction of the tropical squid *Notodarus hawaiiensis* (Cephalopoda: Ommastrephidae) off the North West Slope of Australia. *U.S. Fishery Bulletin*, **96**(4): 779-87.
- Jelley, P. A. and Sayers, M. J., 1988. Seismic exploration on Barrow Island. In: *The North West Shelf, Australia: Proceedings of Petroleum Exploration Society, Australia Symposium*. Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, pp. 479-88.
- Jenkins, C. J., 1997. Building a national scale offshore soils database from both wordbased and numeric datasets. *Sea Technology*, **38**(12): 25-28.
- Jenkins, C. J., and Rawson, G. A., 1994. A GIS of the Australian seabed. *GIS User*, **9**:33-35.
- Jenner, K. C. S. and Jenner, M. N. M., 1991. *Dampier Archipelago Humpback Whale Project Western Australia*. Season Report to Woodside Offshore Petroleum Pty Ltd.
- Jernakoff, P. and Sainsbury, K. J., 1990. *CSIRO's Northern Demersal Finfish Stock Assessments: 1980 to 1989*. Bureau of Rural Resources Information Paper IP/6/90, 169pp.
- Jernakoff, P., 1988. *The Western and North West Shelf Deep-Water Trawl Fisheries: Research Priorities*. Bulletin No 1, Australian Government Publishing Service, Canberra, 33 pp.
- Jernakoff, P., 1989. Fisheries Research for Deep-Water Fisheries of W and NW WA. In: *Bureau of Rural Resources*. Fisheries Resource Branch, 9 pp.
- Jernakoff, P., Scott, L., Heyward, A. J., Revill, A. T. and Sherwood, C. R., 2006. *Bibliography of Marine Research Literature Relevant to Australia's North West Shelf*. NWSJEMS Technical Report No. 2. Report to the Western Australia Department of Environmental Protection, Australian Institute of Marine Science and CSIRO Marine Research.
- Jewell, R. J. a. K. M. S., Rotterdam: A.A. Balkema, pp. 565-75.
- Jewell, R. J. and Khorshid, M. S., 1988. Engineering for Calcareous Sediments. In: *Proceedings of the International Conference on Calcareous Sediments*. 2, Published on behalf of the Institution of Engineers, Australia and the International Society for Soil Mechanics and Foundation Engineering by A. A. Balkema, Rotterdam.
- Jitts, H. R., 1969. Seasonal variations in the Indian Ocean along 110°E. 1V. Primary products. *Australian Journal of Marine and Freshwater Research*, **20**: 65-76. John Consulting Services, 1995. *Wandoo Full Field Development Notice of Intent*.
- Johnson, D. B., Hebbert, D. R., and Moran, M. J., 1993. Genetic analysis of populations of north-western Australian fish species. *Australian Journal of Marine and Freshwater Research*, **44**: 673-85.
- Johnson, M. S., and Joll, L. M., 1993. Genetic subdivision of the pearl oyster *Pinctada maxima* (Jameson, 1901) (Mollusca: Pteriidae) in northern Australia. *Australian Journal of Marine and Freshwater Research*, **44**: 519-26.
- Johnson, M. S., Holborn, K. and Black, R., 1992. Population Genetics of *Drupella cornus*. In: *Drupella cornus: a synopsis*. Turner, S., CALM Occasional Paper 3/92, Conservation and Land Management, Perth, pp. 71-75.
- Johnstone, D., Condon, M. A., and Playford, P. E., 1958. Stratigraphy of the Lower Murchison River area and Yaringa North Station, W.A. *Journal Royal Society of Western Australia*, **41**: 13-16.
- Johnstone, M. H., 1979. A case history of Rough Range. *APEA Journal*, **19**(1): 1-6.
- Johnstone, R. E., 1990. Mangroves and mangrove birds of Western Australia. *Records of the Western Australian Museum*, **Supplement 32**.

- Joll, L. M., 1996. *Stock Evaluation and Recruitment Measurement in the W.A. Pearl Oyster Fishery*. FDWA. FRDC Project 92/147, 1-62 pp.
- Jones, B. G., 1986. *A sedimentological analysis of the Challis 1, 2A 3 and 4 petroleum wells, N.T., Australia*. Report for BHP Petroleum Pty Ltd.
- Jones, D. S. and Hewitt, M. A., 1996. Barnacles. In: *Marine Biological Survey of the Muiron Islands and the Eastern Shore of Exmouth Gulf, Western Australia*. J. B. Hutchins, S. M. Slack-Smith, C. W. Bryce, S. M. Morrison & M. A. Hewitt, eds, Prepared for Ocean Rescue 2000 Program G012/94, Western Australia Museum, Perth, 43-53 pp.
- Jones, D. S., 1986. A catalogue of type specimens of Crustacea in the Western Australian Museum, Perth. *Records of the Western Australian Museum*, **13**(1): 1-46.
- Jones, D. S., 1987. Systematics and Biogeography of Western Australian Cirripedes (Thoracica - Lepadomorpha, Balanomorpha). M.Sc. thesis. University of Western Australia, 650 pp.
- Jones, D. S., 1992. Part VI. Barnacles. In: *Survey of the Aquatic fauna of the Kimberley Islands and reefs Western Australia. Western Australian Museum Kimberley Island and Reef Expedition*. G. J. Morgan, ed., Report, 1991, West Australian Museum, Perth, 23-29 pp.
- Jones, D. S., 1996. Deep-Sea Crabs. *Western Fisheries Magazine*, Winter: 49-50.
- Jones, D., and Morgan, G., 1994. *A Field Guide to Crustaceans of Australian Waters.*, Reed. Jones, H., Protecting WA's marine environment from oil spills.
- Jones, H. A., 1971. Late Cenozoic sedimentary forms on the north west Australian continental shelf. *Marine Geology*, **10**: 20-26.
- Jones, H. A., 1973. Marine Geology of the Northwest Australian Continental Shelf. Australian Government Publishing Service for Department of Minerals and Energy, Canberra, 102 pp.
- Jones, H. A., 1973. The sediments, structure and morphology of the north west continental shelf between Rowley Shoals and Monte Bello Islands. *B.M.R Bulletin*, **136**.
- Jones, H. E., 1986. *Marine Resources Map of Western Australia: The Influence of Oil on Marine Resources and Associated Activities with an Emphasis on Those Found in Western Australia, Part 2*. Report 74, Fisheries Department of Western Australia.
- Jones, H. E., Field, R. A. and Hancock, D. A., 1984. *Procedures for protection of the Western Australian Marine Environment from Oil Spills*. Bulletin 104, 19 pp.
- Jursa, F., 1997. Solubility of carbon dioxide in water.
- Kabanova, Y. G., 1968. Primary production of the northern part of the Indian Ocean. *Oceanology*, **8**: 270-278.
- Kagi, R. I., 1983. *A Report of the Behaviour Prediction for Spills of Number 2 Fuel Oil (Gas Oil) and North Rankin Condensate in Mermaid Sound*. Report for Woodside Report WENV 0039.
- Kailola, P. J., Williams, J. J., Stewart, P. C., Reichelt, R. E., McNee, A. and Grieve, C., 1993. *Australian Fisheries Resources*. Bureau of Resource Sciences, Department of Primary Industries and Energy.
- Kay, R. C. and Hay, J. E., 1993. A decision support approach to coastal vulnerability and resilience assessment: A tool for integrated coastal zone management. In: *Vulnerability assessment to sea-level rise and coastal zone management, Proceedings of the Intergovernmental Panel on Climate Change, Coastal Zone Management Subgroup, Eastern Hemisphere Workshop*. McLean, R. & Mimura, N., pp. 213-25.
- Kay, R., and Lester, C., 1997. Benchmarking the future direction for coastal management in Australia. *Coastal Management*, **25**: 265-92.
- Kay, R., Eliot, I., Panizza, V., and Donaldson, B., 1997. Reforming coastal management in Western Australia. *Ocean & Coastal Management*, **35**(1): 1-29.

- Kay, Robert C., Eliot, Ian, Caton, Brian, Morvell, Gerry, and Waterman, Peter, 1996. A review of the Intergovernmental Panel on Climate Change's Common Methodology for assessing the vulnerability of coastal areas to sea-level rise. *Coastal Management*, **24**: 165-88.
- Kenneally, K. F., 1993. Mangroves of Western Australia. In: *Mangrove Ecosystems in Australia*. B. K. Clough, ed., Australian Institute of Marine Science in association with Australian National University Press, Canberra.
- Kenny, Norman, M., Friestad, A. M., Anchor Drilling fluid, and Risvik, S., 1996. The development and field testing of a less hazardous and technical superior oil-based drilling fluid. *Society of Petroleum Engineers*, **SPE 35952**: 527-35.
- King, B. A., 1994. *OILMAP: Application for BHP Petroleum's Operations on the Australian North West Shelf*. BHP Petroleum Pty Ltd.
- King, B. A., and McAllister, F. A., 1998. Modelling the dispersion of produced water discharges. *APPEA Journal*: 681-91.
- King, B. and McAllister, F., 1997. The Application of MUDMAP to Investigate the Dilution and Mixing of the Above Water Discharge at the 'Harriet A' Petroleum Platform on the Northwest Shelf. In: *Modelling the Dispersion of Produced Water Discharge in Australia*. Report 1 to APPEA and ERDC.
- King, P. P., 1827. *Narrative of a survey of the intertropical and western coasts of Australia performed between the years 1818 and 1822.*, London.
- King, R. and Lodge, M., North West Shelf development - the foundation engineering challenge. In: *Engineering for Calcareous Sediments*. Jewell, R. J. & Khorshid, M. S., 2, International Society for Soil Mechanics and Foundation Engineering, pp. 333-42.
- King, R. W., 1986. The North West shelf Project - Offshore engineering challenges. in: *Proceedings of Workshop on National Needs, Capabilities and Resources for Offshore Engineering*. Victoria, pp. 11-15.
- King, R. W., van Hooydonk, W. R., Kolk, H. F. and Windle, D., 1980. Geotechnical investigations of calcareous soils on the North West Shelf, Australia. In: *Proceedings of the Offshore Technology Conference*. 2, pp. 303-13.
- Kinhill Engineers Pty Ltd, 1987. *Harriet Oilfield Development Varanus Island - LPG Extraction Plant - N.O.I.* Report to Apache Energy Ltd; Reference no. H14; Document no. EAA-60-RI-009, Apache Energy Ltd.
- Kinhill Engineers Pty Ltd, 1991. *Harriet Oilfield Development. Varanus Island. LPG Extraction Plant. Notice of Intent*. Report for Bond Corporation Pty Ltd.
- Kinhill Engineers Pty Ltd, 1997. *Review of Oil and Gas Drilling and Production Activities: Impact on Benthic Communities*. Report to Apache Energy Ltd; Reference no. H165; Document no EA-00-RI-073/B, Apache Energy Ltd.
- Kinhill Stearns, 1985. *Harriet Oilfield Development Notice of Intent - Supplementary Report*. Report to Apache Energy Ltd; Reference no. H4; Document no. EAA-60-RI-003, Apache Energy Ltd.
- Kinhill Stearns, 1985. *Harriet Oilfield Development Notice of Intent - Volume 1 - Report*. Report to Apache Energy Ltd; Reference no. H2; Document no. EAA-60-RI-001, Apache Energy Ltd.
- Kinhill Stearns, 1985. *Harriet Oilfield Development Notice of Intent - Volume 2 - Appendices*. Report to Apache Energy Ltd; Reference no. H3; Document no. EAA-60-RI-002, Apache Energy Ltd.
- Kinhill Stearns, 1986. Harriet Oilfield Development Environmental Management program for Varanus Island, Lowendal Group. In. Kinhill Stearns, 32 pp.
- Kinhill Stearns, 1993. *Harriet Oilfield Development. Notice of Intent*. Report prepared for Bond Oil.
- Kinhill Stearns, 1995. *Harriet Oilfield Development Notice of Intent - Supplementary Report*

- Appendices*. Report to Apache Energy Ltd; Reference no. H5; Document no. EAA-60-RI-004, Apache Energy Ltd.
- Kinhill Stearns, 1996. *Harriet Field Development Varanus Island - Environmental Management Plan*. Report to Apache Energy Ltd; Reference no. H12; Document no. EAA-60-RI-007, Apache Energy Ltd.
- Kirk, R. B., 1977. A Structural, Stratigraphical and Hydrocarbon Potential study in the Rowley Shoals area - North West Continental Shelf. (M.Sc. thesis). University of Western Australia.
- Kirk, R. B., 1984. A seismic stratigraphic case history in the eastern Barrow Sub-basin, North West Shelf, Australia. In: *Seismic stratigraphy II: An integrated approach to hydrocarbon exploration*. O. R. Berg and D. G. Woolverton, eds, American Association of Petroleum Geologists Memoirs, pp. 183-207.
- Kirk, R. B., 1984. Seismic stratigraphic cycles in the Eastern Barrow sub-basin, North West Shelf, Australia. In: *2nd Australian Petroleum Geophysics Symposium: Australian Society of Exploration Geophysicists*.
- Kirk, R., 1985. A seismic stratigraphic case history in the eastern Barrow sub-basin, North West Shelf, Australia. O. R. Berg (ed.), *American Association of Petroleum Geologists Memoirs*, **39**: 183-208.
- Klootwijk, C., 1997. Geodynamic models and palaeomagnetic constraints on the evolution of the North West Shelf. *AGSO Research Newsletter*, **26**: 22-24.
- Knuckley, I. A., 1995. Settlement of *Pinctada maxima* (Jameson) and other bivalves on artificial collectors in the Timor Sea, Northern Australia. **14**: 411-16.
- Kojan, C. J., 1984. The geology and mineral resources of the proposed Dampier Archipelago national park.
- Kopsen, E., and McGann, G., 1985. A review of the hydrocarbon habitat of the eastern and central Barrow-Dampier sub-basin of Western Australia. *APEA Journal*, **25**(1): 154-76.
- Kraus, G. P., and Parker, K. A., 1979. Geochemical evaluation of petroleum source rock in Bonaparte Gulf-Timor Sea Region, north west Australia. *American Association of Petroleum Geologists Bulletin*, **63**(11): 2021-41.
- Kriewaldt, M. J. B., 1964. *Dampier and Barrow Island: Western Australia Geological Survey 1:250,000 Geological Series Explanatory Notes*.
- LA WA, 1988. Lowendal (map). 1:50,000.
- LA WA, 1988. Monte Bello and Pt Tryal Rocks 2057-III and PT 1957-II (map). 1:50,000.
- Labrador Petro-Management Ltd, 1991. *An Environmental Audit of Lasmo Oil (Australia) Limited's Exploratory Drilling Operations in Blocks EP 342 and TP/9 Offshore Western Australia*. Report to Apache Energy Ltd; Reference no. H72; Document no. EAA-61-RD-009, Apache Energy Ltd.
- Labrador Petro-Management, 1995. *A Report on Oil Spill Response Equipment and The Environmental Aspects of Production Testing*.
- Labrador Petro-Management, 1995. *Report on Oil Spill Equipment Used For Austin and Wonnich*.
- Labrador Petro-Management, 1995. *Report on Oil spill Simulation Table Top Exercise For Wonnich*.
- Labrador Petro-Management, 1995. *Report on The Deployment of Oil Spill Equipment*
- Labrador Petro-Management, 1997. *Oil Spill Simulation Exercise Border-1*.
- Labrador Petro-Management, 1997. *Oil Spill Simulation Exercise Wandoo B Facility*.
- Lagdon, R. D., 1991. Barrow Island Oilfield Environmental Review - 25 years of learning. *The APPEA Journal*: 431-41.
- Lai, H. L., and Liu, H. C., 1979. Age and growth of *Lutjanus sanguineus* - in the Arafura Sea and North West Shelf. *Acta Oceanographica Taiwanica*, **10**: 164-75.

- LandCorp/Department of Resources Development, 1997. *Advice to the Minister for the Environment from the EPA under Section 16(e) of the Environmental Protection Act 1986 on Maitland Heavy Industrial Site, Karratha*. Bulletin 855, Environmental Protection Authority, Perth, 47 pp.
- Lasmo Oil Ltd., 1990. Petroleum Exploration Permit Areas EP342 and TP/9, Rowley Shelf, Western Australia. In: *Consultative Environmental Review*.
- Lasmo Oil Pty Ltd, 1992. *The Dispersibility of Leatherback 1 Crude Oil*. Report to Apache Energy Ltd; Reference no. H67; Document no. EAA-61-RF-003, Apache Energy Ltd.
- Lasserre, D., and Choo C.F., 1993. Experience with determination of water saturation from core in the Cossack Field. *APEA Journal*, **1**: 3943.
- Lavering, I. H. and Ozimic, S., 1988. Bonaparte Basin; Western Australia and Northern Territory. In: *Australian Petroleum Accumulations Report*. 5, Bureau of Mineral Resources, Geology and Geophysics.
- Lavering, I. H., 1985. Permian environments and palaeogeography of the onshore Carnarvon Basin and implications for petroleum prospectivity. *PESA Journal*, **7**: 40-46.
- Lavering, I., and Williamson, P., 1994. Maintaining Australia's crude oil reserves: the challenge ahead. *Resource Science Interface*, **3**: 4-13.
- Lavery, S., and Shaklee, J. B., 1989. Population genetics of two tropical sharks, *Carcharhinus tilstoni* and *C. sorrah*, in northern Australia. *Australian Journal of Marine and Freshwater Research*, **40**(5): 541-51.
- Law, J., 1978. An investigation into the bacteria of the Salt Field. 1-15.
- Laws, R. A. and Brown, R. S., 1976. Bonaparte Gulf Basin South Eastern Part. In: *Economic Geology of Australia and Papua New Guinea 3 Petroleum*. R. B. Leslie, J. H. Evans & C. L. Knight, 7, Australian Institute of Mining and Metallurgy, 200-208 pp.
- Laws, R. A., 1981. The petroleum geology of the onshore Bonaparte Basin. *The APEA Journal*, **21**: 5-15.
- Laws, R. A., and Kraus, G. P., 1974. The regional geology of the Bonaparte Gulf-Timor Sea area. *The APEA Journal*, **14**: 77-84.
- Le Mar Marketing & Consultancy Pty Ltd, 1997. *Aquaexport Marine Shell Project Port Hedland*. 93 pp.
- Lee, R. J., and Gunn, P. J., 1988. Bonaparte Basin: Petroleum in Australia. The First Century. *The APPEA Journal*: 252-69.
- Legend, M., and Rivaton, J., 1969. Cycles biologiques des poissons mésopélagiques dans l'Est de l'Océan Indien. Deuxième note: distribution moyenne des principales espèces de l'ichtyofaune. *Cah. ORSTOM Ser. Oceanogr.*, **5**(4): 73-98.
- Lehmann, P. R., 1986. The geology and hydrocarbon potential of the EP 104 permit, north west Canning Basin, Western Australia. *APPEA Journal*, **1**: 261-84.
- LeProvost Dames & Moore & Environmental Drafting Services, Undated. Distribution of Coastal Marine Habitats between North West Cape and Dampier Archipelago (map). 1:250,000. LeProvost Dames & Moore.
- LeProvost Dames & Moore, 1993. *Fate of Hydrocarbons Accumulated by Oysters*. Report to Apache Energy Ltd; reference no. H86; document no. EAA-60-RI-035, 29 pp.
- LeProvost Dames & Moore, 1994. *Environmental Appraisal Bay Cable 2D Seismic Survey - Agincourt & Tanami-Alkimos Prospect Areas Adjacent to Lowendal Islands*. Report to Apache Energy Ltd; reference no. H103; document no. EAA-60-RI-044.
- LeProvost Dames & Moore, 1994. *Harriet Oilfield - Well Workovers, Production & Exploration Drilling - Environmental Appraisal*. Report to Apache Energy Ltd; reference no. H92; document no; EAA-60-RI-038, Apache Energy Ltd.
- LeProvost Dames & Moore, 1996. *Appraisal drilling programme for Wonnich Field south west of*

- Montebello Islands (988)*. Report to Apache Energy Ltd.
- LeProvost Dames & Moore, 1998. *Environmental Information Review Scott Reef North-Western Australia*. Report for Woodside Offshore Petroleum Pty Ltd; WENV 380.
- LeProvost Dames & Moore. 1996. Environmental Management Programme (Extension of Salt Ponds, Port Hedland): Fish and Benthic Fauna Survey of Ponds.
- LeProvost Dames and Moore, 1997. *Environmental Management Plan For the Drilling of Woollybutt-2 and 3, WA-248-P*. Report for Mobil Exploration.
- LeProvost Environmental Consultants and Astron Engineering, 1993. *Griffin Gas Pipeline Development. Consultative Environmental Review*. Report for BHP Petroleum Pty Ltd. and Doral Resources N.L., 54 pp.
- LeProvost Environmental Consultants, 1986. *Coastal natural history in the Port Hedland area*.
- LeProvost Environmental Consultants, 1990. *Hadson Energy Ltd. Harriet Field Development. Fifth Annual Environmental Report June 1990*. Report to Hadson Energy Ltd, LEC Ref J147, Apache Energy Ltd.
- LeProvost Environmental Consultants, 1990. *Marine Habitat Distribution and Composition of Shallow Marine Communities from Twin Island to Barrow Island*. Report for Western Mining Corporation, 22 pp.
- LeProvost Environmental Consultants, 1990. *Sea Floor & Habitat Description, Proposed Gas Pipeline Routes*. Report for Apache Energy Limited.
- LeProvost Environmental Consultants, 1990. *The Mangroves of the Lowendal Islands and Monte Bello Islands - Harriet Oilfield Development. Results of Survey December 1990*. Report to Apache Energy Ltd; reference no. H29; document no. EAA-60-RV-002.
- LeProvost Environmental Consultants, 1991. *Installation of Subsea Gas Pipelines For Gas-Gathering Scheme*. Report to Apache Energy Ltd; reference no. H42; document no. EAA-60-RX-002, Apache Energy Ltd.
- LeProvost Environmental Consultants, 1991. *Installation of Subsea Gas Pipelines for Gas-Gathering Scheme - Marine Monitoring Programme*. Report to Apache Energy Ltd; reference no. H46; document no. EAA-60-RH-008.
- LeProvost Environmental Consultants, 1991. *Permit Area TP/3 Part 1. Five year exploration drilling program. Consultative Environmental Review*. Report for West Australian Petroleum Pty Ltd.
- LeProvost Environmental Consultants, 1991. *Roller oil field development. Consultative Environmental Review*. Report for West Australian Petroleum Pty Ltd.
- LeProvost Environmental Consultants, 1991. *Shallow Marine Habitats and Biotic Assemblages of Barrow Island*. Report to West Australian Petroleum Pty Ltd; LEC Ref J193; Report No. R313.
- LeProvost Environmental Consultants, 1991. *Tanami Prospect Exploration Well Environmental Appraisal*. Report to Apache Energy Ltd; reference no. H39; document no. EAA-60-RD-001.
- LeProvost Environmental Consultants, 1991. *Terrestrial Vegetation of the Lowendal Island Group - Harriet Oilfield Development Triennial Report for 1989 - 1991*. Report to Apache Energy Ltd; reference no. H36; document no. EAA-60-RV-003.
- LeProvost Environmental Consultants, 1991. *The Mangroves of the Lowendal Islands and Monte Bello Islands - Harriet Oilfield Development Triennial Report for Surveys 1989-1991*. Report to Apache Energy Ltd; reference no. H37; document no. EAA-60-RV-004.
- LeProvost Environmental Consultants, 1992. *Environmental Appraisal Bay Cable 2D Seismic Survey - Varanus Island*. Report for Hadson Energy Ltd; LEC Rec: J254; report no. R403, LeProvost Environmental Consultants, 30 pp.
- LeProvost Environmental Consultants, 1992. *WA-155-P & WA-210-P Oil Spill Contingency Plan*.

- LeProvost Environmental Consultants, 1992. *WA-155-P and WA-210-P. Oil Spill Contingency Plan. Environmental Information*. Report for BHP Petroleum Pty Ltd.
- LeProvost Environmental Consultants, 1992. *WA-192-P Part 1, Oil Spill Contingency Plan*. Report to Phillips Australian Oil Company.
- LeProvost Environmental Consultants, 1993. *Environmental Appraisal of Proposed TP/6 Transition Zone 2D Seismic Programme Serrurier Island*. Report for BHP Petroleum Pty Ltd, 54 pp.
- LeProvost Environmental Consultants, 1993. *Harriet - Marine Management and Monitoring Programme - 7th Annual Report June 9-August 92*. Report to Apache Energy Ltd; reference no. H78; document no. EAA-60-RH-015.
- LeProvost Environmental Consultants, 1993. *Harriet Oilfield Marine Biological Monitoring Programme - Seventh Annual Report June 1991 - August 1992*. Report to Hadson Energy Ltd; report R404, Apache Energy Ltd.
- LeProvost Semeniuk & Chalmer, 1988. *The Distribution, Character and Sensitivity to Oil of Shallow Marine Habitats in the Thevenard Island Region*. Report for West Australian Petroleum Pty Ltd.
- LeProvost, C., Genco, M. L., Lyard, F., Vincent, P., and Canceil, P., 1994. Spectroscopy of the world ocean tide a from a finite element hydrodynamic model. *Journal of Geophysical Research*, **99**(C12): 24777-97.
- LeProvost, I., 1991. Marine environmental management of three offshore oilfields in tropical waters of north west Australia. *APPEA Journal*, **31**: 423-30.
- LeProvost, M. I., 1986. Port Hedland port development and the environmental protection (sea dumping) Act of 1981. In: *1st Australasian Port and Harbour Engineering Conference*. pp. 331-35.
- LeProvost, M. I., 1992. Environmental protection on the North West Shelf, Australia. *American Association of Petroleum Geologists Bulletin*, **76**(6): 1113.
- LeProvost, M. I., and Gordon, D. M., 1991. Oilfield development and protection of natural resources within the tropical marine environment of the Rowley Shelf, Northwest Australia. *Society of Petroleum Engineers*, **SPE 23002**: 527-40.
- LeProvost, Semeniuk & Chalmer, 1984. *Port Hedland Port Development: Notice of Intent*. Report for Mt Newman Mining Company Pty Ltd; LSC Ref: J069; report no. R169, 76 pp.
- LeProvost, Semeniuk & Chalmer, 1984. *Predictions of Marine Growth on the Proposed Harriet Platform*. Report to R.K. Steedman & Associates; reference no. H61; document no. EAA-60-RH-011; J060; report no. R054, 4 pp.
- LeProvost, Semeniuk & Chalmer, 1985. *Environmental Assessment of Proposed Marine Dredge Spoil Grounds in the Dampier Archipelago, Western Australia*.
- LeProvost, Semeniuk & Chalmer, 1986. *Harriet Field - The Effect of Underwater Seismic Explosions on Pearl Oysters*. Report to Apache Energy Ltd; ref: no. H62; document no. EAA-60-RU-002.
- LeProvost, Semeniuk & Chalmer, 1987. *Harriet - Baseline Hydrocarbon Analysis of Oysters & Oyster Hydrocarbon Levels After the July 1986 Oil Spill*. Report to Apache Energy Ltd; ref. no. H63; document no. EAA-60-RH-012.
- LeProvost, Semeniuk & Chalmer, 1987. *Saladin Oil Field Development: Environmental Review and Management Programme*. Report for West Australian Petroleum Pty Ltd; LSC Ref: J095; Report No. R114, 54 pp.
- LeProvost, Semeniuk & Chalmer, 1987. *The Debility of Mangroves on Varanus Island in the Lowendal Islands Group*. Report to Bond Corporation Pty Ltd Petroleum; LSC Report No R178.
- LeProvost, Semeniuk & Chalmer, 1988. Cooper No. 1 Notice of Intent Vol 3 Oil Spill Trajectory Analysis. In: *Oil exploration permit EP325 Exmouth Gulf Western Australia: Minora Resources NL*.

