CHAPTER 2

BACKGROUND

Introduction

2.1 Gulf St Vincent is a valuable asset to South Australia. It supports an abundant aquatic system, provides an important sea link to other cities, produces fish and seafood and provides the basis for a wide range of recreational activities including attractive beaches and coastal scenery.

2.2 Gulf St Vincent is the smaller of the two gulfs in South Australia. Adelaide, a city of approximately 1 million people, is located on the eastern side of the Gulf and it is this proximity to major urban development which is responsible for many of the most pressing problems facing Gulf St Vincent today. The Gulf is a multi-use area and as such, there are increasing pressures between its various users for resources. The most significant marine areas under threat in South Australia are in Gulf St Vincent and, in particular, they are in the Adelaide Metropolitan Coastal Waters Zone.

2.3 Along with providing economic and recreational bounty, the Gulf gives less tangible benefits. Since European settlement it has been treated as a "free good" providing a dump for sewage effluent and sludge, industrial effluent, urban runoff, dredging material, and other unwanted material. No information is available on the cost of this pollution to the marine environment from loss of fisheries production, effects on biodiversity, nuisance and loss of amenity and access.[1] It is the taxpayers today however, who are paying for the "free good" of the past. It is obvious that if the degradation is not addressed today it will be future generations who will be paying for a loss of amenity, a loss of resources and for further remedial works.

Description

2.4 The Gulf is approximately 70 km wide from east to west and approximately 160 km long from north to south. It has approximately 350 km of coastline. It connects to the Southern Ocean by Investigator Strait to the south-west, and by Backstairs Passage to the south. It is bounded on the south-east by the Fleurieu Peninsula and on the west by Yorke Peninsula. Kangaroo Island lies at the mouth of the Gulf and acts as a barrier between Gulf waters and the open ocean. Kangaroo Island ensures that it takes 80-100 days to completely flush through.

2.5 As a result, this characteristic has implications for the Gulf in the dilution of pollutants as it takes longer for them to disperse. Twice a month the Gulf can

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1 Our Seas and Coasts - A marine and estuarine strategy for South Australia, Government of South Australia, August 1998, p 12.

experience dodge tides where tidal movement almost ceases. When these occur there is less dilution and dispersion of pollutants.

2.6 The Gulf is highly saline with salinity increasing towards its head at the northern end. As a consequence it behaves as an inverse, or reverse, estuary which is rather uncommon. Inverse estuaries usually occur in arid areas that do not have sufficient fresh-water inflow, or sufficient sea-water flushing, to compensate for evaporation.[2]

2.7 There is a high degree of variability over various parameters across the Gulf. There can be up to a 12°C temperature difference throughout the Gulf waters and salinities vary from 35.5 parts per thousand (ppt) to 42.0 ppt.[3] The Gulf is relatively shallow and its sheltered nature results in low to very low wave regimes. Tidal currents carry fine suspended sediments that settle out in the upper reaches creating large sediment basins. Windwaves rather than currents are the main modifying factor.[4] The Gulf has a diversity of areas and adverse impacts vary across its entirety.

2.8 South Australian waters are naturally low in nutrients due to low levels of runoff from the land because of the arid nature of the region, as well as the aged, nutrient-poor soils. The impact of nutrient rich stormwater runoff as well as wastewater from sewage treatment plants has therefore had a marked impact on Gulf waters.

2.9 Outside of the Adelaide metropolitan area, small towns are situated around the Gulf. Many of these towns are popular tourist destinations and their populations can dramatically increase in the tourist season. Intensive farming activities occur around Dublin and broad acre farming with low populations around the Inkerman area.

2.10 The Yorke Peninsula borders the western side of the Gulf. This region comprises micro to small communities, some of which consist of mainly holiday and retirement shacks, and a sparsely populated farming community. Industry sectors include: tourism and hospitality, agribusiness, information technology, aquaculture and light industries. Salt production takes place at Price.

2.11 At Port Wakefield, at the northern end of the Gulf, is a Proof and Experimental Establishment. This facility tests locally and overseas manufactured ammunition, fuses, projectiles and gun components under simulated operational conditions. Shells and projectiles are extracted from the tidal offshore area at low tide after firing for testing and evaluation. Neither State nor Local Government has jurisidiction over the area as it is run by the Defence Estate Organisation – South Australia, which has a landlord function for the Federal Department of Defence.

