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## Exploring Your Local Area

This localised provides you with specific activities and information relevant to the Corangamite Region of Victoria (see map). This area includes four main river catchments - the Barwon River Basin, Moorabool River Basin, Otway Coast River Basin and Lake Corangamite River Basin. Within these catchments there are eight Local Government Regions each with a number of towns contributing to urban stormwater pollution.

This section includes examples of:

- urban stormwater initiatives;
- significant waterways that are affected by urban stormwater pollution;
- groups working to improve urban stormwater quality; and
- activities that your class can undertake to improve water quality.

Additional resources to support your studies are listed at the end of this section.

While the examples included in this section relate to specific towns in your region, many of the activities can be easily adapted to suit other towns.

Some of the activities have an **F** symbol next to the name of the activity. Contact your local Council, Waterwatch office, Waste Management Group, or Catchment Management Authority to gain assistance in undertaking these activities.

It is recommended that teachers read the "Waterwatch Victoria Urban Stormwater Occupational Health & Safety OH&S booklet" prior to undertaking field activities in this manual (see "Local Contacts" Corangamite Waterwatch).



### Acknowledgements:

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## Lake Corangamite Catchment... Our Back Yard

### Summary

Students examine the features of the Lake Corangamite Catchment.

### CSF Learning Outcomes

- SOSE 3.3 Australia's People and Places  
4.1 Geography  
5.2 Geography

### Aim

Students recognise key features of a terminal lake.

### Materials

- "Lake Corangamite Catchment...Our Back Yard" Catchment Map
- "Lake Corangamite Catchment...Our Back Yard" Worksheet

### Advanced preparation

Photocopy a class set of the "Lake Corangamite Catchment...Our Back Yard" Catchment Map and "Lake Corangamite Catchment...Our Back Yard" Worksheet. You may access additional resources to assist in this activity eg. aerial maps.

NOTE: If your school is not located in the Lake Corangamite Catchment, you can still use this activity. If students are unfamiliar with the area, complete the comprehension exercise prior to undertaking the mapping activity.

### Activity

- 1 Students take time to examine the Catchment Map.
- 2 Students label features in the catchment eg. Lake Corangamite, Lake Colac, towns and industries.

- 3 Make a class list of influences on the river. These may include farming, grazing, urban development, weirs, industry, roads, or land clearing.

- 4 Discuss:
  - What would the catchment look like if there were no industries or major towns?
  - How do these factors influence the water quality, aquatic habitat and the type of animals in the water?

- 5 Students read the Worksheet and complete the questions. The worksheet may assist students to fill in additional features on their map.

### Extension

Visit a site along the river where urban stormwater drains enter. Compare upstream and downstream environments. Changes may be in vegetation, wildlife and stream bank appearance. Students may describe / draw their impressions. Your class could test the water for any water quality changes.

