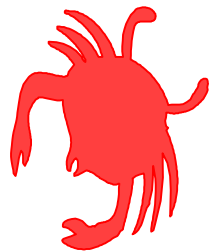
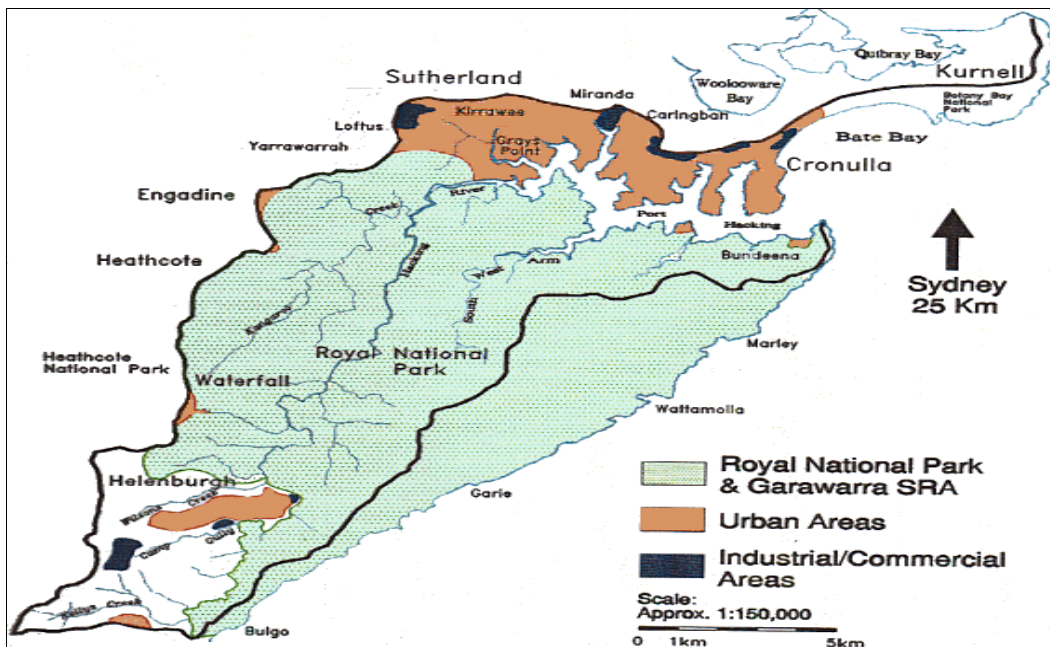
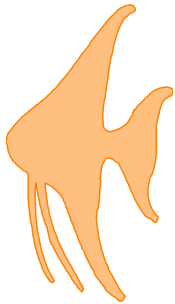
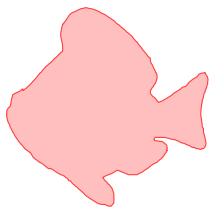




Port Hacking- State of an Estuary

With its origins on the southern and western boundaries of the Royal National Park, and its entire length almost free of human habitation, the Hacking River and the estuary at its mouth should be a beautiful and pristine waterway of which this city can be proud. The absence of industry, and the love of many for Port Hacking and the Royal National Park, should mean that the Hacking, of all the near-urban estuaries, should be able to be managed sustainably.

However neglect, mismanagement and pressures of increasing use have resulted in gradual deterioration in many aspects of this beautiful natural asset. Seagrasses, marine biodiversity, foreshore zones and water quality have all declined. There have been growing disagreements about usage of the Port, about methods of policing, controversy over dredging and development, and public controversy.



The Upper Catchment

The Hacking River gathers its waters in the hills of Helensburgh, Waterfall and Engadine. Pollution of these waters upland is thought to be responsible for the disappearance of the platypus from all the waterways of the Royal National Park and for the introduction of many weeds.

- The colliery at Helensburgh has generated pollution including chemicals and coal wash - now being addressed with new management.
- A rubbish tip outside Helensburgh leaches contaminants into the Hacking River, though Wollongong Council has made efforts to improve its containment.
- Runoff from horse farms, a zoo, a piggery and sewage overflows from Otford add to pollution, though control actions have been undertaken by some landowners.
- Polluted drainage from Waterfall, Engadine and the

major roadways into creeks that feed into the river. This has been improved by the construction of an artificial wetland at Engadine.

The weir at Audley has disrupted the natural ecosystem formed by the interaction of fresh and salt water, which is important in the life cycle of many species of fish. It also prevents fish from swimming upstream and accumulates debris

Lower catchment

The Hacking River flows from Audley, past the suburb of Grays Point and into Port Hacking. Whereas most of the northern foreshore is covered by residential development, the southern shore contains only the urban developments of Bundeena and Maianbar. Urban development on both sides has substantially altered the foreshore, and the effects of population, transport and heavy demands on the estuary are increasingly evident.

