

FLORA AND FAUNA GUARANTEE - SCIENTIFIC ADVISORY COMMITTEE**FINAL RECOMMENDATION ON A NOMINATION FOR LISTING****The discharge of human-generated marine debris
into Victorian marine or estuarine waters (Potentially Threatening Process)****FLORA & FAUNA
GUARANTEE**

Date of receipt of the nomination: 28 May 2001
Date of preliminary recommendation: 2 May 2002
Date of final recommendation: 26 November 2002

File No.: FF/54/0132**Validity:** The nomination is for a valid item**Prescribed Information:** The prescribed information was provided.**Name of the Nominator** is adequately provided.**Name and Description of the process:**

In the opinion of the SAC the process is adequately defined and described.

The nominated process is 'The discharge of human-generated marine debris into Victorian marine or estuarine waters'.

Marine debris is the solid, human-made rubbish that is discarded at sea or ends up in the sea after being disposed of on land. This can be many items but a large proportion is often discarded fishing gear. Lost and discarded fishing gear can harm and kill wildlife, pollute beaches and be hazardous to ships and divers. Fishing gear can harm and kill marine animals by entanglement or by ingestion. Entangled animals can drown, be fatally or seriously wounded, or have reduced ability to catch food, travel or avoid predators. Ingested material can block and damage digestive tracts and reduce feeding. There are many ways that rubbish can enter the sea, including:

- dumping of garbage at sea by ships, fishing boats and pleasure craft.
- deliberate discarding and accidental loss of fishing nets and fishing gear.
- litter left on beaches by picnickers.
- escape of litter from coastal rubbish dumps.
- drains and sewage systems that empty into the sea.

All surveys of marine debris around the world indicate that plastic is the main component. Of all the litter items recorded by 'Clean Up Australia' in 1993 (Clean Up Australia 1993), almost 50% was plastic. Because plastic floats it is carried around the sea by currents and wind and can pollute beaches in remote places, far from the disposal site. The disposal of plastics into the sea, including plastic fishing gear such as nets, rope, monofilament line and packaging bands used on bait boxes, is totally prohibited under the **Protection of the Sea (Prevention of Pollution from Ships) Act 1983**. The Commonwealth Government implements the International Convention for the Prevention of Pollution from Ships (MARPOL). MARPOL is the international treaty regulating the disposal of wastes generated by normal operation of vessels. Annex V of the MARPOL Convention prohibits the disposal of all plastics into the sea. Australia's Commonwealth-managed fisheries are required to be consistent with the principles of ecologically sustainable development (ESD), particularly the need to minimise the impact of fishing on the marine environment.

Nets are responsible for the largest share of the fish catches and are widely used in a variety of configurations and designs. In terms of their contribution to marine debris and harmful effects on marine wildlife, the nets of most concern are gillnets and demersal trawl nets. Lost gillnets can continue to capture target and non-target species (known as 'ghost fishing'). Collapsed gillnets can still be hazardous to wildlife because entangled animals attract predators that may become entangled in the collapsed net. Gillnets are used in a range of ways in Australia. Drifting gillnets are used to catch tropical sharks in Queensland and the Northern Territory. Bottom set gillnets are used to catch school, gummy and whiskery sharks in Victoria, South Australia, Tasmania and southern Western Australia. Trawl nets are widely used in commercial fisheries in Australia. Pieces of trawl net can be lost or discarded following 'hook-ups' (catching the sea floor), bursting or net repairs either on board or on shore. Lost or discarded monofilament line also entangles wildlife. Large quantities of monofilament line are used around Australia (except the Northern Territory) by Japanese and Australian Longline vessels to catch species of tuna.

A wide range of traps and pots are used around Australia to catch fish, rock lobsters and crabs. Some can continue to catch marine animals if they are lost or discarded and ropes attached can form neck collars and entangle marine animals.

Bait containers traditionally have had plastic liners and packaging bands around them. These bands can form harmful neck collars on entangled marine animals and they can entangle marine birds which use the bands as nesting materials.

Participation in recreational fishing in Australia is high. In 1984 it was estimated that 4.5 million Australians fish each year in marine and freshwater areas, including 800 000 frequent fishers (Anon 1992 in Jones 1995). Recent figures suggest this has not changed (LWRRDC 2001). A wide range of gear is used with monofilament line being the main form. Fishing debris, as a percentage of total marine debris found, is higher in Tasmania than anywhere else in the world (Australian Marine Conservation Society).