### Background

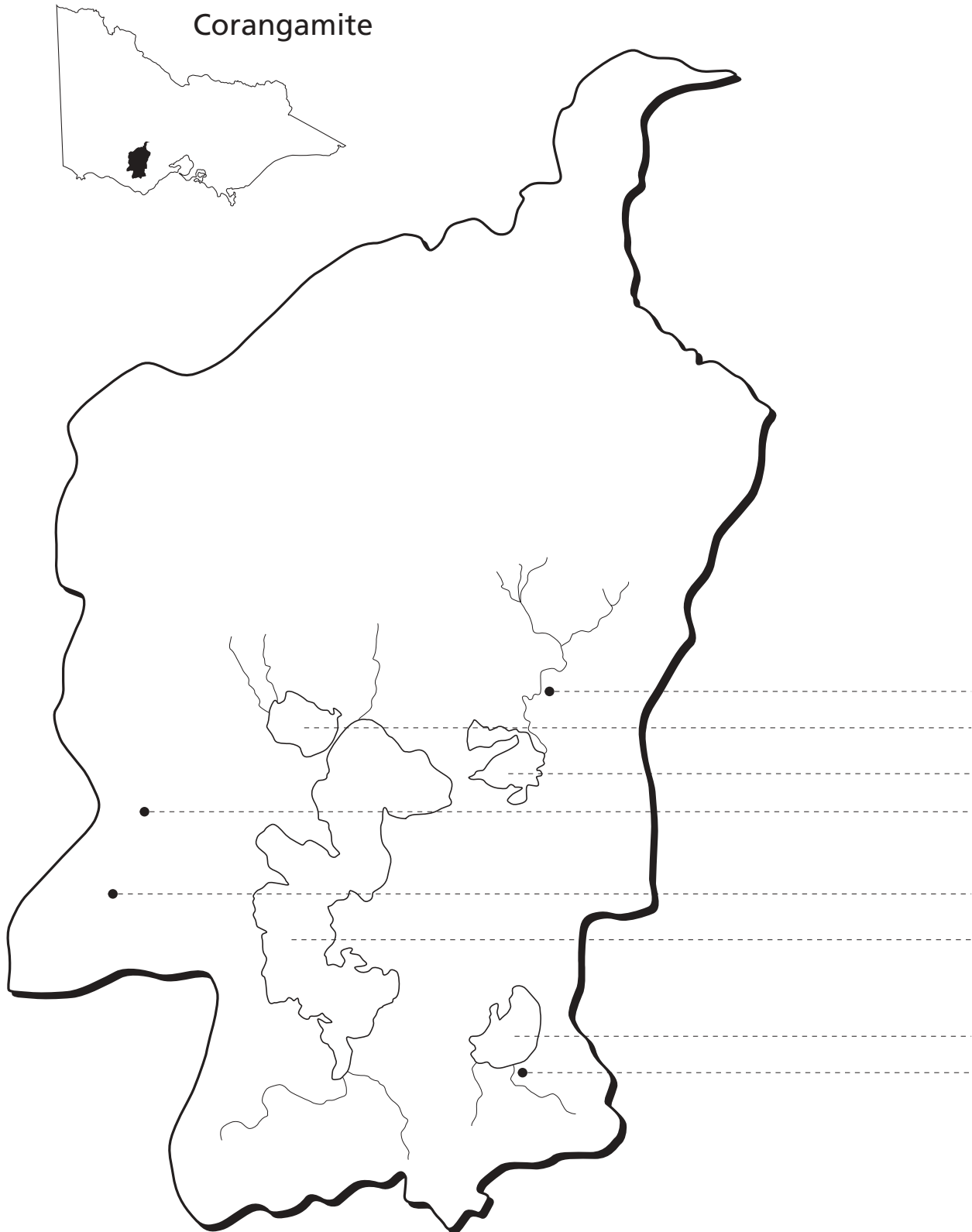
The Lake Corangamite River Catchment is located in southern Victoria. The Woody Yaloak River is the major flowing waterway in the catchment. The catchment also contains many significant wetlands including Lake Corangamite, which is Victoria's largest natural inland lake and is RAMSAR listed.

Urban Stormwater is one of the many influences on water quality in the lakes, wetlands and the river.

The River receives urban stormwater runoff from townships including Cressy, and Pitfield.

## Corangamite Catchment...Our Back Yard Catchment Map

Name: \_\_\_\_\_



## Lake Corangamite Catchment...Our Back Yard Worksheet

Name: \_\_\_\_\_

### Background

The landlocked Corangamite Basin comprises many hundreds of natural wetlands, including Lakes Corangamite, Colac, Bullen Merri and Gnarpurt. The catchment covers three local government areas including Corangamite Shire, Colac Otways Shire and Golden Plains Shire.

The major river in the catchment is the Woody Yaloak River. Many of the wetlands have been drained and many waterways have been channelised. Much of the basin was originally a vast, open native grassland, which has been highly impacted on since European settlement.

