Delineation of environmentally sensitive marine areas around Australia

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Acknowledgments

This report was compiled with the help of several people in various jurisdictions who responded to calls for information with advice and documents, and/or took the time to read and improve the draft. From **Queensland**: Wendy Craik, Gay Deacon, Paul O'Keefe, Steve Raaymakers, Pauline Semple and Simon Woodley; in the **Northern Territory**: Ron Billyard, Brett Struck and Dr Janice Warren; and **New South Wales**: Dr Jennifer Burchmore, Adrian Heggie and Gary Henry. In **Victoria**: Stuart Bowe, Dr Colin Gibbs, Don Hough, Dr David May and Julia Reed; in **Tasmania**: Richard Hammond and Nigel Ricketts; and **South Australia**: Katherine Bellette, Peter Body and Ian Kirkegaard. In **Western Australia**: Dr Chris Simpson, Warren Tacey, Dr Trevor Ward and Gary Whisson; and, finally, in **Canberra**: Dr David Brunckhorst and Tim Gentle. Thank you all.

Summary

This report has been prepared in response to a request from the ANZECC Working Group on Pollution and Shipping Incidents to provide a summary of:

- how each jurisdictional area in Australia goes about defining environmentally sensitive areas (ESAs) in the marine environment; and
- the principles which should be considered in defining environmentally sensitive areas.

Around the coast of Australia there is a three step approach to protection of marine resources from dangerous spills and routine discharges. After classifying all coastal areas to determine their representativeness the first step is to define high value areas. The second is to assess their vulnerability and level of risk to which they are exposed so as to determine what are acceptable activities within them. Thirdly, attempts are made to ensure that high value or high risk areas are afforded protection.

While there are differences in the terminology, there is a high degree of commonality between jurisdictions in the way marine areas have been identified. The term "environmentally sensitive area", as used in this report, has been informally defined as:

'Marine and estuarine areas with high conservation, cultural (educational, recreational, historic, aesthetic) or economic values, and/or high vulnerability to environmental degradation as a result of natural disasters, pollution or over-exploitation of their natural resources.'

The definition leads to the principles or concepts used to identify environmentally sensitive areas. Some principles which have been used to delineate boundaries for key conservation areas are: representativeness, species diversity and rarity, viability, fragility/vulnerability, the connectivity between source and sink reefs, critical habitat, protection for seagrass and fish spawning areas, naturalness, outstanding features and tourism values. Also considered are the distribution of flora, fauna and habitats and how they relate to factors such as climate, currents, morphology, etc.

New South Wales, Victoria, the Northern Territory and Queensland use coastal resource atlas systems to assess the hazard from oil spills. This approach identifies degrees of sensitivity and vulnerability with regard to oil spills, and recommends appropriate contingency plans to deal with spills should they occur. A similar approach has been adopted in Western Australia and Tasmania in that the entire coastline is categorised according to ecological/conservation, cultural and economic values, and scientific or educational significance.

To protect proclaimed areas one approach, used on the Great Barrier Reef, is to establish a system of interrelated marine parks, incorporating zones which permit activities appropriate to the conservation value and sensitivity of each area. These uses range from general use to very restricted use (where few invasive activities are permitted). It allows a high degree of flexibility where there is a large gazetted area. This model, appropriately modified in each jurisdiction, is also being used in the Northern Territory for Marine Parks, in New South Wales for Marine and Estuarine Protected Areas and in some parts of Victoria and Western Australia for Marine Park areas. South Australia and Tasmania have not formally adopted this system.

A system of water quality protection based on specified uses of water bodies is used in South Australia, Victoria and New South Wales, while Western Australia uses a draft modification of the national ANZECC (1992) guidelines on water quality. Water quality guidelines are especially appropriate in areas where there is poor water exchange and/or a high level of human based activity.

In each jurisdiction the environmental acceptability of proposed activities may be assessed according to their likely impacts on identified conservation/ecological resources. The likely impacts will be a function of the vulnerability grading of the areas.

The federal government, through the Department of Environment, Sport and Territories, the Australian Nature Conservation Agency and the Great Barrier Reef Marine Park Authority, is developing a system of marine protected areas. This is a key element of the Ocean Rescue 2000 programme, announced in 1991, which seeks to facilitate development of the marine component of the National Strategy for Ecologically Sustainable Development.

The international (IMO) guidelines on procedures for the identification of particularly sensitiv sea areas have been included to enable comparisons to be made. Many of the criteria used ar very similar to those in Australian jurisdictions.

The various jurisdictions are at different stages in the process of defining and protecting thei marine resources. There is also a need to clarify what is meant by certain commonly used term in this report even though it appears that the general principles used around Australia ar similar.

1. Introduction

This report has been prepared in response to a request from the ANZECC Working Group on Pollution and Shipping Incidents to provide a summary of:

- how each jurisdictional area in Australia goes about defining environmentally sensitive areas (ESAs) in the marine environment; and
- the principles which should be considered in defining environmentally sensitive areas.

The term "ESA" is used here more broadly than in the historical perspective, in which "marine environmentally sensitive areas" was used in a pollution context, specifically with regard to oil spills. To illustrate the current use of the term a partial definition might be:

marine and estuarine areas with high conservation, cultural (educational, recreational, historic, aesthetic) or economic values, and/or high vulnerability to environmental degradation as a result of natural disasters, pollution or over-exploitation of their natural resources. (Note that these may also include areas which are not given any legislated status or protection).

The objective of the brief is to establish whether it is practicable to establish a nationally consistent approach to determining ESAs. The Federal Department of Transport and Communications needs to have appropriate documentation of the environmental significance and vulnerability of islands, shorelines and coastal waters to spills in order to develop navigation corridors for shipping (in particular tankers and other ships carrying prescribed cargoes) as a precautionary measure to minimise the effects of shipping accidents on ESAs.