Sand in the Port

Originally an ancient deep river valley, the Hacking used to carry a much greater volume of water than it now does. When water levels dropped and the strength of the current diminished, offshore sand was pushed into the river by incoming waves. For all of the period of known human habitation, the Hacking has been a shoaled estuary with limited deepwater areas. This geographic fact is fundamental to its character.

- The sand mass is still moving inland at the rate of about 13 500 cubic metres per year and a large 'plug' is currently located near Lilli Pilli Point.
- The sandy character of the port has resulted in shallow, relatively safe waters that are a bonus for low impact users like, swimmers, surfers, and canoers.
- The lack of depth is a problem for those with deep keeled vessels, and for less skilled or experienced navigators. Regular dredging makes it possible for larger vessels to access the Port.
- Wind and wave action constantly redistribute sand within the Port. Navigation dredging has short-lived effects (about 12 to 24 months on average).
- The river was first dredged in 1881 to sustain ferry access to Audley. Other dredging and ill-considered sand placement have changed the sand and tide characteristics of the estuary.
- Since the mid 1970s there have been ten instances of dredging, each one moving between 60 and 90 000 cubic metres of sand.
- Dredging releases turbidity (particles of sediment suspended in the water) which can be damaging for plants and marine creatures, especially phytoplankton which are the beginning of the food chain. This has adversely impacted areas such as the

Shiprock marine reserve.

- Sediment at the heads of bays is often highly contaminated and reduces amenity for foreshore residents and recreation.

In the early 1990s a Memorandum of Understanding (MOU) on Navigational Dredging detailed criteria for dredging to protect the environment. To date, dredging has continued without implementation of the sustainability protections contained in the MOU.

