

Case Study: 3. Waste Management in the Lower Shoalhaven River Catchment

What are the Waste Management Issues of the Shoalhaven River Catchment?

With increasing population, increasing living standards and a growing tourism industry, waste creation in the Shoalhaven River Catchment is likely to increase. All types of waste have a potential to impact negatively on the environment and, in particular, water quality. Water quality is critical to the survival of estuarine and marine ecosystems on which many Shoalhaven River Valley industries depend. The fishing/seafood industry, in the Shoalhaven River coastal zone (estuary and ocean) is particularly vulnerable to declining water quality which in turn affects fish habitats, fisheries and oyster productivity as well as conditions for oyster harvesting (which is directly dependent on water quality).

Waste Streams or Sources of Waste in the Shoalhaven River Catchment

Solid Waste

The total population of the Lower Shoalhaven River Catchment in 2006 was 43,000 and is increasing at an average annual rate of about 1.7%. Nowra, Bombaderry, Culburra and Berry are the main urban centres in the Catchment.

A total solid waste stream of 91,000 tonnes from households and businesses was produced in 2006/2007 in the Lower Shoalhaven River Catchment, with most waste coming from packaging. See Shoalhaven Waste Management data at

<http://www.shoalhaven.nsw.gov.au/council/pubdocs/soe/Region/Issues/Wastemanagement%20ass%20and%20back.htm>



New landfill, West Nowra, source: Shoalhaven City Council

What are the possible impacts of increasing amounts of solid wastes?

The impacts include:

- loss of natural resources used to create the packaging and products;
- an increasing demand for landfill sites;
- impacts on water quality:
 - chemicals and other pollutants from landfill sites may escape into groundwater and enter nearby streams and rivers.
 - leachate develops when waste is buried and decomposes. This can also seep into waterways and cause serious pollution and result in eutrophication (increasing nutrient levels), algal blooms, loss of aquatic habitats and fish kills; and
- impacts on air quality from landfill sites and burning solid waste:
 - Ethane, a greenhouse gas can escape into the atmosphere.
 - Dumps act like large compost heaps and can heat up and catch alight.
 - Dumps are smelly and unattractive and can contribute to air pollution on windy days.

Liquid Waste

Many businesses also produce what is known as 'liquid trade waste'. This waste is usually discharged into the sewerage system and is additional to liquid wastes from showers, toilets, and baths. The types of premises producing liquid trade waste include restaurants, coffee shops, supermarkets, hairdressers, funeral parlours,

dry cleaners, clubs, laundromats, abattoirs, service stations, car wash facilities, marinas and sewage treatment plants (STPs).

Some of the identified high risk or high volume liquid waste producers require a special licence from the Department of Environment and Climate Change (DECC). These activities or businesses are said to be 'scheduled' and include concrete batching plants, STPs and intensive agriculture enterprises (e.g. piggeries, feedlots) above a certain size.

What are the consequences of poor liquid trade waste management?

The consequences include:

- Grease, oil, solid material, if not removed on-site may cause blockages in the sewerage system and result in overflows of untreated sewerage into the environment.
- Strong waste may cause odour problems and corrosion of the sewerage system infrastructure with potential environmental impacts such as leaks or seepage of sewage into waterways.
- Failure of septic/sewage systems can close the river to harvesting for several months as has occurred previously in the Shoalhaven.
- Illegal practices may lead to serious pollution of the waterway including fish kills, mangrove die-off and other long term harm to the waterway and estuary. Such events are investigated by the DECC with heavy fines and cleanup notices imposed.

Those Shoalhaven River industries that are licensed to dispose of their liquid wastes into the Shoalhaven River include a paper mill, starch plant and STPs. The DECC licensing schemes usually contain incentives to reduce the level of contaminants entering the waterway, including hefty licensing fees. These fees collected by DECC are directed back into improving the environment through the NSW Environmental Trusts.



Service station, Berry, source: OceanWatch Australia



Starch plant also located next to the Shoalhaven River, source: OceanWatch Australia



Australian Paper Mill located next to the Shoalhaven River, source: OceanWatch Australia

Construction Waste

Soil that is exposed at construction sites can be washed from the sites into stormwater drains if measures to keep it at the site in place (sediment controls) are poor. This sediment is eventually deposited into the Shoalhaven River or its tributaries and can even make its way into the ocean.