### Some facts about the catchment:

- Major settlements in the catchment include Camperdown, Lismore, Skipton, Cobden, Timboon, Port Campbell, Derrinallum, Darlington, Princetown and Simpson.
- Water is taken from the rivers and lakes in the Corangamite catchment for irrigation, stock and domestic needs, also meet the need for urban water and food industry supplies.
- The tributaries of the Woody Yaloak River include Little Woody Yaloak Creek, Kuruc-A-Ruc Creek and Ferrers Creek.
- The Woody Yaloak River flows into Lake Martin, which is close to Lake Corangamite
- Lake Corangamite is Victoria's largest inland lake. It has a surface area of 234 square kilometres and a circumference of about 150 km.
- Lake Corangamite is surrounded by a number of smaller lakes and swamps, which are fed by small creeks and rivers from across the catchment.
- Corangamite is the an aboriginal word, which means 'bitter'. The lake is called Corangamite as a reference to its extreme salinity. The lake is three times saltier than seawater.

**Question 1:** The major settlements in the Catchment are:

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**Question 2:** Name the 3 uses for water taken from the rivers and lakes in the Corangamite Catchment.

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**Question 3:** What is significant about Lake Corangamite?

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**Extension 1:** Why is stormwater an important influence on the rivers and lakes in the Catchment?

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## Where Does The Water Go?

### Summary

Students investigate the main urban area of Winchelsea.

### CSF Learning Outcomes

SOSE 3.3 Australia's People and Places

4.3 Geography

5.2 Geography

### Aim

Students develop knowledge of their local environment, including features which affect urban stormwater pollution both positively and negatively.

### Materials

- "Where Does The Water Go?" Town Map
- "Where Does The Water Go?" Street Map
- Pencil/s
- Clipboard

### Advanced preparation

Contact a facilitator from Surf Coast Shire or from Waterwatch to assist with this activity (see "Local Contacts").

Invite parents to assist with this activity.

Copy the "Where Does The Water Go?" Town Map and Street Map for each student or pair.

**SAFETY:** Review the "Waterwatch Victoria Urban Stormwater OH&S Booklet" (see 'Resources')

### Activity

- 1 Walk around the township of Winchelsea. Using the Town Map students label landmarks including schools, shops, factories, sports ovals, golf courses and petrol stations.
- 2 Students focus on one street block, marking features on their Street Map.
- 3 Show different surface types and stormwater pits and outfalls. Encourage students to mark on the maps sites where they have seen pollution eg. plastic bottles in a stormwater drain.

- 4 Mark in the types of buildings, businesses and structures that affect stormwater, either in a positive way or a negative way.
- 5 Return to class where students complete their maps.
- 6 Pairs share their findings with the class.

### Extension

Complete the activity "Corporate Cleanup" where students work with local businesses to reduce urban stormwater pollution.

### Background

Winchelsea is a pleasant small town of 1000 people, which is located on the Barwon River 112 km south-west of Melbourne on the Princes Highway between Geelong and Colac.

The first Europeans to reside in the area were squatters who established grazing runs here in 1837. The town developed around the Barwon Hotel and a general store, both of which were established in 1842.