The range of flora or fauna affected or potentially affected was adequately stated in the nomination.

Significance of the threat which the potentially threatening process poses or has the potential to pose was adequately stated in the nomination.

Eligibility for listing as a potentially threatening process under the Flora and Fauna Guarantee

The nominated item satisfies at least one criterion of the set of criteria prepared and maintained under Section 11 of the **Flora and Fauna Guarantee Act 1988**, and stated in Schedule 1 of the Flora and Fauna Guarantee Regulations 1991.

Evidence that criteria are satisfied:

Criterion 5.1 *The potentially threatening process, in the absence of appropriate management, poses or has the potential to pose a significant threat to the survival of a range of flora or fauna.*

Evidence:

A significant number of species (many listed under the FFG Act 1988, see Tables 1 and 2) are likely to be adversely affected by the discharge of human-generated marine debris. Given the rarity and low recruitment rates of some of these species, such adverse effects pose a potentially serious threat to their survival.

Additional Information

- At least 43% of the world's marine mammal species, 44% of the world's seabird species, all but one of the world's seven sea turtle species and at least 68 species of fish and shellfish have been recorded as affected by marine debris entanglement or ingestion (US Government 1996).
- Every year an estimated 30 000 Northern fur seals *Callorhinus ursinus* die due to entanglement in plastic debris (Fowler 1987, Laist 1987).
- Lost or abandoned monofilament fishing line is one of the most dangerous forms of debris in the marine environment. In one Florida clean-up, volunteers retrieved 254 miles of fishing line in just three hours (Centre for Marine Conservation 2001).
- Seabirds also consume other chemicals as a result of ingesting marine debris. Ingestion of plastic is positively correlated with the incidence of polychlorinated biphenyls (PCBs) in seabirds, a group of chemicals commonly found in plastics. It is probable that seabirds assimilate PCBs and other toxic chemicals partly from ingested plastic particles (Ryan *et al.* 1988).

Table 1: FFG-listed Victorian marine/estuarine vertebrate fauna likely to be effected by marine debris and their status.
CE = critically endangered, E = endangered, V = vulnerable, LR = lower risk (near threatened)

Common name	Scientific name	Conservation status	
		Victoria (NRE 2000)	Australia ANZECC (1999)
Mammals			
Blue Whale	<i>Balaenoptera musculus</i>	ce	E
Humpback Whale	<i>Megaptera novaeangliae</i>	e	V
Southern Right Whale	<i>Eubalaena australis</i>	ce	V
Fish			
Great White Shark	<i>Carcharodon carcharias</i>	e	V
Grey Nurse Shark	<i>Carcharias taurus</i>	e	V
Southern Bluefin Tuna	<i>Thunnus maccoyii</i>	-	-
Birds			
Caspian Tern	<i>Sterna caspia</i>	v	-
Great Knot	<i>Calidris tenuirostris</i>	-	-
Grey-tailed Tattler	<i>Heteroscelus brevipes</i>	-	-
Gull-billed Tern	<i>Sterna nilotica</i>	e	-
Hooded Plover	<i>Thinornis rubricollis</i>	e	-
Little Egret	<i>Egretta garzetta</i>	ce	-
Little Tern	<i>Sterna albifrons</i>	v	-
Fairy Tern	<i>Sterna nereis nereis</i>	v	-
Northern Giant-Petrel	<i>Macronectes halli</i>	e	-
Sooty Albatross	<i>Phoebastria fusca</i>	-	V
Southern Giant-Petrel	<i>Macronectes giganteus</i>	c	-
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	e	-

Table 2: Other Victorian marine/estuarine vertebrate fauna likely to be effected by marine debris and their status.