Although a single block of land may seem a small part of the river catchment, the cumulative (additive) effect of polluted, sediment-rich runoff from a number of building sites can have a dramatic impact on water quality.

Thus, there are a number of environmental impacts directly associated with sediment pollution from



Exposed soil at a construction site, source: OceanWatch Australia

building sites. For example, water which runs off building sites, carries pollutants like soil and soil nutrients, as well as building materials such as concrete residues, and enters stormwater drains with subsequent pollution of natural waterways. Furthermore, changes that are made to natural land surfaces and drainage patterns during construction and urban development can result in natural watercourses becoming turbid, silted, littered and undesirably enriched with nutrients ('eutrophication'). This nutrient-rich water often promotes development of algal blooms. When turbid water restricts sunlight filtration, photosynthesis is reduced and productivity of the aquatic ecosystem suffers. This affects habitats (particularly seagrass), marine life and has negative consequences for the fishing and oyster industries.

Most local councils have sediment and erosion guidelines for building and construction work. The approvals for these types of development generally require inclusion of the sediment and erosion control procedures to be employed or are these are required as a condition of consent by council. More details about Shoalhaven City Council's guidelines for construction can be found at:

<http://www.shoalhaven.nsw.gov.au/council/sections/Development/index.htm>

Construction also produces a significant amount of solid waste. About 20% of the solid waste taken to the West Nowra landfill comes from construction sites and is mainly concrete and metals (much of which can be recycled).

Agricultural Waste

Dairying

Dairying is an important agricultural activity in the Shoalhaven River Catchment that can pose an environmental threat to the Shoalhaven River and estuary. It requires the regular congregation of large numbers of cattle to a small area for milking. This can lead to high levels of nutrient runoff from accumulated faecal matter entering and polluting waterways unless these milking areas are well positioned and designed. Dairy cattle can also pollute waterways with nutrient rich faecal matter if they are allowed unrestricted access to rivers or creeks.

Oyster growing

There are five main oyster growing areas in the Shoalhaven River estuary. Oyster growing is greatly dependent on excellent water quality and an ongoing concern for the Shoalhaven industry has been high faecal coliform levels (originating from animal wastes) especially during times of low flow in the catchment.

The Southern Rivers Catchment Management Authority is working with dairy farmers that have properties adjacent to the oyster leases to attempt to minimise the impacts of unrestricted cattle access on the River. To achieve this, 20 kilometres of foreshore have been fenced to exclude cattle. As a result, the number of days the River has been closed for oyster harvesting due to high faecal coliform levels has been significantly reduced.

The oyster industry itself has several waste products that need to be carefully managed. Traditional oyster farming practices have relied on tar-coating oyster poles and trays to preserve the timber. This tar poses a potential risk to the river's water and sediment by gradually leaching toxic chemicals such as hydrocarbons. However, many oyster farmers have replaced the tar-coated poles and trays with recycled plastic poles and floating baskets. Around 70% of the Shoalhaven oyster farmers have already undertaken this. The SRCMA has also partnered with the oyster industry in a one-off clean up of derelict oyster leases with over 40 tonnes of rubbish removed and 20 tonnes of timber recycled from the Shoalhaven.



Cattle with direct access to the river, pollute the water with their waste, source: NSW DPI (Allan Lugg)



Oyster leases in the Shoalhaven River, source: SRCMA

Fishing Industry Waste

As outlined in the fact sheet on the Lower Shoalhaven River Catchment Fishing Industry, waste generated by the fishing industry can include:

- plastics;
- fishing line and nets;
- offal (left over carcass from filleting/processing); and
- fuel emissions.

One of the main issues for this industry is the impact of discarded fishing equipment such as tangled fishing line, torn nets, hooks and ropes etc which pose a threat to aquatic life. It should be noted, however, that the fishing industry is only one of the possible sources of marine debris and other waste impacting on estuaries and marine ecosystems.

Stormwater Runoff

The creation of impervious surfaces such as roads, roofs, driveways, footpaths and pavers, creates a significant increase in stormwater runoff volume and duration. These increased flows may carry sediment, litter and organic waste into waterways through the kerb and gutter system. This stormwater then can carry nutrients and other wastes into the Shoalhaven River resulting in increased siltation and nutrient pollution.