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2 State of the Environment Report, 1996 - Chapter 8, p 8-5.

3 Average salinity in sea water is 35 ppt but varies up to 5% throughout the world.

4 South Australian Fishing Industry Council Inc, Submission 33, pp 6-7.

2.12 The total land holding of the Establishment is currently 5000 hectares. A designated prohibited area also extends seaward to the low water mark, encompassing a further area of approximately 4600 hectares. As such, the area has not been subject to development pressures as have other areas bordering the Gulf. Because access is denied to it, it may provide valuable baseline data about the state of the Gulf.

2.13 Gulf St Vincent has a diverse range of habitats and globally significant regions for temperate biodiversity, exhibiting very high levels of endemism - or uniqueness of species - relative to the southern temperate coastline of Australia. The Southern temperate coastline of Australia itself has an endemism of over 85% compared with 15% in tropical areas such as the Great Barrier Reef.[5]

2.14 Gulf St Vincent contains some of the most extensive areas of temperate mangrove forests (20 000 hectares) and seagrass meadows in Australia. These habitats are of considerable ecological and economic importance. Other habitats include temperate reef systems, samphire, saltmarsh, tidal flats, stranded shell beach ridges and sand beach ridges. There are important breeding areas for waterbirds.

2.15 Dense seagrass areas exist in the Gulf from Aldinga Bay to Yankalilla, some distance off the metropolitan coast and on the eastern side of the upper Gulf. Only sparse seagrass exists on the western side of the upper Gulf. The inner Metropolitan Coast is typified by bare sand.[6]

2.16 A series of low profile platform reefs on the West Coast and lower Gulf and around Port Noarlunga to Aldinga Beach are important nursery areas for a variety of fish and are food sources for other marine life, including rock lobsters and abalone. There is also a number of placed artificial reefs and a series of shipwrecks.

Uses of the Gulf

Shipping and boating

2.17 The Gulf accommodates the Port of Adelaide which comprises an inner and an outer harbour with more than 20 wharves to cater for container ships. There are also three regional ports on the Gulf as well as an additional two situated on the north-eastern side of Kangaroo Island. Along with commercial shipping, the Gulf is used for recreational boating. More than 32 000 recreational boats, not including small motorless boats, use Gulf waters. The infrastructure required to house these craft, including sheltered harbours and jetties, as well as litter, toilets and antifoulant paints, have an impact on the Gulf.

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5 Conservation Council of South Australia, Submission No. 47, paragraph 2.1.

6 South Australian Fishing Industry Council Inc, Submission 33, p 7.

Dredging

2.18 Periodic dredging of the Port Adelaide River shipping channel is necessary to maintain the channel. Spoil is dumped in the Gulf. As part of the Coast Protection Board's beach replenishment program, sand is taken from parts of the Gulf and used to replace sand eroded from metropolitan beaches.

Fishing and aquaculture

2.19 Gulf St Vincent supports commercial and recreational fishing. In fact, in some areas, notably metropolitan Adelaide, the recreational share of the total catch is higher than the commercial share, although the recreational catch rate is not monitored to the same extent as is the commercial catch rate. There are 216 species of fish recorded for the Gulf and of these, 14 are important commercial species. The Gulf supports a Western King Prawn fishery, a blue crab fishery as well as various scale fish fisheries and some rock lobster activity.

2.20 Some aquaculture, mainly oyster and abalone, also takes place in the Gulf. The waters on the western side of the Gulf are more conducive to aquaculture than those on the eastern side because the western side has relatively clean waters. The northern areas of the Gulf are considered suitable only for cultivation of some species of algae.[7] There is also potential for aquaculture in the deeper waters of the Gulf.[8]

Salt Production

2.21 750 000 tonnes of salt is produced at Dry Creek per year and 200 000 tonnes is produced at Price per year.[9]

Tourism and recreation

2.22 Gulf waters are used by a significant proportion of the population for a range of activities such as swimming, boating, yachting, scuba diving, sailboarding windsurfing and relaxing.

Heritage

2.23 Gulf St Vincent has many maritime heritage sites including shipwrecks, jetties, wharves and historic buildings. There are also sites of great Aboriginal significance, including the middens and fish traps of the Narrunga people along the western coast of Gulf St Vincent.

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7 *Proof Committee Hansard,* Port Adelaide, 4 February 2000, p 85.