CE = critically endangered, E = endangered, V = vulnerable, LR = lower risk (near threatened)

* = recommended for listing

Common name	Scientific name	Conservation status	
		Victoria (NRE 2000)	Australia (ANZECC 1999)
Birds			
Antarctic Petrel	<i>Thalassoica antarctica</i>	-	-
Antarctic Prion	<i>Pachyptila desolata</i>	-	-
Arctic Jaeger	<i>Stercorarius parasiticus</i>	-	-
Arctic Tern	<i>Sterna paradisaea</i>	-	-
Australasian Gannet	<i>Morus serrator</i>	v	-
Black Petrel	<i>Procellaria parkinsoni</i>	-	-
Black-bellied Storm-Petrel	<i>Fregata tropica</i>	-	-
Black-browed Albatross	<i>Diomedea melanophrys</i>	-	-
Black-faced Cormorant	<i>Phalacrocorax fuscescens</i>	v	-
Black-fronted Dotterel	<i>Elseyornis melanops</i>	-	-
Black-winged Petrel	<i>Pterodroma nigripennis</i>	-	-
Blue Petrel	<i>Halobaena caerulea</i>	-	V
Broad-billed Prion	<i>Pachyptila vittata</i>	-	-
Brown Booby	<i>Sula leucogaster</i>	-	-
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	-	-
Buller's Shearwater	<i>Puffinus bulleri</i>	-	-
Buller's Albatross *	<i>Thalassarche bulleri</i>	-	V
Bulwer's Petrel	<i>Bulweria bulweria</i>	-	-
Cape Barren Goose	<i>Cereopsis novaehollandiae</i>	-	-
Cape Gannet	<i>Morus capensis</i>	ce	-
Cape Petrel	<i>Daption capense</i>	-	-
Common Diving-Petrel	<i>Pelecanoides urinatrix</i>	lr	-
Common Greenshank	<i>Tringa nebularia</i>	-	-
Common Noddy	<i>Anous stolidus</i>	-	-
Common Sandpiper	<i>Actitis hypoleucos</i>	-	-
Common Tern	<i>Sterna hirundo</i>	lr	-
Crested Tern	<i>Sterna bergii</i>	-	-
Curlew Sandpiper	<i>Calidris ferruginea</i>	-	-
Erect-crested Penguin	<i>Eudyptes sclateri</i>	-	-
Fairy Prion	<i>Pachyptila turtur</i>	lr	V
Fiordland Penguin	<i>Eudyptes pachyrhynchus</i>	-	-
Flesh-footed Shearwater	<i>Puffinus carneipes</i>	-	-
Fluttering Shearwater	<i>Puffinus gavia</i>	-	-
Fulmar Prion	<i>Pachyptila crassirostris</i>	-	-
Gould's Petrel	<i>Pterodroma leucoptera</i>	-	E
Great Cormorant	<i>Phalacrocorax carbo</i>	-	-
Great Skua	<i>Catharacta skua</i>	-	-
Greater Sand Plover	<i>Charadrius leschenaultii</i>	-	-
Great-winged Petrel	<i>Pterodroma macroptera</i>	-	-
Grey Petrel	<i>Procellaria cinerea</i>	-	-
Grey Phalarope	<i>Phalaropus fulicaria</i>	-	-
Grey Plover	<i>Pluvialis squatarola</i>	-	-
Grey Ternlet	<i>Procelsterna cerulea</i>	-	-
Grey-headed Albatross *	<i>Thalassarche chrystoma</i>	-	V
Hutton's Shearwater	<i>Puffinus huttoni</i>	-	-
Indian Yellow-nosed Albatross*	<i>Thalassarche carteri</i>	-	V
Kelp Gull	<i>Larus dominicanus</i>	ce	-
Kerguelen Petrel	<i>Lugensas brevirostris</i>	-	-
King Penguin	<i>Aptenodytes patagonicus</i>	-	-
Laughing Gull	<i>Larus atricilla</i>	-	-
Leach's Storm Petrel	<i>Oceanodroma leucorhoa</i>	-	-
Light-mantled Albatross *	<i>Phoebastria pulpebrata</i>	-	N
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>	-	-
Little Curlew	<i>Numenius minutus</i>	-	-
Little Penguin	<i>Eudyptula minor</i>	-	-
Little Ringed Plover	<i>Charadrius dubius</i>	-	-
Little Shearwater	<i>Puffinus assimilis</i>	-	-
Little Stint	<i>Calidris minuta</i>	-	-
Long-tailed Jaeger	<i>Stercorarius longicaudus</i>	ce	-
Long-toed Stint	<i>Calidris subminuta</i>	-	-
Macaroni Penguin	<i>Eudyptes chrysotophus</i>	-	-
Magellanic Penguin	<i>Spheniscus magellanicus</i>	-	-
Marsh Sandpiper	<i>Tringa stagnatilis</i>	-	-