Sewage

There are four main Sewage Treatment Plants (STPs) in the Lower Shoalhaven River Catchment. These are located near the larger population centres of Nowra, Bomaderry, Shoalhaven Heads and Berry.

Wastewater collected in the sewerage system flows to the STPs where it is either treated or reused. Discharges from the STPs are monitored regularly to ensure that they comply with standards set out by the NSW Government.

According to Shoalhaven Water which manages sewage disposal in the Catchment, use of recycled water has increased from 300 million litres a year in 2001 to approximately 1,600 million litres a year in 2006/2007. This will grow to 2,500 million litres a year by 2015.

Air pollution from waste

Air quality in the Shoalhaven Valley is influenced by bush fires, controlled burning for hazard reduction, industrial discharges both licensed and unlicensed, solid fuel heaters, backyard burning of green waste, transport pollution including private vehicle use, commercial cooking activities, sewage treatment plants, landfills, dust from agriculture and building activities, and indoor air pollution from activities such as smoking and heating.



Oyster farming in the Shoalhaven using recycled plastic poles and trays, source: Lyn DeSoto, Shoalhaven oyster farmer



Fishing waste, source: OceanWatch Australia



Kerb and gutters in Nowra streets, source: OceanWatch Australia



Landfill generates methane, a flammable greenhouse gas, source: OceanWatch Australia

The impacts of air pollution in the Shoalhaven River Catchment include:

- contributing to global warming
- contributing to ozone depletion
- declining water quality when the air borne wastes settle onto and/or wash into waterways
- human health issues from air borne particles.

Water pollution from waste

The *Independent Inquiry into the Shoalhaven River System (2004)* by the Healthy Rivers Commission summarises the major water quality issues of concern throughout the Shoalhaven Catchment. The issues include:

- potential acid sulfate soils (see fact sheet on *Land and Water Management Issues in the Lower Shoalhaven River Catchment*);
- management and disposal of wastewater;
- impacts of urban expansion around Nowra (see fact sheet on *Land and Water Management Issues in the Lower Shoalhaven River Catchment*);
- impacts of various industries located along the river; and
- streambank erosion (see fact sheet on *Land and Water Management Issues in the Lower Shoalhaven River Catchment*).

Nutrients, in small amounts, are required for plant growth but in large amounts they can cause excessive algal growth in waterways (including noxious blue green algae) which can put natural ecosystems out of balance, harming water-life and animals. Blue-green algal growth can also seriously affect human uses of water for purposes such as drinking, recreation, stock water and irrigation.



Runoff from urban areas can result in nutrients being washed into Shoalhaven River via gutters, source: OceanWatch Australia

Sediment smothers aquatic habitats such as seagrass and high turbidity interrupts photosynthesis. Both of these events reduce plant production and interrupt food chains. These habitats are important breeding grounds and nurseries for many aquatic species such as prawns and fish. If breeding is interrupted and nurseries destroyed, fishing productivity is reduced and therefore the fishing industry (recreational and commercial) and the oyster industry suffers.

Major sources of nutrients in the Shoalhaven River Catchment are:

- run off from urban and rural residential areas;
- erosion and chemical run-off from grazing and cultivated land;
- effluent from dairy farms;
- discharges from sewage treatment plants and septic systems; and
- run off water from industries along the river.

What are Some of the Ways These Waste Management Issues are Dealt with in the Shoalhaven River Catchment?

Waste management is an issue that we can all influence. Some of the ways we can reduce the impact of wastes on the environment are:

- reduce the production of waste and therefore the demand for natural resources;
- dispose of all types of waste in a way that minimizes environmental and human impacts;
- recycle or reuse waste products where possible to reduce the demand on natural resources and the need to dispose of the waste into the environment; and
- educate groups and individuals on the role they can play in waste minimisation and responsible disposal of waste to minimize environmental impacts.



Shoalhaven City Council's community workshop on composting, source: Shoalhaven City Council

Councils, schools, State and Commonwealth Governments along with individuals have a responsibility to educate themselves and others about how to improve waste impact from their own activities on the environment.

There have been several strategies implemented to manage waste in the Lower Shoalhaven River Catchment. Some of these strategies are described below in this fact sheet.

While a lot has been achieved there is still progress to be made to reduce the environmental impacts from waste and in particular the impacts on water quality caused by waste disposal.

What are the Types of Strategies for Improving Waste Management?

What can governments do?