- LeProvost, Semeniuk & Chalmer, 1988. Cooper No.1 Notice of Intent Vol 2 Appendices. In: *Oil Exploration Permit EP325 Exmouth Gulf Western Australia: Minora Resources NL*.
- LeProvost, Semeniuk & Chalmer, 1988. *Harriet Field Development Marine Biological Monitoring Programme Triennial Report*. Report to Apache Energy Ltd; reference no. H17; document no. EAA-60-RH-003.
- LeProvost, Semeniuk & Chalmer, 1988. *Harriet Field Development. Triennial Environmental Report June 1988*. Report for Bond Corporation Pty Ltd; LSC Ref: J093; report no. R231, 89 pp.
- LeProvost, Semeniuk & Chalmer, 1989. *Exploration permit TP/3 Part 1. Roller no. 1. Notice of Intent*. Report prepared for West Australian Petroleum Pty Ltd.
- LeProvost, Semeniuk & Chalmer, 1989. In: *Exploration Permit 325 Cooper No.1 Notice of Intent*. Report for Minora Resources NL; LSC Ref: J156; report no. R225.
- LeProvost, Semeniuk & Chalmer, 1990. *Environmental Appraisal Dugong Well*. Report for West Australian Petroleum Pty Ltd, 7 pp.
- LeProvost, Semeniuk & Chalmer, 1990. *Environmental Effects of the Thevenard Island Jetty*. Report for West Australian Petroleum Pty Ltd, 22 pp.
- LeProvost, Semeniuk & Chalmer, 1990. *Oil Spill Contingency Plan, Permit Area WA-147-P*. Report for Western Mining Corporation Ltd.
- LeProvost, Semeniuk & Chalmer, 1991. *Harriet Field Oil Spill Contingency Plan*. Report to Hadson Energy Ltd; R252.
- LeProvost, Semeniuk & Chalmer, *Exploration Permit TP/3 Part 1 Roller No.1 Notice of Intent*. Report for West Australian Petroleum Pty Ltd; LSC Ref: J183; rep. no. R260.
- Lewis, J. G., 1963. The tidal power resources of the Kimberleys. *Journal Institute of Engineers Australia*, **35**: 333-45.
- Lipski, P., 1993. Tectonic setting, stratigraphy and hydrocarbon potential of the Bedout Sub-basin, North West Shelf. *APEA Journal*, **1**: 138.
- Liu, H. C., 1976. The demersal fish stocks of the waters of north and northwestern Australia. *Acta Oceanographica Taiwanica*, **6**: 128-34.
- Liu, H. C., and Lai, H. L., 1980. Cost-revenue analysis of Taiwanese pair trawler operated in Australian waters. *Acta Oceanographica Taiwanica*, **11**: 217-27.
- Liu, H. C., and Yeh, S. Y., 1984. Yield analysis of the ground fish resources in the Australian waters off north and northwestern Australia. *Acta Oceanographica Taiwanica*, **15**: 141-53.
- Liu, H. C., Lai, H. L., and Yeh, S. Y., 1978. General review of demersal fish resources in the Sunda Shelf and the Australian waters. *Acta Oceanographica Taiwanica*, **8**: 109-40.
- Liu, H. C., Sainsbury, K. J., and Chin, T. S., 1985. Trawl cod end mesh selectivity for some fishes of north western Australia. *Fisheries Research*, **3**: 105-29.
- Llewellyn, L., and Endean, R., 1991. Paralytic shellfish toxins in the xanthid crab *Atergatis floridus* collected from Australian coral reefs. *Journal of Wilderness Medicine*, **2**: 118-26.
- Lloyds' Register Advisory Service, 1996. *An Environmental Management Assessment To Determine The Level of Environmental Performance in Line With the APEA Code of Environmental Practise, Ampolex's Environmental Policy and BS7750*.
- Logan, B. S., and Hagan, G. M., 1974. Development of carbonate banks and hypersaline basins. In: Evolution and diagenesis of quaternary carbonate sequences Shark Bay, Western Australia. *American Association of Petroleum Geologists Memoirs*, **22**: 283.
- Logan, B. W. Read J. F., Hagan, G. M., Hoffman, P., Brown, R. G, Woods, P. J., and Gebelein, C. D.,

1974. Evolution and diagenesis of quaternary carbonate sequences Shark Bay, Western Australia. *American Association of Petroleum Geologists Bulletin*, **Memoir 22**.
- Logan, B., 1998. *Sedimentology, Trunkline Corridor, Northwest Shelf*. Final Report to Woodside Offshore Petroleum, Woodside Second Trunkline Project, ARIES Pty Ltd, Applecross, Western Australia, 38 pp.
- London, C. & W. L., 1979. *Proposed gas reception, LNG production and shipment at South Withnell Bay, Western Australia: Assessment of site suitability with respect to safety*. Summary report prepared for the Minister for Industrial Development (unpublished).
- Looby, G., 1997. Management options for Pilbara demersal line fishing. *Fisheries Western Australia*(111).
- Lord, D., Paling, E. and Gordon, G., 1998. *Review of Seagrass Rehabilitation and Restoration Programmes in Australia*. Chapter 5, Fisheries Industries Research and Development Corporation.
- Lorenzo, J. M., and Hillis, R. R., 1992. Tertiary tectonics and seismic stratigraphy of the Vulcan sub-basin (Timor Sea, North West Shelf, Australia); plate tectonic implications. *American Association of Petroleum Geologists Bulletin*, **76**(7): 1115.
- Lorenzo, J. M., Tandon, K., and Boehne, R., 1994. Pliocene flexural extension over the Vulcan sub-basin (Timor Sea, North West Shelf, Australia); observations and elastic modelling. *EOS Transactions, American Geophysical Union*, **75**(16): 332.
- Lourensz, R. S., 1981. *Tropical Cyclones in the Australian Region July 1909 to June 1980*. Bureau of Meteorology, Canberra.
- Lovell, K. F. and Harper, B. A., MEMS - A real time port monitoring system. In: *9th Australasian Conference on Coastal and Ocean Engineering*. pp. 292-95.
- Lu, C. C., and Reid, A., 1997. Two new cuttlefishes (Cephalopoda: Sepiidae) from the North West Shelf, and a redescription of *Sepia sulcata* Hoyle, 1885. *Records of the Western Australian Museum, Supplement 18*: 277-310.
- Lynch, M. J., Prata, A. J. and Hunter, J. R., 1986. Sea surface temperature anomalies off the North West Shelf of Western Australia. In: *Proceedings of the 1st Australian AVHRR Conference*. pp. 259-68 .
- M.P. Rogers & Associates, 1997. *VI. Sediment Dynamics Study*. Report to Apache Energy Ltd, Reference no. H153, Apache Energy Ltd.
- MacDaniel, P. and Rasidi, J., 1987. *Challis Field Geological and Geophysical Evaluation*. Report for BHP Petroleum Pty Ltd.
- MacDaniel, R. P., 1988. The Geological Evolution and Hydrocarbon Potential of the Western Timor Sea Region. *Petroleum in Australia - The First Century. APEA Journal*: 270-284.
- Macilroy, J., 1979. Dampier Archipelago historic sites survey. *Australian Heritage Commission*.
- Mackey, D. J., Szymczak, R., Tomczak, M. Jr., and Gu, Y., 1987. Effects of mixed layer depth and an isolated coral reef on the strong complexing capacity of oligotrophic waters. *Australian Journal of Marine and Freshwater Research*, **38**(4): 491-99.
- Mackey, D., 1984. Trace metals and the productivity of shelf waters off north west Australia. *Australian Journal of Marine and Freshwater Research*, **35**(5): 505-16.
- Makaira Pty Ltd and Ecologia Environmental Consultants, 1997. *Aquaculture Planning in Western Australia: A Synopsis and Review*. The Aquaculture Development Council, 93 pp.
- Marine Environmental Services, 1996. *The Effect of Laboratory Weathering on the Chemical Composition, Physical Characteristics and Dispersability of Three West Australian Crude Oils*. Report to Apache Energy Ltd; Reference no. H144; Document no EA-00-RI-008.
- Marine Parks and Reserves Selection Working Group, 1994. *A Representative Marine Reserve System for Western Australia*. Dept of Conservation and Land Management. Marine Science Associates,

1994. *An Annotated History of Conservation at the Monte Bello Islands*. Report to Apache Energy Ltd: Reference no. H102: Document no. EAA-60-RI-040.
- Marsh, H. (Senior author, coordinator and editor), 1998. Western Australia. In: *National Dugong Action Plan*. Unpublished.
- Marsh, H., 1988. An ecological basis for dugong conservation in Australia. In: *Marine Mammals of Australasia: field biology and captive management*. M. Augee, ed., Royal Zoological Society of New South Wales, Sydney, pp. 9-21.
- Marsh, L. M. and Forde, M. J., 1996. Corals and other cnidarians. In: *Barrow Island Intertidal Survey*. Bowman Bishaw Gorham, Report for West Australian Petroleum Pty Ltd, Bowman Bishaw Gorham, Perth.
- Marsh, L. M. and Slack-Smith, S. M., 1986. *Sea Stingers - and Other Venomous and Poisonous Marine Invertebrates of Western Australia*. Western Australian Museum, 133 pp.
- Marsh, L. M., 1976. Western Australian asteroidea since H.L. Clark. *Thalassia Jugoslavica*, **12**(1): 213-25.
- Marsh, L. M., 1978. Report on the Corals and Some Associated Invertebrates of the Dampier Archipelago. In: *The Marine Fauna and Flora of the Dampier Archipelago*. J. B. Hutchins & L. M. S. S. M. Marsh, eds, Unpublished Report submitted to Meagher and LeProvost (not to be quoted in published literature without prior arrangement with the authors)., Western Australia Museum, Perth.
- Marsh, L. M., 1986. Part III, Cnidaria, other than reef-building corals. History of investigation and description of the physical environment. In: Faunal surveys of the Rowley Shoals, Scott Reef and Seringapatam Reef, north western Australia. P Berry (Ed.), *Records of the Western Australian Museum*, **25**: 37-39.
- Marsh, L. M., 1986. Part IV, Echinoderms. In Faunal Surveys of the Rowley Shoals, Scott Reef and Seringapatam Reef, North Western Australia. P. F. Berry (ed.), *Records of the Western Australian Museum*, **25**: 63-74.
- Marsh, L. M., 1991. A revision of the echinoderm genus *Bunaster* (Asteroidea: Ophidiasteridae). *Records of the Western Australian Museum*, **15**(2): 419-33.
- Marsh, L. M., 1992. Part II. Scleractinian and Other Hard Corals. In: *Survey of the Aquatic Fauna of the Kimberley Islands and Reefs Western Australia*. G. J. Morgan, ed., Report of the Western Australian Museum Kimberley Island and Reef Expedition August 1991, Western Australian Museum, Perth, 15-22 pp.
- Marsh, L. M., 1992. Part III Echinoderms. In: *Survey of the aquatic fauna of the Kimberley Islands and reefs Western Australia*. G. J. Morgan, ed., Report of the Kimberley Island and Reef Expedition August 1991, Western Australian Museum, Perth, 23-29 pp.
- Marsh, L. M., 1993. Cnidaria, other than Scleractinian Corals. In: *Survey of the marine fauna and habitats of the Montebello Islands*. P. F. Berry, ed., Report to the Department of Conservation and Land Management, Western Australian Museum, Perth, 32-34 pp.
- Marsh, L. M., 1993. Corals. In: *Survey of the Marine Fauna and Habitats of the Montebello Islands*. P. F. Berry, ed., Report to the Department of Conservation and Land Management, Western Australian Museum, Perth, 23-31 pp.
- Marsh, L. M., 1993. Echinoderms. In: *Survey of the Marine Fauna and Habitats of the Montebello Islands, August 1993*. P. F. Berry, ed., Report for the Department of Conservation and Land Management, Western Australian Museum, Perth, 74-84pp.
- Marsh, L. M., 1993. Part 3 Cnidaria, other than reef building corals, of Ashmore Reef and Cartier Island. In: Marine Faunal Survey of Ashmore Reef and Cartier Island North Western Australia. *Records of Western Australian Museum*, **Supp 44**: 21-23.

- Marsh, L. M., 1996. Echinoderms. In: *Marine Biological Survey of the Muiron Islands and the Eastern Shore of Exmouth Gulf, Western Australia*. J. B. Hutchins, S. M. Slack-Smith, C. W. Bryc, S. M. Morrison & M. A. Hewitt, eds, Prepared for Ocean Rescue 2000 Program G012/94, Western Australia Museum, Perth, 101-111pp.
- Marsh, L. M., and Marshall, J. L., 1983. Some aspects of the zoogeography of north western Australian echinoderms (other than holothurians). *Bulletin of Marine Science*, **33**(3): 671-87.
- Marsh, L. M., Vail, L. L., Hoggett, A. K., and Rowe, F. W. E., 1993. Part 6. Echinoderms of Ashmore Reef and Cartier Island. In: Marine faunal surveys of Ashmore Reef and Cartier Island, north western Australia. P. F. Berry (ed.), *Records of the Western Australian Museum*, **44**: 53-65.
- Martin, K. R., 1987. *Diagenesis and Reservoir Quality in the Challis Field, Browse Basin, Northern Territory*. Report for BHP Petroleum Pty Ltd .
- Martinson, N. W., McDonald, D. R., and Kaye, P., 1973. Exploration on the continental shelf off northwest Australia. *American Association of Petroleum Geologists Bulletin*, **57**(6): 972-89.
- Masuda, K., Nakane, S., Saito, S., and Fujii, T., 1964. Survey of trawl grounds off the north-west coast of Australia with special reference to hydrographical conditions on the grounds. *Bulletin Faculty of Fisheries Hokkaido University*, **15-16**: 77-88.
- Matsuura, H., Sugimoto, T., Nakai, M., and Tsuji, S., In press. Oceanographic conditions near the spawning ground of Southern Bluefin Tuna: North Eastern Indian Ocean. *Journal of Oceanography (Japan)*.
- Mattiske Consulting, 1996. *Review of Vegetation Monitoring Airlie Island*. Report for Western Mining Corporation; CAR-TL/2-242, Novus West Australia Pty Ltd.
- Mattiske Consulting, 1997. *Vegetation monitoring Airlie Island*. Report for Novus West Australia Pty Ltd; CAR-TL/2-231, Novus West Australia Pty Ltd.
- Maunsell and Partners, 1985. *WA -149-P Offshore Oil production. Environmental Review and Management Program*. Report prepared for Wesminco Oil Pty Ltd; Vol 33:3, 671-687 pp.
- May, J. L., and Maxwell, J. G. H., 1986. Field Guide to Trawl Fish from Temperate Waters of Australia. CSIRO Division of Fisheries Research, Hobart.
- May, R. F., 1992. Marine conservation reserves, petroleum exploration and development, and oil spills in coastal waters of Western Australia. *Marine Pollution Bulletin*, **25**(147-154).
- McCaslin, J. C., 1989. North West shelf exploration in early stages. *Oil & Gas Journal*, **87**(38): 103.
- McCauley *AIMS Bioactivity Unit Marine Invertebrate Collection I. Western Australia*.
- McCauley, R. D., Jenner, M. N., Jenner, C., McCabe, K. A., and Murdoch, J., 1998. The response of humpback whales (*Megaptera Novaengliae*) to offshore seismic survey noise: preliminary results of observations about a working seismic vessel and experimental exposures. *APPEA Journal*: 692-707.
- McClure, I. M., Smith, D. N., Williams, A. F., Clegg, L. J. and Ford, C. C., 1988. Oil and Gas Fields of the Barrow Sub-basin. In: *The North West Shelf, Australia: Proceedings of Petroleum Exploration Society, Australia Symposium*. Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, pp. 371-90.
- McDonald, A.D., L.R. Little, R. Gray, E. Fulton, K.J. Sainsbury and V.D. Lyne. 2008. An agent-based modelling approach to evaluation of multiple-use management strategies for coastal marine ecosystems. *Mathematics and Computers in Simulation*, **78**(2):401-411.
- McGilbery, T. A., Polomka, S. M., and Galloway, W. E., 1997. Tectonically Controlled Paleographic Evolution of the Barrow Group (Early Cretaceous) Barrow Sub-Basin, North West Shelf, Australia. *American Association of Petroleum Geologists and Society of Economic Paleontologists and Mineralogists*, 80 pp.

- McGill, S. A., 1975. The Algae of the Salt Field. 1-5.
- McGilvery, T. A., 1996. Stratigraphic framework, facies architecture, and depositional history of the Barrow Group (Early Cretaceous) in the Barrow Sub-basin, North West Shelf, Australia. 326.
- McGilvery, T. A., Galloway, W. E., and Polomka, S. M., 1995. Lithofacies and Depositional Facies of a Slope-Apron Depositional system; Early Cretaceous Barrow Group, North West Shelf, Australia. American Association of Petroleum Geologists and Society of Economic Paleontologists and Mineralogists, 63 pp.
- McLoughlin, R. and Young, P., Fish resource and sedimentary environments on the NW Shelf. In: *Australian Marine Science Association Conference*. AMSA, Hobart, pp. 67.
- McLoughlin, R. J. and Young, P. C., 1984. A survey of the surficial sediments of the North West Shelf fishing grounds [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. CSIRO, NSW, pp. 11.
- McLoughlin, R. J., 1981. Sediments of the North West Australian Continental Shelf. BSc. (Hons) Thesis, University of New South Wales.
- McLoughlin, R. J., and Young, P. C., 1985. Sedimentary provinces of the fishing grounds of the North West Shelf of Australia: Grain-size frequency analysis of surficial sediments. *Australian Journal of Marine and Freshwater Research*, **36**(5): 671-81.
- McLoughlin, R. J., Davis, T. L. O., and Ward, T. J., 1988. Sedimentary provinces, and associated bedforms and benthos on the Scott Reef-Rowley Shoals platform off north west Australia. *Australian Journal of Marine and Freshwater Research*, **39**(2): 133-44.
- McMillan, C., Young, P. C., Cambridge, M. L., Masini, R. J., and Walker, D. I., 1983. The status of an endemic Australian seagrass, *Cymodocea angustata* Ostenfeld. *Aquatic Botany*, **17**(665-675): 231-41.
- McMinn, A., 1985. Late Cretaceous Dinoflagellate Palynostratigraphy of North Western Australia: Ph.D. Thesis. Macquarie University, Sydney.
- McWhae, J. R. H., Playford, P. E., Lindner, A. W., Glennister, B. F., and Balme, B. E., 1985. The stratigraphy of W.A. *Geological Society Australia Journal*, **4**(2).
- McWilliam, P. S., 1977. Further studies of plankton ecosystems in the Eastern Indian Ocean VI. Ecology of the Euphausiacea. *Australian Journal of Marine and Freshwater Research*, **28**: 627-44.
- Meagher, T. D. a. A., 1984. *South Pepper - North Herald Project. Marine Investigation*. Report to Maunsell and Partners.
- Meath, J. R., and Bird, K. J., 1976. The geology of the West Tryal Rocks gas field . *APEA Journal*, **16**(1): 157-63.
- Meehan, P. J., 1991. Oil exploration opportunities and risks on the North West shelf of Australia. *Bulletin of Canadian Petroleum Geology*, **39**(2): 219.
- Meyers, G., 1996. Variation of Indonesian throughflow and the El Nino - Southern Oscillation. *Journal of Geophysical Research*, **101**: 12255-63.
- Meyers, G., Bailey, R. J., and Worby, A. P., 1995. Geostrophic transport of Indonesian throughflow. *Deep Sea Research Part I*, **42**: 1163-74.
- MI Drilling Fluids, 1996. *Ecotoxicity Test Results*.
- Mildren, S. D., and Hillis, R. R., 1996. The contemporary stress field of the Australian North West Shelf; I Implications for active faulting. *Geological Society of Australia Journal*, **41**: 296.
- Millar, J., 1993. *First Quarterly Interim Report: On the Investigation into Limitation of Microbial Degradation of Petroleum Hydrocarbons in Mangrove Sediment*. Report for Woodside Offshore Petroleum Pty Ltd.

- Mills, D. A., 1985. *A Numerical Hydrodynamic Model Applied to tidal Dynamics In The Dampier Archipelago*. Report 190, Department of Conservation and Environment, 1-30pp.
- Mills, D. A., Pitt, D. R. and Simpson, C. J., 1986. *Summary of Current Meter Data from the Dampier Archipelago 1981-1984*. Environmental Note 178, Department of Conservation and Environment.
- Milner, C., 1995. *Produced Formation Water - Corrosion Inhibitor Study*. Report to Apache Energy Ltd, Reference no. H106; Document no. EAA-60-RI-046, Apache Energy Ltd.
- Mobil Exploration & Producing Australia Pty Ltd, 1997. *Nicole Marine Seismic Survey EP-399 and EP-400: Environmental Management Plan*.
- Mobil Exploration & Producing Australia Pty Ltd, 1998. *Environmental Management Plan for Drilling of Gimlet-1 WA-243-P*.
- Mobil Exploration & Producing Australia Pty Ltd, 1998. *Environmental Management Plan for Drilling of John Brookes-1 WA-214-P*.
- Mobil Exploration & Producing Australia Pty Ltd, 1998. *Environmental Management Plan for Drilling of Morrel-1 WA-202-P*.
- Mobil Exploration & Producing Australia Pty Ltd, 1998. *Environmental Management Plan for Drilling of Vesuvius-1; WA-257-P*.
- Mobil Exploration & Producing Australia Pty Ltd, 1998. *Environmental Management Plan for Drilling of Wandoo A6, WA-14-L*.
- MOBIL, 1997. MEPA Australia Permits and Environmental Areas (map). 1:500 000. Mobil Exploration & Producing Australia Pty Ltd, 1994. *Introduction to the Montebello Island Environment*.
- Molcard, R., Fieux, M., and Ilahude, A. G., 1996. The Indo-Pacific throughflow in the Timor Passage. *Journal of Geophysical Research*, **101**(C5): 12411-20.
- Molcard, R., Fieux, M., Swallow, J. C., Ilahude A.G., and Banjarnahor, J., 1994. Low frequency variability of the currents in Indonesian channels (SAVU-ROTI and ROTIAshmore Reef). *Deep Sea Research, Part 1*: 1643-61.
- Mollan, R. G., Craig, R. W., and Lofting, M. J. W., 1969. Geological Framework of the Continental Shelf off North west Australia. *APEA Journal*, **9**(2): 49-59.
- Moore, P. S., and Hocking, R. M., 1983. Significance of hummocky cross-stratification in the Permian of the Carnarvon Basin, Western Australia. *Geological Society of Australia Journal*, **30**: 323-31.
- Moore, P. S., Denman, P. D. and Hocking, R. M., 1980. *Sedimentology of the Byro Group (Lower Permian), Carnarvon Basin, Western Australia*. Geological Survey of Western Australia, Annual Report for 1979, 55-64 pp.
- Moore, P. S., Hocking, R. M. and Denman, P. D., 1980. *Sedimentology of the Kennedy Group (Permian), Carnarvon Basin, Western Australia*. Geological Survey of Western Australia, Annual Report for 1979, 65-72 pp.
- Moran, M. J., and Jenke, J., 1990. Effects of fish trap mesh size on species and size selectivity in the Australian North West Trap Fishery. *Fishbyte*, **August**: 8-13.
- Moran, M. J., Jenke, J., Burton, C. and Clarke, D., 1988. *The Western Australian Trap and Line Fishery on the North-West Shelf*. Western Australia Marine Research Laboratories FIRTA Project 86/28 Final Report, Western Australia Fisheries Department, 79 pp.
- Moran, M. J., Jenke, J., Cassells, G. and Nowra, G., 1995. *Research for Allocation of North-West Marine Finfish Resources Among Diverse User Groups*. FRDC Final Report: Project no. 91/28, WA Fisheries Dept, 73 pp.
- Moran, M., 1992. Studying the impact of NW trawling. *Western Fisheries*, **Spring**: 13.

- Moran, M., Edmonds, J., Jenke, J., Casells, G. and Burton, C., 1993. *Fisheries biology of emperors (Lethrinidae) in north-west Australian coastal waters*. FRDC Project 89/20 final report, 58 pp.
- Morgan, G. J. and Berry, P. F., 1992. Part X: Management Proposal Survey of the Aquatic Fauna of the Kimberley Islands and Reefs Western Australia. In: *Report of the Western Australian Museum Kimberley Island and Reef Expedition August 1991*. G. J. Morgan, ed., Western Australian Museum, Perth, 23-29 pp.
- Morgan, G. J., 1992. Part V: Decapod Crustaceans Survey of the Aquatic Fauna of the Kimberley Islands and Reefs Western Australia. In: *Report of the Western Australian Museum Kimberley Island and Reef Expedition August 1991*. G. J. Morgan, ed., Western Australian Museum, Perth, 23-29 pp.
- Morgan, G. J., 1992. Survey of the Aquatic Fauna of the Kimberley Islands and Reefs in Western Australia. In: *Report of the Western Australian Museum Kimberley Island and Reef Expedition August 1991*. Western Australian Museum, Perth.
- Morgan, G. J., and Berry, P. F., 1993. Part 5: Decapod crustacea of Ashmore Reef and Cartier Reef. In: Marine faunal survey of Ashmore Reef and Cartier Island north western Australia. *Records of Western Australia, Supplement 44*.
- Morgan, G., 1990. Sixth lobster found in north west. *Western Fisheries*, **May**: 26-27.
- Morgan, R. P., 1982. *Submission to the Director, Department for Conservation and Environment in Respect of Continuation of a Pearling Industry on the Montebello Islands*. Submission by Morgan and Company Pty Ltd.
- Morris, K. D., 1985. The Dampier Archipelago - Managing People in a Nature Reserve. In: *Australia and New Zealand Island: Nature Conservation Values and Management*. A. Burbidge, ed., Dept. of Conservation and Land Management, 183 -192 pp.
- Morris, K. D., 1989. *Dampier Archipelago Nature Reserves Draft Management Plan*. WA Dept of Conservation and Land Management Report, 72 pp.
- Morris, K. D., 1990. *Dampier Archipelago Nature Reserves Management Plan 1990- 2000*. Conservation and Land Management, Management Plan No 18, Department of Conservation and Land Management, 86 pp.
- Morris, K. D., 1991. *Management Proposals for the Montebello Islands and Surrounding Waters*. CALM Occasional Paper No. 3/91, Department of Conservation and Land Management, Como, Western Australia.
- Morris, K. D., 1991. *Management Proposals for the Montebello Islands and Surrounding Waters*. CALM Occasional paper 3/91, Department of Conservation and Land Management, Como, Western Australia, 10 pp.
- Morrison, S. M. and Alderslade, P., 1996. Octocorals. In: *Marine Biological Survey of the Muiron Islands and the Eastern Shore of Exmouth Gulf, Western Australia*. J. B. Hutchins, S. M. Slacksmith, C. W. Bryce, S. M. Morrison & M. A. Hewitt, Prepared for Ocean Rescue 2000 Program G012/94, Western Australian Museum, Perth, 31-42 pp.
- Mory, A. J., 1988. Regional geology of the offshore Bonaparte Basin . In: *The North West Shelf, Australia: Proceedings of Petroleum Exploration Society, Australia Symposium*. Purcell, G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, pp. 287-310.
- Mulhearn, P. J. and Cerneaz, A., 1994. *Sediment Properties off Broome, Port Hedland and Darwin*. Marine Labs Report Technical Note.
- MUN, 1986. *The Stratigraphy, Depositional Environments and Geochemistry of the Lower-Middle Jurassic Sequence, Dampier-Beagle Sub-basins*. CAR-GEN-267,0, Novus West Australia Pty Ltd.
- Murdoch, R., 1994. *Review of the Report on Additional Environmental Monitoring of Formation Water Discharge at Airlie Island*. Western Mining Corporation, 2 pp.

- Murray, N. J., 1976. Biotic Influences on Sedimentation Gaies Bay Tidal Flat, Exmouth Gulf, Western Australia: B.Sc. Hons Thesis. University of Western Australia.
- National Parks Authority, 1980. *Monte Bello Islands: Proposed Outline Working Plan*. 16 pp.
- Natoli, K., 1996. *Pre-sale environmental due diligence audit*. Novus West Australia Pty Ltd.
- Neff, J. M., 1997. *Fate and Effect of Polycyclic Aromatic Hydrocarbons Following Spills of Crude Oil in the Marine Environment*. Report for Apache Energy Ltd; EA-00-RI-076/B H163, 29 pp.
- Negri, A. and Llewellyn, L., 1997. Chemistry of Marine Toxins. In: *Western Australian Research Activities 1994-1996*. Australian Institute of Marine Science Report, 19-20 pp.
- Negri, A., 1997. Marine Bioproducts in Australia's Indian Ocean Province. In: *Western Australian Research Activities 1994-1996*. Australian Institute of Marine Science Report, 21-23 pp.
- Nel, S., 1993. *Kimberley Aquaculture Development Plan*. For Fisheries Department of Western Australia & Kimberley Development Commission, 106 pp.
- Newman, S. J. 2002. Growth rate, age determination, natural mortality and production potential of the scarlet seaperch, *Lutjanus malabaricus* Schneider 1801, off the Pilbara coast of north-western Australia. *Fisheries Research* 58(2):215-225.
- Newman, S., In Progress. *Biomass and Sustainability Yield Assessment of the Outer Shelf Fisheries Resources of the Pilbara Coast of Tropical Western Australia*.
- Newman, S., In progress. *Demersal Finfish Resource Assessment Survey of North West Slope of Western Australia*.
- Nicholls, N., 1979. A possible method for predicting seasonal tropical cyclone activity in the Australian region. *Monthly Weather Review*, **107**: 1221-24.
- Nicholls, N., 1984. The Southern Oscillation, sea-surface-temperature, and interannual fluctuations in Australian tropical cyclone activity. *Journal of Climatology*, **4**: 661-70.
- Nicholls, N., 1985. Predictability of interannual variations of Australian seasonal tropical cyclone activity. *Monthly Weather Review*, **113**: 1144-49.
- Nicholls, N., 1992. Recent performance of a method for forecasting tropical cyclone activity. *Australian Meteorological Magazine*, **40**: 105-10.
- Nicoll, R. S., and Foster, C. B., 1994. Late Triassic conodont and palynomorph biostratigraphy and conodont thermal maturation, North West Shelf, Australia. In. *AGSO Journal of Australian Geology & Geophysics: Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 101-8.
- Nicoll, R. S., and Gorter, J. D., 1995. Devonian-Carboniferous stratigraphy of Quail 1, Carnarvon Basin, Western Australia: Regional implications for geohistory and hydrocarbon prospectivity. *Journal of Australian Geology & Geophysics*, **15**(4): 413-20.
- Nielson, J. and Annandale, D., 1996. *Project S1: Ecological significance of seagrasses. Phase 2 Report*.
- Nikpalj, C. V. and Radok, R., 1972. *The Monitoring of Australian Mean Sea Levels 1966-1970*. Research Paper 31, Horace Lamb Centre for Oceanographical Research, Flinders University of South Australia.
- Niva Report, 1995. *Biodegradation of Ultradril Base Fluid and Drilling Mud on Cutting Deposits in Benthic Chambers*. 77 pp.
- Northern Territory Dept of Mines and Energy, 1985. *The Bonaparte Gulf Gas Project a Key LNG Development for the Northern Territory of Australia*. Northern Territory Department of Mines and Energy, Government Printer.
- Novus West Australia Pty Ltd, 1991. *Site Visit to North Herald South Pepper Production Facilities- Review Current Status Corrosion Monitoring and Mitigation*. CAR-GEN-174,0, Novus West Australia Pty Ltd.

- Novus West Australia Pty Ltd, 1992. *Environmental Management Plan, Production Licence TL/2, First Triennial Report*. CAR-TP/7-64, 5460.
- Novus West Australia Pty Ltd, 1992. *Proposed Chronic Effects Monitoring Programme*. CAR-TP/7-64,5460, Novus West Australia Pty Ltd.
- Novus West Australia Pty Ltd, 1993. *Corrosion Monitoring Upgrade South Pepper North Herald Chervil Corrosion Synopsis*. CAR-TP/7-66,0.
- Novus West Australia Pty Ltd, 1994. *Environmental Health and Safety*. CAR-GEN- 1014,0.
- Novus West Australia Pty Ltd, 1995. *Safety and Environmental Management Reviews 1994*. CAR-GEN-361,0; Novus West Australia Pty Ltd.
- Novus West Australia Pty Ltd, 1997. *Tenth Annual Report for Production License TL/2 1996 - 1997; Airlie Project*.
- Nowak, R., 1977. Pseudovelocity Applications in The Carnarvon Basin. *Geological Survey of Western Australia: 75-79*.
- Nunn, R. M., 1977. *Dampier Archipelago: An Interim Report on a Reconnaissance Inspection of Hamersley Iron Pty Ltd's Mineral Lease Applications*.
- Nunn, R., 1988. Environmental management of the North West Shelf Gas Project: Paper presented to the Petroleum Society of Australia.
- Nyland, G., 1988. Detailed engineering geological investigation of North Rankin 'A' platform site. In: *Engineering for calcareous sediments. Calcareous Sediments*. Jewell, R. J. & Khorshid, M. S., eds, 2, Perth, pp. 503-12.
- Oliver, G. A., 1990. *Interim Guidelines for Operations - Serrurier Island Nature Reserve*. Department of Conservation and Land Management, 20 pp.
- Oliver, G., 1993. *A Review of Ballast Water Introductions into Australia and the Implications for the Port of Dampier*. WENV 236.
- Orchison, K., 1983. Aussie potential high, but exploration ebbs. *Oil & Gas Journal*, **81**(20): 61-63.
- Osborne, D. G., and Howell, E. A., 1987. The geology of the Harriet Oilfield, Offshore Western Australia. *The APEA Journal*, **27**(1): 152-63.
- Ostle, C., 1995. Pioneering the Dampier Peninsular. *Western Fisheries*, **May**: 21-22.
- Ovenden, J. R., Lloyd, J., Newman, S. J., Keenan, C. P. and Slater, L. S. 2002. Growth, Age Validation, Mortality, and other Population Characteristics of the Red Emperor Snapper, *Lutjanus sebae* (Cuvier, 1828), off the Kimberley Coast of North-Western Australia. *Estuarine, Coastal and Shelf Science* 55(1): 67-80.
- Ovenden, J.R., Lloyd, J., Newman, S.J., Keenan, C.P. and Slater, L.S. 2002. Spatial genetic subdivision between northern Australian and southeast Asian populations of *Pristipomoides multidens*. *Fisheries Research* 59(1):57-69.
- Ozimic, S., 1978. *Troubadour Field, Bonaparte Gulf Basin, Northern Territory, Estimated Recoverable Reserves*. Record 1978/27, Bureau of Mineral Resources, Geology and Geophysics.
- Padgett, A., 1990. *Dampier Archipelago Nature Reserves: Summary of Public Submissions*.
- Page, T. J., Humphreys, W. F. and Hughes, J. M. 2008. Shrimps Down Under: Evolutionary Relationships of Subterranean Crustaceans from Western Australia (Decapoda: Atyidae: Stygiocaris). *ONE* 3(2).
- Paling, E. I., 1986. *Analysis of Coral Community Data using Multivariate Techniques, and their Application to other Community Data*. Technical series 3, Department of Conservation and Environment, 28 pp.