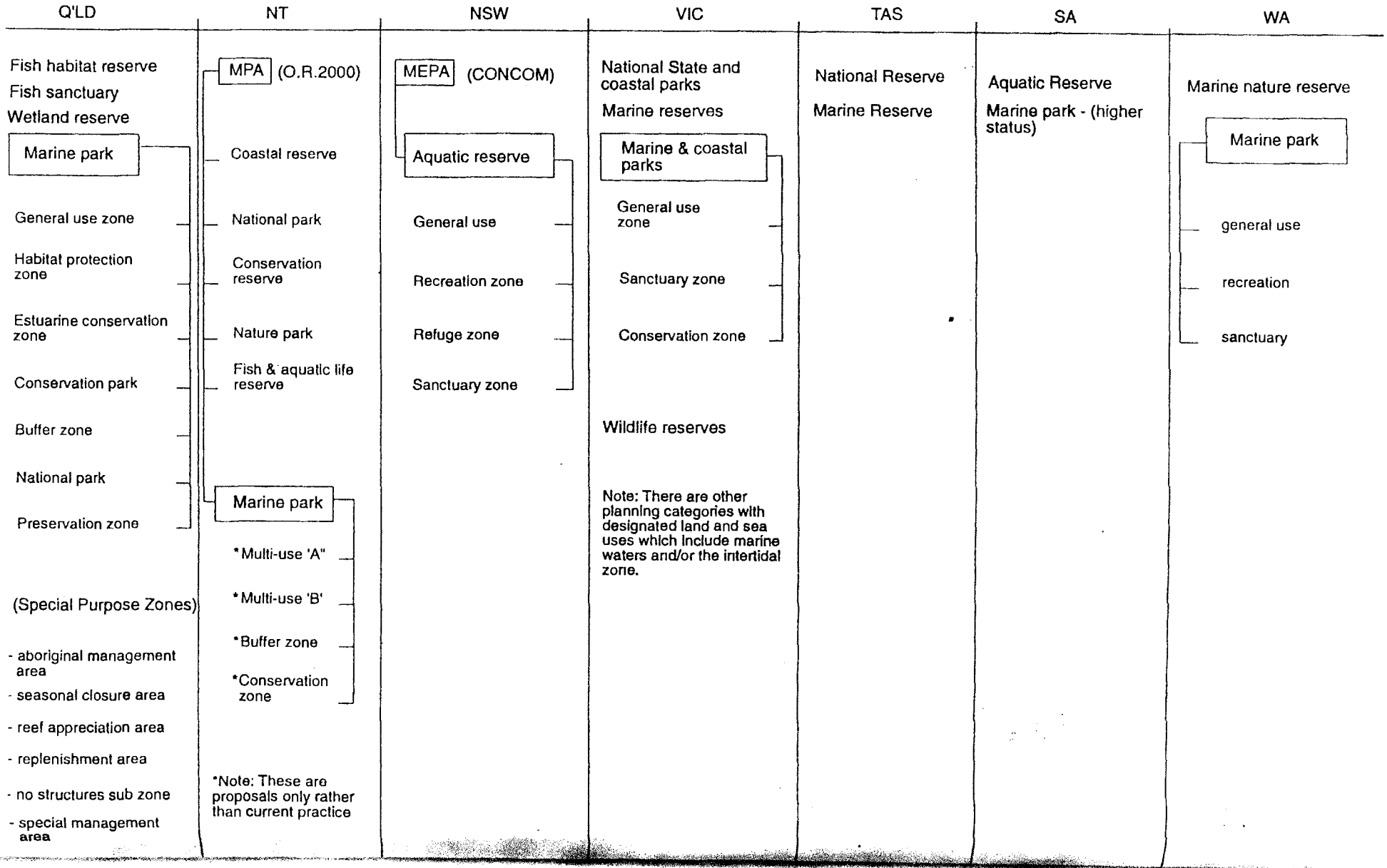
Information was sought from each State and Territory on the status and sensitivity of their marine coastal areas, with particular reference to how they were delineated and what degree of protection they are afforded. As the emphasis is placed on protecting sensitive areas from oil spills, oil is often the focus when vulnerability and risk are considered. This report summarises the data for each jurisdiction. As the bulk of the information received in response to my request was originally compiled for other purposes it has been difficult to make direct comparisons between jurisdictions. This also highlights the difference in approach taken by each State and Territory.

The report is not intended to be encyclopaedic in its coverage. Rather, it is intended as a synopsis of the topic. The main purpose is to show how each jurisdiction has approached the common problem. Feedback received after circulation of the draft of this document indicated that not all data from the relevant literature has been included. However, rather than delay discussion on the report by the ANZECC working group it was decided that any omissions could be recognised as a focus for future study and incorporated, as appropriate, at a later date, if the working party is happy for this interim report to proceed.

A comprehensive listing of all protected areas in Australia at 30th June, 1991 is contained in a document (also on computer) prepared by the Australian National Parks and Wildlife Service (Terrestrial and Marine Protected Areas in Australia:-1991). Each jurisdiction has developed its own system of nomenclature for protected areas, although there is a degree of commonality, with several having categorised specific areas for special purposes, often within larger, more general purpose designations (see Table 1). These specific purposes include: marine and coastal parks, fish sanctuaries, fish habitat reserves and historic shipwreck protected zones. A document entitled "Environmental implications of offshore oil and gas development in Australia", funded jointly by the Australian Petroleum Exploration Association and the Energy Research and Development Corporation has been recently published. It includes a table of the "Status of offshore sedimentary basins, short description of environmental character and areas of sensitivity to oil spills". This is necessarily rather 'broad brush' in its coverage but gives a useful indication of the characteristics, including any specific sensitivities, of each basin.

The various approaches taken by each State and Territory are detailed in the following chapters.

Table 1. Summary of types of marine protected areas around Australia



2. Queensland

The Queensland system was modified to complement the Great Barrier Reef Marine Park system, which is administered under its own (Federal) legislation by the Great Barrier Reef Marine Park Authority (GBRMPA).

State marine parks have been progressively declared adjacent to the Great Barrier Reef Marine Park for complementary management, to include tidal waters around islands and major estuarine and inshore areas. To ensure that the management of the State marine parks and the Great Barrier Reef Marine Park are complementary, all areas are administered in a similar way with respect to declaration, zoning and day-to-day management, principally by the Queensland Department of Environment and Heritage.

2.1 Marine park zones and concepts used in their creation

Marine parks include reef ecosystems habitat for endangered species and benthic communities, coastal fringing reefs, rocky reefs, major wetland areas, etc.

Important concepts for the functioning of reef ecosystems are considered to be:

- connectivity between source and sink reefs;
- protection for seagrass areas in Buffer, Habitat Protection, Conservation Park and National Park zones; and
- protection for reef fish spawning areas.

These concepts were used to help delineate zones. In addition, there are several draft criteria (at August 1993) recognised **for key conservation areas**. These include representativeness, species diversity and rarity, viability, critical habitat, fragility, naturalness, outstanding features, scientific importance, tourism values, recreational opportunities, relevance to industry, existing patterns of use and traditional uses.

The marine parks are multiple-zoned to separate incompatible activities. There are six main zones, which are, in order of increasing protection:

1. General Use Zone;
2. Habitat Protection Zone / Estuarine Conservation Zone;
3. Conservation Park Zone;
4. Buffer Zone (usually 500m wide for zones 3, 5 and 6);
5. National Park Zone;
6. Preservation Zone.

NOTE: These names are in current use but may differ from those used in older marine parks.

In addition, there are a number of **special-purpose categories** including: Aboriginal Management Area; Seasonal Closure Area; Reef Appreciation Area; Replenishment Area and "No Structures" sub-zone .