Mottled Petrel	<i>Pterodroma inexpectata</i>	-	-
Oriental Plover	<i>Charadrius veredus</i>	-	-
Osprey	<i>Pandion haliaetus</i>	-	-
Pacific Golden Plover	<i>Pluvialis fulva</i>	-	-
Pacific Gull	<i>Larus pacificus</i>	lr	-
Pectoral Sandpiper	<i>Calidris melanotos</i>	ce	-
Pied Cormorant	<i>Phalacrocorax varius</i>	lr	-
Pied Heron	<i>Ardea picata</i>	-	-
Pied Oystercatcher	<i>Haematopus longirostris</i>	ce	-
Providence Petrel	<i>Pterodroma solandri</i>	-	-
Red Knot	<i>Calidris canutus</i>	-	-
Red-capped Plover	<i>Charadrius ruficapillus</i>	-	-
Rockhopper Penguin	<i>Eudyptes chrysocome</i>	-	-
Royal Albatross *	<i>Diomedea epomophora</i>	-	-
Sanderling	<i>Calidris alba</i>	-	-
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	-	-
Short-tailed Shearwater	<i>Puffinus tenuirostris</i>	-	-
Shy Albatross *	<i>Thalassarche cauta</i>	-	V
Slender-billed Prion	<i>Pachyptila belcheri</i>	-	-
Snow Petrel	<i>Pagodroma nivea</i>	-	-
Soft-plumaged Petrel	<i>Pterodroma mollis</i>	-	V
Sooty Shearwater	<i>Puffinus griseus</i>	-	-
Sooty Tern	<i>Sterna fuscata</i>	-	-
South polar Skua	<i>Catharacta maccormicki</i>	-	-
Southern Fulmar	<i>Fulmarus glacialis</i>	-	-
Streaked Shearwater	<i>Calonectris leucomelas</i>	-	-
Terek Sandpiper	<i>Xenus cinereus</i>	-	-
Wandering Albatross *	<i>Diomedea exulans</i>	ce	-
Wedge-tailed Shearwater	<i>Puffinus pacificus</i>	-	-
Whimbrel	<i>Numenius phaeopus</i>	-	-
Whiskered Tern	<i>Chlidonias hybridus</i>	lr	-
White-chinned Petrel	<i>Procellaria aequinoctialis</i>	-	-
White-faced Storm-petrel	<i>Pelagodroma marina</i>	v	-
White-fronted Tern	<i>Sterna striata</i>	-	-
White-headed Petrel	<i>Pterodroma lessonii</i>	-	-
White-rumped Sandpiper	<i>Calidris fuscicollis</i>	-	-
White-winged Black Tern	<i>Chlidonias leucopterus</i>	-	-
Wilson's Storm-petrel	<i>Oceanites oceanicus</i>	-	-
Wood Sandpiper	<i>Tringa glareola</i>	-	-
Marine mammals			
Australian Fur Seal	<i>Arctocephalus pusillus doriferus</i>	v	-
Australian Sea lion	<i>Neophoca cinerea</i>	-	-
Blainville's Beaked Whale	<i>Mesoplodon densirostris</i>	-	-
Bottlenose Dolphin	<i>Tursiops truncatus</i>	-	-
Bryde's Whale	<i>Balaenoptera edeni</i>	-	-
Common Dolphin	<i>Delphinus delphis</i>	-	-
Dwarf Sperm Whale	<i>Kogia simus</i>	-	-
False Killer Whale	<i>Pseudorca crassidens</i>	-	-
Fin Whale	<i>Balaenoptera physalus</i>	-	V
Fraser's Dolphin	<i>Lagenodelphis hosei</i>	-	-
Gray's Beaked Whale	<i>Mesoplodon grayi</i>	-	-
Killer Whale	<i>Orcinus orca</i>	-	-
Leopard Seal	<i>Hydrurga leptonyx</i>	-	-
Southern Bottlenose Whale	<i>Hyperoodon planifrons</i>	-	-
Long-finned Pilot Whale	<i>Globicephala melas</i>	-	-
Minke Whale	<i>Balaenoptera acutorostrata</i>	-	-
Pygmy Right Whale	<i>Caperea marginata</i>	-	-
Pygmy Sperm Whale	<i>Kogia breviceps</i>	-	-
New Zealand Fur Seal	<i>Arctocephalus forsteri</i>	-	-
Southern Bottlenose Whale	<i>Hyperoodon planifrons</i>	-	-
Sperm Whale	<i>Physeter macrocephalus</i>	-	-
Spotted Dolphin	<i>Stenella attenuata</i>	-	-
Strap-toothed Whale	<i>Mesoplodon layardii</i>	-	-
Subantarctic Fur Seal	<i>Arctocephalus tropicalis</i>	-	-
True's Beaked Whale	<i>Mesoplodon mirus</i>	-	-
Fish			
Big-bellied Seahorse	<i>Hippocampus abdominalis</i>	-	-
Black Bream	<i>Acanthopagrus butcheri</i>	-	-
Black Stingray	<i>Dasyatis thetidis</i>	-	-
Blue-lined Leather-jacket	<i>Meuschenia galii</i>	-	-
Bony Bream	<i>Nematalosa erebi</i>	-	-
Short-headed Seahorse	<i>Hippocampus breviceps</i>	-	-