- Paling, E. I., 1986. *The Ecological Significance of Blue-Green Algae in the Dampier Archipelago*. Technical Series 2, Department of Conservation and Land Management, 134 pp.
- Paling, E. I., 1988. Aspects of nitrogen cycling in two dominant macroalgae: the kelp (*Ecklonia radiata*) and *Sargassum* sp. In: 'Marine Sciences Beyond 2001 – Perspectives'. Australian Marine Science Association Silver Jubilee 1963 - 1988, Australian Marine Science Association, Sydney.
- Paling, E. I., 1990. Report on the Biological Environments Near Onslow, Western Australia. In: *Gulf Holdings Pty Ltd Environmental Review and Management Programme: Onslow Salt Project. 2*, 26 pp.
- Paling, E. I., 1991. *Description of Tidal Flat Environment North of Chinatown, Broome, Western Australia*. 18 pp.
- Paling, E. I., 1995. Mangrove Processes in the Port Hedland Harbour and Surrounds: Tidal Creek Erosion, Headwater Erosion and Mangrove Health. In: *Marine and Freshwater Research Laboratory, Environmental Science, Murdoch University*. Unpublished report to Halpern Glick Maunsell Pty Ltd. BHP Iron Ore.
- Paling, E. I., 1996. *Mangrove Communities at Cape Keraudren and the Potential Impacts of a Tidal Power Station*. Kinhill Engineers Pty Ltd, 18 pp.
- Paling, E. I., 1997. *Mangrove Assemblages in Doctors Creek, Derby, Their Regional Significance and the Potential Impacts of a Tidal Power Station*. Report 97/10, Marine and Freshwater Research Laboratory.
- Paling, E. I., and McComb, A. J., 1994. Cyanobacterial mats: a possible nitrogen source to arid coast mangroves. *International Journal of Ecology and Environmental Science*, **20**: 47-54.
- Paling, E. I., Humphries, G., McCardle, I. and Thomson, G., 1996. The Effects of Iron Ore Dust on Mangroves 1: Lack of Evidence for Stomatal Damage. In: *Marine and Freshwater Research Laboratory, Environmental Science, Murdoch University*. Unpublished report to Halpern Glick Maunsell Pty Ltd. BHP Iron Ore, 27 pp.
- Paling, E. I., McComb, A. J., and Pate, J. S., 1989. Nitrogen fixation (acetylene reduction) in nonheterocystous cyanobacterial mats from the Dampier Archipelago, Western Australia. *Australian Journal of Marine and Freshwater Research*, **40**(2).
- Parry, J. C., 1967. *Stratigraphic Nomenclature in Onslow No. 1 Well Completion Report (P.S.S.A. Acts Report)*. Report for West Australian Petroleum Pty Ltd (Unpublished Report).
- Parry, J. C., 1967. The Barrow Island Oil Field. *APEA Journal*, **7**(2): 130-133.
- Parry, J. C., 1968. *The Post-Triassic Stratigraphy of the Northern Carnarvon Basin*. WAPET (Unpublished Report).
- Parry, J. C., and Smith, D. N., 1988. The Barrow and Exmouth Sub-basins in: Petroleum in Australia, the First Century. *APE Journal*: 191-212.
- Pass, D. A., and Perkins, F. P., 1985. Protistan parasites or residual bodies in *Pinctada maxima*? **46**: 271-81.
- Pass, D. A., Dybdahl, R., and Mannion, M. M., 1987. Investigations into the causes of mortality of the pearl oyster, *Pinctada maxima* Jameson, in Western Australia. **65**: 149-69.
- Pass, D. A., Perkins, F. P., and Dybdahl, R., 1988. Virus-like particles in the digestive gland of the pearl oyster *Pinctada maxima*. **51**: 166-67.
- Passmore, V. L., 1992. Offshore Canning Basin; hydrocarbon misfit or an early developer on the North West Shelf. *American Association of Petroleum Geologists Bulletin*, **76**(7): 1122.
- Pattillo, J., 1987. *Tectono/stratigraphic framework and structural review of Permit AC/P4, Timor Sea Region*. Report for BHP Petroleum Pty Ltd.
- Paul, M. J. and Lustig, T. L., Sediment movement in Port Hedland Harbour. In: *Australian Conference on Ocean Engineering: The Engineer, the Coast and the Ocean*. 2nd Edition, pp. 120-127.

- Pearce, A. and Cresswell, G. *Ocean circulation off Western Australia and the Leeuwin Current*. Sheet 16.3, CSIRO, Hobart.
- Pearce, A. F., and Griffiths, R. W., 1991. The mesoscale structure of the Leeuwin current: a comparison of laboratory models and satellite imagery. *Journal of Geophysical Research*, **96**(9): 16739-57.
- Pearce, A. F., and Phillips, B. F., 1988. ENSO events, the Leeuwin Current, and larval recruitment of the Western Rock Lobster. *J. Cons. Int. Explor. Mer*, **45**: 13-21.
- Pearce, A., 1983. *A Bibliography of Physical Oceanography in Southwest Australian Waters*. CSIRO Marine Laboratories Report 157, CSIRO, Hobart, 36 pp.
- Pendoley, K. and Wilshaw, J. (West Australian Petroleum Pty Ltd and University of Western Australia), 1996. *The influence of gas flares on the orientation of green turtles hatchlings, Thevenard Island*. 13 pp.
- Pendoley, K., 1992. Hydrocarbons in Rowley Shelf (Western Australia) oysters and sediments. *Marine Pollution Bulletin*, **24**: 285-92.
- Pendoley, K., 1998. Sea turtles and management of marine seismic programs in Western Australia. *PESA Journal*, **25**: 8-16.
- Penn, J. W. and Dybdahl, R., 1988. *A Research Vessel Survey of Pearl Oyster and Prawn Resources North-West of Broome, Western Australia*. Western Australia Fisheries Report WA 81, 24 pp.
- Penn, J. W. and Stalker, R. W., 1979. *The Shark Bay Prawn Fishery 1970-1976*. Report for the Fisheries Department Western Australia, 38 pp.
- Penn, J. W., and Caputi, N., 1986. Spawning stock-recruitment relationships and environmental influences on the tiger prawn (*Penaeus esculentus*) fishery in Exmouth Gulf, Western Australia. *Australian Journal of Marine and Freshwater Research*, **37**: 491-505.
- Penn, J., 1997. *State of the Fisheries Report 1996-1997*. Fisheries Department of Western Australia, Perth.
- Penrose, J. D., and McCauley, R. D., 1998. Underwater character and horizontal propagation of air-gun signals. *APPEA Journal*: 708-14.
- Percival, I. G., and Cooney, P. M., 1985. Petroleum Geology of the Merlinleigh Subbasin, Western Australia. *APEA Journal*, **25**(1): 190-203.
- Percival, S., Drabsch, P. and Glencross, B. 2002. Spatial genetic subdivision between northern Australian and southeast Asian populations of *Pristipomoides multidens*: a tropical marine reef fish species. *Fisheries Research* 59(1-2): 57-69.
- Peters, A., and Verhoeven, K. J. F., 1994. Impact of artificial lighting on the seaward orientation of hatchling loggerhead turtles. *Journal of Herpetology*, **28**(1): 112-14.
- Petkovic, P., Stagg, H. M. J., and Willcox, J. B., 1996. Integrated potential field data sets on the North West Shelf; a framework for basin analysis. *Geological Society of Australia Journal*, **41**(339): 43-54.
- Phillips, B. F. and Wallner, B. G., 1992. The Fisheries Biology of Deepwater Crustacea and Finfish on the Continental Slope of Western Australia. In: *The Fisheries Biology of the Crustaceans*. S. F. Rainer, ed., Final Report to the Fisheries Research and Development Corporation (FRDC Project 1988/74), CSIRO, 45-60 pp.
- Phillips, B. F., and Jernakoff, P., 1991. The North West Slope Trawl Fishery: what future does it have? *Australian Fisheries*, **50**(7): 18-20.
- Pilbara 21 Group, 1992. *Pilbara 21 Final Strategy Report*. Report for the Government of Western Australia.
- Pitt, D. R. and Mills, D. A., 1985. *Summary of anemometer data from Conzinc Island: September 1981 to July 1984*. Environmental Note 176, Department of Conservation and Environment.
- Playford, P. E., Cope, R. N., Cockbain, A. E., Low, G. H., and Lowry, D. C., 1975. Geology of Western Australia. *Western Australia Geological Survey, Memoir*, **2**: 223-457.

- Pollard, P. C. and Moriarty, D. J. W., 1984. Distribution of bacterial numbers and productivity in the water column of the North West Shelf [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. CSIRO, Cronulla, NSW, pp. 10.
- Posaner, F. M., and Goldthorpe, W. H., 1986. The development and early performance of the North Rankin Field. *APEA Journal*, **26** (1): 420-427.
- Powell, D. E., 1976. The geological evolution of the continental margin off north west Australia. *APEA Journal*, **16**(1): 13-23.
- Powell, T. S., and Luyendyk, B. P., 1982. The sea-floor spreading history of the eastern Indian Ocean. *Marine Geophysical Researches*, **5**: 225-47.
- Powell, W. D., Broad, D. S. and Williams, A. J., 1978. *Structure, Stratigraphy and Hydrocarbon Potential of the Jurassic and Neocomian of the Offshore Carnarvon Basin*. Report for West Australian Petroleum Pty Ltd (Unpublished).
- Prata, A. J., 1989. *A Satellite Sea Surface Temperature Climatology of the Leeuwin Current, Western Australia*. Final report to the Marine Sciences and Technology Council.
- Price, G. P., 1988. Effect of mechanical deformation on the fabrics of calcareous sediments from North Rankin 'A', North West Shelf. In: *Engineering for Calcareous Sediments. Proceedings of the International Conference on Calcareous Sediments*.
- Price, G. P., 1988. Fabric of calcareous sediments at North Rankin 'A', North West Shelf. In: *Engineering for calcareous sediments. Proc. Calcareous Sediments*. Jewell, R. J. & Khorshid, M. S., Editors, 2, pp. 367-76.
- Prince, R. I. T., 1986. *Dugongs in northern waters of Western Australia*. Technical Series 7, Department of Conservation and Land Management, 38 pp.
- Prince, R. I. T., Anderson, P. K. and Blackman, D., 1981. Status and distribution of dugongs in Western Australia. In: *The Dugong Workshop Proceedings*. Marsh, H., James Cook University of North Queensland, Townsville, pp. 67-87.
- Provis, D. G., and Radok, R., 1979. Sea-level oscillations along the Australian Coast. *Australian Journal of Marine and Freshwater Research*, **30**: 295-301.
- Public Works Dept of WA, 1979. Port Walcott - Johns Creek Investigations for fishing Industry Facilities. In: *Public Works Dept of WA Harbours and Rivers Branch Coastal Investigations Section Report*. Report no CIS 79/1.
- Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, pp. 413-18.
- Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia, Perth, pp. 29-54.
- Purcell, P. G. & Purcell, R.R., eds, Petroleum Exploration Society of Australia, pp.203-24.
- Purcell, P. G., and Purcell, R. R., eds, 1988. The North West Shelf, Australia: Proceedings North West Shelf Symposium, Perth, WA. Petroleum Exploration Society of Australia Ltd, Perth, 651 pp.
- Quadfasel, D., Frische, A., and Cresswell, G., 1996. The circulation in the sources area of the south equatorial current in the eastern Indian ocean. *Journal of Geophysical Research*, **101**(35): 12483-88.
- Quilty, P. G., 1974. Tertiary stratigraphy of Western Australia. *Geological Society of Australia Journal*, **21**: 301-18.
- Quilty, P. G., 1977. Cenozoic sedimentation cycles in Western Australia. *Geology*, **5**:336-40.
- Quilty, P. G., 1980. Sedimentation cycles in the Cretaceous and Cenozoic of Western Australia. *Tectonophysics*, **63**: 349-66.
- Quilty, P. G., 1980. Tertiary foraminifera and stratigraphy, northern Exmouth Plateau, Western Australia. *BMR Journal of Australian Geology & Geophysics*, **5**: 141-49.

- Raaymaker, S., 1994. Ship Sourced Oil Pollution in the Great Barrier Reef: Causes, Frequency, Response and Prevention. In: *Hulls, Hazard and Hard Questions*. Ottesen, ed., Great Barrier Reef Marine Park Authority Workshop Series No. 19, 11-24 pp.
- Radke, B., and Nicoll, R. S., 1981. Evidence for former evaporites in the Carboniferous Moogooree Limestone, Carnarvon Basin Western Australia. *BMR Journal of Australian Geology & Geophysics*, **6**(1): 106-8.
- Raggatt, H. G., 1936. Geology of the North West Basin, West Australia, with particular reference to the stratigraphy of the Permo-Carboniferous. *Journal of the Royal Society of New South Wales*, **70**: 100-174.
- Rainer, S. F. (ed.), 1992. *The Fisheries Biology of Deepwater Crustacea and Finfish on the Continental Slope of Western Australia*. Final Report to the Fisheries Research and Development Corporation, CSIRO, Perth, WA, 308 pp.
- Rainer, S. F., 1990. Food and diurnal behaviour of deepwater prawns. In: *Proceedings of the International Crustacean Conference*. 31, Memoirs of the Queensland Museum, Queensland, pp. 400.
- Rainer, S. F., 1991. High species diversity in demersal polychaetes of the north west shelf of Australia. *Ophelia, Systematics, Biology and Morphology of World Polychaeta*, **Supplement 5**: 497-505.
- Rainer, S. F., 1992. Crustaceans of the northwestern continental slope of Australia. Abstract. In: *Australian Marine Sciences Association Annual Conference*. pp. 60.
- Rainer, S. F., 1992. Diet of prawns from the continental slope of north-western Australia. *Bulletin of Marine Science*, **50**(2): 258-74.
- Rainer, S. F., 1992. Growth of the Australian scampi *Metanephrops australiensis*.
- Rainer, S. F., 1992. The Diet of North West Slope Prawns. In: *The Fisheries Biology of Deepwater Crustacea and Finfish on the Continental Slope of Western Australia*. S. F. Rainer, ed., Final report to the Fisheries Research and Development Corporation (FRDC Project 1988/74), CSIRO, 123-130 pp.
- Rainer, S. F., and Kaly, U. L., 1988. Nephtyidae (Polychaeta: Phyllodocida) of Australia: new species from the North West Shelf, and a key to Australian species. *Journal of Natural History*, **22**(3): 685-703.
- Rainer, S. F., and Munro, I. S. R., 1982. Demersal fish and cephalopod communities of an unexploited coastal environment in northern Australia. *Australian Journal of Marine and Freshwater Research*, **33**: 1039-55.
- Rainer, S. F., Ward, T. J. and Stanley, C. A., 1984. Habitat partitioning in small demersal fish of the North West Shelf of Australia [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. CSIRO, NSW, pp. 12.
- Ramm, D. C., 1994. *Australia's Northern Trawl Fishery*. Fishery Report, N.T. Fisheries Division, Dept of Primary Industries and Fisheries.
- Ramsay, D. C., and Exon, N. F., 1994. Structure and tectonic history of the northern Exmouth Plateau and Rowley Terrace, outer North West Shelf. In: *AGSO Journal of Australian Geology & Geophysics: Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 55-70.
- Ramsden, C. R. T., 1985. The application of high resolution seismic processing to low relief structures - Harriet oil accumulation. *Exploration Geophysics*, **16**(4): 335-48.
- Ramsden, C. R. T., James, A. R. and Howell, E. A., 1997. Case history: vertical seismic profiles at the Harriet oilfield. In: *5th ASEG Conference*. pp. 179-82.
- Randall, J. E., and Allen, G. R., 1987. Four new species of the genus *Epinephelus* (Perciformes; Epinephelinae) from Western Australia. *Records of the Western Australian Museum*, **13**(3): 387-411.
- Ransden, C., 1991. The oceans overture on the North West Shelf of Australia. *Geological Society of Australia Journal*, **30**: 171-72.

- Rasidi, J. S., 1978. Buried reef structures in the Lennard Shelf, Canning Basin, Western Australian. *B.M.R Journal of Australian Geology & Geophysics*, **3**: 80-83.
- Rathburn, M. J., 1914. Stalk-eyed crustaceans collected at the Monte Bello Islands. *Proceedures of the Zoological Society London*, **11**: 653-64.
- Read, J. F., 1974. Calcrete deposits and quaternary sediments, Edel Province, Shark Bay, Western Australia. In: Evolution and diagenesis of quaternary carbonate sequences, Shark Bay, Western Australia. *American Association of Petroleum Geologists Memoirs*, **22**: 250-283.
- Read, J. F., 1974. Carbonate bank and wave-built platform sedimentation, Edel Province, Shark Bay, Western Australia. In: Evolution and diagenesis of quaternary carbonate sequences, Shark Bay, Western Australia. *American Association of Petroleum Geologists Memoirs*, **22**: 1-60.
- Read, J. F., 1974. Carbonate bank and wave-built platforms sedimentation, western, Shark Bay, Western Australia. In: Recent Advances in carbonate studies. **6**: 33-34.
- Reeckmann, S. A. and Mebberson, A. J., 1984. Igneous intrusions in the north-west Canning Basin and their impact on oil exploration. In: *The Canning Basin, WA: Geological Society of Australia/Petroleum Exploration Society of Australia Symposium, Perth, Proceedings*. Purcell, P. G., ed., pp. 391-99.
- Reid, A., 1991. Taxonomic review of the Australian Rossiinae (Cephalopoda: Sepiolidae), with a description of a new species, *Neorossia leptodons*, and redescription of *N.caroli* (Joubin, 1902). *Bulletin of Marine Science*, **49**(3): 748-831.
- Reid, J., Hunter, J., Walker, S., Craig, P. and Sherwood, C. R., 1997. *North West Shelf Circulation Model Development*. Unpublished Report OMR-97/109, CSIRO Division Marine Research, Hobart.
- Reid, J., Hunter, J., Walker, S. and Craig, P., 1996. *Final Report on Laminaria Modelling*. Unpublished Report OMR-90/96, CSIRO Division of Marine Research, Hobart.
- Reitsema, T. J. and Spickett, J. T. 1999. Imposex in *Morula granulata* as Bioindicator of Tributyltin (TBT) Contamination in the Dampier Archipelago, Western Australia. *Marine Pollution Bulletin* 39(1-12):280-284.
- Renfrey, G. E., Waterdon, C. A. and Van Goudoever, P., Geotechnical data used for the design of the North Rankin 'A' platform foundation. In: *Engineering for Calcareous Sediments*. Jerell, R. J. & Khorshid, M. S., 2, International Society for Soil Mechanics and Foundation Engineering, pp. 343-56.
- Resubi Exploration Services, 1995. *Melinda Seismic Survey Field Operations Report*. Report for Mobil Exploration & Producing Australia Pty Ltd.
- Revell, C. G., and Goulter, S. W., 1986. South Pacific tropical cyclones and the Southern Oscillation. *Monthly Weather Review*, **114**: 1138-45.
- Richardson, M. J., 1994. *Final Field Operation Report- Marine Seismic Reflection Survey*. Report for Western Mining Corporation; CAR-GEN-462, Novus West Australia Pty Ltd.
- Ridgway, K. R., 1985. *Seasonal Cycles of Steric Sea Level off Western Australia with Error Analysis*. CSIRO Division of Oceanography Report No. 168, CSIRO, Hobart.
- Roberta Selleck, 1996. *Dampier Shorebase Environmental Due Diligence Report*. Report for Western Mining Corporation; CAR-GEN-521, Novus West Australia Pty Ltd.
- Robertson Research (Australia) Pty. Ltd., 1978. *Northwest continental shelf of Australia regional geologic synthesis* . Report for Western Australia Department of Mines; S1468; S1468.
- Robertson Research International Limited, 1979. *A Petroleum Geochemical Study of the North West Shelf of Australia*. Unpublished.
- Robins, J., 1969. North West trawl fishing. *Fishing Industry News Service, W.A.*, **2**: 5- 13.

- Robson, G. C., 1914. Cephalopoda from the Montebello Islands. *Procedures of the Zoological Society London*, **11**: 677-80.
- Rochford, D. J., 1969. Seasonal variations in the Indian Ocean along 110°E. Hydrological structure of the upper 500 m. *Australian Journal of Marine and Freshwater Research*, **20**: 1-50.
- Rochford, D. J., 1977. Further studies of plankton ecosystems in the eastern Indian Ocean. II. Seasonal variations in water mass distribution (upper 150 m) along 110°E. (August 1962-August 1963). *Australian Journal of Marine and Freshwater Research*, **28**: 541-55.
- Rochford, D. J., 1977. *Upwelling off the North West Coast of Australia*. Report 55, CSIRO Division of Fisheries and Oceanography, 25 pp.
- Rochford, D. J., 1984. Some general oceanographical features of the North West Shelf study region [abstract]. In: *CSIRO Division of Fisheries Research, Second Divisional Research Seminar*. CSIRO, Cronulla, NSW, pp. 8.
- Rochford, D., 1988. *Seasonal Influx of Nitrates to the Slope and Shelf Waters off Western Australia*. Report 191, CSIRO Division Marine Research, 23 pp.
- Roennfeldt, M., Rowley Shoals - truly an angling paradise. *Fins*: 22-31.
- Rogers, M. P., 1987. *Hydrodynamics study: Rock Cod Hole Creek, Port Hedland 103/76*. Report for Leslie Salt.
- Rogl, F., 1974. The Evolution of the *Globorotalia truncatulinoides* and *Cloborotalia crassaformis* group in the Pliocene and Pleistocene of the Timor Trough. In: *Initial Reports of the Deep Sea Drilling Project*. J. J. Veevers & J. R. Heirtzler, eds, U.S. Government Printing Office, Washington, D.C.
- Romine, K. K., and Durrant, J. D., 1996. Tectonic events, sequence stratigraphy and prediction of petroleum play elements in the Cretaceous and Tertiary of the northern Carnarvon Basin, North West Shelf, Australia. *American Association of Petroleum Geologists and Society of Economic Paleontologists and Mineralogists*, **5**: 121.
- Rose, D. A., 1984. Two massive petroleum projects operational. *Energy Review*, **11**(5): 148.
- Rose, R. A., and Baker, S., 1994. Larval and spat culture of the Western Australian silver- or gold-lip pearl oyster, *Pinctada maxima* (Jameson) (Mollusca: Pteriidae). **126**: 35-50.
- Rose, R. A., Dybdahl, R. E., and Harders, S., 1990. Reproductive cycle of the Western Australian silverlip pearl oyster, *Pinctada maxima* (Jameson) (Mollusca: Pteriidae). **9**: 261-72.
- Rowe, F. W. E., and Marsh, L. M., 1982. A revision of the asterinid genus *Nepanthia* Gray, 1840 (*Echinodermata: Asteroidea*) with the description of three new species. *The Australian Museum Memoir*, **16**: 89-120.
- Russell, K. L., 1988. *Prediction of Oil Spill Envelopes for the Proposed Whalebone Prospect and Rivoli Prospect Exploration Wells, Exmouth Gulf*. Prepared for LeProvost, Semenuik & Chalmer; Steedman Ltd Report No. R395, Steedman Ltd.
- Sainsbury, K. J. and Leyland, G. G., 1984. Identification of Continental Shelf fishes of North Western Australia. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. CSIRO, NSW, pp. 14.
- Sainsbury, K. J. and Lindholm, R. Y., 1986. Demersal habitats and associated fish assemblages on the North West Shelf of Australia [abstract]. In: *Australian Marine Sciences Association*. AMSA, Hobart, pp. 67.
- Sainsbury, K. J. and Whitelaw, A. W., 1981. Age, growth, mortality and feeding of *Nemipterus peronii*, *Saurida undosquamis* and *Lethrinus choerhynchus* on the North West Shelf of Australia [abstract]. In: *CSIRO Division of Fisheries Research. Divisional Research Seminar*. CSIRO, NSW, pp. 63-64.

- Sainsbury, K. J. and Whitelaw, A. W., 1984. Habitat usage by some fish species of the North West Shelf [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. CSIRO, NSW, pp. 13.
- Sainsbury, K. J., 1979. CSIRO defining fish stocks on NW shelf. *Australian Fisheries*, **38**(3): 4-13.
- Sainsbury, K. J., 1982. *Assessment of the North West Shelf Demersal Fish Stocks*. Submitted to the Department of Primary Industry.
- Sainsbury, K. J., 1982. *The Biological Management of Australia's Multispecies Fisheries: a Review of Problems and some Approaches*. 147, CSIRO Division Marine Research, 16 pp.
- Sainsbury, K. J., 1982. The ecological basis of tropical fisheries management. In: *ICLARM Conference Proceedings 1981*. Pauly, D. & Murphy, G. I., eds., pp. 167-94.
- Sainsbury, K. J., 1984. Optimal mesh size for tropical multi-species trawl fisheries. *Journal Du Conseil International Pour L'Exploration De La Mer*, **41**: 129-39.
- Sainsbury, K. J., 1986. Estimation of food consumed by periodically feeding fish from field observations. *Journal of Fish Biology*, **29**: 23-36.
- Sainsbury, K. J., 1987. Assessment and management of the demersal fishery on the continental shelf of north western Australia. In: *Tropical Snappers and Groupers, Biology and Fisheries Management*. J. J. Polovina and S. Ralston, eds, pp. 465-503.
- Sainsbury, K. J., 1988. The ecological basis of multispecies fisheries, and management of a demersal fishery in tropical Australia. In: *Fish Population Dynamics*, second edition. J. A. Gulland, ed., John Wiley & Sons, New York, pp. 383-406.
- Sainsbury, K. J., 1989. Logbook data leads to trawl closure on the Northwest Shelf . *Australian Fisheries*, November: 25-27.
- Sainsbury, K. J., 1991. Application of an experimental approach to management of a tropical multispecies fishery with highly uncertain dynamics. In: *ICES Marine Science Symposium*. 193, pp. 301-20.
- Sainsbury, K. J., and Jones, G., Daily food ration of *Nemipterus furcosus* (Pices: Nemipteridae) from the Northwest shelf of Australia.
- Sainsbury, K. J., and Lindholm, R. Y., in prep. Escapement and avoidance of a Frank and Bryce Demersal trawl on the North West Shelf of Australia. *Manuscript*.
- Sainsbury, K. J., and Lindholm, R. Y., in prep. Fish and demersal habitat associations on the North West Shelf of Australia. *Manuscript*.
- Sainsbury, K. J., and Whitelaw, A. W., 1984. Biology of Peron's threadfin bream, *Nemipterus peronii* (Valenciennes), from the North West Shelf of Australia. *Australian Journal of Marine and Freshwater Research*, **35**(2): 167-85.
- Sainsbury, K. J., and Whitelaw, A. W., 1991. Smooth sailing on *Southern Surveyor's* inaugural cruise. *Australian Fisheries*, **50**(6): 32-33.
- Sainsbury, K. J., and Whitelaw, A. W., In review. Daily food consumption of the Lizardfish *Saurida undosquamis*, on the North West Shelf of Australia.
- Sainsbury, K. J., Campbell, R. A. and Whitelaw, A. W., 1993. Effects of trawling on the marine habitat on the north west shelf of Australia and implications for sustainable fisheries management. In: *Australian Society for Fish Biology Workshop*. Hancock, D. A., Editor, Hancock, D.A., Australian Government Publishing Service, Canberra, Australia.
- Sainsbury, K. J., Campbell, R. A., Lindholm, R., and Whitelaw, A. W., 1997. Experimental management of an Australian multispecies fishery: examining the possibility of trawl-induced habitat modification. *Global Trends: Fisheries Management*. eds E. K. Pikitch, D. D. Huppert, and M. P. Sissenwine, American Fisheries Society, Bethesda, Maryland, pp. 107-12.

- Sainsbury, K. J., The Demersal Fishery Of The North West Shelf Of Australia. In: *Proceedings of the Mexico and Australian Marine Science Workshop*. pp. 311-20.
- Sakthivel, M., 1977. Further studies of plankton ecosystems in the eastern Indian Ocean VIII. Seasonal, diurnal and latitudinal variations in abundance of Euthecosomata along the 110°E. Meridian. *Australian Journal of Marine and Freshwater Research*, **28**: 645-62.
- Sammy, N., 1996. *Technical Report 2/76*.
- Sarle, L. L., Kastritis, G. J., Smith, M. P., and Hall, D. L., 1992. Offshore Canning oil potential, North West Shelf, Australia. *American Association of Petroleum Geologists Bulletin*, **76**(7): 1124.
- Saxby, J. D. and Lambert, D. E., 1988. The petroleum exploration geochemistry: application of solid-state NMR spectroscopy to the characterization of source rocks from the North West Shelf. In: *The North West Shelf, Australia: Proceedings of Petroleum Exploration Society, Australia Symposium*. Purcell P.G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, pp. 553-58 .
- SCH, 1994. *Final Field Operation Report. Marine Seismic Reflection Survey- Kathleen*. CAR-GEN-503, Novus West Australia Pty Ltd.
- SCH, 1994. *Wesminco Oil Pty Ltd WA- 149-P Offshore Oil Production*. CAR-WA-215-P-13,0, Novus West Australia Pty Ltd.
- Scheltema, R. S., and Scheltema, A. H., 1984. Larval dispersal and the geographic range among species in the bivalve family Pinnidae. **24**: 132.
- Scherrer, P, Smith, A and Dowling, R. 2008. Tourism and the Kimberley coastal waterways. Environmental and cultural aspects of expedition cruising. CRC for Sustainable Tourism Pty Ltd.
- Schiller, A., Godfrey, J. S., McIntosh, P. C., Meyers G., and Wijffels, S. E., Nearsurface dynamics and thermodynamics of the Indian Ocean and Indonesian throughflow in a global ocean general circulation model. *Journal of Geophysical Research*.
- Schlumberger Dowell, 1995. *The Ultradill System: Advanced Synthetic Based Drilling Fluid*.
- Scholten, M., Kuiper, J., Groenewoud, H. v. h., Hoornsman, G. and Vlies, E. v. d., 1987. The effects of oil and chemically dispersed oil on natural phytoplankton communities. In: *Proceedings of the conference on oil pollution organised under the auspices of international association on water pollution research and control*. IAWPRC by the . Kuiper, J. & Brink, W. J. J., Editors, Amsterdam, pp. 173-85.
- Schwiderski, E. W., 1980. On charting global ocean tides. *Reviews of Geophysics and Space Physics*, **18**(1): 243-68.
- Scoones, R. J. S., 1991. *Research on practices in the Western Australian cultured pearl industry. Final Report to Fishing Industry Research and Development Council Project BP 12*. MG Kailis Group of Companies.
- Scott, W. E., 1977. Australia takes brake off natural gas developments. *Energy International*, **14**(12): 30-32.
- Scott, W. E., 1979. North West Shelf gas for Western Australia. *Energy International*, **16**(3): 39-41.
- Scott, W. E., 1979. Western Australia updates AUD billion North West Shelf scheme. *Energy International*, **17**(2): 20-22.
- Self, R. H., and Macey, D., 1987. Harriet - one year from approval to production. *APE Journal*, **27** (1): 345-56.
- Semeniuk, V., 1983. Mangrove distribution in north western Australia in relationship of region and local freshwater seepage. *Vegetatio*, **53**: 11-31.
- Semeniuk, V., 1985. Development of mangrove habitats along ria shorelines in north and north western tropical Australia. *Vegetatio*, **60**: 3-23.