Operations for the extraction of minerals are precluded by Commonwealth legislation within the boundaries of the Great Barrier Reef Marine Park and petroleum exploration and production is further excluded by regulation from the whole of the Great Barrier Reef Marine Region. However, express provision is made for mineral mining operations in the Queensland zoning plan where extensive sampling programmes or mineral extraction are seen as acceptable uses (subject to environmental assessment on a case by case basis) in "general use" zones, but not in "conservation" or "protection" zones .

In the Great Barrier Reef World Heritage Area, the approach is parallel to that adopted on Queensland islands which form part of the World Heritage listing, but fall outside the boundaries of the Great Barrier Reef Marine Park. For example, on Magnetic and Hamilton Islands, quarry materials have been extracted for construction purposes.

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All other activities, except for spearfishing with SCUBA equipment, littering, and the taking of large specimens of certain species of fish, are catered for within the zoning plan.

To reflect changing needs, the zones of the marine parks are revised where necessary by the State, in consultation with GBRMPA, every 5-8 years in a process which requires public consultation and submissions.

2.2 Oil spill protection and coastal resource atlas

For oil spill protection an oil spill sensitivity scale has been developed which classes coastal and nearshore areas under categories from 'Low' sensitivity (eg cliffs, rocky headlands, high energy environments) to 'Extreme' sensitivity (coral reefs, mangroves, rookeries, seagrass beds and industrial/commercial facilities requiring seawater). This sensitivity scale is used in conjunction with a resource atlas which grades all areas and serves to flag those which require special protection and/or those at highest risk. State contingency plans interface with the national contingency plans and are the responsibility of the Queensland Department of Transport, with the Department of Environment and Heritage providing scientific input as required.

2.3 Shipping

For shipping passage through the park the following criteria apply:

- zones should not impede access to existing or potential ports or to shipping routes;
- zones should provide for shipping movements along current and historic routes;
- major anchorages attract General Use Zone status.

Legislation by the federal government requires all vessels >70 metres long and all loaded oil tankers and chemical carriers to carry a pilot when sailing the inner route of the Great Barrier Reef, which enables a saving of 124 miles over the outer passage.

3. Northern Territory

3.1 Marine protected areas and delineation of zones

The system of marine protected areas (MPAs) is determined by criteria established under 'Ocean Rescue 2000' (refer Sect. 9). In brief these are:

- physical factors such as climate, geology, morphology, currents;
- biological factors — distribution of fauna, flora and habitats;
- resource use — tourism, fishing grounds, port facilities, mine locations;
- land tenure, educational and scientific values; and
- cultural information — aboriginal associations such as traditional hunting and fishing.

There are currently eight marine protected areas, variously described as Marine park; National park; Coastal Reserve; Conservation Reserve; Nature Park; or Fish and Aquatic Life Reserve. These have been proclaimed to protect a range of habitats and species, such as fish feeding on high tide at the 14ha Doctors Gully Fish and Aquatic Life Reserve; intertidal portions of terrestrial parks; mangroves and corals; tidal portions of rivers and creeks; and extensive coastal ecosystems (the 2290 km^2 Cobourg Marine Park). A proposal for the creation of a marine park east and west of Darwin (the Beagle Gulf Marine Park) is in draft form.

MPAs may be managed separately or jointly by the Conservation Commission of the Northern Territory and the Department of Primary Industry and Fisheries. Each is administered under an agreed management plan which is prepared with public input.

The marine parks are designed for multiple use and are zoned according to appropriate use patterns. The following zones have been proposed for the Cobourg Marine Park: Multiple Use 'A' (provision for closure to trawling) and Multiple Use 'B' zones, (similar to 'A' but cannot be closed to trawling), Buffer zones and Conservation zones. Commercial fishing and trawling is permitted in some areas but is closely regulated. In the draft Cobourg Marine Park Plan of Management (March 1993) offshore mining/petroleum activities may be permitted, subject to the requirements of relevant mining and environmental legislation. In this context the point is made that seagrass meadows (dugong habitat) are accorded especially high levels of protection.

3.2 Vulnerability grading of habitats

In the broader context, marine protection is based on concepts of sensitivity and vulnerability to the threat of oil and dispersant pollution. The increasing vulnerability grading of 1 to 5 is based on the physical characteristics, biological and cultural sensitivity of the coastline, and uses a modified version of the standard evaluation criteria established for the National Plan to Combat Pollution of the Sea by Oil (NATPLAN). The degree of vulnerability is an indication of the natural ability of the system to cleanse itself. High energy environments such as rocky shores and exposed beaches have a greater likelihood of being able to remove and degrade oil from their systems than sheltered areas which do not have a self-cleaning action. Much of Darwin Harbour falls into the two most sensitive categories, these being classed as 'moderately to highly sensitive' (vulnerability grading 3-4) , and 'extremely sensitive and productive' habitats (grading 4-5). The highest grade category receives priority for protection and for the clean up of oil spills.

Habitats in the 'extremely sensitive' category (4-5) are expected to be:

- of international or critical regional conservation significance;
- severely damaged or destroyed by oil or dispersants and cannot be effectively cleaned, restored or replaced; and
- worsened in terms of environmental damage by attempts at cleaning.

Examples of such areas are: protected bird habitats, turtle nesting areas, mangroves, coral reefs, fishery reserves and power generating station water intakes.

In the 'moderate to highly sensitive' category (3-4), habitats:

- may be of regional conservation significance;
- may be severely damaged or destroyed; and
- are expensive and difficult to clean, restore or replace. Attempts at cleaning would be protracted and at best partially successful.

This category includes habitats of bird species not specifically targeted for protection, habitats of marine mammals, mariculture leases, water intakes, aboriginal sacred sites, areas of high recreational/tourist usage, marinas and anchorages.

3.3 Oil spill protection and coastal resource atlas

In the allocation of limited oil spill protection resources to areas of particular significance, priority is given to the protection of environmental rather than socio-economic values on the basis that environmental damage would lead to subsequent impacts on cultural and commercial values.

The Coastal Resource Atlas of the NT is maintained by the Conservation Commission of the Northern Territory. Work to incorporate this information into a geographic information system has begun on a priority basis. A pilot project encompassing Darwin harbour has been

completed. Coverage will be extended from Darwin (Beagle Gulf Marine Park) to the WA border in 1994 and to the Queensland border in 1995-6.

4. New South Wales

4.1 Marine and estuarine protected areas (MEPAs)

MEPA is a general term defined by the Australian Council of Nature Conservation Ministers (CONCOM) as:

any area of intertidal or subtidal terrain, together with its superadjacent waters and associated flora and fauna, which has been reserved by legislation to protect part or all of the enclosed environment for conservation, scientific, educational or recreational purposes.