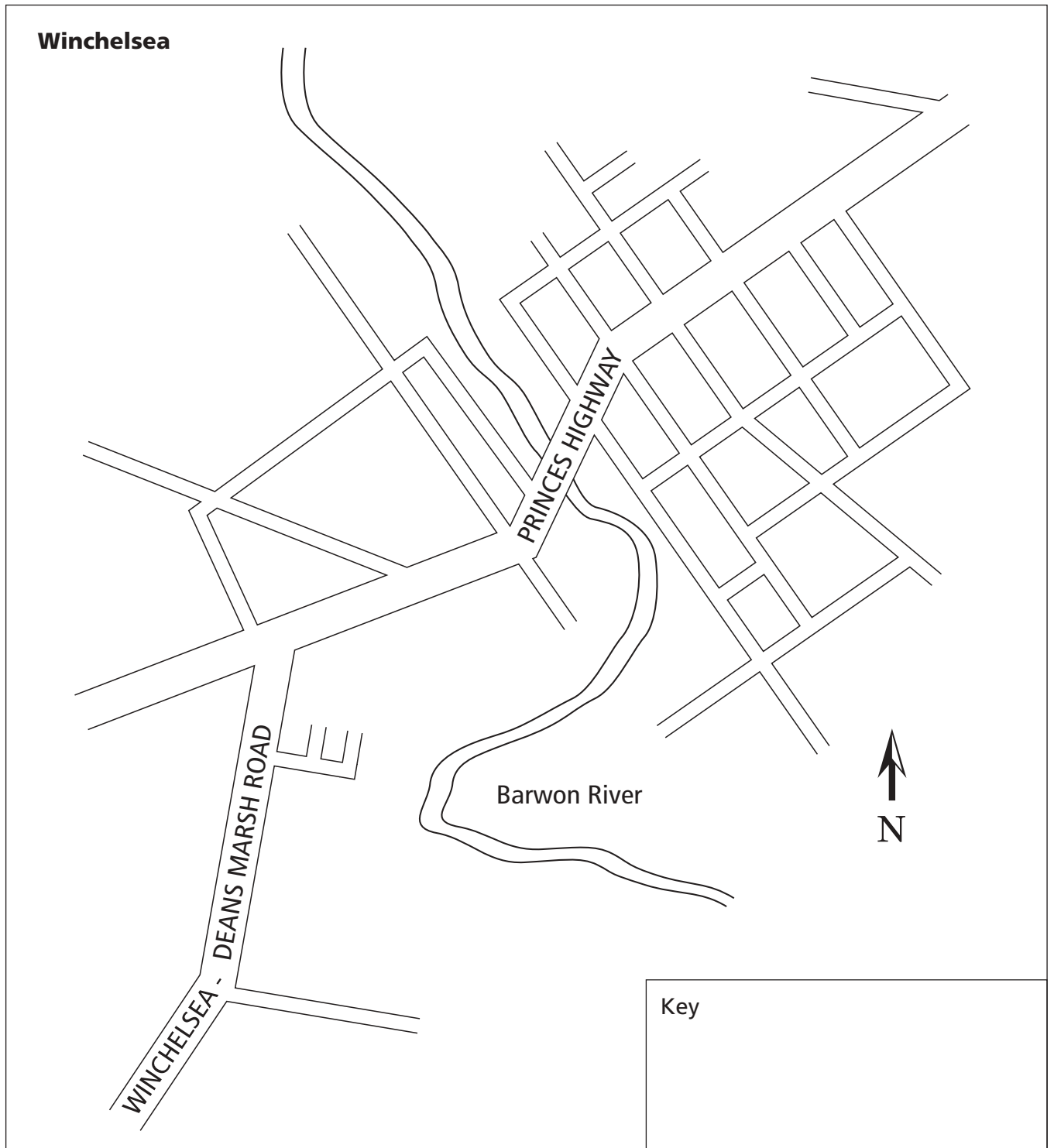
## Where Does The Water Go?

### Town Map

Name: \_\_\_\_\_

**Activity 1:** Using symbols, mark in familiar features eg. our school, shops, factories, sports ovals, golf course, petrol stations etc.

**Activity 2:** Find the street you are in and mark it on your town map.



## Where Does The Water Go? Street Map

Name: \_\_\_\_\_

**Activity 3:** Write the street name here: \_\_\_\_\_

**Activity 4:** Sketch the street. Mark in the buildings, businesses and surface types that affect stormwater.

**Activity 5:** Include on your map places where you see stormwater pollution, where the stormwater flows and use arrows to show direction of the flow.

**Activity 6:** Discuss your findings with the class.

### Street Map

Key

## No Litter In Lake Colac

### Summary

Students investigate the impacts of and remedies to the urban stormwater pollution entering Lake Colac.

### CSF Learning Outcomes

- Science
- 3.1 Biological Science
  - 4.1 Chemical Science
  - 5.4 Chemical Science
  - 5.4 Physical Science

### Aim

Students gain an understanding of the drains entering the lake and their impacts.

### Materials

- Waterwatch Test Kit (see “Local Contacts” - Otway Coast Waterwatch)
- “No Litter In Lake Colac” Record Sheet

### Advanced preparation

Plan an excursion to the Lake Colac.