- Semeniuk, V., 1986. Terminology for geomorphic units and habitats along the tropical coast of Western Australia. *Journal of the Royal Society of Western Australia*, **68**(3): 53-79.
- Semeniuk, V., 1993. The Pilbara Coast: a riverine coastal plain in a tropical arid setting, north western Australia. *Sedimentary Geology*, **83**: 235-56.
- Semeniuk, V., 1994. *Port Hedland mangrove description and assessment*. Unpublished report for AGC Woodward-Clyde Pty, Ltd.
- Semeniuk, V., and Wurm, P. A. S., 1982. The mangroves of the Dampier Archipelago, Western Australia. *Journal of the Royal Society of Western Australia*, **69**(2): 1-87.
- Semeniuk, V., Chalmer, P. N., and Le Provost, I., 1982. The marine environments of the Dampier Archipelago. *Journal of the Royal Society of Western Australia*, **65**(3): 97-114.
- Semeniuk, V., Kenneally, K. F., and Wilson, P. G., 1978. Mangroves of Western Australia. *West Australian Naturalists' Club, Perth, Handbook number 12*: 92.
- Semeniuk, V., Kenneally, K. F., and Wilson, P. G., 1978. Mangroves of Western Australia. Western Australian Naturalist's Club.
- Semeniuk, V., Mangroves. *Landscape*, **2**(4): 44-46.
- Seow, J., 1993. *Environmental Information for Petroleum Operations in Western Australia*. Revised edition 1 July 1993, Western Australia Department of Minerals and Energy, Petroleum Division, 51 pp.
- Seymour, E. V., 1981. North West Shelf Pipeline Design - 1. Design detailed for Australia's North West Shelf Pipeline. *Oil & Gas Journal*, **79**(35): 51-54 .
- Seymour, E. V., 1981. North West Shelf Pipeline Design - 2. Oceanographic Studies, Route Selection Detailed for North West Shelf Line. *Oil & Gas Journal*, **79**(36): 143- 47.
- Seymour, E. V., 1981. North West Shelf Pipeline Design - 3. Design and construction plans detailed for North West Shelf line in Australia. *Oil & Gas Journal*, **79**(3): 75-79 .
- Seymour, E. V., 1981. Oceanographic studies, route selection detailed for North West Shelf line. *Oil & Gas Journal*, **Sept 7**: 143-46.
- Seymour, E. V., Craze, D. J., and Ruinen, W., 1984. North West shelf pipeline - 1: Designing Australia's North West shelf offshore pipeline. *Oil & Gas Journal*, **82**(19): 128-34.
- Seymour, E. V., Craze, D. J., and Ruinen, W., 1984. North West Shelf pipeline - 2 (conclusion). Laying Australia's north west shelf pipeline. *Oil & Gas Journal*, **82**(20): 97-103.
- Shafik, S., 1978. The near surface sediments of the Scott Plateau and Java Trench: nannofossil assessment and implications. *B.M.R. Journal of Australian Geology and Geophysics*, **3**: 341-45.
- Shafik, S., 1994. Significance of calcareous nannofossil-bearing Jurassic and Cretaceous sediments on the Rowley Terrace, offshore Northwest Australia. In. *AGSO Journal of Australian Geology & Geophysics: Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 71-88.
- Sheard, K., 1950. Villaret Cruise, North West Coast, August 1950. In: *8th Annual Conference, Inspectors Fisheries Dept, Perth, W.A.* pp. 1-16.
- Shepherd, B. W., 1975. A History of the Pearling Industry off the North West Coast of Australia from its origins until 1916: MA Thesis. University of Western Australia.
- Sherwood, C. R., 1988. *Estimate of Bottom Stress on the North West Shelf of Australia* CSIRO Division Marine Research; OMR-109/116.
- Shu, F. W., Shaur, S. C. and Tzong, S. C., 1973. *Investigations of Bottom Trawl Grounds in the Arafura Sea: Taiwan Fisheries Research. Inst. Keelung Cruise Report*. Cruise Report 40.
- Shu, F. W., Shoa, S. C. and Chun, H. C., 1973. *Survey of bottom trawl grounds in the Arafura Sea: Taiwan Fisheries Research Inst. Keelung Cruise Report*. Cruise Report 39.

- Simpson, C. J. and Bancroft, K. P., 1998. *A Framework for Prioritising the Establishment of Marine Conservation Reserves in Western Australia*. manuscript, Department of Conservation and Land Management, 12 pp.
- Simpson, C. J., 1985. Mass spawning of Scleratinian Corals in the Dampier Archipelago and the implications from management of coral reefs in Western Australia. *Department of Conservation and Environment Bulletin*, **244**: 35.
- Simpson, C. J., 1988. Ecology of Scleractinian corals in the Dampier Archipelago, Western Australia. *Environmental Protection Authority, Technical Series*, **23**: 227pp.
- Simpson, C. J., 1991. Mass spawning of scleractinian corals on Western Australian reefs and comparisons with the Great Barrier Reef. *Journal of the Royal Society of Western Australia*, **74**: 85-91.
- SIMTARS, 1992. *Environmental Testing of Wandoo Crude Oil*. Report for Ampol Exploration Limited; MENV 003.
- SIMTARS, 1996. *Dispersion Efficiency Testing on Wandoo Crude Oil for Ampolex Ltd*. L-0134-96/97, 16 pp.
- Sinclair and Knight, 1992. *Marine Fouling Growth on Aquatect Jackets Installed at Southpepper*. Novus West Australia Pty Ltd.
- Sinclair and Knight, 1993. *Environmental constraints for potential oil and gas developments in Caernarvon Basin, Western Australia*. Report for BHP Petroleum Pty Ltd.
- Sinclair and Knight, 1994. *Additional Environmental Monitoring of Formation Water Discharge at Airlie Island*. CAR-GEN-262,0, Novus West Australia Pty Ltd.
- Sinclair and Knight, 1994. *Environmental Appraisal and Management Actions for Seismic Activity Airlie, West Chervil and Barrow Shoals*. CAR-GEN-259, 0, Novus West Australia Pty Ltd.
- Sinclair and Knight, 1994. *Seventh Annual Environmental Report, 1993-1994*. CARTL/ 2-119,2800, Novus West Australia Pty Ltd.
- Sinclair and Knight, 1994. *Wedge-Tailed Shearwater and Oyster Monitoring*. Report for Western Mining Corporation; CAR-TL/2-223, CARGEN-260,0, Novus West Australia Pty Ltd.
- Sinclair Knight and Partners, S. a. M. G. and LeProvost Semeniuk and Chalmer, 1987. *Onslow Coastal Study*. Draft report prepared for the State Planning Commission. Sinclair Knight Consulting Engineers, 1992. *5th Annual Marine Monitoring Report for TL/2*. Report for Western Mining Corporation, 52 pp.
- Sinclair Knight Consulting Engineers, 1993. *Proposed Chronic Effects Monitoring Programme*. Report for Western Mining Corporation, 13 pp.
- Sinclair Knight Merz, 1980. *Exmouth Plateau Submarine Fan Study III. Petrographic Pints*. CAR-GEN-14,0, Novus West Australia Pty Ltd.
- Sinclair Knight Merz, 1994. *Trial of a Videographic Vegetation Monitoring Technique*. Report for Western Mining Corporation; CAR-TL/2-248, Novus West Australia Pty Ltd.
- Sinclair Knight Merz, 1995. *Emperor and Bay Prospects Post-Drill Environmental Survey*. Report for Western Mining Corporation; CAR-GEN-520, Novus West Australia Pty Ltd.
- Sinclair Knight Merz, 1996. *Desktop Environmental Evaluation of Control fluid HW525*. Report for Western Mining Corporation, 140 pp.
- Sinclair Knight Merz, 1996. *Desktop environmental evaluation of control fluid HW525*. CAR-GEN-407.
- Sinclair Knight Merz, 1996. *East Spar Gas Field Long Term Environmental Monitoring: Pre Production Survey*. Report for Apache Energy Limited.

- Sinclair Knight Merz, 1996. *Environmental Assessment of Bifouling Communities- Bifouling of Pipeline Structures Within TL/2*. Report for Western Mining Corporation; CAR-TL/2-197, Novus West Australia Pty Ltd.
- Sinclair Knight Merz, 1996. *Environmental Review of Coral Reefs of the Montebello Islands*. Report to Apache Energy Ltd; H132 Document no. EAA-00-RI-062, Apache Energy Ltd, 30 pp.
- Sinclair Knight Merz, 1996. *Preliminary Environmental Assessment of Pipeline Biofouling Communities*. Report for Western Mining Corporation; CAR-TL/2-227, Novus West Australia Pty Ltd.
- Sinclair Knight Merz, 1997. *Airlie Island Marine Survey: Tenth Annual Report for Production Licence TL/2*. CAR-TL/2-233, Novus West Australia Pty Ltd.
- Sinclair Knight Merz, 1997. *Broadscale Habitat Mapping For The Dampier Region*. Report for Mobil Exploration & Producing Australia Pty Ltd; MENV 098.
- Sinclair, A. J., O’Dea, K., and Naughton, J. M., 1983. Elevated levels of arachidonic acid in fish from northern coastal waters. *Lipids*, **18**: 877-81.
- Slack-Smith, S. M. and Bryce, C. W., 1996. Molluscs. In: *Marine Biological Survey of the Muiron Islands and the Eastern Shore of Exmouth Gulf, Western Australia*. Hutchins J.B., S. M. Slacksmith, C. W. Bryce, S. M. Morrison & M. A. Hewitt, eds, Prepared for the Ocean Rescue 2000 Program G012/94, Western Australia Museum, Perth, WA, 64-100 pp.
- Slack-Smith, S. M., 1978. Marine Plants of the Rocky Shores of the Dampier Archipelago. In: *The Marine Fauna and Flora of the Dampier Archipelago*. J. B. Hutchins, L. M. Marsh & S. M. Slack-Smith, Unpublished Report submitted to Meagher and LeProvost, Western Australia Museum, Perth, WA.
- Slack-Smith, S. M., 1978. Molluscs of the Rocky Shores of the Dampier Archipelago. In: *The Marine Fauna and Flora of the Dampier Archipelago*. J. B. Hutchins, L. M. Marsh & S. M. Slacksmith, eds, Unpublished report submitted to Meagher and LeProvost, Western Australia Museum, Perth, WA.
- Slack-Smith, S. M., Undated. *Molluscs of the Rocky Shores of the Dampier Archipelago*. unidentified report.
- Smith, B. L., and Lawrence, R. B., 1989. Aspects of exploration and development, Vulcan sub-basin Timor Sea. *APPEA Journal*, **1**: 546-56.
- Smith, D. N., 1965. *Monte Bello Geological Reconnaissance*. Report to Western Australian Petroleum Pty Ltd (WAPET).
- Smith, R. L., Huyer, A., Godfrey, J. S., and Church, J. A., 1991. The Leeuwin Current off Western Australia, 1986-1987. *Journal of Physical Oceanography*, **21**: 323-45.
- Smith, S., 1998. Western Australian Petroleum Services Index 1998. *Commerce and Trade*.
- Smyth, N. F., and Holloway, P. E., 1988. Hydraulic jump and undular bore formation on a shelf break. *Journal of Physical Oceanography*, **18**(7): 947-62.
- Sobey, R. J., and Young, I. R., 1986. Hurricane wind waves - a discrete spectral model. *Journal of Waterway, Port, Coastal and Ocean Engineering*, **112**(3): 370-389.
- Stagg, H. J. M. and Exon, N. F., 1981. *Geology of the Scott Plateau and Rowley Terrace off North Western Australia*. Bulletin 213, Bureau of Mineral Resources.
- Stagg, H. M. J., 1978. The geology and evolution of the Scott Plateau. *APEA Journal*, **18**(1): 34-43.
- Stagg, H. M. J., 1992. Deep structure of the northern Carnarvon Basin, North West Shelf. *American Association of Petroleum Geologists Bulletin*, **76**(7): 1127.
- Stagg, H. M. J., 1993. Deep Structure of the Offshore Canning Basin, North West Shelf: SNOWS-3 (Survey 120). In: *AGSO Record*. Post Cruise Report, 56 pp.
- Stagg, H. M. J., and Exon, N. F., 1981. The geology of Scott Plateau and Rowley Terrace, off north western Australia. *B.M.R. Bulletin*, **213**.

- Stanley, C. A., Ward, T. J. and Rainer, S. F., 1984. Benthic habitats on the North West Shelf [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. CSIRO, NSW, pp. 11-12.
- Stanley, G. D. Jr., 1994. Upper Triassic spongiomorph and coral association dredged off the northwestern Australia. In: *AGSO Journal of Australian Geology & Geophysics: Thematic Issue: Geology of the Outer North West Shelf, Australia*, **15**(1): 127-33.
- Steedman Limited, 1984. *Prediction of Oil Spill Trajectories for Harriet Location*. Steedman Ltd Report R256, Prepared for Australian Occidental Pty Ltd.
- Steedman Limited, 1988. *Current Modelling Workshop, March 9-11, 1988. Summary Notes*. Report for Woodside Offshore Petroleum Pty Ltd; A9640RC042, 15 pp.
- Steedman Limited, 1988. *Scopes of Work for the Goodwyn Current Modelling and Associated Studies*. Woodside Offshore Petroleum Pty Ltd, 24 pp.
- Steedman Science and Engineering, 1989. *Modelling and analysis of currents for the Goodwin Development North West Australia*. Report for Woodside Offshore Petroleum Pty Ltd; Technical Report R426.
- Steedman Science and Engineering, 1992. *Prediction of Spill Trajectories For Wandoo-1 Location*. Mobil Exploration & Producing Australia Pty Ltd.
- Steedman Science and Engineering, 1994. *Tsunami of 3 June, 1994*. Report prepared for BHP Petroleum Pty Ltd, (unpublished).
- Steedman, R. K. & A., 1982. *Preliminary Study of Oceanic and Tidal Currents and Extreme Winds, Waves and Storm Surges for Various Locations Around Australia's Northern and Western Coast*. S. Buchan and S. Stroud to Oceanographic Services Inc.
- Steedman, R. K. & A., 1983. *Final Report Oceanographic and Meteorological Measurements, Barrow Island Tanker Terminal, March 1982 to April 1983*. Report for West Australian Petroleum Pty Ltd.
- Stein, A., Scott, J., and Lunn, G., 1992. Hydrocarbon distribution on the Rankin Platform, Western Australia. *American Association of Petroleum Geologists Bulletin*, **76**(7): 1127-28.
- Stejskal, I. V. and Hayes, D., 1995. *Overview of Operations on the Lowendal Islands*. Report to Apache Energy Ltd, Reference no. H107; Document no. EAA-60-RI-047, Apache Energy Ltd.
- Stejskal, I. V., 1991. *The Effect of Seismic Surveys on Marine Animals*. Report for Woodside Offshore Petroleum Pty Ltd.
- Stejskal, I. V., 1995. *Environmental Management of Proposed Seismic Program*. Apache Energy Ltd, Reference no. H109; Document no. EAA-61-RI-007, Apache Energy Ltd.
- Stejskal, I. V., 1995. *Hydrogeological Investigation and Groundwater Monitoring, Apache Energy Lease Area, Varanus Island, Western Australia*. Report for Groundwater Technology Australia Pty Ltd.
- Stejskal, I. V., 1998. Drilling in environmentally sensitive marine areas in Western Australia: The Wonnich appraisal drilling program setting and industry example. In: *Offshore Technology Conference*. pp. 263-72.
- Stephenson, P. and Dunk, I., 1996. *Related Fishing Mortality to Trawl Effort on the North West Shelf of Australia*. Report for Fisheries Research and Development Corporation Report; 93/25.
- Stevens, J. D., and Cuthbert, G. J., 1983. Observations on the identification and biology of *Hemigaleus* (Selachii: Charcharinidae) from Australian waters. *Copeia* (2): 487-97.
- Stevens, J. D., and Lyle, J. M., 1989. Biology of three Hammerhead Sharks (*Eusphyra blochii*, *Sphyrna mokarran* and *S. lewini*) from Northern Australia. *Australian Journal of Marine and Freshwater Research*, **40**(2): 129-46.
- Stevens, J. D., and Wiley, P. D., 1986. The biology of two commercially important sharks from northern Australia. *Australian Journal of Marine and Freshwater Research*, **37**: 671-88.

- Stevens, J. D., Cuthbert, G. J., Davenport, S. R. and Wiley, P. D., 1984. The species composition of sharks taken by trawl and longline on the North West Shelf of Australia, with observations on their distribution and biology [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. pp. 17-18.
- Stewart, R. A., 1993. *Mass Spawning in the Acroporidae on the Ningaloo Reef Tract*. Report for Apache Energy Ltd, 94 pp.
- STL, 1993. *Final Field Operation Report: Yvette 3D Marine Seismic Survey*. CARGEN-206,0, Novus West Australia Pty Ltd.
- STL, 1993. *Review of Oceanography of North West Shelf and Timor Sea Regions Pertaining to the Environmental Impact of the Offshore Oil Industry. Volume 2*. CARGEN-206,0, Novus West Australia Pty Ltd.
- Stoddard, J., Fatal Attraction. *Landscape*, **4**(4): 14-20.
- Stroud, S. A., 1978. *Tropical cyclone modelling, North West Australia, Volumes 1 - 3*. Technical Report R60, prepared for EG&G International Inc., Steedman & Associates.
- Stroud, S. A., 1996. Oceanographic Research Areas to Assist Ocean Engineering on the North West Shelf of Australia. In: *ORV Franklin Workshop on "Future Strategic Workshop Directions"*. Unpublished, Hobart, pp. 33.
- Suzuki, T., Masuda, K., and Nakane, S., 1964. Variation of the catches and the volume of stomach contents of medium sized 'Kuchinidai' (*Lethrinus ornatus* Cuvier & Valencienna) between day and night and observed in the trawl ground along the north western coast of Australia. *Bull. Fac. Fish., Hokkaido University*, **15-16**: 29-44.
- Swan, J. M., Neff, J. M., and Young, P. C., 1994. *Environmental implications of offshore oil and gas development in Australia*. First ed., Australian Petroleum Exploration Association, Sydney.
- Tait, A. M., 1985. A depositional model for the Dupuy Member and Barrow Group in the Barrow Sub-Basin, north western Australia. *APEA Journal*, **25**: 282-90.
- Tait, A. M., 1985. *Harriet field geological outline based on core and log data (Harriet Nos. 1-6)*. Bond Corporation Pty. Ltd; Apache Energy Ltd.
- Tait, A. M., Bartlett, R. M., McLerie, K. M., and McKay, D. M., 1989. The Saladin Oil Field. *APEA Journal*, **1**: 212-19.
- Taiwan Fisheries Research Institute, 1981. *Preliminary Report of the R.V. Hai-Hung Cruise HK1981, in the Bass Strait and North West Shelf of Australia. Jan 30 April 13*. Cruise Report, 36-67 pp.
- Talbot, V. and Creagh, S., 1985. *Mineralogical Variation within the Marine Sediments of the Dampier Region: a Dynamic Approach*.
- Talbot, V., 1984. *Heavy Metal Concentrations in the Oysters Saccostrea cucullata and Saccostrea sp. (probably S. commercialis) from the Dampier Archipelago, Western Australia*. DEP Accession no. 907613.
- Talbot, V., Creagh, S. and Schulz, R., 1985. *The Derivation of Threshold Mean Concentrations of Copper and Zinc in Seawater, to Protect Edible Tropical Rock Oyster, Saccostrea cucullata, From Exceeding the Health (Food) Standards*. Department of Conservation and Environment.
- Tandon, K., Lorenzo, J. M., Boehme, R. S., and Pyne, D. A., 1995. Continental flexural extension in collisional margins: Timor Sea area, North West Shelf of Australia and offshore southwestern Taiwan. *EOS Transactions, American Geophysical Union*, **76**(46): 613.
- TAY, 1992. *Review of Oceanography of North West Shelf and Timor Sea. Regions Pertaining to the Environmental Impact of the Offshore Oil Industry*. CAR-GEN-183,0, Novus West Australia Pty Ltd.

- TAY, 1993. *WMC Petroleum Division Review of Corrosion Monitoring July 1992- February 1993*. CAR-GEN-220, Novus West Australia Pty Ltd.
- Taylor, G., 1990. The whale shark. *Western Australian Naturalist*, **16**: 34-38.
- Taylor, M. L., 1985. *The Pearling Industry of Western Australia 1850-1985*. Report 3, Western Australian Department of Fisheries and Wildlife, Fisheries Education Publication 3, 1-30 pp.
- Taywood Engineering Limited, 1992. *Site visit to Western Mining Corporation Petroleum Division Nth Herald /Sth Pepper Production Facilities*. Report for Western Mining Corporation, 100 pp.
- Teichert, C., 1939. The Mesozoic Transgression in Western Australia. *Australian Journal of Science*, **2**: 84-86.
- Teichert, C., and Fairbridge, R. W., 1948. Some corals of the Sahul Shelf. *Geographical Review*, **38** (2): 222-49.
- Terrell, J., and von Perger, B., 1998. Innovative petroleum industry does it again. *Prospect*, **March - May**: 6-7.
- The Ecology Lab Pty Ltd, 1997. *Macroalgal Habitats of the Lowendal/Montebello Island Region*. Report to Apache Energy Ltd; Reference no. H178; Document no EA-60-RI-072, Apache Energy Ltd.
- The Seismic Atlas of Australian and New Zealand Sedimentary Basins, 1984. *The Earth Resources Foundation, University of Sydney*. eds C. G. Skilbeck, and M. J. Lennox.
- Thom, B. G. and Chappell, J., Shelf and coastal environments in northern Australia. In: *53rd ANZASS Congress*. Paper 337, Section 11.
- Thomas, B. M. and Smith, D. N., 1976. Carnarvon Basin. In: *Economic Geology of Australia and Papua New Guinea 3 - Petroleum*. R. B. Leslie, H. G. Evans & C. L. Knight, ed., Australasian Institute of Mining and Metallurgy, 126-155 pp.
- Thomas, B. M., 1978. Robe River - an onshore shallow oil accumulation. *APEA Journal*, **18**(1): 3-12.
- Thomas, B. M., and Smith, D. N., 1974. A summary of the petroleum geology of the Carnarvon Basin. *APEA Journal*, **14**(1): 66-76.
- Thomas, J. S., Nestvold, E. O. and Crostella, A., 1981. Exploration of part of the North West Shelf of Australia (A case history). In: *Offshore South East Asia Conference*. Southeast Asia Petroleum Exploration Society.
- Thompson, N. B., 1996. Recent developments on the North West Shelf: an operator's perspective. *American Association of Petroleum Geologists and Society of Economic Paleontologists and Mineralogists*, **5**: 139-40.
- Thompson, R. O. R. Y., 1984. Observations of the Leeuwin Current off Western Australia. *Journal of Physical Oceanography*, **14**: 623-28.
- Thompson, R. O. R. Y., 1987. Continental-shelf-scale model of the Leeuwin Current. *Journal of Marine Research*, **45**: 813-27.
- Thompson, R., and Cresswell, G. R., 1983. The Leeuwin Current and undercurrent. *Tropical Oceanography and Atmospheric News*, **19**: 10-11.
- Thomson, C., and Stevens, J., 1994. A whale of a shark. *Landscape*, **10**(2): 29-34.
- Thorogood, J. A. and Davis, T. L. O., 1984. Preliminary results on age and growth of *Lutjanus vittus* from the North West Shelf [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. CSIRO, NSW, pp. 16.
- Thresher, R. E. and Gunn, J. S., 1984. Preliminary investigations involving daily ageing of fishes of the North West Shelf [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. CSIRO, NSW, pp. 16.

- Thresher, R. E., Sainsbury, K. J., Gunn, J., and Whitelaw, A. W., 1986. Life history strategies and recent changes in population structure in the lizard-fish genus, *Saurida*, on the Australian North West Shelf. *Copeia*, **4**: 876-85.
- Tingay, A. and Tingay, S. R. *Vertebrate Fauna Study of Burrup Peninsula*. Report for Woodside Petroleum Development Pty Ltd, 66 pp.
- Tout, J. T., and Houghton, D. J., 1989. Australian continent in major resource projects; the North West Shelf Project Experience. *APEA Journal*, **2**: 92-97.
- Towner, R. R. and Gibson, D. L., 1983. *Geology of the Onshore Canning Basin, Western Australia*. Bulletin 215, Bureau of Mineral Resources, Australia.
- Tranter, D. J. and Leech, G. S., 1984. Tidal influences on the ecology of the North West Shelf [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. CSIRO, NSW, pp. 10-11.
- Tranter, D. J., 1958. Reproduction in Australian pearl oysters (Lamellibranchia). I. *Pinctada albina* (Lamarck): primary gonad development. *Australian Journal of Marine and Freshwater Research*, **9**: 135-43.
- Tranter, D. J., 1958. Reproduction in Australian pearl oysters (Lamellibranchia). II. *Pinctada albina* (Lamarck): gametogenesis. *Australian Journal of Marine and Freshwater Research*, **9**: 143-58.
- Tranter, D. J., 1958. Reproduction in Australian pearl oysters (Lamellibranchia). III. Breeding season and sexuality. *Australian Journal of Marine and Freshwater Research*, **9**: 191-216.
- Tranter, D. J., 1958. Reproduction in Australian pearl oysters (Lamellibranchia). IV. *Pinctada margaritifera* (Linnaeus). *Australian Journal of Marine and Freshwater Research*, **9**: 509-25.
- Tranter, D. J., 1959. Reproduction in Australian pearl oysters (Lamellibranchia). V. *Pinctada fucata* (Gould). *Australian Journal of Marine and Freshwater Research*, **10**: 45-66.
- Tranter, D. J., 1962. Zooplankton abundance in Australasian waters. *Australian Journal of Marine and Freshwater Research*, **13**: 106-42.
- Tranter, D. J., 1977. Further studies of plankton ecosystems in the eastern Indian Ocean. 1. Introduction - the study and study area. *Australian Journal of Marine and Freshwater Research*, **28**(5): 529-39.
- Tranter, D. J., 1977. Further studies of plankton ecosystems in the eastern Indian Ocean. 5. Ecology of the Copepoda. *Australian Journal of Marine and Freshwater Research*, **28**(5): 593-625.
- Tranter, D. J., 1977. Further studies of plankton ecosystems in the eastern Indian Ocean. 7. Ecology of the Amphipoda. *Australian Journal of Marine and Freshwater Research*, **28**: 645-62.
- Tranter, D. J., and Kerr, J. D., 1977. Further studies of plankton ecosystems in the eastern Indian Ocean. 3. Numerical abundance and biomass. *Australian Journal of Marine and Freshwater Research*, **28**(5): 557-83.
- Tranter, D. J., and Leech, G. S., 1987. Factors influencing the standard crop of phytoplankton on the Australian North West Shelf seaward of the 40 m isobath. *Continental Shelf Research*, **7**(2): 115-33.
- Tranter, D. J., Bulleid, N. C., Campbell, R. A., Higgins, H. W., Rowe, F., Tranter, H. A., and Smith, D. F., 1981. Nocturnal movements of phototactic zooplankton in shallow waters. *Marine Biology*, **61**: 317-26.
- Trendall, J., 1996. Aquaculture opportunity in the tropics. *Western Fisheries*, **Spring/Summer**: 30-31.
- Treerell, J., 1998. Gorgon bigger than the Olympics. *Prospect*, **March-May**: 12-13.
- Tsvetnenko, Y. B. and Evans, L. H., 1996. *Comparative Bioassay of Toxicity of Harriet and Wonnich Crude Oils to Marine alga Isochrysis sp.* Report to Apache Energy Ltd; Reference no. 133; Document no. WO-00-RI-002, Apache Energy Ltd.
- Tsvetnenko, Y. B. and Evans, L. H., 1996. *Comparative Bioassay of Toxicity of Harriet and Wonnich Crude Oils*. Report to Apache Energy Ltd; Reference no. H133; Document no. WO-00-RI-002, Apache Energy Ltd.

- Tsvetnenko, Y. B., Evans, L. H. and Gorrie, J., 1996. *Toxicity Bioassay with Ultradril Drilling Fluid and Untidril *C380 Base Oil using Three Australian Marine Species*. Schlumberger Dowell, 20 pp.
- Tsvetnenko, Y. B., Evans, L. H. and Gorrie, J., 1996. *Toxicity of the water-solubility fraction of Stag-6H crude oil to three marine species*. Report to Apache Energy Ltd; Reference no. H149; Document no EA-62-RI-001/B, Apache Energy Ltd.
- Tuppin, N. K., 1969. Carbonate sediments and sedimentation, Hopeless Reach, Shark Bay, Western Australia: (BSc Hons thesis). Dept of Geology, University of Western Australia.
- Turner, S. J., 1992. The egg capsule and early life history of the corallivorous gastropod *Dupella cornus*. *The Veliger*, **35**(1): 16-25.
- Turner, S. J., 1994. Spatial variability in the abundance of the corallivorous gastropod *Dupella cornus*. *Coral Reefs*, **13**: 41-48.
- Turner, S. J., 1994. The biology and population outbreaks of the corallivorous gastropod *Drupella* on the Indo-Pacific reefs. *Oceanography and Marine Biology*, **32**: 461-530.
- V & C Semeniuk Research Group, 1991. *Mangroves Along the Pipeline Route - Mardie Coastal Area: Their Population Structure and Maintenance Strategy - Implications for Rehabilitation*. Report to Apache Energy Ltd; Reference no. H43; Document no. EAA-60-RV-005, Apache Energy Ltd.
- V & C Semeniuk Research Group, 1992. *Monitoring of Terrestrial Vegetation Lowendal Island Group - June 1992 Survey*. Report to Apache Energy Ltd: Reference no. H7: Document no. EAA-60-RV-011, Apache Energy Ltd.
- V & C Semeniuk Research Group, 1992. *Use of Insecticides as Possible Remedial Action to Eradicate Scale Insects on Mangrove Leaves - Results of Surveys October 1992 - June 1992*. Report to Apache Energy Ltd: Reference no. H74: Document no. EAA-60-RV-010, Apache Energy Ltd.
- V & C Semeniuk Research Group, 1993. *Monitoring of Terrestrial Vegetation Lowendal Island Group - June 1993 Survey*. Report to Apache Energy Ltd; Reference no. H80; Document no. EAA-60-RV-014, Apache Energy Ltd.
- V & C Semeniuk Research Group, 1995. *Monitoring of Terrestrial Vegetation June 1995*. Report to Apache Energy Ltd; Reference no. H117; Document no. EAA-60-RI-57, Apache Energy Ltd.
- Vail, A. M. A., Bremner, H. A., Olley, J. and Stathan, H. A., 1986. Influence of nucleotide catabolism on the storage life of tropical species of fish from the North West Shelf of Australia. In: *CSIRO-DSIR Workshop on Fish technology*.
- van Senden, D. C., 1994. *Harriet Alpha Produced Water Dispersion: A Preliminary Assessment*. Report to Apache Energy Ltd; Reference no. H96; Document no. EAA-60-RI-040, Apache Energy Ltd.
- Vaughan, P. S., 1993. North West Shelf 3-D seismic; a decade of developments. *APEA Journal*, **33**(1): 315-21.
- Veenstra, E., 1985. Rift and drift in the Dampier Sub-basin, a seismic and structural interpretation. *APEA Journal*, **18**(1): 177-89.
- Veevers, J. J. and Johnstone, M. H., 1974. Comparative Stratigraphy and Structure of the Western Australian Margin and the Adjacent Deep Ocean Floor. In: *Initial Reports of the Deep Sea Drilling Project*. J. J. Veevers & J. R. Heirtzler, eds, 27, 571-585 pp.
- Veevers, J. J. and Roberts, J., 1968. In: *Upper Palaeozoic Rocks, Bonaparte Gulf Basin of northwestern Australia*. Bulletin 97, Bureau of Mineral Resources, Geology and Geophysics.
- Veevers, J. J., 1973. Stratigraphy and structure of the continental margin between North West Cape and Seringapatam Reef, north West Australia. *B.M.R Bulletin*, **139**: 79-102.
- Veevers, J. J., 1982. *Western and Northwestern Margin of Australia*. Plenum Press, New York.