There are presently 22 MEPAs in NSW; this number includes marine reserves, aquatic reserves and national parks and nature reserves if they have marine and/or estuarine components.

Administration of marine and of aquatic reserves is by NSW Fisheries, under the Fisheries and Oyster Farms Act 1935. Under the terms of the legislation, management plans are developed with public input and there is a responsibility to protect all aquatic animals (although whales are excluded). To date, one marine reserve and seven aquatic reserves have been declared. Several additional reserves, including Lord Howe Island and Jervis Bay, are proposed.

A multi-zone model similar to the one for the Great Barrier Reef Marine Park is used. Marine reserves usually contain up to three zones:

- Sanctuary Zones — highest protection, prohibit the removal of any aquatic animals, diving and observation are permitted;
- Refuge Zones — buffer areas around Sanctuary Zones, some recreational fishing permitted;
- General Use Zones — largest and least restrictive, allow for most compatible uses to continue. Commercial activities such as fishing and dive charters are controlled through the issue of licences and permits; and
- Recreational Zones — less commonly used but have more recreational uses than commercial and limit the types of organisms that can be taken from some areas.

Exploration or mining further offshore currently rests under an informal understanding that these activities would be unlikely to be permitted.

4.2 Oil spill protection and coastal resource atlas

New South Wales has a coastal resource atlas system prepared by the EPA which categorises the entire coastline on its sensitivity to oil spills. This is a four tier system (ie. Low, Moderate, High and Extreme sensitivity) similar to the one described for Queensland. The three main areas covered are: analysis of resources at risk, assessment of the threat, and review of resources for oil spill response. The atlas does not prescribe activities for the four tiers but gives a guide on (1) whether dispersants should be used, (2) preferred sites for the deployment of booms and (3) potential conflicts of interest.

4.3 Protection of water quality

The discharge of sewage effluent and other pollutants into the ocean is governed by regulations which reflect water quality criteria, including acceptable levels of bacteria and contaminants, the appearance of the ocean waters and the amount of particulate matter the discharge may contain.

Under the Clean Waters Act 1970 (NSW) it is an offence to pollute waters unless a pollution control licence is obtained and its conditions met. Guidelines for discharges to ocean waters

have been published for the purpose of ensuring that the environmental protection criteria in the Clean Waters Regulations 1972 (NSW) can be met. Licences for any discharges to ocean waters reflect the criteria in the guidelines and regulations. Criteria covered by the regulations and licences may include limits to the concentrations of a wide range of restricted substances, faecal bacterial limits, physical properties of the discharge and nutrient levels.

5. Victoria

5.1 Marine parks and marine reserves

A document entitled "Marine and Coastal Special Investigation: Descriptive Report" (Land Conservation Council 1993), identifies eight types of marine habitat along the Victorian coast. These are: sheltered intertidal flats, intertidal rocky shores, subtidal rocky reefs, subtidal soft substrates, mangroves, sandy beaches, seagrass beds and pelagic environments. The adequacy of planning measures for the protection of significant environmental values and the provision of sustainable use are currently under review by the Land Conservation Council, with recommendations to the Victorian Government expected in 1995.

At present, protection of some of the more significant areas is provided by their inclusion within reserves with specifically designated land and sea uses.

Reserves that are essentially marine-based vary in size by over three orders of magnitude, with the smallest at 3ha. Management arrangements vary accordingly.

Other policies provide general protection for a wide range of marine and foreshore values. These include the determination of an area as critical habitat under the Flora and Fauna Guarantee Act.

The draft management plan for the largest marine reserve (Wilson's Promontory Marine Park) uses a zoning scheme to allow the separation of potentially conflicting uses.

Areas of critical habitat can be determined under the Flora and Fauna Guarantee Act. This can be extended to consideration of the marine biota, such as the nursery grounds for the Southern Right Whale near Warrnambool, soon to be determined under this Act.

5.2 Oil spill protection and coastal resource atlas

In 1980 Victoria produced a coastal atlas as an accompanying document to the Guidelines for the Control of Oil Spills. This was the basis for a following atlas which designated areas where dispersants should not be used. These documents are used as a guide to oil spill contingency planning.

In the late 1980's, with funding provided jointly by Esso and AMSA, the Victorian Institute of Marine Science produced a comprehensive coastal atlas for Western Port under the National Plan to Combat Pollution of the Sea by Oil. Preliminary planning is under way for a similar atlas for Port Phillip Bay. Relevant references include: Atlas of Biological and Recreational Resources of the Victorian Coast, Ministry for Conservation 1980; and Oil Spills on the Victorian Coast, Advice on the Use or Non-Use of Oil Dispersants, Scientific Support Coordinator to the State Plan 1988.

5.3 Protection of water quality

The key legislation is the State Environment Protection Policy for the Waters of Victoria, which was gazetted in 1988 under the Environment Protection Act. Under this legislation (and other similar policies which deal with partly enclosed bodies of water elsewhere in Victoria) several beneficial uses are listed and given protection by the setting of discharge limits:

- maintenance of natural aquatic systems and associated wildlife;
- commercial and recreational fisheries;

- production of molluscs for human consumption;
- swimming, aesthetic enjoyment and boating; and
- industrial usage.

The quality of the water resource in these areas is managed by the control of point source discharges under licencing arrangements, and by legislating to establish good catchment management practices to reduce the amount of pollution entering river systems. It is not known whether ships' ballast waters are controlled.

5.4 Shipping traffic

Traffic separation zones have been created where shipping traffic density is high. These lie in Commonwealth waters off the Victorian coast and channel ships in one direction only. In the zone off Wilson's Promontory large vessels are discouraged from entering the central area of the separation zone. For the protection of offshore oil installations such as platforms and seabed pipelines there is a 90km wide 'Area to be Avoided' adjoining Ninety Mile Beach, which unauthorised ships must not enter.

6. Tasmania

6.1 Marine reserves

Six marine reserves have been proclaimed in Tasmanian coastal areas jointly under the National Parks and Wildlife Act 1970 and the Sea Fisheries Regulations 1962. To qualify prospective areas, four **key criteria** were used:

- conservation — marine species, communities and habitats in their natural state to provide a reservoir of genetic diversity;
- scientific — undisturbed aquatic ecosystems for studies in applied ecology;
- educational — benefits from exposure to marine reserves; and
- recreational — popular diving habitats.

Currently a formal system of zoning has not been developed. Knowledge of the coastal resources is limited to some of the popular resorts and to areas devoted to mariculture.

6.2 Oil spill protection and coastal resource atlas

Oil spill contingency plans are in place for each of the seven Marine Board and Port Authority jurisdictions within the State. Macquarie Island is covered by a contingency plan prepared by the Australian Antarctic Division.

A hard copy coastal resource atlas has been prepared and covers the entire coastline (except for Macquarie Island). The atlas contains basic information on shoreline type and areas of major environmental, cultural, recreational and commercial significance.