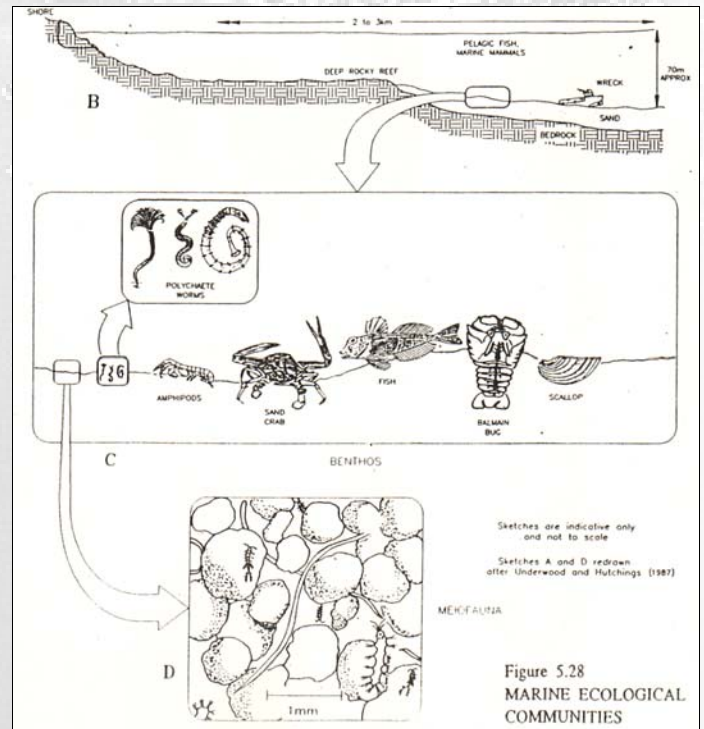


Figure 5.28
MARINE ECOLOGICAL
COMMUNITIES

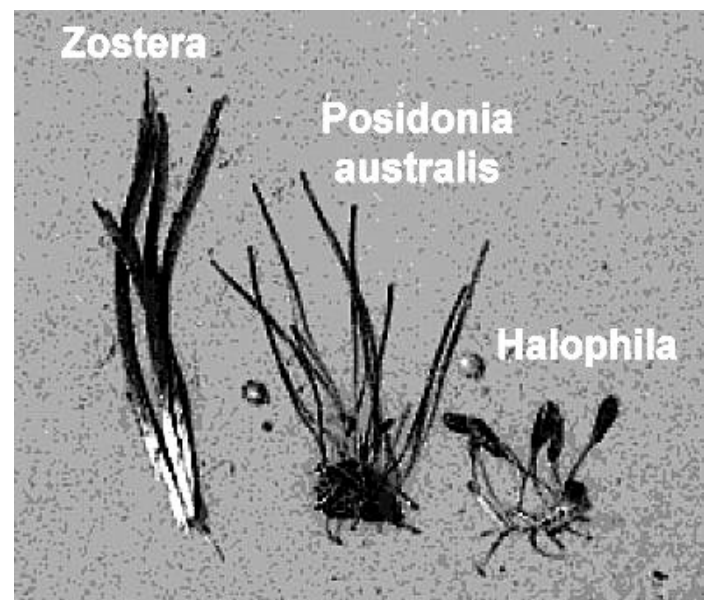
Seagrasses

Seagrasses are important habitats for marine life in estuaries. They serve as nurseries and feeding grounds for fish. Many species of deep-sea fish swim into estuaries and lay their eggs in seagrasses or in proximity to seagrass. As with forests on the land, seagrasses act to improve water clarity and oxygen content, and minimise sediment movement.

- In the last 40 years at least half of the river's original seagrass has been destroyed, with as much as 70% lost in the major channels of the Port.
- As a result of seagrass loss many species of fish have been lost to the Port since the turn of the century.
- Most seagrass loss occurs as a result of sedimentation, shoreline development and boating activities such as anchoring. Seagrass-friendly moorings have been tried but are not in widespread use. There are few measures in place to protect seagrass from the gradual incremental loss.

Posidonia seagrass meadows are particularly impor-

tant as they do not readily re-establish, and have suffered significant losses both in the Hacking and along the NSW coast.



Water quality

Fundamental to the health of a river is the quality of its water. Where water quality is poor, there is loss of biodiversity, loss of the capability of plants and animals to survive in the marine environment due to changed chemical levels, and reduced oxygen content. Algal blooms that smother the capacity of any other life become an increased hazard.

- The Gunnamatta baths have consistently failed Beachwatch water quality tests and are unsafe for swimming 20% of the time.
- Fifty percent of the shellfish in the Western end of the estuary have tested as being unfit for human consumption.
- So much litter enters the river that it could fill two lanes of a 25 meter swimming pool annually.
- The estuary is often affected by oil spills which are left untreated.
- Tests have found high levels of turbidity, ammonia, phosphorous, nitrates and faecal coliforms at a creek in Engadine.
- Heavy metal contamination (eg from galvanised roofs, tyres, brake linings) in sediments has reached a level that would qualify as industrial waste, according to the EPA's guidelines. Ingested by fish, these pollutants enter the food chain.
- The invasive algae *Caulerpa toxifolia* (the growth of which is accelerated by nutrients) is spreading.

A Department of Land and Water Conservation study in 1998 found that some of the major sources of pollution are as follows:

- Sewerage is one of the most significant sources of pollution in the river, with around 1 723 100 cubic metres of sewerage entering the river each year. It en-



ters the river from unmaintained septic systems, from licenced sewerage overflow points, from boats and, till recently, from the Cronulla sewerage plant. Sewering of Bundeena and Maianbar and the commissioning of a new sewage treatment plant will reduce these loads.

- Stormwater drains into the Hacking from urbanised areas within Sutherland Shire and Helensburgh. It often contains contaminants such as litter, animal faeces, fertilizers, pesticides, weedicides, domestic cleaning chemicals and paint residue. Sealing of natural surfaces (eg for roads, footpaths, driveways, landscaping) increases the amount of runoff and results in higher levels of fuel contaminants washing into the river. There is increased attention to these problems, but such high-volume runoff continues to be a major issue.
- In periods of heavy rain, sand from disused sand mines at Kellys Creek and Gills Gully in the upper catchment washes into the river and increases the build up of silt. Sediment from construction sites and roads also has been a contributor to shoreline siltation.

Through-the-hull sewage disposal, oil (either from two strokes or oil spills) are two of the major forms of water contamination from boating.

Foreshore development

The foreshores of waterways play an important role in protecting the health of the waterway. Vegetation along the shores act as a natural filter for runoff, trapping sediment and reducing or eliminating contaminants before they enter the water. The natural character of the Port is also substantially dependent on the protection of foreshore vegetation.

Urbanisation of particularly the northern shores of Port Hacking has reduced the capacity of the natural ecosystem to safeguard the waterway. Densely-packed developments are often accompanied by the reclamation of land and the construction of seawalls, ramps, slipways and jetties. Ironically, it is the very appeal of this beautiful waterway that is now threatening its future health. Insensitive development is leading to a deterioration of the river in a number of important respects.