- Veevers, J. J., 1988. Morphotectonics of Australia's Northwestern Margin A Review. In: *The North West Shelf, Australia: Proceedings of Petroleum Exploration Society, Australia Symposium*. Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia, pp. 19-28.
- Veevers, J. J., and Powell, C. M., 1979. Sedimentary-wedge progradation from transform-faulted continental rim: Southern Exmouth Plateau, Western Australia. *American Association of Petroleum Geologists Bulletin*, **63**: 2088-96.
- Veevers, J. J., Tayton, J. W., and Johnson, B. D., 1985. Prominent magnetic anomaly along the continent-ocean boundary between the north western margin of Australia (Exmouth and Scott Plateaus) and the Argo Abyssal Plain. *Earth and Planetary Science Letters*, **72**: 415-26.
- Vernon, J. E. N., 1986. Part 2: Reef Building Corals. *Records of the Western Australian Museum*, **25**: 27-34.
- Vernon, J. E. N., 1987. Coral reefs on Western Australia. A study of coral reefs in Western Australia reveals widely diverse species. *Ascent*(13).
- Vernon, J. E. N., 1993. Part 2. Hermatypic Corals of Ashmore Reef and Cartier Island. In: *Marine Faunal Survey of Ashmore Reef and Cartier Island North Western Australia*. Supplement 44, Western Australian Museum.
- Vernon, J. E. N., and Marsh, L. M., 1988. Hermatypic corals of Western Australia: Records and annotated species list. *Records of the Western Australian Museum*, **29**: 1-136.
- Verth, P., 1993. The Aboriginal occupation of the Montebello Islands, north west Australia. *Australian Aboriginal Studies*, **2**.
- Vincent, P. and Tilbury, L., 1988. Gas and oil fields of the Rankin Trend and Northern Barrow-Dampier Sub-basin. In: *The North West Shelf Australia*. Purcell, P. G. & Purcell, R. R., Petroleum Exploration Society of Australia Ltd, pp. 341-70.
- Vinnicombe, P., 1987. *Dampier Archaeological Project. Resource Document, Survey and Salvage of Aboriginal Sites, Burrup Peninsula, Western Australia*. Report for Woodside Offshore Petroleum Pty Ltd.
- Volkman, J. K., Alexander, R., Kagi, R. I., Noble, R. A., and Woodhouse, G. W., 1983. A geochemical reconstruction of oil generation in the Barrow sub-basin of Western Australia. *Geochimica Et Cosmochimica Acta*, **47**: 2091-105.
- Volkman, J. K., Alexander, R., Kagi, R. I., Rowland, S. J., and Sheppard, P. W., 1984. Biodegradation of aromatic hydrocarbons in crude oils from the Barrow Sub-Basin of Western Australia. *Organic Geochemistry*, **6**: 619-32.
- Vollprecht, R., 1972. *Climatic Survey Northwest, Region 6*. Western Australia: Australian Government Publishing Service, Canberra, 144 pp.
- von Rad, U., and Exon, N. F., 1982. Mesozoic-Cainozoic sedimentary and volcanic evolution of the starved passive continental margin off north west Australia. *American Association of Petroleum Geologists Bulletin*, **66**: 253-81.
- von Stackelberg, U., Exon, N. F., von Rad U., Quilty, P., Shafik, S., Beiersdorf, H., Seibertz, E., and Veevers, J. J., 1980. Geology of the Exmouth and Wallaby Plateaus off northwest Australia: sampling of seismic sequences. *BMR Journal of Australian Geology & Geophysics*, **5**: 113-40.
- von Stackelberg, U., Exon, N. F., von Rad, U., Quilty P., Shafik, S., Beiersdorf, M., Seibertz, E., and Veevers, J. J., 1980. Geology of Exmouth and Wallaby Plateaus of north west Australia: sampling of seismic sequences. *BMR Journal of Australian Geology and Geophysics*, **5**: 113-40.
- Vos, R. G. and McHattie, C. M., 1981. Upper Triassic depositional environments, Central Exmouth Plateau (permit WA-84-P) north western Australia. In: *5th Australian Geological Convention*.
- Wadley, V. A. and Evans, D. R., 1992. *Crustaceans from the West and North West Slope Deepwater Trawl Fisheries*. CSIRO, 40 pp.

- Wadley, V. A. and Morris, S. M., 1990. Deepwater fishery for prawns and carids off Western Australia. In: *Proceedings of the International Crustacean Conference*. 31, Memoirs of the Queensland Museum., Queensland, pp. 456.
- Wadley, V. A. and Phillips, B. F., 1990. Development of a trawl fishery for deepwater metanephropod lobsters of the north west continental slope of Australia. Designing a management strategy compatible with species life history. In: *Symposium on Shellfish Life Histories and Shellfishery Models*.
- Wadley, V. A. and Swainston, R., 1990. *Squid from the West and North West Slope Deepwater Trawl Fishery*. CSIRO (Australia), 12 pp.
- Wadley, V. A., 1990. First Australian Workshop Pelagic Molluscs: Summary and Recommendations. *Australian Marine Science Bulletin*, **109**: 16.
- Wadley, V. A., 1992. Biology of the deep-water prawn, *Aristaeomorpha foliacea* (Decapoda: Aristeidae), on the north-west slope of Australia. In: *Australian Marine Sciences Association Annual Conference*. AMSA, pp. 67.
- Wadley, V. A., 1992. Cephalopods from Demersal Trawling on the North West Slope. In: *The Fisheries Biology of Deepwater Crustacea and Finfish on the Continental Slope of Western Australia*. S. F. Rainer, ed., Final report to the Fisheries Research and Development Corporation (FRDC Project 1988/74), CSIRO.
- Wadley, V. A., 1992. Distribution, Growth and Reproductive Development of the Giant Red Prawn, *Aristaeomorpha foliacea* (Risso, 1827) in the North West Slope Fishery. In: *The Fisheries Biology of Deepwater Crustacea and Finfish on the Continental Slope of Western Australia*. S. F. Rainer, ed., CSIRO, 75-94 pp.
- Wadley, V. A., 1992. The Biology of Scampi, Prawns, Carids, Bugs and Crabs exploited by Deepwater Trawling. In: *The Fisheries Biology of Deepwater Crustacea and Finfish on the Continental Slope of Western Australia*. S. F. Rainer, ed., Final report to the Fisheries Research and Development Corporation (FRDC Project 1988/74, CSIRO, 95-122 pp.
- Wadley, V. A., 1993. Cephalopods from demersal trawling on Australia's North West Slope. In: *Recent Advances in Cephalopod Fisheries Biology*. eds T. Okutani, R. K. O'Dor, and T. Kubodera, Tokai University Press, Shimizu, Japan, pp. 603-13.
- Wadley, V. A., 1994. Biology and fishery of *Aristaeomorpha foliacea* on the North- West Slope of Australia pp. 63-64. In: *Life cycles and fisheries of the deep-water red shrimps *Aristaeomorpha foliacea* and *Aristeus antennatus**. M. L. Bianchini, and S Ragonese *N.T.R.-I.T.T.P. Special Publication*, **3**: 87.
- WAIT: The Petroleum Geochemistry Group *Reconnaissance Survey of Background Levels of Halogenated Materials in Rock Oysters from Mermaid Sound, Western Australia*. Report for Woodside Petroleum Development Pty Ltd.
- WAIT: The Petroleum Geochemistry Group, 1983. Polycyclic Aromatic Hydrocarbons in Rock Oysters from Mermaid Sound, Western Australia. In. Report for Woodside Petroleum Development Pty Ltd.
- Walker, Alison E., and Wilkin, John L., 1998. Optimal averaging of NOAA/NASA Pathfinder satellite sea surface temperature data. *Journal of Geophysical Research*, **103**(C6): 12869-83.
- Walker, D. I., 1991. The effect of sea temperature on seagrass and algae on the Western Australia coastline. *Journal of the Royal Society of Western Australia*, **74**: 71-77.
- Walker, D. I., 1992. *Part IX. Seagrasses Survey of the Aquatic Fauna of the Kimberley Islands and Reefs Western Australia*. G. J. Morgan, ed., Report of the Kimberley Island and Reef Expedition August 1991, Western Australian Museum, Perth, WA, 23-29 pp.
- Walker, D. I., 1994. Grasses of the sea. *Landscape*: 42-46.

- Walker, D. I., and McComb, A. J., 1992. Seagrass degradation in Australian coastal waters. *Marine Pollution Bulletin*, **25**(5-8): 191-95.
- Walker, D. I., and Prince, R. I. T., 1987. Distribution and biogeography of seagrass species on the northwest coast of Australia. *Aquatic Botany*, **29**: 19-32.
- Walker, D. I., Kendrick, G. A., and McComb, A. J., 1988. The distribution of seagrasses in Shark Bay, Western Australia, with notes on their ecology. *Aquatic Botany*, **30**: 305-17.
- Walker, D. I., Kendrick, G., Campey, M., Kinhill Engineers Pty. Ltd., Wells, F.,
- Walker, D. I., Wells, F. E. and Hanley, J. R., 1996. *Marine Biological Survey of the Eastern Kimberley, Western Australia*. Western Australian Museum and the Museum and Art Gallery of the Northern Territory.
- Walker, D.I. and Prince, R.I.T. 1987. Distribution and biogeography of seagrass species on the North-West Coast of Australia, *Aquatic Botany* 29: 19-32.
- Walker, DI. 1995. Seagrass and macroalgae. In: Wells, FE, Hanley R and Walker, DI (Eds.). *Marine Biological survey of the southern Kimberley, Western Australia*. Western Australian Museum, Perth, W.A.
- Walker, DI. 1997. Macroalgae and seagrasses. In: Walker, DI (ed.) *Marine Biological survey of the central Kimberley coast, Western Australia*. University of Western Australia, Crawley, W.A.
- Walker, S. J., 1997. *Exploratory 2-Dimensional Vertical Slice Simulations of a Region of the North West Shelf*. unpublished report OMR-100/109, CSIRO Division of Marine Research, Hobart.
- Wallace, B. C. and Wilkinson, D. L., 1981. Run-Up Characteristics of Shoaling Internal Waves. In: *Fifth Australian Conference on Coastal and Ocean Engineering 1981: Offshore Structures*. National Committee on Coastal and Ocean Engineering Australia, pp. 121-22.
- Wallingford Hydraulics Research Station, 1972. *Port of Wyndham W.A. Siltation Study*. EX 586, Wallingford Hydraulics Research Station, U.K..
- Wallner, B. G., and Phillips, B. F., 1988. From scampi to deepwater prawns: developments in the north west shelf deepwater trawl fishery. *Australian Fisheries*, **47**(9): 34-8.
- Wallner, B., Phillips, B. F. and Hobbs, L. J., 1989. *The Fisheries Biology of Scampi (Metanephrops spp.)*. Fishing Industry Research and Development Council, Final Report to FIRTA, Grant Number 1985/82; 46.
- Walter, D. G., 1981. Some historical aspects of Taiwanese gill netting off northern Australia. In: *Northern Pelagic Fish Seminar*. Grant, C. J. & Walter, D. G., eds, Australian Government Publishing Service.
- Ward, T. and Davis, T., 1986. Deepwater crustaceans from the continental slope of north west Australia. In: *Australian Marine Sciences Association*. AMSA, Hobart.
- Ward, T. J. and Blaber, S. J. M., 1994. Continental shelves and slopes. In: *Marine Biology*, 1. L. S. Hammond and R. N. Synnot, eds, Addison Wesley Longman Australia Pty Ltd, Melbourne, pp. 333-44.
- Ward, T. J., and Davis, L. O., 1987. Diel periodicity of *Metanephrops australiensis* and other deep-water crustaceans of north west Australia. *Fisheries Research*, **5**: 91-97.
- Ward, T. J., and Rainer, S. F., 1988. Decapod crustaceans of the North West Shelf, a tropical continental shelf off north western Australia. *Australian Journal of Marine and Freshwater Research*, **39**: 751-65.
- Ward, T. J., Rainer, S. F. and Stanley, C. A., 1984. Diel changes in epibenthic crustaceans on the North West Shelf [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. pp. 13.
- Ward, T. M., 1996. Sea snake by-catch of fish trawlers on the northern Australian continental shelf. *Marine and Freshwater Research*, **47**(4): 625-30.

- Waring, J., Walker, S. and Condie, S., 1988. *20 km Coarse and 5 km Nested Hydrodynamic Models of the North West Shelf*. unpublished report OMR-117/109, CSIRO Division of Marine Research, Hobart.
- Warris, B. J., 1973. Plate tectonics and the evolution of the Timor Sea, north west Australia . *APEA Journal*, **13**(1): 13-18.
- Warris, B. J., 1988. The geology of the Mount Horner oilfield, Perth Basin, Western Australia . *APEA Journal*, **28**: 88-99.
- Warris, B. J., 1993. The hydrocarbon potential of the Palaeozoic basins of Western Australia. *APEA Journal*, **33**(1): 123-37.
- Warris, G. J., 1976. Canning Basin, Offshore. In: *Economic Geology of Australia and Papua-New Guinea-3, Petroleum Australasian Institute of Mining and Metallurgy*. R. B. Leslie, H. J. Evans & C. L. Knights, eds, 541.
- Weaver, A. J., and Middleton, J. H., 1988. On the dynamics of the Leeuwin Current. *Journal of Physical Oceanography*, **19**: 626-48.
- Weaver, A. J., and Middleton, J. H., 1990. An analytic model for the Leeuwin Current off Western Australia. *Continental Shelf Research*, **10**: 105-22.
- Weaver, O. D., and Houde, Y., 1979. Perth, Carnarvon basins merit more tests. *Oil & Gas Journal*, **78**(4): 208-21.
- Weaver, O. D., and Houde, Y., 1980. The North West Shelf - Exmouth Plateau activity. *Oil & Gas Journal* , **78**(3): 110-112, 114, 117-19.
- Weaver, O. D., Houde, Y., and Smitherman, J., 1980. Western Australia: oil and gas potential - Part 1. *Oil & Gas Journal*, **78**(2): 139-43.
- Webster, I., 1985. Wind-driven circulation on the North West Shelf of Australia. *Journal of Physical Oceanography*, **15**(11): 1357-68.
- Webster, I., 1986. The vertical structure of currents on the North West Shelf of Australia at sub-tidal frequencies. *Journal of Physical Oceanography*, **16**(7): 1145-57.
- Webster, Ian, 1985. Frictional continental shelf waves and the circulation response of a continental shelf to wind forcing. *Journal of Physical Oceanography*, **15**(7): 855-64.
- Wells, F. E., and Slack-Smith, S. M., 1986. Part IV. Molluscs. In: Faunal surveys of the Rowley Shoals, Scott Reef and Seringapatam Reef, north-western Australia. *Records of the Western Australian Museum, Perth*, **Supplement 25**.
- Wells, F. E. and Slack-Smith, S. M. Zonation of Molluscs in a Mangrove Swamp in the Kimberley, Western Australia. In: *Biological Survey of Mitchell Plateau and Admiralty Gulf, Kimberley, WA*. Western Australian Museum, Museum of Western Museum, 265- 274 pp.
- Wells, F. E., 1980. *The Distribution of Shallow-Water Marine Prosobranch Gastropod Molluscs along the Coastline of Western Australia*. 22, Western Australian Museum, 232-247 pp.
- Wells, F. E., 1983. An analysis of marine invertebrate distributions in a mangrove swamp in Northwestern Australia. *Bulletin of Marine Science*, **33**(3): 736-44.
- Wells, F. E., 1984. Comparative distribution of macromolluscs and macrocrustaceans in a north western Australian mangrove system. *Australian Journal of Marine and Freshwater Research*, **35**: 591-96.
- Wells, F. E., 1992. Part IV. Molluscs. In: *Survey of the Aquatic Fauna of the Kimberley Islands and Reefs Western Australia*. G. J. Morgan, ed., Report of the Kimberley Island and Reef Expedition August 1991, Western Australian Museum, Perth, WA, 23-29 pp.
- Wells, F. E., 1993. Part 4. Molluscs of Ashmore Reef and Cartier Island. In: *Marine Faunal Survey of Ashmore Reef and Cartier Island North Western Australia*. Supp 44.

- Wells, F. E., 1997. Shallow Water Marine Gastropods Endemic to Western Australia, 26, 73-80 pp.
- Wells, F. E., Hanley, J. R. and Walker, D. I., 1995. *Marine Biological Survey of the Southern Kimberley Islands, Western Australia*. Western Australian Museum.
- Wells, F., Slack-Smith, S. and Bryce, C. W., 1993. *Molluscs Survey of the Marine Fauna and Habitats of the Montebello Islands, August 1993*. P. F. Berry, ed., Report to the Department of Conservation and Land Management, Western Australian Museum, Perth, WA, 35-65 pp.
- Wells, F.E. and Walker, D.I. 2003 Introduction to the marine environment of Dampier, Western Australia. In: *The Marine Flora and Fauna of Dampier, Western Australia*. (Eds. F.E. Wells, D.I. Walker and D.S. Jones), Western Australian Museum. pp.1-12
- Wells, P. E., and Chivas, A. R., 1994. Quarternary foraminiferal bio and isotope stratigraphy of ODP holes 122-760A and 122-762B, Exmouth and Wombat Plateaus northwest Australia. *Australian Journal of Earth Science*, **41**: 455-62.
- Wells, S. M., 1988. Indian Ocean, Red Sea and Gulf. In: *Coral Reefs of the World*. Cambridge, UK, pp. 1-26.
- Wells, V., 1960. The 1959/60 survey of pearling grounds. *Fishing News*, **19**(4): 3-9.
- Wen, T., Liu, H., and Yeh, S., 1987. Age and growth of lizard fish saurida Undosouamis (Richardson), in the North West Shelf off Australia . *ACTA Oceanographica Taiwanica*, **18**(1-15).
- Wesminco Oil Pty Ltd, 1984. WA-149P, Offshore Oil Production. In: *Consultative Environmental Review*. Wesminco Oil Pty Ltd, 1985. South Pepper - North Herals Oil Field Project. In: *ERMP Position Statement*.
- West Australian Environmental Protection Authority, 1994. *Red Book Status Report*. Environmental Protection Authority Bulletin.
- West Australian Petroleum Pty Ltd, 1988. Thevenard Island Environmental Management Programme. In: *Saladin Field Development*.
- West Australian Petroleum Pty Ltd, 1991. *Permit Area TP/3 Part 1, Five Year Exploration and Drilling Programme*. Consultative Environmental Review.
- West Australian Petroleum Pty Ltd, 1991. *Pre-Drilling Site Survey Skate, Roller 3, Roller Shoal, Weld, Coaster, Blade*. Report prepared for West Australian Petroleum Pty Ltd.
- West Australian Petroleum Pty Ltd, 1992. *Saladin Oilfield Development*. Triennial Environment Management Report.
- West Australian Petroleum Pty Ltd, 1993. *Disposal of Produced Water on Thevenard Island Environmental Review of Deep Well Injection Proposal*. 40 pp.
- West Australian Petroleum Pty Ltd, 1994. *Environment Management Review*. Final report, 54 pp.
- West Australian Petroleum Pty Ltd, 1994. *Safety & Environmental Management Review 1994*. 23 pp.
- West Australian Petroleum Pty Ltd, 1997. *Characterisation and Management of Contaminated Sites on Barrow Island*.
- West, G. J. and Davis, T. L. O., 1984. Preliminary results on reproductive cycles of lutjanids from the North West Shelf based on field data [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar* . CSIRO, NSW, pp. 16.
- Western Australian Maritime Museum, 1991. *Macey's Wreck: An Unidentified Wreck in the Mangroves at Mardie Station*. Report to Apache Energy Ltd; Reference no. H34; Document no. EAA-60-RI-013, Apache Energy Ltd.
- Western Mining Corporation, 1995. *East Spar Offshore Gas/Condensate Proposal*. Consultative Environmental Review.

- Western Mining Corporation, 1995. *Environmental Management Plan Part 1 Construction on Varanus Island*.
- Western Mining Corporation, 1995. *Environmental Management Plan Part 2 Offshore Environment and Pipeline Construction*.
- Western Mining Corporation, 1995. *WMC East Spar Consultative Environmental Review*.
- Western Mining Corporation, 1996. *Airlie Island Oil Storage Facility TL/2- Environmental Site Assessment*. CAR-TL/2-183, Novus West Australia Pty Ltd.
- Western Mining Corporation, 1996. *East Spar Development EMP Part 3; Commissioning and Operations*.
- Western Mining Corporation, 1996. *East Spar Environmental Management Plan: Part Three - Operation*.
- Western Mining Corporation, 1996. *Integrated Shearwater Monitoring Program Annual Report*. CAR-GEN-463, Novus West Australia Pty Ltd.
- Western Mining Corporation, 1996. *Marine Operations Project Plan for Job #8690*. CAR-GEN-456, Novus West Australia Pty Ltd.
- Western Mining Corporation, 1996. *Proceedings Of Workshop: Offshore Platform Decommissioning*.
- Western Mining Corporation, 1996. *Proposed Changes to Environmental Protection Act Licensing System and Fee Structure*. CAR-TL/2-174, Novus West Australia Pty Ltd.
- Western Mining Corporation, 1996. *Vegetation Monitoring Airlie Island*. CAR-TL/2- 182, Novus West Australia Pty Ltd.
- Western Mining Corporation, 1998. *Airlie Project Environmental Management Plan*. CAR-TL/2-236; Draft.
- WGC, 1995. *Health, Safety and Environmental (HSE) Policy Manual*. CAR-GEN-512, Novus West Australia Pty Ltd.
- White, M., 1993. North West Shelf program points the way for increased use of 3-D Seismic as oil exploration tool. *Petroleum Gazette*, **1**: 31-35.
- Whitelaw, A. W., 1986. Ageing of tropical demersal fish species of north west Australia. In: *Australian Marine Sciences Association*. AMSA, Hobart.
- Whitelaw, A. W., and Sainsbury, K. J., Biology of the starry triggerfish *Abalistes stellatus* (Pices: Balistidae) from the North West Shelf of Australia. *in Preparation*. Whitelaw, A. W., and Sainsbury, K. J., 1986. Tag loss and mortality rates of a small tropical demersal fish species, *Lutjanus carponotatus* (Pices: Lutjanidae), tagged with dart and anchor tags. *Australian Journal of Marine and Freshwater Research*, **37**: 323-27.
- Whitelaw, A. W., Campbell, R. A., Sainsbury, K. J., and Dews, G. J., 1991. New ideas about fish trapping. *Australian Fisheries*, **August**: 26-29.
- Whitelaw, A. W., In review. *Condition changes and length weight relationships for 21 species of fish from the families; Lutjanidae, Nemipteridae, Carangidae, Lethrinidae, Synodontidae, Balistidae, Haemulidae and Mullidae, from the North West Shelf of Australia*. CSIRO Divisional Report.
- Whitelaw, A. W., Sainsbury, K. J., Dews, G. J., and Campbell, R. A., 1991. Catching characteristics of four fish-trap types on the North West Shelf of Australia. *Australian Journal of Marine and Freshwater Research*, **42**(4): 369-82.
- Whitely, G. P., 1945. Cruise of the MV Isobel July 13 to December 14, 1945. In: *Biologists Log*. Fisheries Dept Western Australia (unpublished report).
- Whitfield, F. B, Shaw, K. J., and Walker, D. I., 1992. The source of 2,6-dibromophenol: cause of an iodoform taint in Australian prawns. *Water Science Technology*, **25**(2): 131-38.

- Whitley, G. P., 1950. A new shark from north-western Australia. *Western Australian Naturalist*, **2**(5): 100-105.
- Whitworth, R., 1972. *Marine Geophysical Survey of the North-west Continental Shelf, 1968*. 41, Mineral Resources Development Series, 234-242 pp.
- Wijffels, S. E., Bray, N. A., Meyers, G., and Morawitz, W. M. L., 1996. The WOCE Indonesian throughflow repeat hydrography sections: I10 and IR6. *International WOCE Newsletter*: 25-28.
- Wilkins, R. W. T., 1992. The thermal maturity of organic matter in North West Shelf sedimentary basins. *Exploration Research News*, **6**: 6-7.
- Wilkins, R. W. T., Wilmshurst, J. R., Hladky, G., Ellacott, M. V., and Buckingham, C. P., 1992. The suppression of vitrinite reflectance in some North West Shelf wells: Barrow-1, Jupiter-1 and Flamingo-1. *APEA Journal*: 300-312.
- Wilkinson, R., 1979. NW Shelf: it's a clean scheme, says Woodside Petroleum report. *Offshore Engineering*, **7**: 35.
- Wilkinson, R., 1982. *Offshore Engineering*, **1982**(11): 69-88.
- Wilkinson, R., 1988. Australia's oil exploration history: Petroleum in Australia, The First Century. *APEA Journal*: 15-22.
- Willcom, J. B., Stagg, H. M. J., Symonds, P. A., Colwell, J. B., O'Brien, G. W., and Smith, P. L., 1994. Deep reflection on the North West Shelf of Australia. *EOS Transactions, American Geophysical Union*, **75**: 666.
- Willcox, J.B., 1996. Critical tectonic events in the development of the North West Shelf. *Geological Society Australia Journal*, **41**: 473.
- Williams, A. F., and Poynton, D. J., 1985. The geology and evolution of the South Pepper hydrocarbon accumulation. *APEA Journal*, **25**(1): 235-47.
- Williams, A. J., 1988. The Rosette discovery, Barrow Sub-basin. In: *The North West Shelf, Australia: Proceedings of Petroleum Exploration Society, Australia Symposium*. Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia, pp. 403-12.
- Williams, A., 1990. *Commercial Trawl Fish from the Western and North West Slope Deepwater Trawl Fisheries*. CSIRO Report, 46 pp.
- Williams, A., 1992. Continental slope fishes from western and north western Australia. In: *Australian Marine Sciences Association Annual Conference*. pp. 69.
- Williams, A., 1992. The Fisheries Biology of the Finfish. In: *The Fisheries Biology of Deepwater Crustacea and Finfish on the Continental Slope of Western Australia*. S. F. Rainer, ed., Final report to the Fisheries Research and Development Corporation (FRDC Project 1988/74), CSIRO, 157-162 pp.
- Williams, A., Moran, M., Caputi, N., and Walters, C., 1993. Didymozoid trematode infection of snapper, *Pagrus auratus* (Sparidae), off Western Australia: parasite population biology and fishery implications. *Fisheries Research*, **16**: 113-29.
- Williams, C. T., 1977. An analysis of the production performance of the Windalia Sand Reservoir of the Barrow Island Oil Field. *APEA Journal*, **17**(1): 105-13.
- Williams, L. W., Forman, D. J. and Hawkins, P. J., 1973. *Sedimentary basins of the Sahul Shelf (unpublished)*. 1973/74, Bureau of Mineral Resources Geology and Geophysics.
- Williams, S. T. and Benzie, J. A. H., 1997. Genetic Structure of Starfish *Linckia laevigata* on Northwest Australian Reefs. In: *Western Australian Research Activities 1994-1996*. Australian Institute of Marine Science Report, 14-15 pp.
- Williams, S. T., and Benzie, J. A. H., 1996. Genetic uniformity of widely separated populations of the coral reef starfish *Linkia laevigata* from the West Pacific and East Indian Oceans, revealed by allozyme electrophoresis. *Marine Biology*, **126**: 99-108.

- Williams, S. T., and Benzie, J. A. H., In press. Indo-West Pacific patterns of genetic differentiation in the high dispersal starfish *Linckia laevigata*. *Molecular Ecology*.
- Williamson, P. E., Exon, N. F., and Falvey, D. A., 1987. Crustal structure, stratigraphic framework and reassessment of the resource potential of the Exmouth Plateau. *B.M.R Yearbook*: 72-73.
- Williamson, P. E., Exon, N. F., Ul Haq, B., and von Rad, U., 1989. A North West Shelf Triassic reef play; results from ODP leg 122. *APEA Journal*, **29**(1): 328-44.
- Wilson, B. R. (for Bowman Bishaw Gorham), 1996. *Barrow Island Intertidal Survey: Section 6. Shelled Molluscs*. Report for West Australian Petroleum Pty Ltd.
- Wilson, B. R. (for Bowman Bishaw Gorham), 1996. In: *Barrow Island Intertidal Survey. Section 3: Results and Discussion*. Report for West Australian Petroleum Pty Ltd, Perth, WA.
- Wilson, B. R. and Marsh, L. M., 1974. *Acanthaster* studies on a Western Australian coral reef. In: *Proceedings of the Second International Symposium on Coral Reefs. Great Barrier Reef Committee, Brisbane*. 1, pp. 621-30.
- Wilson, B. R. and Marsh, L. M., 1975. Seasonal behaviour of a 'normal' population of *Acanthaster* in Western Australia. In: *Crown-of-Thorns Starfish Seminar Proceedings*. Australian Government Publishing Service, Canberra, pp. 167-79.
- Wilson, B. R., 1978. *Expedition to coral reefs of the Sahul Shelf*.
- Wilson, B. R., Marsh, L. M., and Hutchins, J. B., 1974. A puffer fish predator of crown-of-thorns in Australia. *Search*, **6**(11-12): 601-2.
- Wilson, B., A thorny problem, crown of thorns starfish in WA. *Landscape*, **3**(1): 35-39.
- Wiseman, J. F., 1979. Neocomian eustatic changes - biostratigraphic evidence from the Carnarvon Basin. *APEA Journal*, **19**(1): 66-73.
- WNI Science & Engineering, 1997. *Prediction of Oil Spill Envelopes for the Proposed Drill Location in WA-257P*. Report for Ampolex; MENV 097.
- WNI Science and Engineering, 1995. *Verification of Oil Spill Trajectory Analysis Using Satellite Tracked Drifters; Wandoo Location*. Report for Mobil Exploration & Producing Australia Pty Ltd.
- WNI Science and Engineering, 1995. *Waste Water Discharge Hakuryru VII*. Report for Mobil Exploration & Producing Australia Pty Ltd.
- WNI Science and Engineering, 1996. *Oil Spill Trajectory Envelopes For Border-1 Location, NWS*. Report for Mobil Exploration & Producing Australia Pty Ltd.
- Wolf, P. H., and Sprague, V., 1978. An unidentified protistan parasite of the pearl oyster, *Pinctada maxima*, in tropical Australia. **31**: 262-63.
- Wood, K., 1978. *Activity Quickens on North West Shelf*. Report for Mobil Exploration & Producing Australia Pty Ltd; 3.
- Woods, P. J. and Lewis, J. (for Gulf Holdings Pty Ltd), 1990. *Environmental Review and Management Programme: Onslow Salt Project*. 1.
- Woodside Offshore Petroleum Pty Ltd, 1984. *North West Shelf Gas Development (Woodside) Agreement. Additional Proposals for Treatment Plant, Environmental Management of the Project, Port Facilities and Leases, Licences and Easements*. Unpublished report.
- Woodside Offshore Petroleum Pty Ltd, 1988. A review of the petroleum geology and hydrocarbon potential of the Barrow-Dampier Subbasin and environs. Petroleum in Australia, The First Century. *APEA Journal*: 213-31.
- Woodside Offshore Petroleum Pty Ltd, 1988. *Physical, Chemical and Biological Characteristics of the Goodwyn Field*.