Plans are in place to convert the coastal resource atlas into a geographic information system which may incorporate modules for oil spill fate and trajectory as well as resource impact.

Offshore exploration for oil and gas has occurred close to the Tasmanian mainland but outside coastal waters. Future exploration (again outside coastal waters) is likely both along the north coast and off the west coast.

6.3 Protection of water quality

The primary legislation under which protection of water quality is effected is the Environment Protection Act 1973 which sets discharge limits for a number of pollutants into various classes of waters. There is no special provision for marine reserves.

A new Act, which includes definitions of serious and material environmental harm is in preparation. These definitions can apply to any segment of the environment, including marine reserves.

The Pollution of Waters by Oil and Noxious Substances Act 1987 gives effect to the provisions of the MARPOL 73/78 Convention, as amended.

7. South Australia

7.1 Aquatic reserves and marine parks

Limited access for fishing activities is allowed in some of the 13 (in mid-1991) aquatic reserves, whilst others are designated 'non-entry' areas, thereby affording complete protection to marine life within the reserve.

Under the Marine Environment Protection Act 1990* marine parks may be proclaimed over waters, or land and waters, which are considered to be of national significance by reason of the aquatic flora and fauna or the aquatic habitat. At the time of writing, South Australia has no proclaimed marine parks. Marine parks may also be proclaimed under the Fisheries Act. A requirement under the Fisheries Act is that an environmental management plan must be prepared for all marine parks using a process which allows for public consultation. Once a marine park is proclaimed provisions of the Mining Act and petroleum Acts do not apply. Aquatic reserves are protected, regulated and administered under the Fisheries Act 1982, which is the responsibility of the Minister for Fisheries.

7.2 Protection of water quality

Because of the restricted water exchange rates in much of coastal South Australian waters a system of water quality protection has been developed.

The Marine Environment Protection Act 1990 currently regulates water quality for the State, but, as indicated above, is to be repealed and replaced with the Environmental Protection Act (1993). Presently the statutory body responsible for administering the Act is the Environmental Protection Council of South Australia, which reports on protection of the environment to the Minister. Water quality guidelines are linked to the concept of beneficial uses in a similar way as in the Victorian system. The guidelines have been adapted from national guidelines on the advice of the SA Marine Environment Protection Committee.

The criteria for management of water quality are:

salinity and volume of discharge, class of pollutant and area of impact. The permitted levels of these criteria are controlled by the beneficial use or uses to which the area is dedicated.

The beneficial uses include:

- passive recreation — pristine environment;
- primary contact recreation — swimming, water skiing, surfing;
- secondary contact recreation — wading, boating, fishing;

  passive recreation — non-pristine environment;

* to be repealed soon and replaced with the Environment Protection Act (1993), presently a bill

- maintenance of water-associated fauna — indigenous vertebrates, other than fish and humans, which depend on aquatic* environments for drinking water, food and other habitat needs;
- protection of aquatic* ecosystems — near natural state, and modified systems;
- criteria for protection of fisheries and of shellfish;
- criteria for production of edible fish and crustacea; and
- criteria for the protection of the human consumer.

There is no indication from the data provided whether ships' ballast waters fall within the management role of the Marine Environment Protection Act.

8. Western Australia

8.1 Sensitive marine environments and their protection

Using data available from numerous sources, the entire Western Australian coastline has been appraised for sensitive marine environments. In WA a Sensitive Marine Environment (SME) is defined as:

a marine or intertidal area which has been classified because it contains specially diverse or productive plants and animals, or waters of special significance.

The delineation of sensitive marine environments depends on the identification of one or more of the following criteria:

- environments of international, national or State ecological/conservation significance;
- environments where the biological resources are of major economic significance;
- environments of major cultural significance; and
- environments of major scientific or educational significance.

The above are used as a guide rather than mandating designation of an area. It will be apparent that SMEs are very similar in concept to ESAs, as defined elsewhere in this report. Figure 1 indicates the relationship of ESAs to other zones in Western Australia.

Marine parks (MP) and marine nature reserves (MNR) are vested in the National Parks and Nature Conservation Authority and managed by the Department of Conservation and Land Management. WA has one proclaimed marine nature reserve (Hamelin Pool). **Criteria for marine nature reserves** are:

- conservation or restoration of the natural environment;
- protection, care and study of the indigenous flora and fauna; and
- the preservation of any feature of archaeological, historic or scientific interest.

While any of the above may also apply to **marine parks**, these have the extra function of catering for public recreation. There are six marine parks presently in WA. There is a statutory requirement for a management plan to be developed with public input for each marine park and nature reserve. The *State* Management Plan for Ningaloo Marine Park (which is the State's largest) identifies management zones, the configuration of which may change over time if the community expresses different needs. Currently there are General Use, Recreation, and Sanctuary zones. The draft management plan for the Commonwealth sector of the park is congruent with the State plan.