- The density of development for private use reduces the availability of the foreshores for public use and spoils the visual amenity of the river. Comparative studies of the shoreline in 1988 and repeated in 1998 found that the natural beauty of the port had been diminished by the emergence of unsympathetic developments along the foreshores.²



- Elimination of vegetation along the banks results in more runoff and sediment flowing into the river.
- Destruction of native vegetation along the foreshore reduces habitat and they affects the broader ecosystem.
- Gardens harbour weeds which escape to native bushland, and nutrients and chemicals (eg from fertilizers) used on gardens flush into the river. A 1996 report estimated that a total of 100 000 kg of phosphorus and 270 000 kg of nitrogen had flowed into the river since 1950 from Yowie Bay alone.³
- Runoff from building sites causes sedimentation.

Water craft

Whilst non-boating activities are the dominant use of the Port, the Hacking Estuary is a popular playground for watercraft of all descriptions. In 1987 the Maritime Services Board reported that the river was "one of the most intensive areas of weekend boating activity in NSW."⁴ The northern foreshore houses four marinas, five boat ramps and nine public wharves to accommodate demand. By 1988 there were about 1200 moorings in the Port. Dredging to provide boating access costs between \$600,000 and \$1,000,000 every couple of years. Other boating facilities include Waterways, Water Police, Coastguard, the Riverkeeper, channel marking and boat ramps.

The use of water craft and the type of water craft

used is one of the controversial issues facing the Port. Activities involving high-powered small craft, such as jetskis, often conflict with passive recreation such as swimming, fishing, canoeing and bush-walking. Issues of safety, the rights of near-foreshore residents, and the amenity for those who want to use the area for its natural values, are difficult to manage.

The Waterways Authority, the main authority regulating the river, developed a draft Boating Plan of Management in 2000. It attracted much criticism from many groups, including other government agencies, and has still not been adopted. However, the Authority has increased its policing of boating activities as well as improving regulations for managing sewerage discharge from boats.

Watercraft are associated with a number of management problems from pollution to noise:

- Discharge of untreated sewage directly into the river.
- Petrol and oil residue in the water, particularly from jetskis and power boats.
- Fuel spills as a result of accidents, negligence and inappropriate siting of fueling facilities.
- Anti-fouling treatments used on boats have generated heavy metal pollution.
- Litter, contaminated bilge water and galley waste (including detergents and grease) can be discharged directly into the river.
- Anchors and propellers damage to seagrasses
- Increasing turbidity in low energy environments.
- The spread of the invasive *Caulerpa* algae.
- Wash from speeding craft leading to erosion of river banks, and uprooting foreshore vegetation.
- Noise of motor powered boats and (particularly) jetskis.

Marinas and moorings have a visual impact and can involve an appropriation of public space for private uses.

Management

Like many estuaries, the Hacking River has no central management authority and no integrated management structure. This has resulted in a mish-mash of policies, an opportunity to pass the buck, and an avoidance of management responsibility. In addition, when regulations are introduced, there are neither the resources nor the will to enforce them, so that they are often blatantly ignored. All categories of stakeholder, whether resident, low impact or boating user, highlight these issues as management problems.

Some of the many agencies that share responsibility for the river include:

- Sutherland Shire Council
- National Parks and Wildlife Service
- Department of Land and Water Conservation
- Waterways Authority
- State Fisheries
- Catchment Management Board.

In August 2001, many community groups concerned about the state of the Hacking issued a joint report card in which they outlined the problems facing the river and rated the success of the existing management structure. These groups unanimously condemned the existing situation and outlined suggestions for improving the

health of the river.

If the Hacking River is to face a healthy and sustainable future, it requires the assistance of all levels of society. From State government and Council to foreshore resident and occasional visitor. All must respect the waterway and ensure that personal actions neither degrade it nor impinge on its viability for future generations.

Notes

- 1 Draft "Water Quality Guidelines for NSW Rivers", 1998.
- 2 1988 Port Hacking Management Study (Sutherland Shire Council)
- 3 Patterson Britton & Partners, "Yowie Bay Process Study", 1996.
- 4 Pictorial News 4.3.87.
- 5 Department of Public Works, Environmental Impact Statement, Port Hacking Tombolo, December 1987.

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"A Future for Port Hacking" Transcript of Proceedings of Conference, 4 April 1992, organised by Port Hacking Protection Society and sponsored by Sutherland Shire Council.

"A Report Card on Port Hacking", Coordinated by PHPS and compiled by various community groups, 2001.

Port Hacking Catchment Authority, Briefing Paper, May 1991.

Port Hacking Protection Society, "The Port Hacking Protectorate", 1993-2000.

Sutherland Shire Council, "Port Hacking Plan of Management", 1992.