In NSW, the Department of Environment and Climate Change (DECC) is the lead government agency responsible for state-wide regulation of waste management. Local government is vested with the regulatory responsibility at the local level for carrying out waste management services within this state-wide framework. The Commonwealth Government is also involved through incentives and partnerships with Local and State Governments, as well as with industry. Councils develop policy and operating plans to ensure that they meet their obligations under legislation.



Shoalhaven City Council collection of recycling bins, source: Shoalhaven City Council

How Does Shoalhaven City Council Carry out its Waste Management Functions?

Disposal of solid waste and recycling

Shoalhaven City Council has a comprehensive approach to managing and disposing of solid waste materials within its area. It has ten waste and recycling depots at various locations throughout its area with the largest being at West Nowra. It offers a weekly kerbside collection to properties and a fortnightly collection of recycling bins.

http://www.shoalhaven.nsw.gov.au/council/sections/Waste/WasteRecyclingDepots/waste_&_recycling_depots.htm

Shoalhaven City Council actively supports and promotes recycling to the community due to the wide-reaching environmental benefits that recycling offers. Strategies to encourage recycling and reduce waste being sent to landfill include:

- general waste collection that includes waste and recycling bins to increase the amounts being recycled;
- a wide range of recyclable materials is encouraged;
- a pay for service facility for all garden waste;
- a pay for service facility for large bulky items;
- special waste minimisation services that include special waste disposal, buy back centres, worm farms and composting facilities available;
- recycling at landfill sites;
- encouraging the reuse of materials;
- favouring industries that limit waste production by providing advisory and support services; and
- encouraging the development of new 'greener' technology.

As a result of these strategies and community support there have been general improvements in waste management. Although at the West Nowra depot there has been approximately 60,000 tonnes of waste delivered to landfill in each of the last five years, with increases in population there has been a decline in the amount per person delivered. There has also been an increase in the amount of solid waste being recycled with 9,905 tonnes recycled in 2006/07 in the Shoalhaven area.

The Shoalhaven City Council also has in place strategies to deal with specific types of waste to reduce environmental and health impacts from wastes that include concrete, soil, cooking oils, out of date medications, toxic liquids, mobile phones, asbestos, pesticides, bulk motor oil, sediment runoff from building and construction sites and the disposal of 'sharps' used by thousands of people at home to treat medical conditions, such as diabetes, cancer or multiple sclerosis.

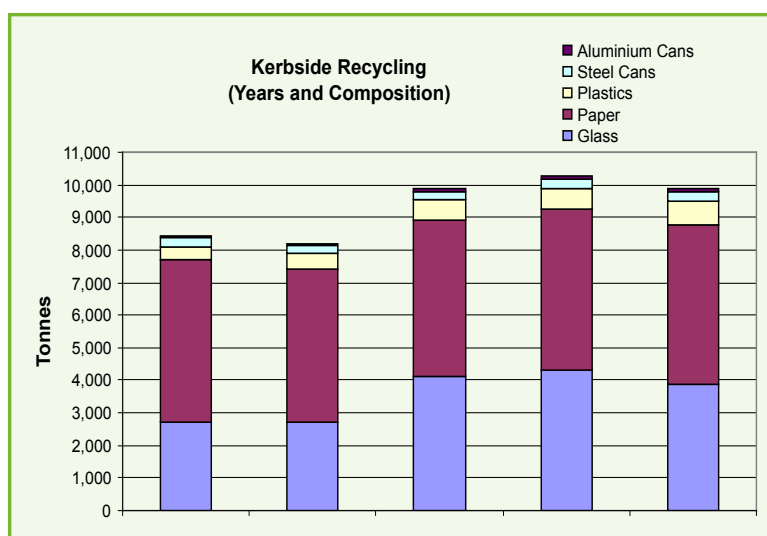
Disposal of liquid waste

Sewage, liquid trade waste and stormwater waste disposal systems are located throughout the entire Shoalhaven River Catchment. Sewerage treatment plants are monitored under licence to DECC and, where necessary, upgraded to reduce leaks and breakdowns. In many new urban developments, lakes and wetlands are being constructed to filter stormwater waste and protect downstream water quality. Water Sensitive Urban Design (WSUD) is now an important part of planning processes for all new developments.