8 *Proof Committee Hansard,* Adelaide, 3 February 2000, p 40.

9 South Australian Fishing Industry Council Inc, Submission 33, p 6.

Barker Inlet/Port Adelaide River[10]

2.24 The Barker Inlet and Port River surrounds are part of the metropolitan area of the Gulf. The area forms the largest tidal inlet in Gulf St Vincent and is an important nursery and feeding area for commercial and recreational fish species. Despite being home to a commercial shipping terminal, various industries and two wastewater treatment plant outfalls, the area has been identified as being of the very highest significance in ecological and economic terms to the State.[11]

2.25 The Barker Inlet shoreline has wide tidal mud flats and an extensive belt of mangroves fringing the samphire salt flats and low-lying dunes of the coastal plain. Torrens Island and Garden Island, split by Angas Inlet, lie within the Barker Inlet. Several creeks feed into the Inlet and extensive salt evaporation ponds occur adjacent to most of the mangrove and samphire areas.[12]

2.26 The Port River is subjected to a range of competing uses. It has provided Adelaide and South Australia with major port facilities since the early days of settlement. The North West region of Adelaide has intensive industrial and commercial land use with an estimated 8000 business premises. This is approximately half of metropolitan Adelaide's industry.[13] There is a legacy of contaminated land and contaminated groundwater in some areas.

2.27 The Port River and the Barker and Angus Inlets are important feeding and nursery areas for many species of aquatic animals, including migratory birds, dolphins, black swans and many fish species. Industrial uses in the area have included coal handling facilities, the use of water for cooling in electricity generating plants, cement works, a sugar refinery, boat building facilities, major fuel storage depots, a major sewage treatment plant, chemical plants and rubbish dumps.[14]

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10 The Port Adelaide River is referred to variously as the "Port River", the "Port River Estuary" and the "Port Adelaide River". This report will use the terms interchangeably to refer to the area.

11 Barker Inlet Port Estuary Committee (BIPEC), Submission 32, p 1.

12 A Directory of Important Wetlands - South Australia Chapter at http://www.erin.gov.au/bg/environm/wetlands/directory/wetdir.htm, 5. Barker Inlet & St Kilda - EYB002SA.

13 Torrens and Patawalonga Catchment Water Management Boards website at http://www.cwmb.sa.gov.au/programs/ssrc/portriver.htm, Street Smart River Clean, Port River and Environs Catchment.

14 Torrens and Patawalonga Catchment Water Management Boards website at http://www.cwmb.sa.gov.au/programs/ssrc/portriver.htm, Street Smart River Clean, Port River and Environs Catchment.

Reserves

2.28 In 1971, South Australia was the first Australian state to legislate for marine protected areas. By 1995, however, only 1.5% of the State's waters were listed[15] although the proclamation of the Great Australian Bight Marine Park improved the situation in 1996.

2.29 Primary responsibility for the protection of aquatic habitats lies with the *Fisheries Act 1982* (SA) but marine protected areas may also be declared under the *National Parks and Wildlife Act 1972* (SA) and the *Historic Shipwrecks Act 1981* (SA). Listed marine reserves under the Fisheries Act in Gulf St Vincent are: Aldinga Reef, Barker Inlet, St Kilda, Port Noarlunga-Onkaparinga Estuary, St Kilda-Chapman Creek and Troubridge Hill.

2.30 Conservation Park listings are Port Gawler Marine Park and Troubridge Island Conservation Park. The Clinton Conservation Park is situated at the head of the Gulf and is listed on the Register of the National Estate. It represents the only significant natural mangrove/samphire community left in the region. The northern tip of Torrens Island is also a Conservation Park.

2.31 Gleesons Landing is the only marine sanctuary and is for pilchard protection. Thirteen netting closures exist in the Gulf region. They have not been formally recognised as Marine Protected Areas. They are: Edithburgh, Coobowie, Stansbury, Price, Port Wakefield, Port Adelaide, Outer Harbor and metropolitan beaches, Patawalonga Lake, Onkaparinga River, Parsons Beach, Waitpinga Beach, Hindmarsh and Inman Rivers.[16]

15 *Our Sea, Our Future*, Major findings of the State of the Marine Environment Report for Australia, compiled by Leon P Zann, 1995, p 84.

16 South Australian Fishing Industry Council Inc, Submission 33, p 8.