Advertisement for public comment

In accordance with the requirements of Section 14 of the **Flora and Fauna Guarantee Act 1988**, the preliminary recommendation was advertised for a period of at least 30 days.

The preliminary recommendation was advertised in:

'The Age' - on 12 June 2002

'The Weekly Times' - on 12 June 2002

The *Government Gazette* - on 13 June 2002

Submissions closed on 19 July 2002.

Further evidence provided:

No submissions were received and no evidence was provided to warrant a review of the Scientific Advisory Committee's preliminary recommendation that the potentially threatening process is eligible for listing.

Documentation

The published information and research data provided to the SAC have been assessed. Based on the available information, the SAC believes that the data presented are not the subject of scientific dispute and the inferences drawn are reasonable and well supported.

Final Recommendation of the Scientific Advisory Committee

The Scientific Advisory Committee concludes that on the evidence available the nominated item is eligible for listing in accordance with Section 11 of the Act because primary criterion 5.1 has been satisfied.

The Scientific Advisory Committee recommends that the nominated item be supported for listing on Schedule 3 of the **Flora and Fauna Guarantee Act 1988**.

Selected references:

- ANZECC (1996) *Strategy to protect the marine environment. Volume 1. Strategy and Action Plan*. ANZECC.
- Balazs, G. (1984) *Impact of ocean debris on marine turtles: Entanglement and ingestion*, Proceedings of the workshop of the fate and impact of marine debris 26-29 November 1984. Honolulu: Florida.
- Bannister, J., Kemper, C. & Warneke, R. M. (1996) *The Action Plan for Australian Cetaceans*. Australian Nature Conservation Agency: Canberra.
- Blight, L. & Burger, A. (1997) Occurrence of plastic particles in sea birds from the eastern North Pacific. *Marine Pollution Bulletin* 34 (5): 323-325.
- Brown, R., Norman, F. I. & Eades, D. (1986) Notes on Blue and Kerguelen Petrels found beach washed in Victoria, 1984. *Emu* 86 (4): 228-238.
- Clean Up Australia (1993) *Cleaning Up Australia*. Clean Up Australia Ltd. Sydney.
- Coe, J. & Rogers, D. (1997) *Marine Debris, Sources, Impacts and Solutions*. Springer Press.
- Fowler, C. (1987) Marine Debris and Northern Fur seals: a case study. *Marine Pollution Bulletin*. 18 (6): 326-335.
- Herfort, A. (1997) *Marine Debris on beaches in NSW with a Special Focus on Fishing Debris*. Marine Environmental Study. NSW Environmental Restoration and Rehabilitation Trust, Ocean Watch Australia.
- Laist, D. W. (1987) Overview of the biological effects of lost and discarded plastic debris in the marine environment. *Marine Pollution Bulletin* 18 (6): 319-26.
- (1997) Impacts of marine debris: entanglement of marine life in marine debris including a comprehensive list of species with entanglement and ingestion records. In *Marine Debris: Sources, Impacts and Solutions*. (J.M. Coe and D.B. Rogers, eds) Springer-Verlag, NY.
- Jones, M. (1995) Fishing Debris in the Australian Marine Environment. *Marine Pollution Bulletin* 30 (1): 25-33.
- (1994) *Fishing debris in the Australian marine environment*. Bureau of Resource Sciences: Canberra.
- Prendergast, R. (1992) Places where plastic is not so fantastic. *ESSO Environment newsletter* No. 1.