- 1 Contact Colac Otway Shire Council or the Waterwatch coordinator to organise a facilitator to assist in this activity. They can discuss the source of the stormwater and initiatives of Council to reduce stormwater pollution. The facilitator may also be able to gain class access to the litter trap.
- 2 Photocopy : “No Litter in Lake Colac” Record Sheet

If you are modifying this activity for a town other than Colac see the definition of ‘upland / lowland’ rivers (see “Resources”) Those in upland rivers will require the Upland “Water Quality Rating Table” (see “Resources”)

**SAFETY:** Review the “Waterwatch Victoria Urban Stormwater OH&S Booklet” (see ‘Resources’)

### Activity

- 1 At Lake Colac look at the drains entering the lake. Discuss where these come from. Students should record features of the site.
- 2 Discuss the types of pollution which may be carried down the drain and how they can be captured.

- 3 Walk to Armstrong Street and examine the litter trap. Ask the facilitator to discuss the source of the water / pollution and how the litter trap works.
- 4 Given sufficient adult supervision, split the class into groups.
- 5 Use the Waterwatch Test Kit to test the water:
  - At the drain outlets
  - Upstream and downstream of the drain outlets
  - In the stormwater drain upstream of the trap and at the trap
- 6 Record results then complete ratings and questions on the record sheet.
- 7 Pose the question -“Are there any differences between the sites?”

### Extension

Students write up their excursion as a practical report. Report findings to the Colac Otway Shire Council and make recommendations for action (see pages 63 - 66 of the Statewide section for ideas). Compare results with schools upstream in Echuca or downstream in Mildura.

### Background

Colac, like most towns, has a number of drains, which remove stormwater runoff from the township.

To prevent the pollution on our streets from passing through this drainage system into our waterways, councils are installing litter traps. These traps reduce gross pollution but are ineffective at trapping smaller litter and invisible pollution (nutrients, salt, pesticides, petrol and oil)

It is therefore essential that we stop pollution at its source by ensuring that all rubbish is put in secure bins, by washing cars on the lawn, scooping up animal droppings and collecting grass clippings.

## No Litter In Lake Colac Record Sheet

Name: \_\_\_\_\_

### At Lake Colac

**Activity 1:** Describe the features of the site eg. How many drains enter the lake here?  
What types of trees and plants can you see? Is there any rubbish?

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### Activity 2: Water Testing

To find out the water quality of each site test the

- **Turbidity** (muddiness)
- **Salinity / Conductivity** (salt levels)
- **Water Temperature**
- **pH** (acidity),
- **Phosphorus** (can promote excess plant growth)

**Activity 3:** Record the results for your site in Table 1

**Table 1 - *Urban Stormwater Monitoring Results***

Test	Drain Outlet		Upstream of the outlets		Downstream of the outlets	
	Results	Rating	Results	Rating	Results	Rating
Turbidity						
Temperature						
Salinity / Conductivity						
pH						
Phosphorus						

Test	Upstream of the Litter Trap		At the Litter Trap	
	Results	Rating	Results	Rating
Turbidity				
Temperature				
Salinity / Conductivity				
pH				
Phosphorus				

## No Litter In Lake Colac Record Sheet

Name: \_\_\_\_\_

**Table 2 - *Water Quality Ratings for Lowland Streams*** (Adapted from the Index of Stream Condition Reference Manual 1999)

Parameter	Units	Rating (out of 4)				
		4	3	2	1	0
		Excellent	Good	Average	Poor	Degraded
Conductivity	µS/cm	<100	100 - <300	300 - <500	500 - <800	>800
pH	-	6.5 - 7.5	6.0 - 6.5 or 7.5 - 8.0	5.5 - <6.0 or >8.0-8.5	4.5 - <5.5 or 8.5 - 9.5	<4.5 or >9.5
Turbidity	NTU	<15	15 - <17.5	17.5 - <20	20 - <30	>30
Phosphorus	mg/L	< 0.02	0.02 - <0.04	0.04 - <0.075	0.075 - <0.1	> 0.1

**Note:** Temperature has not been included in the table. This is because there are a large number of conditions that affect water temperature including time of day, shading, seasonality wind and waterflow.

**Activity 4:** Use Table 2 to find the rating for each of the results in Table 1. An example is given to assist you develop your ratings.