- Woodside Offshore Petroleum Pty Ltd, 1989. *The Effect of Condensate on Mangrove and the Degradation Process of Condensate in Sediment*. WENV 0136.
- Woodside Offshore Petroleum Pty Ltd, 1990. *Goodwyn 'A' Production Platform*. WOP Production 174.
- Woodside Offshore Petroleum Pty Ltd, 1997. *Environmental Profile: Woodside Acreage (Dampier Sub-Basin)*.
- Woodside Petroleum Development Pty Ltd, 1978. *North-west Shelf Development Environmental Review and Management Plan*. Consultative Environmental Review.
- Woodside Petroleum Development Pty Ltd, 1979. *Draft Environmental Impact Statement and Environmental Review and Management Programme*. Unpublished report.
- Woodside Petroleum Development Pty Ltd, 1979. *Supplement to Draft Environmental Impact Statement and Environmental Review and Management Programme, July 1979*. Unpublished.
- Woodside Petroleum Development Pty Ltd, 1986. *Woodside's Guide to Fishing on the Dampier Archipelago Part I*. Woodside Offshore Petroleum Pty Ltd.
- Woodside Petroleum Development Pty Ltd, 1989. *Woodside's Guide to Fishing on the Dampier Archipelago Part II*. Woodside Offshore Petroleum Pty Ltd.
- Woodside Petroleum Development Pty Ltd, 1992. *Woodside's Guide to Fishing on the Dampier Archipelago Part III*. Woodside Offshore Petroleum Pty Ltd.
- Woodward-Clyde, 1993. *Disposal of Produced Water on Thevenard Island, Environmental Review of Deep Well Injection Proposal*. Report for West Australian Petroleum Pty Ltd, 40 pp.
- Woodward-Clyde, 1993. *Pre-purchase Environmental Audit Production Licences TL/1, TL/5 & TL/6 Facilities and Operations, W.A.* Report to Apache Energy Ltd, Reference no. H81; Document no. EAA-60-RI-033, Apache Energy Ltd.
- Woodward-Clyde, 1995. *Disposal of Produced Water on Barrow Island, Environmental Review of Deep Well Injection Proposal*. Report for West Australian Petroleum Pty Ltd, 45 pp.
- Woodward-Clyde, 1996. *Boodarie Resources Processing Estate*. Report for LandCorp and Department of Resources Development, 180 pp.
- Wooster, W. S., and Reid, J. L., 1963. Eastern boundary currents. *The Sea*, **2**: 253-80. Wiley Engineering, 1990. *Tubridgi Gas Field Development*. Report for Dorland Resources Incorporated.
- Wormald, G. B. and Halyburton, R. V., 1987. *Challis field front end engineering study: Petrophysics*. Report for BHP Petroleum Pty Ltd.
- Wormald, G., 1988. The Geology of the Challis Oilfield-Timor Sea. In: *The North West Shelf Australia*. Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, pp. 425-38.
- Wright, A. J., and Wheatley, T. J., 1979. Trapping mechanisms and the hydrocarbon potential of the Exmouth Plateau, Western Australia. *APEA Journal*, **19** (1): 19-29.
- Wright, C. A., 1977. Distribution of Cainozoic foraminiferida in the Scott Reef No. 1 well, Western Australia. *Geological Society Australia Journal*, **24** (5): 269-77.
- Wu, Chi-Lun, Liu, H-C., and Yeh, S-Y., 1986. Age and growth of *Nemipterus peroni* (Cuvier) in the North West Shelf off Australia. *ACTA Oceanographica Taiwanica*, **16**: 74-89.
- Wyrski, K., 1973. Physical Oceanography of the Indian Ocean. In: *The Biology of the Indian Ocean*. B. Zeitzschell, ed., Springer-Verlag: Heidelberg.
- Yeates, A. N., Bradshaw, M. T., Dickins, J. M., Brakel, A. T., Exon, N. F., Langford, R. P., Mulholland, S. M., Totterdell, M. and Yeung, M., 1987. The Westralian Superbasin: An Australian link with Tethys. In: *Shallow Tethys 2*. K. G. McKenzie, ed., Australian Institute of Mining and Metallurgy, 199-213 pp.

- Yeates, A. N., Gibson, D. L., Towner, R. R. and Crowe, R. W. A., 1984. Regional geology of the onshore Canning Basin, W. A. In: *The Canning Basin, W. A. Proceedings of Geological Society of Australia/ Petroleum Exploration Society of Australia Symposium*. Purcell, P. G., ed., pp. 23-55.
- Yeatman, J., and Benzie, J. A. H., 1994. Genetic structure and distribution of *Photololigo* spp. in Australia. *Marine Biology*, **118**(1): 79-87.
- Yeh, S. Y., and Chin, T. S., 1982. Standardisation of fishing effort of the Taiwanese pair trawl fishery of northern Australia. *Acta Oceanographica Taiwanica*, **13**(215-225).
- Young, P. C., 1984. Objectives of the North West Shelf Program [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. CSIRO, NSW, pp. 8.
- Young, P. C., 1985. North West Shelf Research Program. In: *Research Report. Marine Laboratories, CSIRO Australia*. CSIRO Division of Fisheries Research, Technical Reports, 69-74 pp.
- Young, P. C., and Martin, R. B., 1982. Evidence for protogynous hermaphroditism in some lethrinid fishes. *Journal of Fish Biology*, **21**(4): 475-91.
- Young, P. C., and Martin, R. B., 1985. Sex ratios and hermaphroditism in Nemiperid fish from Northern Australia. *Journal of Fish Biology*, **26**: 273-87.
- Young, P. C., Hausfeld, H. F. and Leis, J., 1984. Ichthyoplankton of the North West Shelf [abstract]. In: *CSIRO Division of Fisheries Research. Second Divisional Research Seminar*. CSIRO, NSW, pp. 17.
- Zann, L. P., 1995. *Our Sea, Our Future: Major Findings of the State of the Marine Environment Report for Australia*. Ocean Rescue 2000 Program, Department of the Arts, Sports, and Territories, Canberra.
- Zhou, S., Hillis, R., and Sandiford, M., 1994. A study of the design of inclined wellbores with regard to both mechanical stability and fracture intersection, and its application to the Australian North West Shelf. *Journal of Applied Geophysics*, **32**(4): 293-304.
- Zhu, S., and Imberger, J., 1996. Computer-simulated current responses to cyclones on the North West Shelf of Australia. *Mathematical Computer Model*, **24**(3): 93-115.
- Ziolkowski, V., Guppy, N., and Durrant, J., 1992. Sequence analysis of a Maastrichtian shelf margin systems tract on the Australian North West Shelf. *American Association of Petroleum Geologists Bulletin*, **76**(7): 1135.

9.0 Appendices

Appendix 1. Knowledge gaps identified from the accessible research literature

The following points were identified as the major gaps in our knowledge of the target regions based upon the literature review. In this section, the knowledge gaps are not identified in any order of priority, however, they were placed into themes that became apparent as the list of knowledge gaps were compiled

Abbreviations at the end of each gap identifies how the gap relates to the framework classifications: P - Pilbara general; PW - Pilbara marine water and sediment quality; PP - Pilbara primary production; PV - Pilbara marine vegetation; PI - Pilbara marine invertebrate communities; PF - Pilbara marine fish species; PR - Pilbara marine reptile species; PM - Pilbara marine mammal species; K - Kimberley general; KW - Kimberley marine water and sediment quality; KP - Kimberley primary production; KV - Kimberley marine vegetation; KI - Kimberley marine invertebrate communities; KF - Kimberley marine fish species; KR - Kimberley marine reptile species; KM - Kimberley marine mammal species.

Endangered/Threatened Habitats

1. CALM (2005) highlighted the need to review and monitor the status of current threats to seagrasses in the Dampier Archipelago (currently no threats), however the need for a review and monitoring of threats to seagrasses applies throughout the Pilbara and Kimberley. [PV, KV]
2. Due to their apparent sensitivity to pollution and habitat loss/ modification, the use of invertebrate fauna as indicators of such impacts needs to be assessed. [P, PW, PP, PV, PI, K, KW, KP, KV, KI]
3. The impact of historical overfishing and bad fishing practices on benthic assemblages are unknown, and the recovery these habitats (specifically sponge gardens) are also unknown. [P, PP, PV, PI, PF, PR, PM, K, KP, KV, KI, KF, KR, KM]
4. Influence of large scale oceanographic features on inshore habitats of the Pilbara and Kimberley are mostly unknown (Wood & Mills, 2008). [P, PW, PP, K, KW, KP]

Endangered/Threatened Species

5. Knowledge of basic biological information is lacking for dugongs around the Dampier Archipelago, including population size, distribution, migratory habits, etc... (CALM, 2005), however, the same is true for the Pilbara and Kimberley region in general. [PM, KM]
6. The survivability of dolphins that have passed through a BRD escape hatch is unknown (Stephenson *et al.*, 2008). [PM, KM]
7. The misidentification frequency of threatened river sharks (genus *Glyphis*) for whaler sharks in the Kimberley Gillnet and Barramundi Fishery is unknown (Fletcher & Santoro, 2007) and applies to all areas where river sharks occur. [PF, KF]
8. A full understanding of habitat use by threatened fresh water sharks and rays, which apparently changes ontogenetically, is lacking. [PF, KF]
9. There is no mention of seabird catches in any of the fishery reports in Fletcher & Santoro (2007). Recording of seabird interactions has just begun for recreational charter boat

fishing, however, no monitoring procedures are in place for the commercial fishery to the best of our knowledge. [P, K]

10. The impact of the Pilbara Demersal Finfish Fishery bycatch on pipefishes and seahorses is recorded but not assessed (Fletcher & Santoro, 2007). [PF,KF]
11. The survivability of bycatch released alive is presumed. There appears to be little to no available data on actual survivability. [PF, PR, PM, KF, KR, KM]
12. Will directing the effort from demersal long-lining to pelagic gill-netting in the WA North Coast Shark Fishery and the Joint Authority Northern Shark Fishery (Fletcher & Santoro, 2007) increase bycatch of threatened species such as river sharks, sawfishes, turtles, and mammals? [PF, PR, PM, KF, KR, KM]

Biodiversity

13. CALM (2005) highlighted the need for a thorough biodiversity survey of the invertebrate fauna of the Dampier Archipelago, however, the same is true for the Pilbara and Kimberley region in general. [PP, PI, KP, KI]
14. Biodiversity hotspots in the Pilbara, and in the Kimberley, for various flora and fauna groups, need to be reassessed and verified, or identified. [PV, PI, PF, PR, PM, KV, KI, KF, KR, KM]
15. The amount of genetic input from Indonesia into WA waters is unknown (Wood & Mills, 2008). [P, PP, PV, PI, PF, PR, PM, K, KP, KV, KI, KF, KR, KM]
16. Species composition of the flora and fauna in the shallow coastal zone of the Kimberley is poorly surveyed (Wood & Mills, 2008), and the same is apparently true of the Pilbara. [PV, PI, PF, PR, PM, KV, KI, KF, KR, KM]
17. There are no published baseline data against which to measure or detect introduced species (Heyward et al., 2006). [PP, PV, PI, PF, PR, PM, KP, KV, KI, KF, KR, KM]

Ecological/Oceanographic

18. There has been virtually no research conducted on the primary production for the Pilbara and Kimberley. Virtually nothing is known of the ecological significance and interactions of the phytoplankton and zooplankton of the area. [PP, KP]
19. The trophic links between plankton and benthos communities are poorly understood in both the Pilbara and Kimberley regions. [PP, PV, PI, PF, KP, KV, KI, KF]
20. The role of plankton in trophic dynamics and nutrient cycling, particularly in the near shore environment is poorly understood. [PP, PV, PI, PF, KP, KV, KI, KF]
21. Seasonal primary productivity is very poorly understood (Heyward et al., 2006). [PP, KP]
22. The dynamic interactions between plankton and physical oceanography are poorly known, particularly for small scale processes (Heyward et al., 2006). [PP, KP]
23. The establishment of a standard set of environmental quality indicators, criteria, and standard monitoring procedures appropriate to the tropical marine ecosystem to assess resource condition, provide early warning of change, and to trigger management responses where necessary is needed (DoE, 2006). [P, PW, PP, PV, PI, PF, PR, PM, K, KW, KP, KV, KI, KF, KR, KM]
24. What will be the effects of sea level rise? [P, PW, PP, PV, PI, PF, PR, PM, K, KW, KP, KV, KI, KF, KR, KM]

25. What will be the effects of climate change, with particular reference to sea temperature rise? [P, PW, PP, PV, PI, PF, PR, PM, K, KW, KP, KV, KI, KF, KR, KM]
26. Water movements in the commonwealth North-West Shelf Transition Bioregion (the Holloway Current) are not well understood and has implications for pollution and invasive pest dispersal (DEWHA, 2008) [P, PW, PP, K, KW, KP]
27. Large scale oceanographic features are only partially characterised for the Pilbara and Kimberley (Wood & Mills, 2008). [P, PW, PP, K, KW, KP]
28. Community composition of the trophic tiers immediately following the primary producers, are poorly known in the Kimberley (DEWHA, 2008) and in the Pilbara. [PW, PV, PI, PF, KW, KV, KI, KF]
29. The ecological processes within and between fringing reef and seagrass bed communities are virtually unknown (Wood & Mills, 2008). [PP, PV, PI, KP, KV, KI]
30. Long-term biological time series data are virtually non-existent for the Pilbara and the Kimberley, particularly for inshore environments. [P, PW, PP, PV, PI, PF, PR, PM, K, KW, KP, KV, KI, KF, KR, KM]
31. Health indicators of tropical marine communities are poorly known. [P, PW, PP, PV, PI, PF, PR, PM, K, KW, KP, KV, KI, KF, KR, KM]
32. Responses to stress by tropical marine communities are poorly known. [P, PW, PP, PV, PI, PF, PR, PM, K, KW, KP, KV, KI, KF, KR, KM]
33. There is a paucity of marine water and sediment quality testing and monitoring for the Kimberley region. [KW]

Fisheries/Aquaculture

34. More information is needed for non-target fishes of the Dampier Archipelago (CALM, 2005), and for the Pilbara and Kimberley fisheries in general. [PI, PF, KI, KF]
35. There have been no environmental impact assessments conducted to assess the impact of establishing various aquaculture activities around the Dampier Archipelago, and there have only been limited studies elsewhere in the Pilbara and Kimberley regions. [PW, PP, PV, PI, PF, PR, PM, KW, KP, KV, KI, KF, KR, KM]
36. The impact of increased charter vessel operation for recreational fishing has yet to be fully investigated (Fletcher & Santoro, 2007). [KI, KF, KR, KM]
37. The occurrence and impact of ghost fishing from discarded fishing gear, both commercial and recreational, in the Pilbara and the Kimberley is limited. [PI, PF, PR, PM, KI, KF, KR, KM]
38. Recreational fishing for Spanish mackerel is apparently high in the Pilbara and increasing in the Kimberley, the last survey for this fishery/region was conducted in 1999/2000, is this fishery sustainable in its current form? (Williamson et al., 2006; and Fletcher & Santoro, 2007). [PF, KF]
39. The recreational catch of sharks and rays has not been assessed in the Pilbara or Kimberley regions. [PF, KF]
40. Only the primary target species (*Carcharhinus plumbeus*, sandbar shark) has been stock assessed in detail, with all other shark and ray species needing more detailed stock assessments (Fletcher & Santoro, 2007). [PF, KF]
41. The impact of climate change on fisheries is unknown. [P, PI, PF, K, KI, KF]

42. The impacts of illegal foreign fishing vessels on shark, beche de mer, trochus shell, and other stocks, are unknown (Fletcher & Santoro, 2007). [PI, PF, PR?, PM?, KI, KF, KR?, KM?]
43. The last detailed surveys of recreational fishing in the Pilbara were conducted in 1999/2000 (Williamson et al., 2006) and only phone surveys of recreational fishing in the Kimberley have been conducted (Henry & Lyle, 2003). DoF (2005) recommended catch surveys to be undertaken every three years. [PI, PF, KI, KF]
44. It is estimated that recreational fishing pressure will be 14 million fishing days per year by 2012 (DoF, 2004), the impact of this on various habitats is unknown. [P, PW, PP, PV, PI, PF, K, KW, KP, KV, KI, KF]
45. No studies on the effectiveness of BRD's in any Kimberley trawl fisheries (Stephenson et al., 2008), and only limited studies in Pilbara trawl fisheries (Stephenson & Chidlow, 2003; and Stephenson et al.. 2008). [PF, PR, PM, KF, KR, KM]

NB. A total of 46 knowledge gaps were presented during the stakeholder workshops. Gap #36 - There have been no stock assessments of target species other than barramundi in the Kimberley Gillnet and Barramundi Fishery (Fletcher & Santoro, 2007). [KF], as it was presented at the workshops has since been addressed in Fletcher & Santoro (2008).

Appendix 2. List of participants and photographs of the Kununurra workshop held at the Kununurra Country Club Plaza Resort on Monday 4th May, 2009

Name	Position	Organisation
Ms Katya Tripp	Environmental Projects Officer	Shire of Wyndham-East Kimberley
Brolga	Tourist Committee Member	Wyndham Tourist Committee
Mr Luke Parker		Department of Indigenous Affairs
Ms Cathy McLaughlin		East Kimberley Regional Recreational Fisheries Advisory Committee
Mr Dick Pasfield		East Kimberley Regional Recreational Fisheries Advisory Committee / Ord Land and Water
Mr Dave Woods		East Kimberley Regional Recreational Fisheries Advisory Committee
Mr Brian Warren	General Manager	Rangelands NRM WA
Ms Trish Terry	Indigenous Engagement Facilitator	Rangelands NRM WA
Ms Fiona Tingle	Project Officer	Rangelands NRM WA
Ms Sonia Leonard	Indigenous Community Water Facilitator	MG Corporation
Mr Michael Burk		Yawoorroong Miriuwung Gejerrong Yirrgeb Noong Dawang Aboriginal Corporation
Mr Alan Pardoe-Bell		East Kimberley Volunteer Marine Rescue
Kelvin		East Kimberley Volunteer Marine Rescue
Ms Kristy - Lee Cooke	Product Development Manager	Tourism WA; Australia's North West Region
Dr Steve Blake	CEO	Western Australian Marine Science Institute



Figure 16. Photographs of the Kununurra workshop held at the Kununurra Country Club Plaza Resort on Monday 4th May, 2009.

Appendix 3. List of participants and photographs of the Broome workshop held at the Mercure Inn, Broome on Wednesday 6th May, 2009

Name	Position	Organisation
Ms Fiona Galloway	Marine and Coastal Reserves Officer	Department of Environment and Conservation
Mr Alan Byrne	District Manager	Department of Environment and Conservation
Mr Peter Godfrey	Regional Manager	Department of Fisheries (WA)
Ms Justine Homes	Community Education Officer	Department of Fisheries (WA)
Ms Rachel Green		Department of Fisheries (WA) / Roebuck Bay Working Group
Ms Pam Baskind	Senior Planner	Department for Planning and Infrastructure
Mr Chris Mitchell	Executive Officer	Kimberley Area Consultative Committee / Shire of Broome Councillor
Mr Micklo Corpus	Park Supervisor	Minyirr Park / Kimberley Land Council
Mr John Kennedy	Secretary	Broome Sailing Club / Broome Volunteer Sea Rescue
Ms Naida Darcy	President	Broome Historical Society - Broome Museum
Mr Steve McLaughlin	President	Broome Fishing Club
Mr Cole Lewis		Eighty Mile Beach Caravan Park
Mr Martin Pritchard	Director	Environs Kimberley
Ms Sharon Griffiths		Sharon Griffiths and Associates
Mr Neil Gower	CEO	Kujurta Buru & Mamabulanjin Aboriginal Corporation
Mr Max Goodwin	Training Coordinator	Kullarri Regional CDEP Inc
Will		Beagle Bay Rangers
David		Beagle Bay Rangers
Corrina		Beagle Bay Rangers
Ms Kandy Curran	Project officer	Roebuck Bay Working Group
Mr Doug Van Bavel	Managing Ranger	Shire of Broome
Mr Kenn Donohoe	CEO	Shire of Broome
Mr Darryl Butcher	Director of Development Services	Shire of Broome
Ms Sara Hennessy	Chair	West Kimberley Regional Recreational Fishing Advisory Committee
Dr Steve Blake	CEO	Western Australian Marine Science Institute
Mr Bob Masters		Northern Demersal Scalefish Managed Fishery
Mr Mik Burton	Pearl Producers Association	C/- Western Australian Fishing Industry Council Inc
Mr Patrick Moase	Clipper Pearls	Pearl Producers Association
Mr Dwayne Tang Wei		Broome Indigenous Coordination Centre
Dr Deborah Thiele	Research Fellow	Marequus Pty Ltd, Deakin University

Name	Position	Organisation
Ms Marguerite Tarzia	PhD Student	Deakin University
Mr Dennis Lennaker		Northern Demersal Scalefish Managed Fishery
Mr Adam Masters		Northern Demersal Scalefish Managed Fishery
Mr Todd Morris		Kimberley Gillnet and Barramundi Managed Fishery



Figure 17. Photographs of the Broome workshop held at the Mercure Inn, Broome on Wednesday 6th May, 2009.



Figure 17. Continued.

Appendix 4. List of participants and photographs of the Karratha workshop held at the Tambrey Centre, Karratha on Friday 8th May, 2009

Name	Position	Organisation
Ms Cath Samson	Regional Marine Program Coordinator	Department of Environment and Conservation
Mr Mike Dunne		Department of Fisheries (WA)
Mr John Verbeek	Principal Project Officer	Pilbara Development Commission
Ms Linda Anderson	Project Manager	Rangelands NRM WA C/- Department of Agriculture and Food
Ms Alison McGilvary	Biodiversity Facilitator	Rangelands NRM WA C/- Department of Environment and Conservation
Mr Bevan Grey	Indigenous Facilitator	Rangelands NRM WA
Mr Dennis Bryan-Smith		Dampier Archipelago Preservation Association
Mr Len Vernagan		Dampier Archipelago Preservation Association
Mr Wayne Young	Environmental Manager	Dampier Port Authority
Dr Damon Newling	Superintendent Environment - Coastal Operations	Rio Tinto
Dr Jason Rossendell	Ecosystems Monitoring Advisor	Rio Tinto
Mr Cameron McEvoy	Environmental Advisor	Dampier Salt Limited
Mr Jim Kaucz	Planner	Department for Planning and Infrastructure
Dr Steve Blake	CEO	Western Australian Marine Science Institute



Figure 18. Photographs of the Karratha workshop held at the Tambrey Centre, Karratha on Friday 8th May, 2009.

Appendix 5. Information package supplied to stakeholders prior to the stakeholder meetings in Kununurra, Broome and Karratha during May, 2009



Information Package for the first stakeholder meetings regarding the

**COASTAL AND MARINE RESOURCE
CONDITION MONITORING
- SCOPING PROJECT**

Karratha Broome Kununurra

May, 2009

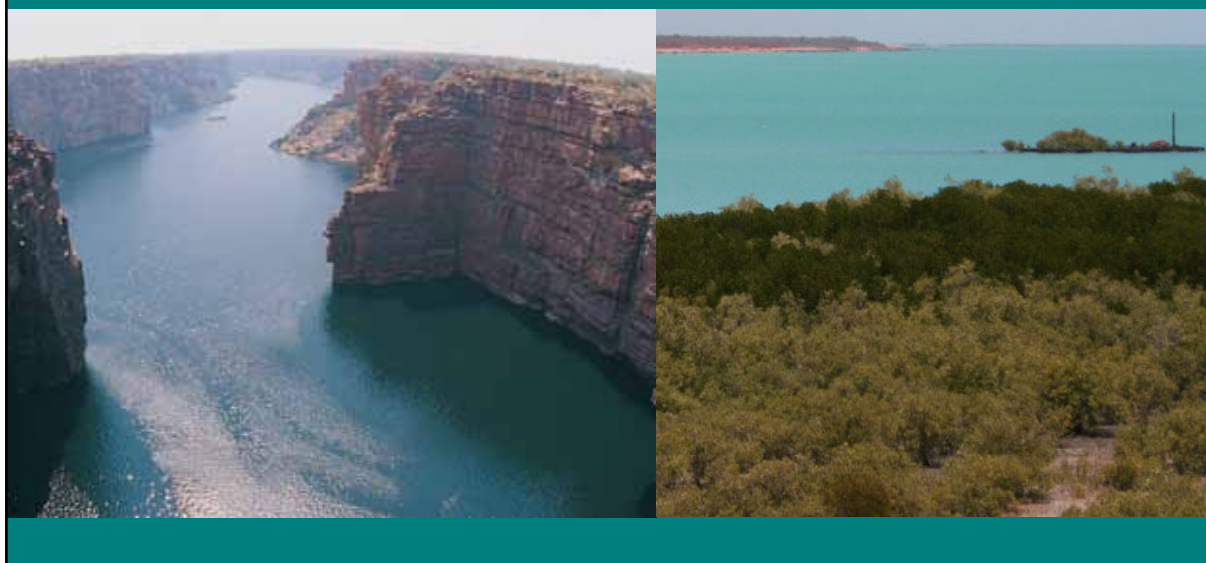


Photo credits: top, Tourism WA; all other images copyright Department of Fisheries.

Background

The Pilbara and Kimberley regions offer a suite of unique natural characteristics. As such, these regions are recognised as valuable natural assets and valuable natural resources sustaining and providing numerous habitats and ecosystems, which themselves contain a diverse range of fauna and flora. Many of these organisms from the Pilbara and Kimberley are endemic to Australia or the region.

The Pilbara and Kimberley regions are also hubs for various industries. Perhaps best known for the mining and petrochemical industries, the area also supports productive fishing industries, which include both commercial and recreational fishing. An emerging and rapidly developing industry of the region is tourism, particularly ecotourism, which showcases the natural assets of the region to the many visitors that pass through the Pilbara and Kimberley each year.

The unique natural characteristics of the region and the ever developing industries located in the Pilbara and Kimberley region, especially along the coastal fringe, creates the need for “a long term monitoring strategy to ensure the future integrity of the marine environment of the Pilbara and Kimberley regions”.

The *Coastal and Marine Resource Condition Monitoring - Scoping Project* is a one year project, which commenced in October 2008, and was developed in order to increase our understanding and develop a standardised long term monitoring protocol, for the marine and coastal environments of the Pilbara and Kimberley regions.

Objectives

The project has three objectives:

1. Undertake a desktop study of the current coastal and marine resource condition monitoring programs being undertaken in the Pilbara and Kimberley Regions.
2. Develop standard monitoring protocols and test in two inter-tidal habitats.
3. Provide a coastal and marine Resource Condition Monitoring report on Pilbara and Kimberley regions.

What has been achieved

To date, the project has satisfied the first objective by undertaking a major literature search of the research that has been conducted in the Pilbara and Kimberley regions, which identified over 2000 research papers. The majority of the available research literature for the region is dedicated to geology and petrochemistry, with only ~10% of the literature relating to the marine and coastal environments. It is worth mentioning that there is a significant amount of research literature that is not accessible because the research has been undertaken by consultancies and/or private companies, and is not publicly available.

The WA Department of Fisheries (DoF) has been working in close collaboration with the WA Department of Environment and Conservation (DEC) in developing a suite of standardised monitoring protocols for various marine environments. This project will field trial those protocols with a small scale assessment in two habitats, mangroves and intertidal sand flats, to assess the effectiveness of the protocols. The field trial is scheduled for mid-May.

Work has begun on the final objective, to provide a resource condition monitoring report on the Pilbara and Kimberley regions and provide a strategic framework for long term resource condition monitoring of the coastal and marine environments. Again, DoF is working in close association with DEC to ensure that the framework is practical and standardised.

The purpose of the stakeholder meeting

The aim of examining the available literature, for objective 1, was to identify knowledge gaps, i.e. areas that require further research, in the Pilbara and Kimberley regions. A total of 46 knowledge gaps have been identified and range from very specific questions to broad scale environmental issues. These knowledge gaps will be the focus of the upcoming stakeholder meetings. The aim will be to gather feedback from stakeholders as to the accuracy of the gaps identified and if there are further gaps that need addressing in terms of environmental health and monitoring requirements.

The knowledge gaps have been grouped into five main categories to identify the main issue highlighted by that knowledge gap. The categories are *Endangered/ Threatened Habitats*, *Endangered/ Threatened Species*, *Biodiversity*, *Ecological/ Oceanographic*, and *Fisheries/ Aquaculture*.

Another aim of the workshop will be to prioritise these knowledge gaps, which will be achieved through a voting process. Each participant will be given the opportunity to vote for the three knowledge gaps that they think are the most important questions that need answering in order to ensure the long term sustainability of the marine and coastal environments.

Things to be considered when assessing which gap to vote for:

- 1) All of the gaps are questions specific to the marine and coastal environments relating only to the Pilbara and the Kimberley.
- 2) Critically assess which gaps you think are most essential to understanding and monitoring the marine environment.
- 3) Consider the following, "If I vote for this gap, what will be the potential environmental implications?"

The procedure for the stakeholder meeting

Provided below is the list of knowledge gaps that have been identified from the literature search. It is essential that you have read each gap, and preferably given some thought as to which knowledge gaps you might vote for and the implications for choosing that knowledge gap, prior to the workshop. The workshop will run through each knowledge gap and you will have the opportunity to ask any queries or seek clarifications regarding each gap as we proceed through them.

Once the presentation is over, you will be asked if there are any other knowledge gaps relevant to the marine and coastal environments for the Pilbara and Kimberley environments. Issues of fisheries quotas and fishery policy will not be addressed here.

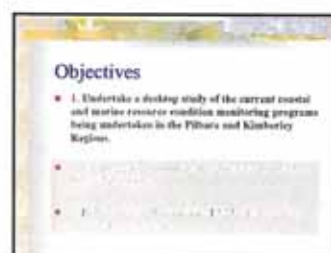
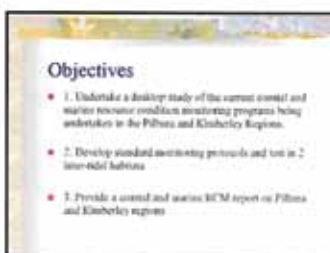
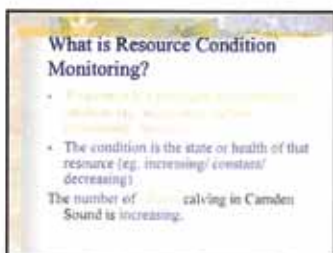
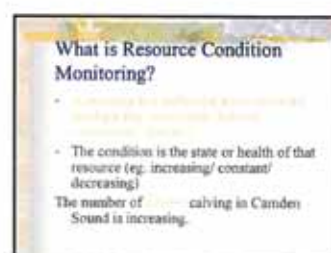
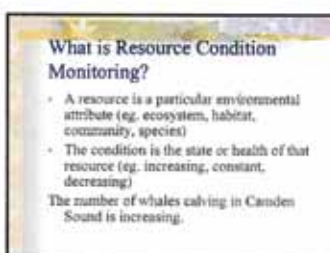
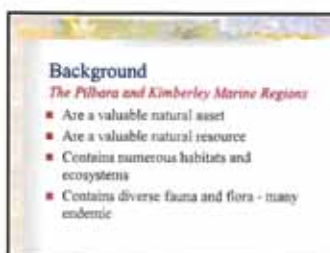
After any other knowledge gaps have been added to the list, you will be asked to vote for three knowledge gaps that you consider having the greatest implications for long term marine and coastal sustainability for the Pilbara and Kimberley regions.

#	CATEGORY	KNOWLEDGE GAP
1	Endangered/ Threatened Habitats	There are currently no threats identified for seagrasses. Do we need to review and monitor the status of current threats to seagrasses?
2	Endangered/ Threatened Habitats	Invertebrates are sensitive to pollution and habitat loss or modification. Should more research be conducted to assess using invertebrates as indicators for such impacts?
3	Endangered/ Threatened Habitats	Historical overfishing and bad fishing practices have impacted benthic assemblages (eg. coral communities, sponge gardens, seagrass meadows), however the recovery of these habitats are unknown. Should more research be conducted to assess the impacts of historical overfishing and bad fishing practices?
4	Endangered/ Threatened Habitats	The influence of large scale oceanographic features (eg. effects of large ocean currents) on inshore habitats of the Pilbara and Kimberley are unknown. Should research concentrate on resolving these influences?
5	Endangered/ Threatened Species	Knowledge of basic biological information is lacking for dugongs. Is understanding the biology of dugongs important?
6	Endangered/ Threatened Species	The survivability of dolphins that have passed through a bycatch reduction device (BRD) escape hatch is unknown. Is survivability of dolphins a priority?
7	Endangered/ Threatened Species	Threatened river sharks (genus <i>Glyphis</i>) are misidentified for whaler sharks in the various fisheries. How often are they actually caught by fisheries?
8	Endangered/ Threatened Species	Threatened fresh water sharks, sawfishes, and rays use different habitats as they grow. At what ages do the freshwater sharks and rays use the various habitats?
9	Endangered/ Threatened Species	Seabird catches are not reported for commercial fisheries and have just begun for recreational charter boat fishing. Is it important to know how many seabirds are being caught in the fisheries?
10	Endangered/ Threatened Species	Pipefishes and seahorses are caught in some commercial fisheries, however the effects of this are unknown. Should this be an area of research priority?
11	Endangered/ Threatened Species	The survivability of bycatch released alive is presumed. Do we need to know what the actual survivability is?
12	Endangered/ Threatened Species	Fishing effort will be directed away from demersal long-lining to pelagic gill-netting in the WA North Coast Shark Fishery and the Joint Authority Northern Shark Fishery. Will this increase the bycatch of threatened species such as river sharks, sawfishes, turtles, and mammals in this fishery?
13	Biodiversity	The biodiversity of the invertebrate fauna in the Pilbara and Kimberley region is poorly known. Do we need a comprehensive biodiversity survey of the invertebrate fauna?
14	Biodiversity	Do biodiversity hotspots in the Pilbara and Kimberley need to be reassessed and verified, or identified?