* includes the marine environment

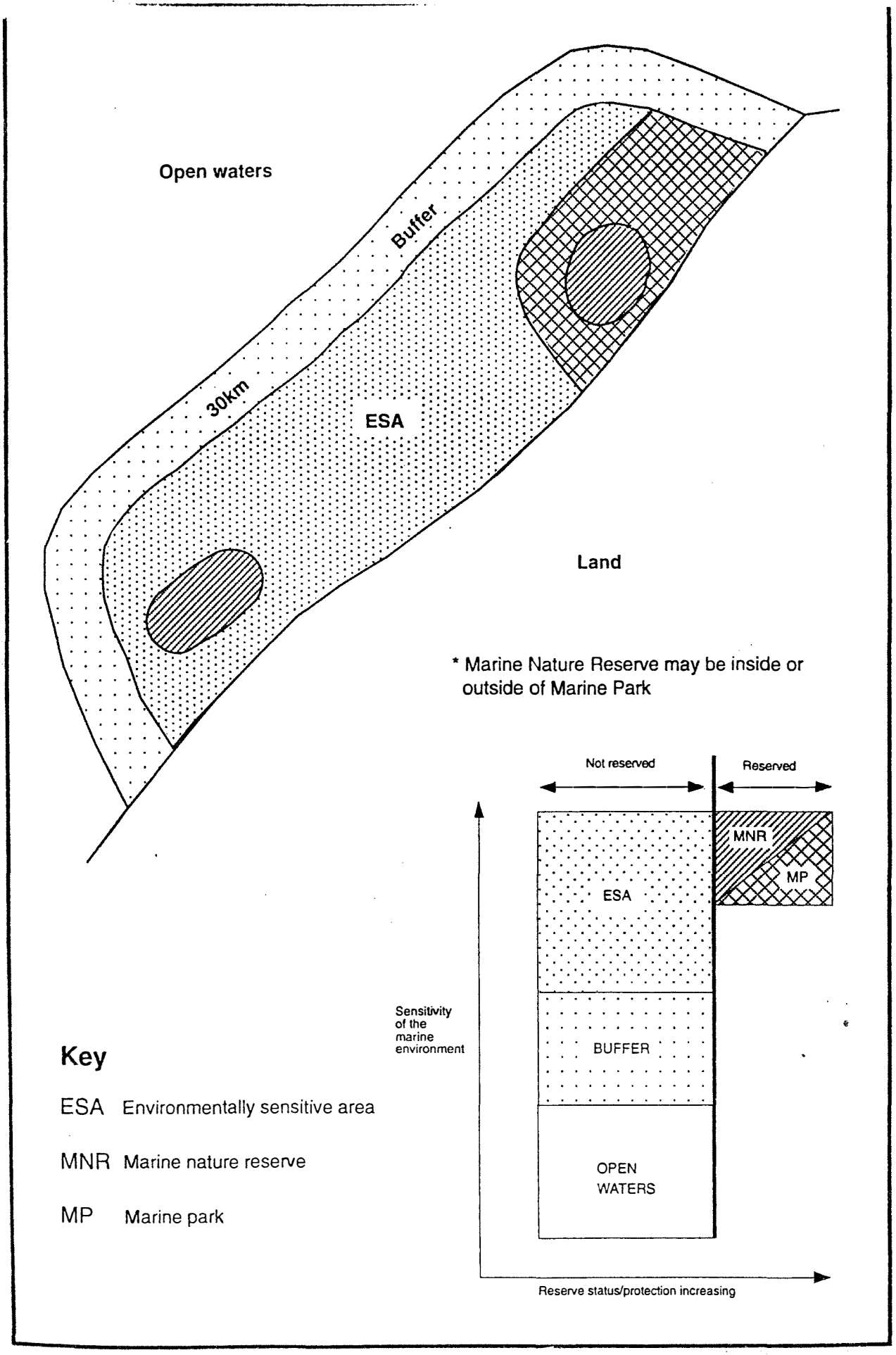

Figure 1. Arrangement and sensitivity of marine protection zones (in WA).

The Western Australian Government established a Marine Park Selection Working Group which has prepared a report with recommendations for marine parks and marine nature reserves for WA. A draft has been recently submitted to Government.

8.2 Oil spill protection

A system of coastal zoning which was originally devised in 1979 has been revised and simplified (April 1993, EPA Bulletin 679-see Fig 1). The zones were established in response to the perceived threat of oil or chemical spills from shipping or offshore petroleum operations. They are linked to controls and guidelines on the range of petroleum activities and oil spill contingency plans pertaining to them.

SMEs encompass marine parks and marine nature reserves, which have been given special status for environmental protection, and environmentally significant areas (ESAs), which may contain equally environmentally sensitive parts but do not have any administrative reserve status at present. All these areas are backed by a 30km wide buffer, which relates to the distance an oil spill might be expected to travel in a 24 hour period under a continuous wind of 35km/h.

8.3 Protection of water quality

The Western Australian draft Water Quality Guidelines for Marine and Fresh Waters (EPA Bulletin 711, October, 1993) are a development of the national guidelines (ANZECC 1992) which were finalised after extensive consultation with all jurisdictions. "Beneficial use" is used instead of "environmental value" in the ANZECC guidelines and covers five values:

- ecosystem protection;
- recreation and aesthetics;
- raw water for drinking;
- agricultural water; and
- industrial water.

The sixteen previously identified beneficial uses now fall into these five categories. The ballast water issue is not specifically addressed.

9. Federal initiatives

9.1 Marine protected areas

A draft paper has been prepared by the Australian Nature Conservation Agency (D J Brunkhorst, August, 1993) for the ANZECC National Advisory Committee on Marine Protected Areas. It proposes a framework for the development of a nationwide system of MPAs, based on the draft International Union for the Conservation of Nature (IUCN) classification. This is an outcome of the Ocean Rescue 2000 programme, announced in 1991, which seeks to facilitate development of the marine component to the National Strategy for Ecologically Sustainable Development.

An MPA is defined as:

any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment.

The objectives of MPAs include:

- to assist in the maintenance of ecosystem function and biological diversity;
- the rehabilitation of coastal marine environments and the replenishment of fisheries, or protection of their natural resource bases, such as breeding, nursery and recruitment areas; and
- to serve as symbols of the values of protecting marine resources.

Individual MPAs may be small or large but must make ecological, social and economic sense as part of a related network of bioregional planning. The discussion paper raised questions for consideration of how MPAs are to be delineated, protected, managed and progressed.

10. International guidelines

The IMO issued guidelines in 1991 on procedures for the identification of particularly sensitive sea areas. These are appended to this report. A summary of the criteria used follows:

- **ecological:** uniqueness, dependency, representativeness, diversity, productivity, naturalness, integrity, vulnerability;
- **social, cultural and economic:** economic benefit, recreation, human dependency; and
- **scientific and educational:** research, baseline and monitoring studies, education, historical value.

The use of ships' routing measures for environmental protection is also discussed elsewhere in these guidelines.

11. Conclusions

Not all regions are at the same stage with regard to the three steps identified in the summary of this report, ie the definition of high value areas, assessment of their vulnerability and level of risk to exposure to spills, and procedures to afford these areas protection.

The principles used to determine ESAs in the various jurisdictions are similar but it is apparent that the terminology differs around Australia and possibly the terms may have different connotations to users. These should be more specifically or formally defined in the next stage of the review by the Task Force.

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Appendix 1

Extract from IMO Resolution A720(17): "Guidelines for the designation of special areas and the identification of particularly sensitive sea areas"

Annex

GUIDELINES FOR THE DESIGNATION OF SPECIAL AREAS AND THE IDENTIFICATION OF PARTICULARLY SENSITIVE SEA AREAS

Contents

2.4 Criteria for the designation of a special area

2.4.1 The criteria which must be satisfied in order for an area to be given special area status are grouped into the following categories:

- oceanographic conditions,
- ecological conditions, and
- vessel traffic characteristics.

Generally, one of the conditions in each category should be satisfied. However, it may be necessary to take additional conditions into account.

Oceanographic conditions

2.4.2 Conditions which would cause the concentration or retention of harmful substances in the waters or sediments of the area, including:

.1 particular circulation patterns (e.g. convergence zones and gyres) or temperature and salinity stratification;

.2 long residence time caused by low flushing rates;

.3 extreme ice state; and

.4 adverse wind conditions.