Shoalhaven Water is developing one of the largest water-recycling schemes undertaken by an Australian water authority. It will utilise up to 80 percent (2,000 million litres) of the reclaimed water from six Shoalhaven wastewater treatment plants to irrigate local dairy farms, golf courses and sports fields.



West Nowra waste and recycling depot, source: OceanWatch Australia



Recycled materials yield 2002/2007, source: Shoalhaven City Council, State of the Environment Report (2006/2007)



Unsewered towns and rural properties with on-site sewage systems are managed under Shoalhaven Water's septic tank pump out facility and On-Site Sewage Management DCP 78 which requires certain standards for installation, inspections, minimum treatment standards, and upgrading of treatment systems to reduce environmental threats.

Stormwater

Shoalhaven City Council has a number of strategies to reduce the level of stormwater runoff as well as influence its quality. These strategies are included in its Stormwater Management Plan and the Shoalhaven River Estuary Management Plan.

Council through its Stormwater Management Plan is moving the emphasis in stormwater management from end-of-pipe solutions such as gross pollutant traps (devices that catch litter and other larger wastes before they enter waterways) to ways to minimise pollution at the source. This involves finding out where the main sources are pollution might be and developing ways to minimise them with the community.

Gaseous Waste

Council regulates backyard burning and non scheduled industrial emissions into the atmosphere. This helps reduce waste that impacts on air quality in urban areas. Council is also able to regulate the level of open burning-off under the Protection of the Environment Operations (Control of Burning) Regulation 2000.

Council has participated in the Sustainable Energy Development Authority Energy Smart Homes program that requires new homes meet minimum energy efficiency requirement to reduce greenhouse emissions. New homes must comply with the requirements of BASIX (Building Sustainability Index).

Education

Education for sustainability is a state-wide initiative that recognises the vital role education has across all sectors of the community. Shoalhaven City Council, in recognition of its important local role in educating its community, undertakes a variety of community education programmes to advance awareness, uptake and participation in Council's environmental initiatives including the area of waste reduction.



Shoalhaven City Council's educational slogans, source: Shoalhaven City Council

Council's waste education initiatives include:

- waste management web page at <http://www.shoalhaven.nsw.gov.au/council/sections/Waste/Default.htm>
- promotion of Clean Up Australia with local businesses, community groups and individuals;
- fridge recycling calendar;
- composting information;
- recycling information; and
- Green Home composting trial.

Community involvement in national initiatives such as 'Clean up Australia' and the NSW Government's various litter reduction campaigns help to promote waste minimisation and appropriate disposal messages in the Shoalhaven River Catchment.

How can locals respond to the local Shoalhaven waste issues?

Businesses, environmental groups, government bodies and individuals can all get involved in waste minimisation projects such as those outlined above.

Often when community members, groups and businesses all get together to work on special projects it benefits the whole community in ways beyond just that project.

For example, over 700 households in the Shoalhaven Council area wanted to be part of Great Green Home Composting Trial. Only 205 households could take part in the trial but if it is successful in reducing the amount of green waste going to landfill the program, it will be offered by Council to the wider community. More details can be found at:

<http://www.shoalhaven.nsw.gov.au/council/sections/Waste/SpecialPros/Home%20Composting%20Trial.htm>

Further actions individuals can take to minimise waste

Ultimately it is in the home, at play or at work that practices of individuals make a difference.

At home ask the question Do I –

- recycle all the recyclable containers and packaging?
- make sure I don't contaminate waste by putting the wrong things in the wrong bin?
- compost all the organic and green waste that I can?
- ensure that I don't litter?

Reduce waste when shopping by:

- avoiding excessive packaging on items you purchase;
- taking your own bags or shopping basket to reduce the use of plastic bags;
- buying your fresh food and vegetables loose;
- avoiding the use of freezer bags in your supermarket;
- avoiding pre-packaged fresh foods;
- cutting packaging – buy in bulk;
- buying concentrated products; and
- only buying things that you need.

Contribute to cleaner waterways by:

- preventing pollutants including soil, leaves, detergents, litter and animal faeces from washing into stormwater drains;
- protecting trees and other vegetation along local waterways (and planting more);
- encouraging the protection of local wetlands as these act as natural filters for pollutants, as well as providing habitat for birds and aquatic life; and
- recycling products and their packaging.



Planting mangroves to help stabilise eroding banks of the Shoalhaven River, source: SRCMA, (Peter Pigott)