#	CATEGORY	KNOWLEDGE GAP
15	Biodiversity	The amount of genetic input from Indonesia into WA waters unknown. Do we need to assess the amount of genetic input from Indonesia?
16	Biodiversity	Species composition in the shallow coastal zone is poorly surveyed. Do we need a better understanding of the species composition?
17	Biodiversity	There is no baseline data against which to measure or detect introduced species. Do you consider introduced marine pests an area of priority research?
18	Ecological/ Oceanographic	Virtually nothing is known of the ecological significance and interactions of the phytoplankton and zooplankton of the area. How does plankton influence marine ecology in the region?
19	Ecological/ Oceanographic	What are the ecological links between plankton and benthos communities (corals, sponges, seagrasses, etc...)?
20	Ecological/ Oceanographic	What roles do plankton play in food webs and the recycling of nutrients along the coastline?
21	Ecological/ Oceanographic	How does the plankton vary seasonally?
22	Ecological/ Oceanographic	How is the plankton affected by small scale oceanography (eg. tidal currents, waves, etc...)?
23	Ecological/ Oceanographic	A standard set of environmental quality indicators, criteria, and standard monitoring procedures are not currently available. Should these be developed to monitor the environment?
24	Ecological/ Oceanographic	What will be the effects of sea level rise?
25	Ecological/ Oceanographic	What will be the effects of climate change, with particular reference to sea temperature rise?
26	Ecological/ Oceanographic	Water movements are not well understood and have implications for pollution and invasive pest dispersal. Do we need to understand these currents better?
27	Ecological/ Oceanographic	Large scale oceanographic features (currents, etc...) are only partially characterised. Do you think understanding these currents better will provide critical knowledge for understanding our environment?
28	Ecological/ Oceanographic	Initial steps in the food web are poorly known. Is it important to understand these first steps?
29	Ecological/ Oceanographic	The ecology within and between fringing reef and seagrass bed communities are virtually unknown. Would understanding these interactions increase our understanding of the environment?
30	Ecological/ Oceanographic	Long-term monitoring has not occurred for most of the marine environment for the Pilbara and Kimberley. Is long-term monitoring the key to healthy environments?

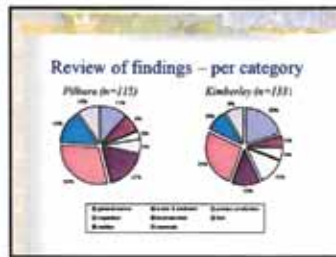
#	CATEGORY	KNOWLEDGE GAP
31	Ecological/ Oceanographic	Health indicators of tropical marine communities are poorly known. Should these be developed?
32	Ecological/ Oceanographic	Responses to stress by tropical marine communities are poorly known. Is understanding stress critical in understanding environmental health?
33	Ecological/ Oceanographic	There has been little testing of marine water and sediment quality. Is knowing marine water and sediment quality necessary for monitoring the environment?
34	Fisheries/ Aquaculture	There is a lack of information on non-target fishes caught in fisheries. Should non-target catch be monitored?
35	Fisheries/ Aquaculture	Our knowledge of the environmental impact of aquaculture activities is limited. Does aquaculture significantly impact the whole environment?
36	Fisheries/ Aquaculture	There have been no stock assessments of target species other than barramundi in the Kimberley Gillnet and Barramundi Fishery. Should stock assessments be performed on those other fishes?
37	Fisheries/ Aquaculture	Recreational charter fishing is increasing. Should there be more research on the impacts of such fishing?
38	Fisheries/ Aquaculture	The occurrence and impact of ghost fishing from discarded fishing gear is unknown. Is ghost fishing a significant environmental impact?
39	Fisheries/ Aquaculture	Recreational fishing pressure on Spanish mackerel is high and has not been surveyed since 1999/2000. Should this fishery be surveyed again?
40	Fisheries/ Aquaculture	The recreational catch of sharks and rays has not been assessed. Should the recreational catch of sharks and rays be assessed?
41	Fisheries/ Aquaculture	Only the primary target species (sandbar/ thick skin shark) has been adequately stock assessed in the WA North Coast and the Joint Authority Northern Shark Fisheries. Should other shark species caught in this fishery be assessed?
42	Fisheries/ Aquaculture	The impact of climate change on fisheries is unknown. Should this be a research priority?
43	Fisheries/ Aquaculture	The impacts of illegal foreign fishing vessels are unknown. Should more research be done on this problem?
44	Fisheries/ Aquaculture	Recreational fishing pressure is increasing but has not been surveyed since 1999/2000. Should there be another survey of recreational fishing?
45	Fisheries/ Aquaculture	It is estimated that recreational fishing pressure will be 14 million fishing days per year by 2012 and the impact of this on various habitats is unknown. Are the activities of recreational fishers a threat to the environment?
46	Fisheries/ Aquaculture	The effectiveness of bycatch reduction devices are mostly unknown. Should we have a better understanding of the effectiveness of these devices?

Appendix 6. Literature review and knowledge gap slides presented at the stakeholder meetings, 4th - 8th May, 2009



Objective 1.
Knowledge review – the searching.....

- Over 2000 references
 - Library searches
 - online scientific research tools (e.g. SCISIS & Scisearch)
 - meta-databases (eg. WAMSI BioNet MEST & DEC Biological Inventory)
- Pilbara 1013 references – 11% (115) relevant
- Kimberley 1131 references – 11% (133) relevant



The Gaps

Categorisation of Gaps

- Endangered/ Threatened Habitats
- Endangered/ Threatened Species
- Biodiversity
- Ecological/ Oceanographic
- Fisheries/ Aquaculture

Procedure for the rest of the seminar

- Each gap will be presented and explained sequentially (in no order of preference)
- Any questions or comments specific to the gap will be addressed at the end of each explanation
- Are there any gaps that have not been addressed here?
- Voting on priority of knowledge gaps

Why prioritise the gaps?

- We can't do everything!
- We have limited budgets
- We have limited personnel
- There are time constraints to deliver products to funding bodies
- Therefore we want to focus on areas of research that will provide the greatest contributions to resource condition monitoring

Things to consider for each gap

- All gaps are questions specific to the marine and coastal environments of the Pilbara and Kimberley
- Which gaps do you think are most essential to understanding and monitoring the marine environment
- If I vote for this gap, what will be the potential environmental implications?

Things to consider for each gap

- What criteria should be used to assess which gaps are "essential"
 - Does the gap address a broad environmental issue?
 - Are the species associated with the gap likely to influence the environment on a large scale?
 - Is the gap specific to a certain site? If so, is that site important for the surrounding areas?
 - Will ignoring a gap have a knock-on effect to other environments/ habitats/ species?

How to use the survey sheet

#	Important?	Importance
1	Y	3
2	Y	5
3	Y	1
4	N	
5	Y	2
6	Y	4
7		

Endangered/ Threatened Habitats
Gap #1

There are currently no threats identified for seagrasses. Do we need to review and monitor the status of current threats to seagrasses?

Endangered/ Threatened Habitats
Gap #2

Invertebrates are sensitive to pollution and habitat loss or modification. Should more research be conducted to assess using invertebrates as indicators for such impacts?

Endangered/ Threatened Habitats
Gap #3

Historical overfishing and bad fishing practices have impacted benthic assemblages (eg. coral communities, sponge gardens, seagrass meadows), however the recovery of these habitats are unknown. Should more research be conducted to assess the impacts of historical overfishing and bad fishing practices?

Endangered/ Threatened Habitats
Gap #4

The influence of large scale oceanographic features (eg. effects of large ocean currents) on inshore habitats of the Pilbara and Kimberley are unknown. Should research concentrate on resolving these influences?

Things to consider for each gap

- All gaps are questions specific to the marine and coastal environments of the Pilbara and Kimberley
- Which gaps do you think are most essential to understanding and monitoring the marine environment
- If I vote for this gap, what will be the potential environmental implications?

Endangered/ Threatened Species
Gap #5

Knowledge of basic biological information is lacking for dugongs. Is understanding the biology of dugongs important?

Endangered/ Threatened Species
Gap #6

The survivability of dolphins that have passed through a bycatch reduction device (BRD) escape hatch is unknown. Is survivability of dolphins a priority?

Endangered/ Threatened Species
Gap #7

Threatened river sharks (genus *Glypto*) are misidentified for whaler sharks in the various fisheries. How often are they actually caught by fisheries?

Endangered/ Threatened Species
Gap #8

Threatened fresh water sharks, saw fishes, and rays use different habitats as they grow. At what ages do the freshwater sharks and rays use the various habitats?

Endangered/ Threatened Species
Gap #9
 Seabird catches are not reported for commercial fisheries and have just begun for recreational charter boat fishing. Is it important to know how many seabirds are being caught in the fisheries?

Endangered/ Threatened Species
Gap #10
 Pipefishes and seahorses are caught in some commercial fisheries, however the effects of this are unknown. Should this be an area of research priority?

Endangered/ Threatened Species
Gap #11
 The survivability of bycatch released alive is presumed. Do we need to know what the actual survivability is?

Endangered/ Threatened Species
Gap #12
 Fishing effort will be directed away from demersal long lining to pelagic gill-netting in the WA North Coast Shark Fishery and the Joint Authority Northern Shark Fishery. Will this increase the bycatch of threatened species such as river sharks, sawfishes, turtles, and mammals in this fishery?

Things to consider for each gap

- All gaps are questions specific to the marine and coastal environments of the Pilbara and Kimberley
- Which gaps do you think are most essential to understanding and monitoring the marine environment
- If I vote for this gap, what will be the potential environmental implications?

Biodiversity
Gap #13
 The biodiversity of the invertebrate fauna in the Pilbara and Kimberley region is poorly known. Do we need a comprehensive biodiversity survey of the invertebrate fauna?

Biodiversity
Gap #14
 Do biodiversity hotspots in the Pilbara and Kimberley need to be reassessed and verified, or identified?

Biodiversity
Gap #15
 The amount of genetic input from Indonesia into WA waters unknown. Do we need to assess the amount of genetic input from Indonesia?

Biodiversity
Gap #16
 Species composition in the shallow coastal zone is poorly surveyed. Do we need a better understanding of the species composition?

Biodiversity
Gap #17
 There is no baseline data against which to measure or detect introduced species. Do you consider introduced marine pests an area of priority research?

Things to consider for each gap

- All gaps are questions specific to the marine and coastal environments of the Pilbara and Kimberley
- Which gaps do you think are most essential to understanding and monitoring the marine environment
- If I vote for this gap, what will be the potential environmental implications?

Ecological/ Oceanographic
Gap #18
 Virtually nothing is known of the ecological significance and interactions of the phytoplankton and zooplankton of the area. How does plankton influence marine ecology in the region?

Ecological/ Oceanographic
Gap #19
 What are the ecological links between plankton and benthos communities (corals, sponges, seagrasses, etc...)?

Ecological/ Oceanographic
Gap #20
 What roles do plankton play in food webs and the recycling of nutrients along the coastline?

Ecological/ Oceanographic
Gap #21
 How does the plankton vary seasonally?

Ecological/ Oceanographic
Gap #22
 How is the plankton affected by small scale oceanography (eg. tidal currents, waves, etc...)?

Ecological/ Oceanographic
Gap #23
 A standard set of environmental quality indicators, criteria, and standard monitoring procedures are not currently available. Should these be developed to monitor the environment?

Ecological/ Oceanographic
Gap #24
 What will be the effects of sea level rise?

Ecological/ Oceanographic
Gap #25
What will be the effects of climate change, with particular reference to sea temperature rise?

Ecological/ Oceanographic
Gap #26
Water movements are not well understood and have implications for pollution and invasive pest dispersal. Do we need to understand these currents better?

Ecological/ Oceanographic
Gap #27
Large scale oceanographic features (currents, etc...) are only partially characterised. Do you think understanding these currents better will provide critical knowledge for understanding our environment?

Ecological/ Oceanographic
Gap #28
Initial steps in the food web are poorly known. Is it important to understand these first steps?

Ecological/ Oceanographic
Gap #29
The ecology within and between fringing seef and seagrass bed communities are virtually unknown. Would understanding these interactions increase our understanding of the environment?

Ecological/ Oceanographic
Gap #30
Long-term monitoring has not occurred for most of the marine environment for the Pilbara and Kimberley. Is long-term monitoring the key to healthy environments?

Ecological/ Oceanographic
Gap #31
Health indicators of tropical marine communities are poorly known. Should these be developed?

Ecological/ Oceanographic
Gap #32
Responses to stress by tropical marine communities are poorly known. Is understanding stress critical in understanding environmental health?

Ecological/ Oceanographic
Gap #33
There has been little testing of marine water and sediment quality. Is knowing marine water and sediment quality necessary for monitoring the environment?

Things to consider for each gap

- All gaps are questions specific to the marine and coastal environments of the Pilbara and Kimberley
- Which gaps do you think are most essential to understanding and monitoring the marine environment
- If I vote for this gap, what will be the potential environmental implications?

Fisheries/ Aquaculture
Gap #34

There is a lack of information on non-target fishes caught in fisheries. Should non-target catch be monitored?

Fisheries/ Aquaculture
Gap #33

Our knowledge of the environmental impact of aquaculture activities is limited. Does aquaculture significantly impact the whole environment?

Fisheries/ Aquaculture
Gap #36

There have been no stock assessments of target species other than barramundi in the Kimberley Gillnet and Barramundi Fishery. Should stock assessments be performed on those other fishes?

Fisheries/ Aquaculture
Gap #37

Recreational charter fishing is increasing. Should there be more research on the impacts of such fishing?

Fisheries/ Aquaculture
Gap #38

The occurrence and impact of ghost fishing from discarded fishing gear is unknown. Is ghost fishing a significant environmental impact?

Fisheries/ Aquaculture
Gap #35

Recreational fishing pressure on Spanish mackerel is high and has not been surveyed since 1999/2000. Should this fishery be surveyed again?

Fisheries/ Aquaculture
Gap #40

The recreational catch of sharks and rays has not been assessed. Should the recreational catch of sharks and rays be assessed?

Fisheries/ Aquaculture
Gap #41

Only the primary target species (sandbar thick skin shark) has been adequately stock assessed in the WA North Coast and the Joint Authority Northern Shark Fisheries. Should other shark species caught in this fishery be assessed?

Fisheries/ Aquaculture
Gap #42
 The impact of climate change on fisheries is unknown. Should this be a research priority?

Fisheries/ Aquaculture
Gap #43
 The impacts of illegal foreign fishing vessels are unknown. Should more research be done on this problem??

Fisheries/ Aquaculture
Gap #44
 Recreational fishing pressure is increasing but has not been surveyed since 1999/2000. Should there be another survey of recreational fishing?

Fisheries/ Aquaculture
Gap #45
 It is estimated that recreational fishing pressure will be 14 million fishing days per year by 2012 and the impact of this on various habitats is unknown. Are the activities of recreational fishers a threat to the environment?

Fisheries/ Aquaculture
Gap #46
 The effectiveness of bycatch reduction devices are mostly unknown. Should we have a better understanding of the effectiveness of these devices?

Have we missed anything?
 Do the knowledge gaps presented here cover all of the areas that need further scientific research, or are there other areas that need addressing specific to the marine environment?
Issues of fisheries science and fisheries policy will not be addressed here.

Voting for research priorities

- You have been given 3 stickers each
- At the front of the room is a form with the gap numbers on it
- Place a sticker in the blank space next to the gap number to vote for that gap to have research priority
- Do not let others influence your vote!!

Appendix 7. Monitoring knowledge review matrix. Refer to Table 6 for definitions of the criteria used to assign quality ratings. Abbreviations: P - Pilbara; K - Kimberley; W&S - water and sediment quality; PP - primary production; V - marine vegetation; I - marine invertebrate communities; F - marine fish species; R - marine reptile species; and M - marine mammal species

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT									
				P	K	G	W &S	PP	V	I	F	R	M		
AIMS	Alongi, D., Clough, B., Tirendi, F., Dixon, P., Dalhaus, O. and Goldrick, A., 1997. Mangrove Studies Western Australian Research Activities 1994-1996. In: <i>Australian Institute of Marine Science Report</i> . 16-18 pp.	Initial survey	1994 - 1996	X						X					
AIMS	Burns, K., Furnas, M., King, B. and Heggie, D., 1996. Fates of materials in the discharge water from offshore petroleum production of the North-West Shelf. In: <i>Western Australian Research Activities 1994-1996</i> . AIMS Report, Australian Institute of Marine Science, Townsville, 44-45 pp.	Initial survey	1994 - 1995	X			X								
AIMS	Furnas, M. and Steinberg. C., 1997. <i>Environmental and oceanographic monitoring at oceanic coral reefs on the North-West Shelf. Western Australian Research Activities 1994-1996</i> . Australian Institute of Marine Science Report.	Inaccessible	1994 - 1996		X	X									
AIMS	Heyward, A., Halford, A., Smith, L. and Williams, D. M., 1997. Coral reefs of north west Australia: baseline monitoring of an oceanic reef ecosystem. In: H.A. Lessios and I.G. Macintyre (eds.) <i>Proceedings of the 8th International Coral Reef Symposium</i> Vol. 1. Smithsonian Tropical Research Institute, Panama., <i>Panama, June, 1996</i> . 289-284 pp.	Inaccessible	?	X	X						X				
AIMS	Heyward, A., Smith, L., Halford, A. and Field, S., 1997. Monitoring and Benthic Dynamics in Western Australian Coral Reefs. In: <i>Western Australian Research Activities 1994-1996</i> . Australian Institute of Marine Science Report, 9-11 pp.	Initial survey	1995 - 1996	X	X						X				

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W &S	PP	V	I	F	R	M	
AIMS	Johnson, D. B. and Stoddart, J. A., 1988. <i>Report on Surveys of the Distribution, Abundance and Impact of Acanthaster planci on Reefs Within the Dampier Archipelago (Western Australia)</i> . Australian Institute of Marine Science Report, 15pp.	Inaccessible	?	X							X			
AIMS	Robertson, A., 1993. <i>Study of the Impact of Pilbara Coastal Development on Arid Zone Mangroves Stage 1</i> . AIMS, 41 pp.	Inaccessible	?	X										
AIMS	Stoddard, J. and Johnson, D. B., 1988. <i>Report on Surveys of the Distribution, Abundance and Impact of Acanthaster planci on Reefs within the Dampier Archipelago, Western Australia</i> . Australian Institute of Marine Science.	Inaccessible	?	X										
CSIRO	Althaus, F, K Woolley, X He, P Stephenson and R Little. 2006. The Spatial Distribution of Commercial Fishery Production on Australia's North West Shelf. North West Shelf Joint Environmental Management Study. NWSJEMS Technical Report No. 10, 122pp.	Fair	1973 - 2000	X								X		
CSIRO	CSIRO Division Marine Research, 1991. <i>North West Shelf Development Project Benthic Samples from Cossack Field</i> . Report for Woodside Offshore Petroleum Pty Ltd; WENV 0168.	Inaccessible	?	X										
CSIRO	CSIRO Division of Fisheries and Oceanography (1968). Oceanographical observations in the Indian Ocean in 1964. H.M.A.S. Diamantina cruise Dm5/64. Oceanographical Cruise Report. Division of Fisheries and Oceanography. CSIRO Australia, no. 40.	Initial survey	1959 - 1964	X	X	X	X	X						
CSIRO	CSIRO, 1992. North West Shelf Development Project <i>Benthic Samples From North Rankin A Field</i> . Report for Woodside Offshore Petroleum Pty Ltd.	Inaccessible	?	X										
CSIRO	Fandry, C, A Reville, K Wenziker, K McAlpine, S Apte, R Masini and K Hillman. 2006. Contaminants on Australia's North West Shelf: Sources, Impacts, Pathways and Effects. North West Shelf Joint Environmental Management Study. NWSJEMS Technical Report No. 13, 46pp.	Initial survey	2000	X			X	X						

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W & S	PP	V	I	F	R	M	
CSIRO	Hallegraeff, G. M., and Jeffrey, S. W., 1984. Tropical phytoplankton species and pigments of continental shelf waters of north and north west Australia. <i>Marine Ecology Progress Series</i> , 20: 59-74.	Initial survey	1980 - 1983	X	X			X						
CSIRO	Lyne, V, M Fuller, PR Last, A Butler, M Martin and R Scott. 2006. Ecosystem Characterisation of Australia's North West Shelf. North West Shelf Joint Environmental Management Study. NWSJEMS Technical Report No. 12, 73pp.	Initial survey	?	X		X								
CSIRO	Wenziker, K, K McAlpine, S Apte and R Masini. 2006. Background Quality for Coastal Marine Waters of the North West Shelf, Western Australia. North West Shelf Joint Environmental Management Study. NWSJEMS Technical Report No.18, 50pp.	Initial survey	2003	X			X							
CSIRO	Whitelaw, A. W., In review. <i>Condition changes and length weight relationships for 21 species of fish from the families; Lutjanidae, Nemipteridae, Carangidae, Lethrinidae, Synodontidae, Balistidae, Haemulidae and Mullidae, from the North West Shelf of Australia.</i> CSIRO Divisional Report.	Inaccessible	?											
CSIRO	Young, P. C., and Sainsbury, K. J., 1985. CSIRO's North West Shelf program indicates changes in fish populations. <i>Australian Fisheries</i> , 44(3): 16-20.	Fair	1966 - 1982	X								X		
CSIRO	Young, P. C., Leis, J. M., and Hausfeld, H. F., 1986. Seasonal and spatial distribution of fish larvae in waters over the North West Continental Shelf of Western Australia. <i>Marine Ecology Progress Series</i> , 31(3): 209-22.	Initial survey	1982 - 1983	X								X		
Regulatory Agency	Chittleborough, R. G., 1983. <i>The Dampier Archipelago Marine Study: A Progress Report.</i> Bulletin 141, Department of Conservation & Environment, Western Australia, 12 pp.	Fair	1980 - 1981	X		X	X	X	X					
Regulatory Agency	Deegan, P. M., 1992. <i>Montebello and Lowendal Islands, Summary Report of Marine Resources.</i> Report for Western Australia Department of Conservation and Land Management, Perth, 16 pp.	Initial survey	1992	X		X			X	X	X	X	X	X

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT									
				P	K	G	W & S	PP	V	I	F	R	M		
Regulatory Agency	Department of Environment and Conservation. 2008. Preliminary Reconnaissance Survey of Benthic Habitats in the Anjo Peninsula Area, Kimberley Bioregion, Western Australia. Report to the Northern Development Taskforce Prepared by the Marine Ecosystems Branch. Department of Environment and Conservation, Government of Western Australia. iv+22pp.	Initial survey	2008		X	X									
Regulatory Agency	Department of Minerals and Energy, 1997. <i>Environmental Compliance Audit of Wandoo B Production Facility</i> . Mobil Exploration & Producing Australia Pty Ltd.	Inaccessible	?	X											
Regulatory Agency	Environmental Protection Authority. 2007. State of the Environment Report: Western Australia 2007. Department of Environment and Conservation. Perth, Western Australia. xv + 312pp.	Very Good	2007	X	X	X	X		X	X	X				
Regulatory Agency	Fletcher, WJ and K Santoro (Eds.). 2008. State of the Fisheries Report 2007/08. Department of Fisheries, Western Australia, Perth. 308pp. (And other State of the Fisheries Reports)	Very Good	(1944 - 2007 - 2008)	X	X					X	X				
Regulatory Agency	Forde, M. J., 1985. <i>Technical Report on Suspended matter in Mermaid Sound, Dampier Archipelago Marine Study</i> . Department of Conservation and Environment, 102 pp.	Inaccessible	?	X			X								
Regulatory Agency	Gordon, D. M., 1987. Disturbance to Mangroves in the Tropical- arid Western Australia: Hypersalinity and Restricted Tidal Exchange as Factors Leading to Mortality. In. Technical Series 12, Environmental Protection Authority.	Inaccessible	?	X	X				X						
Regulatory Agency	Newman, SJ, GC Young and IC Potter. 2004. Characterisation of the Inshore Fish Assemblages of the Pilbara and Kimberley Coasts. FRDC Project No. 2000/132. Department of Fisheries. 204pp.	Fair	1990 - 2002	X	X						X				
Regulatory Agency	Northern Development Taskforce. 2008. Site Evaluation Report, Part A. Department of Industry and Resources, Government of Western Australia. 10pp.	Initial survey	2008		X	X									

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT									
				P	K	G	W & S	PP	V	I	F	R	M		
Regulatory Agency	Northern Development Taskforce. 2008. Site Evaluation Report, Part B. Department of Industry and Resources, Government of Western Australia. 63pp.	Initial survey	2007 - 2008		X	X									
Regulatory Agency	Nowara, GB and SJ Newman. 2001. A history of foreign fishing activities and fishery-independent surveys of the demersal finfish resources in the Kimberley region of Western Australia. Fisheries Research Report 125:84pp.	Fair	1980 -1990		X							X			
Regulatory Agency	Simpson, C. J. and Grey, K. A., 1989. <i>Survey of Crown-of-Thorns Starfish and Coral Communities in the Dampier Archipelago, Western Australia</i> . Environmental Protection Authority, Technical Series No.25, 23 pp.	Initial survey	1985	X							X				
Private	AGC Woodward-Clyde Pty Ltd, 1991. <i>Assessment of the Marine Biological Monitoring Programme for the Harriet Oilfield</i> . Report to Apache Energy; Reference no. H30; Document no. EAA-60-RH-006, Apache Energy Ltd.	Inaccessible	?	X											
Private	AGC Woodward-Clyde Pty Ltd, 1994. <i>Maitland Heavy Industry Estate Karratha: Public Environmental Review</i> . LandCorp and Department of Resources Development.	Inaccessible	?	X											
Private	Ampolex, 1996. <i>Australia Region Health Safety and Environment Annual Report</i> .	Inaccessible	?												
Private	Apache Energy Ltd, 1996. <i>Agincourt-1 Exploration Well Environmental Appraisal</i> . Report to Apache Energy Ltd, Reference no. H129; Document no. EAA-00-RI-050, Apache Energy Ltd.	Inaccessible	?		X										
Private	Apache Energy Ltd, 1997. <i>Impact of Artificial Lighting on Sea Turtles</i> . Reference no.183; Document no.EA-00-RI-085/B H183, 25 pp	Inaccessible	?										X		
Private	Astron Engineering, 1991. Development of South Pepper, North Herald and Chervil Fields. Airlie Island Terminal. In: <i>First Triennial Environment Review, 1987-1990</i> . Unpublished Report prepared for Western Mining Corporation Ltd.	Inaccessible	1987 - 1990	X											

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W &S	PP	V	I	F	R	M	
Private	Astron Environmental Pty Ltd, 1994. <i>Saladin Oilfield Second Triennial Report Vegetation Monitoring 1988 - 1994</i> . Report for West Australian Petroleum Pty Ltd, 56pp.	Inaccessible	1988 - 1994	X						X				
Private	Astron Environmental Pty Ltd, 1995. <i>Integrated Shearwater Monitoring Program Annual Report</i> . Report to Apache Energy Ltd; Reference no. H115; Document no. EAA-60-RI-055.	Inaccessible	?	X		X								
Private	BHP Petroleum, Apache Energy Ltd, Murdoch University and EPA, 1993. <i>Coral Spawning Study</i> . Report for West Australian Petroleum Pty Ltd, Apache Energy Ltd.	Inaccessible	?								X			
Private	Bidwell, J. R. and Tsvetnenko, Y., 1995. <i>The Effect of Three Water Treatment Chemicals on the Growth of the Algae, Isochrysis sp., and Survival of the Tiger Prawn, Penaeus monodon</i> . Report to West Australian Petroleum Pty Ltd, 18 pp.	Inaccessible	?						X	X				
Private	Bidwell, J. R., Tsvetnenko, Y. and Gorrie, J., 1995. <i>Toxicity of the Water-Soluble Fraction of Wanaea-Cossack Crude Oil to Three Marine Species</i> . Woodside Offshore Petroleum Pty Ltd, WENV 275.	Inaccessible	?	X										
Private	Bidwell, J. R., Tsvetnenko, Y., Gorrie, J. and Chegwidde, A., 1994. <i>Acute Toxicity of the Water-Soluble Fraction of Harriet Crude Oil to Three Marine Species</i> . Report to Hadson Energy Ltd; Reference no. H11; Document no EA-00-RI-046, Apache Energy Ltd.	Inaccessible	?											
Private	Bowman Bishaw Gorham and UWA Histopathology, 1993. <i>Thevenard Island Outfall Monitoring</i> . Report for West Australian Petroleum Pty Ltd.	Inaccessible	?	X										
Private	Bowman Bishaw Gorham, 1988. <i>Port Walcott Oil Spill Environmental Investigation</i> . Report for Robe River Iron Associates.	Inaccessible	?	X										
Private	Bowman Bishaw Gorham, 1991. <i>Photographs of Monitored Corals - Leatherback-1 Drilling Program</i> . Report to Apache Energy Ltd, Reference no. H151; Document no. EAA-61-LD-001, Apache Energy Ltd.	Inaccessible	?								X			

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W &S	PP	V	I	F	R	M	
Private	Bowman Bishaw Gorham, 1992. <i>Petroleum Exploration in Permit Areas EP 342 and TP/9 Results of a Pre-Drilling Site Survey for the Proposed Loggerhead - 1 Location</i> . Report to Apache Energy Ltd; Reference no. H50; Document no. EAA-61-RD-006, Apache Energy Ltd.	Inaccessible	?											
Private	Bowman Bishaw Gorham, 1992. <i>Re-Inspection of the Leatherback - 1 Drill Sites</i> . Report to Apache Energy Ltd; Reference no. H47; Document no. EAA-61-RD-005, Apache Energy Ltd.	Inaccessible	?											
Private	Bowman Bishaw Gorham, 1993. <i>Petroleum Exploration in Permit Areas EP 342 and TP/9: Results of Environmental Monitoring of the Loggerhead-1 Drilling Program</i> . Report to Apache Energy Ltd, Reference no. H53; Document no. EAA-61-RD-007, Apache Energy Ltd.	Inaccessible	?											
Private	Bowman Bishaw Gorham, 1994. <i>Roller Oilfield Development: Environmental Monitoring; Results of Initial Monitoring Survey during November, 1993 and April 1994</i> . Report prepared for West Australian Petroleum Pty Ltd.	Inaccessible	1993 - 1994											
Private	Bowman Bishaw Gorham, 1995. <i>Survey of the Intertidal Habitats of Thevenard Island</i> . Report to Western Australian Petroleum Pty Ltd, 66 pp.	Inaccessible	?	X										
Private	Bowman Bishaw Gorham, 1995. <i>TP/3 Marine Environment Monitoring Program: Triennial Report</i> . 90 pp.	Inaccessible	?											
Private	Bowman Bishaw Gorham, 1996. <i>Barrow Island Intertidal Survey</i> . Report to West Australia Petroleum Pty Ltd, 102 pp.	Inaccessible	?	X										
Private	Bowman Bishaw Gorham, 1996. <i>Environmental Baseline Survey of Wandoo B Location</i> . Report for Mobil Exploration & Producing Australia Pty Ltd.	Inaccessible	?	X										

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W &S	PP	V	I	F	R	M	
Private	Bowman Bishaw Gorham, 1996. <i>Existing Environment at the Leatherback-2 Well Site</i> . Report to Apache Energy Ltd, Reference no. H148; Document no. EAA-61-RI-009/B, Apache Energy Ltd.	Inaccessible	?											
Private	Bowman Bishaw Gorham, 1996. <i>Inspection Surveys of the Mydas-1 and Hawksbill-1 Well Sites</i> . Report to Apache Energy Ltd; Reference no. H135; Document no. EAA-61-RU-004, Apache Energy Ltd.	Inaccessible	?											
Private	Bowman Bishaw Gorham, 1997. <i>Eclectus Environmental Baseline Review</i> . Report for Woodside Offshore Petroleum Pty Ltd; WENV 334.	Inaccessible	?											
Private	Bowman Bishaw Gorham, 1997. <i>Survey of the Intertidal Shore of the Eastern Side of Barrow Island</i> . Report for West Australian Petroleum Pty Ltd, 175 pp.	Inaccessible	?	X										
Private	Bowman Bishaw Gorham, 1997. <i>Survey of the Intertidal Shore of the Western Side of Barrow Island</i> . Report for West Australian Petroleum Pty Ltd, 175 pp.	Inaccessible	?	X										
Private	Bowman Bishaw Gorham, 1998. <i>Environmental Survey of Two Proposed Exploration Well Sites in EP369 and EP364</i> . Report for Tap Oil NL, 65 pp.	Inaccessible	?											
Private	Bowman Bishaw Gorham, 1998. <i>Saladin 15 Drilling Program: Monitoring Surveys</i> . Report for West Australian Petroleum Pty Ltd, 11 pp.	Inaccessible	?											
Private	Carr, W., 1988. Environmental Impact Assessments of three offshore oilfields, Western Australia. In: <i>The North West Shelf, Australia: Proceedings of Petroleum Exploration Society, Australia Symposium</i> . Purcell, P. G. & Purcell, R. R., eds, Petroleum Exploration Society of Australia Ltd, Perth, pp. 625-32.	Inaccessible	?											