Parameter	Units	Rating (out of 4)				
		4	3	2	1	0
		Excellent	Good	Average	Poor	Degraded
Conductivity	µS/cm	<100	100 - <300	300 - <500	500 - <800	>800

	Results	Rating
<b>Example</b>	<b>50µS/cm</b>	<b>4/4 or Excellent</b>

**Activity 5:** Describe the difference in temperature readings (if any) between the sites. Give reasons for your findings

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**Extension 1:** What do your results suggest about the impact of the stormwater drains on the Lake Colac?

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**Extension 2:** What does this indicate about the health of the Lake Colac in Colac?

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## A Birdseye View

### Summary

Students study the Kennett River Wetlands and discuss the impact caused by stormwater.

### CSF Learning Outcomes

- SOSE 3.3 Australia's People and Places  
5.2 Geography  
5.4 Geography

### Aim

Students understand the importance of the Kennett River Wetlands on mitigating urban stormwater pollution impacts.

### Materials

- "A Birdseye View" Results Sheet
- Bird identification book (optional)
- Waterwatch Test Kit (see "Local Contacts" Corangamite Waterwatch")

### Advanced preparation

Plan a trip to the Kennett River Wetlands  
Photocopy the Results Sheet prior to the fieldtrip.  
Contact a facilitator from Colac Otway Shire Council or the Waterwatch Coordinator to provide your class with additional information about the site or to provide support on the day.

**SAFETY:** Review the "Waterwatch Victoria Urban Stormwater OH&S Booklet" (see 'Resources')

### Activity

- 1 Take an excursion to Kennett River Wetlands. Sit quietly for 10 minutes and try to identify some of the birds you can see / hear. Look at the habitat requirements for these birds.
- 2 Use the Waterwatch kit to test the water for salinity and turbidity. Test to see if there is a difference in the water quality in the wetlands compared to the river. Advanced secondary classes may also wish to test nutrient levels and / or macroinvertebrates.
- 3 Discuss the importance of the wetlands in terms of its ability to reduce pollution levels entering the river.
- 4 Repeat the process in the Kennett River.
- 5 Discuss the differences between the two sites and the impacts of stormwater on the wetland.

### Extension

Return to the sites each year to compare the birdlife. Undertake water testing at the sites.

### Background

Kennett River is a very small coastal town situated on the along side the Kennett River and the shores of the Southern Ocean.

The township is a very popular holiday destination and can have a population 4000 during the summer months. Stormwater from the township flows directly from the drains to the Kennett River and into the ocean.

The development of the wetlands funded by the Colac Otways Shire, the Corangamite Catchment Management Authority and a company specialising in stormwater wetland construction.

## A Birdseye View Results Sheet

Name: \_\_\_\_\_

Kennett River is a very small coastal town situated on the along side the Kennett River and the shores of the Southern Ocean. The township is a very popular holiday destination and can have a population of 4000 during the summer months. The wetlands were established in 2001 by restoring the original wetland/estuary service that was there naturally. The wetland ponds collect stormwater runoff and sewage outfall from the holiday homes in the township.

Seven ponds were constructed, with the first being a sedimentation pond.

Trees and wetland plants were planted along the banks and edges of the ponds to extend the sanctuary for wildlife.

Animals and birds have taken up residence and breeding in the new environment.

The wetlands have reduced the phosphorus levels in the water and have also stopped blue-green algal blooms from frequently occurring in the river.

**Question 1:** Fill in the table below.

	Kennett River Wetland	Kennett River
Features of the site		
Birds seen or heard		
Turbidity NTU		
Salinity $\mu\text{S}/\text{cm}$		

**Question 2:** Are there any differences in the site features, the number / type of birds and water quality results - for each site?

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**Extension 1:** What considerations were incorporated in the design of each site (non-water quality)?

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**Extension 2:** If you were to construct a wetland in your town, what design features do you think would help to improve water quality, while respecting social values associated with wetlands?

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**Extension 3:** Complete water quality sampling at the outfall of the sites, and upstream and downstream of the wetland.