Ecological conditions

2.4.3 Conditions indicating that protection of the area from harmful substances is needed to preserve:

.1 depleted, threatened or endangered marine species;

.2 areas of high natural productivity (such as fronts, upwelling areas, gyres);

.3 spawning, breeding and nursery areas for important marine species and areas representing migratory routes for sea-birds and marine mammals;

.4 rare or fragile ecosystems (such as coral reefs, mangroves, seagrass beds and wetlands); and

.5 critical habitats for marine resources including fish stocks and/or areas of critical importance for the support of large marine ecosystems.

Vessel traffic characteristics

2.4.4 The sea area is used by ships to an extent that the discharge of harmful substances by ships when operating in accordance with the requirements of MARPOL 73/78 for areas other than special areas would be unacceptable in the light of the existing oceanographic and ecological conditions in the area.

Implementation

2.4.5 The requirements of a special area designation can only become effective when adequate reception facilities are provided for ships in accordance with MARPOL 73/78.

Other considerations

2.4.6 The threat to amenities posed by the discharge of harmful substances from ships operating in accordance with the MARPOL 73/78 requirements for areas other than special areas may strengthen the argument for designating an area as a special area.

2.4.7 The extent to which the condition of a sea area is influenced by non-maritime sources of pollution such as pollution from land-based sources, dumping of wastes and dredged materials,

as well as atmospheric deposition should be taken into account. Proposals would be strengthened if measures are being, or will be, taken to prevent, reduce and control pollution of the marine environment by these sources of pollution.

2.4.8 Consideration should be given to the extent to which a management regime is used in managing the area. Proposals for designation of a special area would be strengthened if measures are being taken to manage the area's resources.

Examples

2.4.9 Examples of existing special areas and of texts of documents submitted to IMO to support proposals for the adoption of special areas are given in appendix A to these Guidelines.

CHAPTER 3 - PARTICULARLY SENSITIVE SEA AREAS

3.1 Protective measures under IMO regulations – General

3.1.1 The MEPC began its study of the question of particularly sensitive sea areas in response to a resolution of the International Conference on Tanker Safety and Pollution Prevention of 1978.

3.1.2 A particularly sensitive sea area is defined as an area which needs special protection through action by IMO because of its significance for recognized ecological or socio-economic or scientific reasons and which may be vulnerable to environmental damage by maritime activities. In order for the area to be identified as a particularly sensitive sea area, it must meet one of the criteria listed in section 3.3.

3.1.3 In the context of these Guidelines, special protective measures are limited to actions within the purview of IMO and include the following options:

.1 to designate an area as a special area under annexes I, II or V of MARPOL 73/78 or to apply certain discharge restrictions to vessels operating in a particularly sensitive sea area. Procedures and criteria for the designation of a special area are contained in chapter 2 of these Guidelines;

.2 to adopt routeing measures near or in the area, under the SOLAS Convention (chapter V, regulation 8) and in accordance with the General Provisions on Ship's Routeing. For this purpose a particularly sensitive sea area may be designated as an area to be avoided or it may be protected by other ships' routeing measures. Procedures and criteria for the adoption of routeing measures are contained in sections 3.4 to 3.7 of these Guidelines;

.3 to develop and adopt other measures aimed at protecting specific sea areas against environmental damage from ships, such as compulsory pilotage schemes or vessel traffic management systems. Procedures and criteria for the adoption of such measures are contained in section 3.8 of these Guidelines.

3.1.4 The above options are shown in summary form in table 8.

3.1.5 In some circumstances, a proposed particularly sensitive sea area may include a buffer zone, in other words, an area contiguous to the site-specific feature (core area) for which specific protection from shipping is sought. However, the need for such a buffer zone should be justified in terms of how it would contribute to the adequate protection of the core area.

Table 8 - *Protective measures for particularly sensitive sea areas*

All the following measures may be used in connection with the management of particularly sensitive sea areas (PSAs); the table provides a synopsis of the measures available to IMO as codified in existing IMO provisions.

	MARPOL – special areas	Areas to be avoided and other routeing measures	Vessel traffic service (VTS)
Application	Strict discharge and equipment requirements for ships (e.g. oil tankers, ships greater/smaller than 400 grt, installation of oil discharge monitoring and control system/ oil filtering equipment	SOLAS regulation V/8 provides that IMO can adopt areas to be avoided and other routeing measures in international waters. These measures can indirectly assist protection of the marine environment by preventing casualties and may be applied to different classes of ships in accordance with the General Provisions on Ships' Routeing.	A VTS is intended to improve safety and efficiency of traffic and protection of the environment
Concept of regulation	The regime of special areas has been designed for the purpose of environmental protection. To minimize pollution two main methods of protection have been established: • discharge control and • shipboard operational controls.	All routeing measures are intended to provide safety of navigation. If collision and grounding are avoided, the environment will be protected by preventing accidental or intentional discharges. Navigational measures can be used as a method of indirect discharge control. This effect can be enhanced by establishing buffer zones.	VTS is especially useful, in conjunction with ship reporting systems, to identify ships carrying environmentally sensitive cargoes and to control their safe passage through PSAs by means of providing information, navigation assistance and controlling traffic
(a) Discharge control	The nature and amount of discharged material are regulated	Routeing and other measures ensure the source of potential pollution is controlled within or kept out of a particularly sensitive sea area	
(b) Shipboard operational/ traffic controls	Depending on ship's type and discharge material/ amount, some shipboard operational controls have to be applied in the case of discharges: • minimum distance from coast • speed limits • minimum water depth.	The General Provisions on Ships' Routeing prescribe measures which can assist in environmental protection, including: • traffic separation schemes and associated inshore traffic zones* • two-way routes • recommended tracks • areas to be avoided* • roundabouts • precautionary areas • deep-water routes.* Other navigational measures: • established directions of traffic flow • recommended directions of traffic flow.	The Guidelines for VTS include: • data collection • data evaluation • information service • navigational assistance service • traffic organization service • support of related activities* (e.g. compulsory pilotage).
Technical support of ship-related measures	Reception facilities have to be established by national authorities in order to support discharge control measures	Routeing measures are included on related navigational charts	VTS provides information to ships on traffic within its coverage area and with problems related to navigation. Details of VTS are included in nautical publications.
Jurisdiction	MARPOL is compulsory and is applicable in international waters as well as in national waters including EEZ, territorial sea and internal waters	With the exception of traffic separation schemes, where behaviour of ships therein is regulated by the 1972 Collision Regulations, all other routeing measures are recommendatory. Use of VTS is also recommendatory in international waters.	

* Measures which have already been used for environmental protection purposes.

3.3.4 In order to be identified as a particularly sensitive sea area, the area should meet at least one of the criteria listed below:

3.3.5 *Ecological criteria*

.1 Uniqueness

An ecosystem can be unique or rare. An area is unique if it is "the only one of its kind". Habitats of endangered species that occur only in one area are an example. A unique ecosystem may extend beyond country borders, assuming regional or international significance.

