# A Catchment Story

#### **PURPOSE:**

To illustrate how different land uses can impact on the health of a waterway.

## A Catchment Story

This is a story of a river – much like the Bremer River - and how everyone, including all of us, have an impact on its health as it travels through its catchment. Starting in the hills and mountains where the rain runs down the slopes, to where it finishes its journey as it flows into the sea.

Our river starts out as a trickle, with many small gullies and creeks coming together as they flow down from the mountains to the valley forming the river which grows in size as it continues its journey. As the river travels down from the mountains, it gathers speed and enters **farming land** where crop fields were recently fertilised. Afterwards, the crops are watered and the run-off, carrying some of the fertiliser, flows into the river.

Next to this farm is the **stock yards**. Each month large numbers of stock are brought to the sale yards, leaving behind manure. The rain washes some of this manure into the river, causing <u>eutrophication</u> (u-tro-fic-ay-shon) of the water.

On the other side of the river are **grazing lands**. Few trees remain and there is very little <u>riparian</u> vegetation. In the lower areas the water table has risen because there are not enough trees to use the water any more. This water brings the salts in the soil up to the surface, creating salt pans, making the land unusable. It also means that run-off from the land is salty and this threatens the freshwater plants and animals in the river.

Cattle feed on the riparian vegetation and drink water from the river. Their heavy hooves make the banks unstable and when heavy rain arrives the banks collapse and soil falls into the river.

In the valley is a **power station** which generates electricity for the region. It burns large quantities of coal, supplied by the surrounding coal mines, and releases pollutant gases (acids) and particles, such as fly ash, into the atmosphere. The gases and other air pollutants, such as car exhaust fumes and factory smoke, combine with water vapour droplets in the air and fall back down to earth when it rains. Some of these pollutants can then enter the river as rain falls in the catchment.

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PAGE 1

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Slowly the river winds closer to the main city. Before it gets there it creates an area that is enjoyed by many local people. One person is **fishing** from the river's edge, but their line gets snagged on a rock and is left in the water, creating a hazard for aquatic animals. Other people are **water-skiing** and their boat leaves behind a trail of oil and fuel. A family picnicking in the **park** forget to put their rubbish in the bin and it is blown into the river by a gust of wind.

As the river <u>meanders</u> around a bend it starts to enter the outer suburbs of the city. A new housing development is taking place on the side of the river. Many trees have been removed and the top soil has been left bare. Rain washes the soil into the river causing erosion and <u>sedimentation</u> of the waterway. Houses in the developed suburbs take pride in the appearance of their gardens. They use <u>pesticides</u> to stop bugs eating their flowers, but when they hose their garden, the pesticides are washed into the storm water drains and directly into the river.

Cars and trucks that travel on the suburban streets and **roads** slowly drip oil and passengers often throw rubbish into the gutters. All of these pollutants are washed into the stormwater drains with the rain and flow directly into the river.

The sewerage treatment plant along the river bank releases <u>effluents</u> containing nutrients such as nitrogen and phosphorus as well as other pollutants into the river. These nutrients provide food for algae which in turn uses up extra oxygen in the water which aquatic organisms rely on. Local **industries** use water to wash equipment, with the run-off carrying pollutants back into the waterways.

Our river travels down past a **quarry** where road base is excavated. Trucks used are diesel powered and leak oil into the creek, and the wind blows rock dust into the water. The quarry pumps water out of the river to clean its equipment and flush out some of the waste. This waste includes acids, oils and crushed rock which all drain back into the river.

Finally, the river flows out of the catchment and into the sea, carrying with it everything that has been added along the way, now creating problems for the coastal <u>ecosystems</u>.

#### Source: Adapted from 'A Catchment Story', Land & Water Australia



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**ACTIVITY SHEET 7** 

## A Catchment Story

ACTIVITY What's in the river?

#### **Teachers / Group Leaders Notes:**

- Step 1 Divide the group into small groups of two or three.
- **Step 2** Place a large, clear bowl containing 4 -5 litres of water in the centre of the room. This represents the river before it starts its journey through the catchment.
- **Step 3** Fill one glass with the clean water from the bowl. Leave the glass aside for comparison at the end of the story.
- **Step 4** Give each group a small container (e.g. a film canister) labelled with a land use from the 'Catchment Story', filled with the substance for that land use as listed below.
- **Step 5** Do not open the containers until each groups 'land use' is mentioned in the story. Groups will then empty their containers into the clear bowl of water. Note: All substances are non-toxic.
- **Step 6** Re-read the 'Catchment Story' and have the groups empty their containers into the bowl when they hear their land use mentioned in the story.
- **Step 7** At the completion of the story the group will see how each land use has contributed to the condition of the river.

#### List of Land Use Substances

LAND USE	SUBSTANCE
Farming land	Baking powder (fertiliser)
Stock yards	Thick muddy water
Grazing land	Soil and salt
Power Station	Vinegar and ash
Fishing	Nylon line
Water skiing	Vegetable oil
Park	Litter / paper
Housing development	Soil
Gardens	Baking powder (pesticides) and grass clippings
Roads	Vinegar or vegetable oil and litter
Industry	Vinegar (acid) and soil and small rocks
Quarry	Soapy water

PAGE 3



## A Catchment Story

#### ACTIVITY

Land uses and their associated impacts

The 'Catchment Story' highlights a number of different land uses and their impacts on the catchment. See if you can match the list of land uses to the correct impact.

#### **IMPACTS**

Eutrophication Air pollution Litter Water pollution Erosion and sedimentation Algal blooms Salinity and salt pans Oil and rubbish entering storm water drains Air pollution Fertilisers entering the water Pesticides washed down storm water drains Bank instability and collapse

## LAND USE

Housing development Sewerage treatment plant Farming land Streets and roads Power station Stock yards Suburban gardens Grazing Clearing of vegetation Industry Industry Park land



PAGE 4





**ACTIVITY SHEET 7** 

## A Catchment Story

## **TEACHER'S NOTES**



### Discussion

The group can now refer back to their list of present and past land uses in Activity Five. Make a note next to each of the impacts that it has on the river. Use the following questions, as well as others, to prompt the group to discuss the effect of different land uses on the quality of water in the river.

- 1. How did the group feel about the change in the colour and look of the water when they emptied their containers into it?
- 2. How would they feel about swimming or fishing in the river?
- 3. Would they like to drink the water?
- 4. Do they think that aquatic plants and animals would like to live in this water?
- 5. Many of these land use activities are important to the community. How do they think these can change to help the condition of the water?
- 6. Is their anything that they can do to help reduce the amount of pollution entering the river?
- 7. Does this activity raise their awareness of water pollution and how different land uses impact on the river?



PAGE 5

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