- (1996) *The Australian Fur Seal (Arctocephalus pusillus doriferus) at Kanowna Island, Victoria; entanglement in plastic ocean debris*. Report to National Parks Service, Victoria.
- I.WRRDC (2001) River and Riparian habitat for fish. Land and Water Resources Research and Development Corporation *RipRap* 19: June 2001.
- NRE (2000) *Threatened Vertebrate Fauna in Victoria - 2000. A systematic list of vertebrate fauna considered extinct, at risk of extinction or in major decline in Victoria*. Department of Natural Resources and Environment: Victoria.
- Ross, G., Weaver, K. & Greig, J. (1996) *The Status of Australia's Seabirds*, Proceedings of the National Seabird Workshop, Canberra, 1-2 November 1993. Biodiversity Group, Environment Australia: Canberra.
- Ryan, P., Connell, S. & Gardner, B. (1988) Plastic Ingestion and PCB's in Seabirds: is there a Relationship? *Marine Pollution Bulletin*. 19 (4): 174-176.
- US Government (1996) Impacts of marine debris, ch. VIII, pp. 161-171 in *Marine Mammal Commission, Annual Report to Congress 1995*. Marine Mammal Commission: Washington, D.C.

Whiting, S. (1998) Types and Sources of Marine Debris in Fog Bay, Northern Australia. *Marine Pollution Bulletin* 36 (11): 904-910.

Some relevant websites:

Background on marine debris (*Humane Society International*) - <http://www.hsi.org.au/debris.html>
Bureau of Resource Sciences (Fisheries & the Environment) - <http://www.brs.gov.au/fish/environment.html>
Centre for Marine Conservation (US) - <http://www.cmc-ocean.org/cleanupbro/marpol.php3>
 Coastal and marine pollution (*Environment Australia* site) - <http://www.ea.gov.au/coasts/pollution/>
Environment Australia (marine website) - <http://www.environment.gov.au/marine/index.html>
Global Marine Litter Information Gateway - <http://marine-litter.gpa.unep.org/regional/region-4.htm>
 Marine debris & impacts on wildlife (US) - <http://www.marinc.usf.edu/beachbuddies/background.html>
 Marine debris clean-up effort 2001 (Hawaii) - <http://www.nmfs.hawaii.edu/cleanup/history.html>
 Marine Debris – The Facts (*Aust. Marine Conservation Society*) – <http://www.amcs.org.au/issues/facts/htm/fcmrndeb.htm>
MARPOL Convention – <http://www.rempec.org/marpol.htm>
 Monitoring marine debris in the antarctic - http://cep.npolar.no/innhold/cep_archive/Docs/CEP%20IV/English/ip13e.pdf
National Oceans Office (Commonwealth Government site) – <http://www.oceans.gov.au/home>
 Plastics may pose threat to marine life on ocean floor (report) - <http://www.seaweb.org/resources/8oceanrep/plastic.html>
 Survey of marine debris of Sydney beaches (poster presentation) –
<http://www.oca.nsw.gov.au/ecology/BinaryData/Marine%20Debris%20Poster%20Presentation%201.pdf>
 The problem with marine debris (US) - <http://www.coastal.ca.gov/publiced/marinedebris.html>

NRE (2000) *Threatened Vertebrate Fauna in Victoria - 2000. A systematic list of vertebrate fauna considered extinct, at risk of extinction or in major decline in Victoria.* Department of Natural Resources and Environment: Victoria.

Available at: <http://www.nre.vic.gov.au>

then 'Plants & animals' then 'Native Plants & animals' then 'Threatened species'

Endorsement by the Convenor of the Scientific Advisory Committee

Date



Dr Michael Clarke
 Convenor

29/11/02