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W &S	PP	V	I	F	R	M	
Private	Carter, D., Maxwell, J. G. and Bowtell, C., 1983. <i>North West Shelf Crustacean Survey Report</i> . Report to the Australian Fisheries Service by K.F.V. Fisheries Pty Ltd.	Initial survey	1983	X	X						X			
Private	Chegwidden, A., Fisher, S. J., Alexander, R., and Kagi, R. I., 1993. The fate of hydrocarbons associated with drilling from the North Rankin 'A' gas and condensate platform, Western Australia. <i>APEA Journal</i> : 386-94.	Inaccessible	?	X										
Private	Coffey & Partners, 1996. <i>Stage 1 Environmental Audit Airlie Island WA: Western Mining Corporation</i> . Report E9002/1-AC for Western Mining Corporation Ltd, Novus West Australia Pty Ltd.	Inaccessible	?	X										
Private	Corteen, L., 1998. <i>Varanus Island Turtle Monitoring Program 1997/98 Report</i> . EA-60- RI-082 H205, Apache Energy Ltd, 63 pp.	Inaccessible	1997 - 1998	X									X	
Private	Dames & Moore, 1990. <i>Consultative Environmental Review Harriet Gas Project</i> . Report to Apache Energy Ltd, Reference no. H25; Document no. EAA-60-RI-012, Apache Energy Ltd.	Inaccessible	?	X										
Private	Dampier Salt, 1973. <i>Removal of Marine Species from Dampier Salt Ponds</i> . 6 pp.	Inaccessible	?	X										
Private	Dampier Salt, 2003. <i>2002 Annual Environmental Report</i> . Dampier Salt Ltd, 48pp + appendices.	Fair	2002	X		X	X		X		X			
Private	Dinara Pty Ltd, Butler, W. H. and Butler, MA., 1987. <i>Harriet Field Development Varanus Island - Annual Environmental Report</i> . Report to Apache Energy Ltd, Reference no. H13; Document no. EAA-60-RI-008.	Inaccessible	?	X										
Private	Ecos Consulting Pty Ltd, 1996. <i>Marine Monitoring of Dredging Operations in Mermaid Sound, WA</i> . Report to Woodside Offshore Petroleum Pty Ltd, WENV 293.	Inaccessible	?	X										

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W &S	PP	V	I	F	R	M	
Private	Fisher, S., 1996. In: <i>Chemical Analysis of Petroleum Hydrocarbons and Heavy Metals in Sediments Collected in October 1996 from the Sea Floor Adjacent to the Lynx 1A Well</i> . Woodside Offshore Petroleum Pty Ltd.	Inaccessible	1996	X			X							
Private	Furnas, M. and Steinberg C., 1995. <i>Environmental and Oceanographic Measurements at Scott Reef, Western Australia</i> . Report for Woodside Offshore Petroleum Pty Ltd, 32 pp.	Inaccessible	?		X									
Private	Furnas, M. and Steinberg C., 1996. <i>Environmental and Oceanographic Measurements at Scott Reef, Mermaid Reef and Broome, Western Australia: September 1994 to October 1995</i> . Report for Woodside Offshore Petroleum Pty Ltd, 185 pp.	Inaccessible	1994 - 1995		X									
Private	Geotech, 1995. <i>A Summary of the Chemical Analysis of Sediments Collected from Withnell Bay between September 1987 and July 1995 Following a Discharge of Oil Contaminated Water from the Woodside Onshore Treatment Plant, Burrup Peninsula, North -Western Australia</i> . Report for Woodside Offshore Petroleum Pty Ltd; WENV 286.	Inaccessible	1987 - 1995	X			X							
Private	Geotech, 1997. <i>Analysis of sea-floor sediments collected in April 1997 (Eclectus)</i> . Report for Bowman Bishaw Gorham.	Inaccessible	1997		X		X							
Private	Geotech, 1998. <i>Chemical Analysis of Rock Oyster and Sediments Collected in February 1998 from the Intertidal Zone Near to the Terminal Tank Area, Barrow Island</i> . West Australian Petroleum Pty Ltd, 28 pp.	Inaccessible	1998	X			X							
Private	Gordon, D. M., Bougher, A. R., LeProvost, M. I., and Bradley, J. S., 1995. Use of models for detecting and monitoring change in a mangrove ecosystem in northwestern Australia. <i>Environmental International</i> , 21(5): 605-18.	Fair	1992 - 1995	X					X					

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W &S	PP	V	I	F	R	M	
Private	Hadson Energy Ltd, 1990. <i>Harriet Field Development Fifth Annual Environmental Report - June 1990</i> . Report to Apache Energy Ltd; Reference no. H27; Document no. EAA-60-RI-017, Apache Energy Ltd.	Inaccessible	?	X										
Private	Hadson Energy Ltd, 1990. <i>Harriet Field Development Varanus Island - Annual Environmental Report</i> . Report to Apache Energy Ltd; Reference no. H21; Document no. EAA-60-RI-015, Apache Energy Ltd.	Inaccessible	?	X										
Private	Hadson Energy Ltd, 1991. <i>Harriet Field Development Varanus Island - Second Triennial Environmental Report</i> . Report to Apache Energy Ltd; Reference no. H35; Document no. EAA-60-RI-016, Apache Energy Ltd.	Inaccessible	?	X										
Private	Hadson Energy Ltd, 1991. <i>Tanami # 1 Environmental Report</i> . Report to Apache Energy Ltd; Reference no. H44; Document no. EAA-60-RD-002, Apache Energy Ltd.	Inaccessible	?	X										
Private	Hadson Energy Ltd, 1992. <i>Harriet Oilfield Marine Biological Monitoring Programme - Second Triennial Review from June 1989 to June 1991</i> . Report to Apache Energy Ltd; Reference no. H48; Document no. EAA-60-RH-007, Apache Energy Ltd.	Inaccessible	1989 - 1991	X										
Private	Hadson Energy Ltd, 1994. <i>Seventh Environmental Report - October 1991 to December 1993</i> . Report to Apache Energy Ltd; Reference no. H88; Document no. EAA-60-RI-037, Apache Energy Ltd.	Inaccessible	1991 - 1993	X										
Private	Hanley, R., 1993. <i>Wanaea Baseline Study: Report on the Benthic Invertebrate Survey of Wanaea Oil Field</i> . Report for Woodside Offshore Petroleum Pty Ltd; Marine Ecology Technical Report 94/1.	Inaccessible	?	X										
Private	Hick, P. and Caccetta, M., 1997. <i>Spectral Measurements of Illumination Sources at Varanus Island: A study of the Possible Effects of the East Spar Facility Lights on Turtles</i> . In. Report for Apache Energy Limited, Apache Energy Limited, 14 pp.	Inaccessible	?	X									X	

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W & S	PP	V	I	F	R	M	
Private	Holdway, D., Tindall, C. and Heggie, D., 1995. <i>Produced Formation Water Discharge to Seawater from Harriet 'A' Production Platform, NW Shelf, 1995.</i> unpublished report.	Inaccessible	?	X			X							
Private	Kinhill Pty Ltd, 1998. <i>Marine Biological Monitoring and Reporting Program Thevenard Island (WAPET).</i> Report for West Australian Petroleum Pty Ltd.	Inaccessible	?	X										
Private	LeProvost Dames & Moore, 1991. <i>Chemical and Ecological Monitoring of Mermaid Sound Triennial Report 1988 - 1991.</i> For Woodside Offshore Petroleum Pty Ltd.	Inaccessible	1988 - 1991	X										
Private	LeProvost Dames & Moore, 1994. <i>Chemical and Ecological Monitoring of Mermaid Sound 1991 -1993 Triennial Review.</i> For Woodside Offshore Petroleum Pty Ltd.	Inaccessible	1991 - 1993	X										
Private	LeProvost Dames & Moore, 1994. <i>Harriet Oil & Gas Development, Eastern Bay Seafloor Survey, Varanus Island.</i> Report to Hadson Energy Ltd; LDM Ref: 19989-010- 367 (R516), 8 pp.	Inaccessible	?	X										
Private	LeProvost Dames & Moore, 1994. <i>Harriet Oil and Gas Fields Development Marine Management and Monitoring Programme.</i> Report to Apache Energy Ltd; reference no. H110; document no. EAA-60-RI-050/B.	Inaccessible	?	X										
Private	LeProvost Dames & Moore, 1994. <i>Wanaea Prospect, Calcarenite Ridges 1 & 4 Seafloor Video Analysis.</i> Report for Woodside Offshore Petroleum Pty Ltd, LeProvost Dames & Moore.	Inaccessible	?	X						X				
Private	LeProvost Dames & Moore, 1995. <i>1994 LPG Jetty and Ship-Turning Basin Dredging Programme Marine Monitoring Program.</i> Unpublished Report No. R551 for Woodside Offshore Petroleum Pty Ltd, LeProvost Dames & Moore, 53 pp.	Inaccessible	1994											
Private	LeProvost Dames & Moore, 1996. <i>Agincourt Marine Habitat Survey August 1996.</i> Report to Apache Energy Ltd; reference no. H143; document no. EAA-60-RH-017/B.	Inaccessible	?	X										

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W &S	PP	V	I	F	R	M	
Private	LeProvost Dames & Moore, 1996. <i>Chemical and Ecological Monitoring of Mermaid Sound Annual Report 1996</i> . Report for Woodside Offshore Petroleum Pty Ltd.	Inaccessible	1996	X										
Private	LeProvost Dames & Moore, 1997. <i>Letter Report: Mangrove monitoring at North East Creek</i> . Report for Woodside Offshore Petroleum Pty Ltd.	Inaccessible	?						X					
Private	LeProvost Environmental Consultants, 1990. <i>Hadson Energy Ltd. Harriet Field Development. Fifth Annual Environmental Report June 1990</i> . Report to Hadson Energy Ltd, LEC Ref J147, Apache Energy Ltd.	Inaccessible	?	X										
Private	LeProvost Environmental Consultants, 1990. <i>Harriet Oilfield Marine Biological Monitoring Programme - Coral and Rocky Shore Fauna Monitoring to June 1990</i> . Report to Apache Energy Ltd; reference no. H28; document no. EAA-60-RH-005.	Inaccessible	?	X						X				
Private	LeProvost Environmental Consultants, 1990. <i>Saladin Oilfield Development Marine Biological Monitoring Programme Second Annual Report</i> . Report for West Australian Petroleum Pty Ltd, 66 pp.	Inaccessible	?	X										
Private	LeProvost Environmental Consultants, 1992. <i>Harriet Oilfield Marine Biological Monitoring Programme - second Triennial Review June 1989 - June 1991</i> . Report to Hadson Energy; Report R361, Apache Energy Ltd, Perth.	Inaccessible	1989 - 1991	X										
Private	LeProvost Environmental Consultants, 1993. <i>Harriet - Marine Management and Monitoring Programme - 7th Annual Report June 9-August 92</i> . Report to Apache Energy Ltd; reference no. H78; document no. EAA-60-RH-015.	Inaccessible	?	X										
Private	LeProvost, Semeniuk & Chalmer, 1980. <i>Fauna and Flora Survey of Western Lease No. 5976^H</i> . Dampier Salt (Operations), Dampier, WA.	Initial survey	1980	X					X	X	X			
Private	LeProvost, Semeniuk & Chalmer, 1980. <i>Marine Biological Monitoring Programme Burrup Peninsula, Western Australia: Phase One</i> . Report for Woodside Petroleum Development Pty Ltd.	Inaccessible	?	X										

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W &S	PP	V	I	F	R	M	
Private	LeProvost, Semeniuk & Chalmer, 1986. <i>Harriet Oilfield Marine Biological Monitoring Programme</i> . Report to Apache Energy Ltd; reference no. H9; Document no. EAA-60-RH-001.	Inaccessible	?	X										
Private	LeProvost, Semeniuk & Chalmer, 1987. <i>Harriet - Marine Biological Monitoring Programme - Coral & Rocky Shore Fauna Monitoring to June 1987</i> . Report to Apache Energy Ltd; ref. no. H64; document no. EAA-60-RH013.	Inaccessible	?	X						X				
Private	LeProvost, Semeniuk & Chalmer, 1987. <i>Harriet Oilfield development. Mangrove monitoring surveys, Progress Report June 1987</i> . Report to Bond Corporation Pty Ltd; LSC Report No R178.	Inaccessible	?	X					X					
Private	LeProvost, Semeniuk & Chalmer, 1987. <i>Port Hedland Port Development 1984-86 Environmental Monitoring Programme Final Report</i> . Report for Mt Newman Mining Co. Pty Ltd; volume 1 text - 187/81.	Inaccessible	1984 - 1986	X										
Private	LeProvost, Semeniuk & Chalmer, 1989. <i>Harriet Field Development. Fourth Annual Environmental Report June 1989</i> . Report for Bond Energy Resources Ltd Petroleum Division; H18 document no. EAA-60-RI-011.	Inaccessible	?	X										
Private	LeProvost, Semeniuk & Chalmer, 1989. <i>South Pepper - North Herald Oilfield Marine Monitoring Program. Baseline Survey and First Annual Report</i> . Report for Western Mining Corporation Ltd.	Inaccessible	?	X										
Private	LeProvost, Semeniuk & Chalmer, 1989. <i>The Mangroves of the Lowendal Islands and Monte Bello Island - Harriet Oilfield Development Results of a Survey Late November 1989</i> . Report to Apache Energy Ltd; ref. no. H1; document no. EAA-60-RV-001.	Inaccessible	?	X					X					
Private	LeProvost, Semeniuk & Chalmer, 1990. <i>Harriet - Results of Hydrocarbon Sampling, Baseline Sediment & Supplemental Oyster Surveys - June 1989</i> . Report to Apache Energy Ltd; ref. no. H65; document no. EAA-60-RH-014.	Inaccessible	?	X		X				X				

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W & S	PP	V	I	F	R	M	
Private	LeProvost, Semeniuk & Chalmer, 1990. <i>Harriet Oilfield Marine Biological Monitoring Programme - Coral and Rocky Shore Fauna Monitoring to June 1989</i> . Report to Apache Energy Ltd; ref. no. H20; document no. EAA-60-RH-004.	Inaccessible	?	X										
Private	LeProvost, Semeniuk & Chalmer, 1996. <i>Harriet Oilfield - Marine Biological Monitoring Programme Environmental Description, Establishment of Baseline and Collection of First Data Set</i> .	Inaccessible	?	X										
Private	LeProvost, Semeniuk & Chalmer, <i>Marine Biological Monitoring Programme Burrup Peninsula, Western Australia: Phase Two</i> . Report for Woodside Petroleum Development Pty Ltd.	Inaccessible	?	X										
Private	Meagher and Le Provost. 1979. <i>Marine Environment of Dampier Archipelago</i> . Woodside Petroleum Development Pty. Ltd. 202pp.	Initial survey	1978 - 1979	X		X		X	X	X	X			
Private	Mobil Exploration & Producing Australia Pty Ltd, 1997. <i>Border-1 Environmental Closeout Report</i> .	Inaccessible	?											
Private	Mobil Exploration & Producing Australia Pty Ltd, 1997. <i>Cherring-1 Environmental Closeout Report, WA202P (R1)</i> .	Inaccessible	?	X										
Private	Mobil Exploration & Producing Australia Pty Ltd, 1997. <i>Effects of Wandoo Crude and Wonnich Condensate on Gametes and Larvae of the Coral Acropora millepora</i> .	Inaccessible	?	X						X				
Private	Mobil Exploration & Producing Australia Pty Ltd, 1998. <i>Environmental Monitoring of Sediment Characteristics at Wandoo</i> .	Inaccessible	?	X			X							
Private	Murdoch, R., 1994. <i>Review of the Seventh Annual Environmental Report by WMC of the Production Licence Area TL/2</i> . Report for Western Mining Corporation; CAR-TL/2- 24, Novus West Australia Pty Ltd.	Inaccessible	?											

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W & S	PP	V	I	F	R	M	
Private	NIW, 1994. <i>Review of the Second Triennial Report on Environmental Management by Western Mining Corporation of the Production Licence TL/2</i> . CAR-GEN-305,0, Novus West Australia Pty Ltd.	Inaccessible	?											
Private	Novus West Australia Pty Ltd, 1990. <i>Production Licence TL/2 Marine Monitoring Programme Triennial Report</i> . CAR-GEN-58,0, Novus West Australia Pty Ltd.	Inaccessible	?											
Private	Novus West Australia Pty Ltd, 1992. <i>Fifth Environmental Report Airlie Project Monte Bello and Lowendal Islands</i> . In: <i>Summary Report of Marine Resources and Bibliography</i> . CAR-TL/2-61,0; Novus West Australia Pty Ltd.	Inaccessible	?	X										
Private	NSR Environmental Consultants, 1995. <i>Wandoo Full Field Development Public Environmental Review</i> . Report for Mobil Exploration & Producing Australia Pty Ltd.	Inaccessible	?	X										
Private	Oliver, G. A., and Fisher, S. J., 1999. <i>The persistence and effect of non-water based drilling fluids on Australia's North West Shelf, progress findings from three seabed surveys</i> . <i>APPEA Journal</i> .	Inaccessible	?											
Private	Oliver, G., 1995. <i>Environmental report on the impact of disposal of ballast water by ships loading LPG and condensate</i> . Report for Woodside Offshore Petroleum Pty Ltd; WENV 258.	Inaccessible	?											
Private	Phatak, A. and Palmer, M., 1998. <i>Effect of Drilling at North Rankin A on Benthic Fauna and Sediment Chemistry</i> . Woodside Offshore Petroleum Pty Ltd.	Inaccessible	?	X										
Private	Racal, 1994. <i>Reconnaissance Survey for The Extensions to the Port of Dampier Mermaid Strait Regional Survey Area Port Approach Routes Dixon Survey Area & Proposed Jetty Location Cape Lambert</i> . A2242.	Inaccessible	?	X										
Private	Sinclair and Knight, 1992. <i>5th Annual Marine Monitoring Report for TL/2</i> . Report for Western Mining Corporation; CAR-TL/2-224, Novus West Australia Pty Ltd.	Inaccessible	?	X										

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W &S	PP	V	I	F	R	M	
Private	Sinclair and Knight, 1993. <i>Annual Report of Environmental Management of Oilfield Operations on Thevenard Island January 1993</i> . CAR-GEN-143,0, Novus West Australia Pty Ltd.	Inaccessible	?	X										
Private	Sinclair and Knight, 1994. <i>Airlie Project Production Licence TL/2 Triennial Environmental Report 1991-1993</i> . CAR-TL/2-113,2800, Novus West Australia Pty Ltd.	Inaccessible	1991 - 1993	X										
Private	Sinclair and Knight, 1994. <i>Seventh Annual Environmental Report for Production Licence TL/2</i> . CAR-TL/2-121, Novus West Australia Pty Ltd.	Inaccessible	?	X										
Private	Sinclair and Knight, 1994. <i>Wedge-Tailed Shearwater and Oyster Monitoring</i> . Report for Western Mining Corporation; CAR-TL/2-223, CARGEN-260,0, Novus West Australia Pty Ltd.	Inaccessible	?											
Private	Sinclair Knight Merz, 1995. <i>Eighth annual Environmental Report for Production Licence TL/2</i> . CAR-TL/2-162, Novus West Australia Pty Ltd.	Inaccessible	?	X										
Private	Sinclair Knight Merz, 1996. <i>East Spar Gas Field Long Term Environmental Monitoring: Pre Production Survey</i> . Report for Apache Energy Limited.	Inaccessible	?	X										
Private	Sinclair Knight Merz, 1997. <i>Airlie Island Marine Survey: Tenth Annual Report for Production Licence TL/2</i> . CAR-TL/2-233, Novus West Australia Pty Ltd.	Inaccessible	?	X										
Private	Sinclair Knight Merz, 1997. <i>East Spar Biological Monitoring: Post Commissioning Survey</i> . Report for Apache Energy; 054 EA-00-RI-078/B, 48 pp.	Inaccessible	?	X										
Private	V & C Semeniuk Research Group, 1988. <i>The Mangroves of the Lowendal Islands and Montebello Islands</i> . Harriet Oilfield development triennial report, October 1988, 65 pp.	Inaccessible	?	X						X				
Private	V & C Semeniuk Research Group, 1989. <i>The Mangroves of the Lowendal Islands and Monte Bello Islands: Results of Surveys December 1988 and June 1989</i> . Annual Report, June 1989, Apache Energy Ltd.	Inaccessible	1988 - 1989	X						X				

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W & S	PP	V	I	F	R	M	
Private	V & C Semeniuk Research Group, 1989. <i>The Mangroves of the Lowendal Islands and Monte Bello Islands: Results of Surveys Late November 1989. December 1989.</i> Apache Energy Ltd.	Inaccessible	1989	X						X				
Private	V & C Semeniuk Research Group, 1992. <i>The Mangroves of the Lowendal Islands and Monte Bello Islands - Annual Report: Results of Survey December 1991 & June 1992</i> Report to Apache Energy Ltd; Reference no. H76; Document no. EAA-60-RV-012, Apache Energy Ltd.	Inaccessible	1991 - 1992	X						X				
Private	V & C Semeniuk Research Group, 1993. <i>The Mangroves of the Lowendal Islands and Monte Bello Islands - Annual Report: Results of Surveys, December 1992 & June 1993.</i> Report to Apache Energy Ltd: Reference no. H79: Document no. EAA-60-RV-013, Apache Energy Ltd.	Inaccessible	?	X						X				
Private	V & C Semeniuk Research Group, 1995. <i>The Mangroves of the Lowendal Islands and Monte Bello Islands June 1995.</i> Report to Apache Energy Ltd; Reference no. H116; Document no. EAA-60-RI-056, Apache Energy Ltd.	Inaccessible	?	X						X				
Private	West Australian Petroleum Pty Ltd, 1990. <i>Barrow Island Oil Field Environmental Review 1963-1988.</i> Report by West Australian Petroleum Pty Ltd.	Inaccessible	1963 - 1988	X										
Private	West Australian Petroleum Pty Ltd, 1991. <i>Barrow Island Oil Field Environmental Review Update 1989 - 1991.</i> 70 pp.	Inaccessible	1989 - 1991	X										
Private	West Australian Petroleum Pty Ltd, 1996. <i>Barrow Island Oilfield: Environmental Review 1992-1996.</i> 75 pp.	Inaccessible	1992 - 1996	X										
Private	West Australian Petroleum Pty Ltd, 1997. <i>Barrow Island Annual Environmental Review Report 1997.</i>	Inaccessible	?	X										
Private	West Australian Petroleum Pty Ltd, 1997. <i>Thevenard Island Third Triennial Environmental Report 1995-1997.</i> 220 pp.	Inaccessible	1995 - 1997	X										

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W &S	PP	V	I	F	R	M	
Private	Western Mining Corporation, 1990. <i>TP/7 and TL/2 Five Year Offshore Drilling Program Consultative Environmental Review</i> . CAR-TL/2-12, Novus West Australia Pty Ltd.	Initial survey	?	X						X	X	X	X	X
Private	Western Mining Corporation, 1992. <i>Airlie Project: Fifth Environmental Report</i> .	Inaccessible	?	X										
Private	Western Mining Corporation, 1994. <i>Airlie Project Second Triennial 1993 Report</i> .	Inaccessible	?	X										
Private	Western Mining Corporation, 1995. <i>Eighth Annual Environmental Report for Production Licence TL/2</i> .	Inaccessible	?	X										
Private	Western Mining Corporation, 1996. <i>Airlie Island Annual Marine Survey</i> . CAR-TL/2- 184, Novus West Australia Pty Ltd.	Inaccessible	?	X										
Private	Western Mining Corporation, 1996. <i>East Spar Long Term Monitoring</i> . Western Mining Corporation, 1996. <i>Environmental Audit Airlie Island- Stage 1</i> . CAR-TL/ 2-173, Novus West Australia Pty Ltd.	Inaccessible	?	X										
Private	Woodside Offshore Petroleum Pty Ltd, 1996. <i>Annual Report on Environmental Investigations and Monitoring September 1996</i> . WENV 317.	Inaccessible	?											
Private	Woodside Offshore Petroleum Pty Ltd, 1997. <i>Biannual Report on Environmental Monitoring January to June 1997</i> .	Inaccessible	?											
Private	Woodside Petroleum Development Pty Ltd, 1989. <i>The Effects of Dredge Spoil on the Sedimentology and Biology of No Name Bay 1988 -1989</i> . WENV 0132.	Inaccessible	1988 - 1989											

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W & S	PP	V	I	F	R	M	
Universities	Carr, B. L. N. and Paling, E., 1996. <i>Pilbara Mangrove Study, Volume 2A Introduction, Site Lists and Site Information, Mangrove Site Database</i> . NEDP Report no. 18, Institute for Environmental Science Murdoch University & Conservation Council of WA, Murdoch University.	Inaccessible	?	X						X				
Universities	Carr, B., Livesey, N. and Paling, E., 1996. <i>Pilbara Mangrove Study, Volume 1</i> . NEDP Report No. 18, Institute for Environmental Science Murdoch University & Conservation Council of WA, Murdoch University, 102 pp.	Inaccessible	?	X						X				
Universities	Carr, B., Livesey, N. and Paling, E., 1996. <i>Pilbara Mangrove Study, Volume 2B Introduction, Site Criteria Lists, Selected Site Information and Maps</i> . NEDP Report no. 18, Institute for Environmental Science Murdoch University & Conservation Council of WA, Murdoch University.	Inaccessible	?	X						X				
Universities	Chappell, J., 1982. <i>Some Effects of Cyclonic Waves and Tidal Currents on the Coast and Continental Shelf near Dampier, Western Australia</i> . Australian National University, Canberra.	Inaccessible	?	X		X								
Universities	Jenner, KCS, MNM Jenner and KA McCabe. 2001. Geographical and temporal movements of Humpback Whales in Western Australian waters. <i>APPEA Journal</i> :749-765.	Excellent	1990 - 1998	X	X									X
Universities	Morgan, DL, H Gill, M Allen and M Maddern. 2003. Distribution and Biology of Fish in Inland Waters of the Pilbara (Indian Ocean) Drainage Division. Report to the Natural Heritage Trust. March 2003. Project Number 003026. Murdoch University. Perth. 70pp.	Taxonomic Survey	2000 - 2002	X								X		
Universities	Paling, E. I., 1996. <i>Mangrove Processes in the Port Hedland Harbour and Surrounds: Tidal Creek Erosion and Mangrove Health from September 1993 to March 1995</i> . Marine and Freshwater Research Laboratory, Environmental Science, Murdoch University. Report No. MAFRA 96/8. Unpublished report to Halpern Glick Maunsell Pty Ltd. BHP Iron Ore, 39 pp.	Inaccessible	1993 - 1995	X						X				

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W & S	PP	V	I	F	R	M	
Universities	Paling, EI, G Humphreys and I McCardle. 2003. The effect of a harbour development on mangroves in northwestern Australia. <i>Wetlands Ecology and Management</i> 54:281-290.	Fair	1993 - 1996	X						X				
Universities	Pedretti, YM and EI Paling. 2000. WA Mangrove Assessment Project 1999-2000. Murdoch University. Perth. 83pp.	Initial survey	1999 - 2000	X	X					X				
Universities	Reitsema, T., 1997. <i>Imposex in Morula granulata as Bioindicator of Turbidity Contamination in Dampier Archipelago</i> . Draft Report, 23 pp.	Inaccessible	?	X							X			
WAM	Berry, PF (Ed.) 1986. <i>Faunal Surveys of The Rowley Shoals, Scott Reef and Seringapatam Reef North-western Australia</i> . Records of the Western Australian Museum, Supplement No. 25, Perth. 106pp.	Taxonomic Survey	1981 - 1984		X	X				X	X	X	X	
WAM	Berry, PF (Ed.) 1993. <i>Marine Faunal Surveys of Ashmore Reef and Cartier Island North-western Australia</i> . Records of the Western Australian Museum, Supplement No. 44, Perth. 91pp.	Taxonomic Survey	1986 - 1987		X						X	X		
WAM	Berry, PF and FE Wells (Eds.). 2000. Survey of the marine fauna of the Montebello Islands, Western Australia and Christmas Island, Indian Ocean. Records of the Western Australian Museum. Supplement 59. Western Australian Museum, Perth. 127pp.	Taxonomic Survey	1993	X		X				X	X	X	X	X
WAM	Hutchins, JB. 2003. Checklist of marine fishes of the Dampier Archipelago, Western Australia. In Wells, FE, DI Walker and DS Jones (Eds.). <i>The Marine Flora and Fauna of the Dampier Archipelago, Western Australia</i> . Western Australian Museum, Perth. 453-478.	Taxonomic Survey	1972 - 2000	X								X		

WHO	REFERENCE	QUALITY	WHEN	WHERE		WHAT								
				P	K	G	W &S	PP	V	I	F	R	M	
WAM	Jones, DS (Ed.) 2004. <i>Marine Biodiversity of the Dampier Archipelago Western Australia 1998-2002. Report on the Results of the Western Australian Museum/Woodside Energy Ltd. Partnership. Records of the Western Australian Museum Supplement No. 66, Perth. 401pp.</i>	Taxonomic Survey	1998 - 2002	X						X	X	X		
WAM	Walker, DI (Ed.) 1997. <i>Marine Biological Survey of the Central Kimberley Coast, Western Australia. University of Western Australia, Perth. 95pp.</i>	Taxonomic Survey	1996		X					X	X	X		
WAM	Walker, DI, FE Wells and JR Hanley. 1996. <i>Survey of the Marine Biota of the Eastern Kimberley, Western Australia. Marine Biological Survey of the Eastern Kimberley, Western Australia. University of Western Australia, Western Australian Museum, and Museum and Art Gallery of the Northern Territory. Perth. 84pp.</i>	Taxonomic Survey	1995		X					X	X	X		
WAM	Wells, FE and GR Allen. 2005. <i>Marine biodiversity on offshore coral reefs in north-western Australia. The Beagle, Records of the Museums and Art Galleries of the Northern Territory Supplement 1:43-50.</i>	Taxonomic Survey	1982 - 2000	X	X						X	X		
WAM	Wilson, B. 2008. <i>Intertidal Habitats of Selected Sites in the Canning Bioregion. Preliminary Field Results May-June 2008. Report submitted to the Northern Development Taskforce. 77pp.</i>	Initial survey	2008		X	X								
WAMSI	Fry, G, G Heyward, T Wassenberg, T Taranto, T Stieglitz and J Colquhoun. 2008. <i>Benthic Habitat Surveys of Potential LNG Hub Locations in the Kimberley Region. A study commissioned by the Western Australian Marine Science Institution on behalf of the Northern Development Taskforce. A joint CSIRO and AIMS Preliminary report for the Western Australian Marine Science Institute. 61pp.</i>	Initial survey	2008		X	X								