.2 Dependency

Ecological processes of such areas are highly dependent on biotically structured systems (e.g. coral reefs, kelp forests, mangrove forests, seagrass beds). Such biotically structured ecosystems often have high diversity, which is dependent on the structuring organisms. Dependency also embraces areas representing the migratory routes of marine fish, reptiles, birds and mammals.

.3 Representativeness

These areas have highly representative ecological processes, or community or habitat types or other natural characteristics. Representativeness is the degree to which an area represents a habitat type, ecological process, biological community, physiographic feature or other natural characteristic.

.4 Diversity

These areas have a high variety of species or include highly varied ecosystems, habitats, communities, and species. However, this criterion may not apply to some simplified ecosystems, such as pioneer or climax communities, or areas subject to disruptive forces, such as shores exposed to high energy wave action.

.5 Productivity

The area has a high natural biological productivity. Production is the net result of biological processes which result in an increase in biomass in areas of high natural productivity such as oceanic fronts, upwelling areas and some gyres.

.6 Naturalness

The area has a high degree of naturalness, as a result of the lack of human-induced disturbance or degradation.

.7 Integrity

The area is a biologically functional unit, an effective, self-sustaining ecological entity. The more ecologically self-contained the area is the more likely it is that its values can be effectively protected.

.8 Vulnerability

The area is highly susceptible to degradation by natural events or the activities of people. Biotic communities associated with coastal habitats may have a low tolerance to changes in environmental conditions, or they may exist close to the limits of their tolerance (defined by water temperature, salinity, turbidity or depth). They may suffer such natural stresses as storms or prolonged emersion that determine the extent of their development. Additional stress (such as domestic or industrial pollution, excessive reduction in salinity, and increases in turbidity from watershed mismanagement) may determine whether there is total, partial, or no recovery from natural stress, or the area is totally destroyed. Certain oceanographic and meteorological factors could cause an area to be vulnerable or increase its vulnerability, for example by causing the concentration or retention of harmful substances in the waters or in the sediment of the area, or by otherwise exposing the area to harmful substances. These conditions include circulation patterns such as convergence

3.2 Procedures for the identification of a particularly sensitive sea area

3.2.1 A proposal to IMO for the identification of a particularly sensitive sea area will normally consi of two parts:

.1 information why a given area should be considered as a particularly sensitive sea are and identifying the type of protection that area needs against damage from maritim activities; and

.2 a proposal for the adoption of the required protective measures.

3.2.2 This section of the Guidelines will only address the elements which should be containe in the first part.

3.2.3 The information should include the following elements:

.1 the definition of the area which is proposed as a particularly sensitive sea area, includir its precise geographical location. It is essential also to include a reference chart;

.2 a general description of the area addressing such issues as its oceanography, ecologic characteristics, social and economic value, scientific and cultural significance, enviro mental pressures (including those of ship-generated pollution and other types of potenti ship-generated damage) and measures which have already been taken to protect th environment of the proposed area. This general description may be supplemented l annexes containing additional information or references to documentation containir such information;

.3 a review of the criteria for the identification of a particularly sensitive sea area, showi that the area in question satisfies these criteria. Section 3.3 below lists the criteria whi should be satisfied;

.4 an evaluation of the kind of protective measures which should be taken within t framework of IMO to protect the area against damage caused by ships;

.5 a description of existing or proposed protective and management measures taken f the area.

3.2.4 In cases where a particularly sensitive sea area is within the jurisdiction of more than o State agreement should be reached between those States before a proposal is submitted.

3.2.5 A proposal for the identification of a particularly sensitive sea area should be submitted the MEPC at least three months before a session of the MEPC. The MEPC will then decide whetl the proposed area is to be identified as a particularly sensitive sea area.

3.3 Criteria for the identification of a particularly sensitive sea area

3.3.1 The following criteria apply to the identification of particularly sensitive sea areas only w respect to the adoption of measures to protect such areas against damage from shipping.

3.3.2 These criteria do not therefore apply to the identification of such areas for the purpose establishing whether they should be protected from dumping activities, since that is implicitly cove by annex III of the London Dumping Convention (the Convention on the Prevention of Mar Pollution by Dumping of Wastes and Other Matter, 1972) and by the Guidelines for the Implementat of annex III of that Convention, adopted by the Contracting Parties to the London Dump Convention (resolutions LDC.17(8) and LDC.32(11)).

3.3.3 The criteria relate to particularly sensitive sea areas within and beyond the limits of the territc sea. They can be used by IMO to identify particularly sensitive sea areas beyond the territorial with a view to bringing about the development of international protective measures regard pollution and other damage caused by ships. These criteria can also be used by natic Administrations to identify particularly sensitive sea areas within their territorial waters.

zones, oceanic fronts and gyres, long residence times caused by low flushing rat the occurrence of seasonal or permanent density stratification which can result in oxygen depletion in the bottom layer, as well as adverse ice states and wind conditions. An area already subject to environmental stresses owing to human activities or natural phenomena (e.g. natural oil seepage) may be in need of special protection from further stress, including stress arising from maritime activities.

3.3.6 *Social, cultural and economic criteria*

.1 Economic benefit
The area is of particular importance to utilization of living marine resources.

.2 Recreation
The area has special significance for recreation and tourism.

.3 Human dependency
The area is of particular importance for the support of traditional subsistence and/or cultural needs of the local human population.

3.3.7 *Scientific and educational criteria*

.1 Research
The area has high scientific interest.

.2 Baseline and monitoring studies
The area provides suitable baseline conditions with regard to biota or environmental characteristics.

.3 Education
The area offers opportunity to demonstrate particular natural phenomena.

.4 Historical value
The area has historical and/or archaeological significance.

Other considerations

3.3.8 In identifying an area as a particularly sensitive sea area and considering what special protective measures should be taken, consideration should be given to the degree to which actions already under way may indicate the need for further special protective measures and to the beneficial effects that such measures will have, in view of the environmental stresses from other sources.

3.3.9 In many cases a particularly sensitive sea area may be identified within a special area. It should be noted that the criteria given in this section with respect to the identification of particularly sensitive sea areas and the criteria given in chapter 2 with respect to the designation of special areas are not mutually exclusive.

3.4 Use of ships' routeing measures for environmental protection

General

3.4.1 In accordance with regulation V/8(b) and (c) of SOLAS 1974, IMO is recognized as the only international body for establishing and recommending measures on an international level concerning routeing and areas to be avoided by ships or certain classes of ships. The selection and development of routeing measures, however, is primarily the responsibility of the Governments concerned.

3.4.2 The purpose of ships' routeing is to improve the safety of navigation in converging areas and in areas where the density of traffic is great or where freedom of movement of shipping is inhibited by restricted sea-room, the existence of obstructions to navigation, limited depths or unfavourable