## Laying Down the Law

### Summary

Students examine the laws / rules for Whites Beach in Torquay.

### CSF Learning Outcomes

SOSE 3.3 Australia's People and Places  
Economics 4.2 Economy and Society  
5.1 Economy and Society

### Aim

Students gain an understanding of some local laws and examine whether or not they are effective.

### Materials

- Local laws for Whites Beach in Torquay.

### Advanced preparation

Optional - Contact Surf Coast Shire Local Laws Unit and Open Space Planning Unit to obtain copies of local laws and guidelines (see contacts list)

Photocopy 'Local Laws' worksheet.

### Activity

- Using the worksheet and / or information from the Shire, list all the laws / guidelines that are recommended for Whites Beach.
- Complete the questions on the worksheet and review class findings.
- Discuss what other laws are in place to protect our streets, waterways, and parks? Why have these laws been introduced? Do you think that they are always effective? If so why or why not? How do these laws affect stormwater and stormwater pollution?
- Conduct a class debate on what rules students would implement if they were in charge of Whites Beach?

- Discuss how they would ensure these rules were obeyed?

### Extension

Visit Whites Beach and review the signage. What could be changed? Design signs to encourage people to look after the area.

### Background

Particularly during the summer months, Torquay is a very popular tourist destination. The beaches in the area are famous for providing excellent surfing conditions and many other recreational activities.

As the site is frequently visited, litter and other pollutants can easily be washed into the ocean, making it unpleasant for people and dangerous to wildlife.

The Surf Coast Shire has put into place a number of guidelines to preserve the beaches in the area for visitors.



## Laying Down the Law Worksheet

Name: \_\_\_\_\_

Whites Beach in Torquay is a very popular location throughout the summer months for swimming, surfing, boating, fishing, picnicing and barbequing. The beach is suitable for both young children and adults and is well known for its cleanliness. The beach is used most frequently from December through to April and is a popular place to walk dogs.

In order to make the beach safe for all visitors, the Surf Coast Shire has designed a number of guidelines to protect and enhance the area for everyone. Rubbish bins have been placed right along the foreshore to ensure that litter does not end up in the ocean.

The Surf Coast Shire has joined the City of Greater Geelong in declaring a number of beaches around the coastline as Dog Free Zones from 1 December to 30 April each year. The owners of dogs caught on these beaches could be liable for fines of up to \$400. This law ensures that wastes from dogs do not wash into the ocean during the busiest times of the year. From May to November, dogs must be on leashes and owners must clean up after their pets.

**Question 1:** Name some features of Whites Beach that makes it important to the local community.

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**Question 2:** How would the local laws at the beach reduce urban stormwater pollution in Torquay?

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**Extension 1:** Undertake a debate. Your challenge is to form a committee of management for the lake, and devise rules and regulations for their future use. You will need the following representatives: dog owners, environmental groups, council, tourist association, historical society, developer looking for new land, recreation groups and a scientist. A project officer will be responsible for ensuring a plan is developed that satisfies all the different groups.

## Leap Frogs

### Summary

Students survey the frogs at Lake Colac Wetland to review their abundance and distribution.

### CSF Learning Outcomes

Science 3.1 Biological Science  
4.1 Biological Science  
5.1 Biological Science

### Aim

Students determine the links between frogs, their habitat and water quality.

### Materials

- Tape recorder
- Paper and pen
- Frog identification books
- Optional - obtain tapes of frog calls from Gould League

### Advanced preparation

Organise transport to Lake Colac Wetland Reserve. Keep in mind that the best time for listening for frogs is early morning and after rain.

**SAFETY:** Review the "Waterwatch Victoria Urban Stormwater OH&S Booklet" (see 'Resources')

### Activity

- 1 Visit Lake Colac Wetland Reserve.
- 2 Listen for frog calls. You may wish to tape calls for identification back at school.
- 3 If frogs are heard, their sound can be "triangulated" to identify possible habitats. (Three students form a triangle around the sound and move with the sound to find where the frog may be).
- 4 Discuss where frogs were found. Was there any relationship to distance from stormwater drains or other features?
- 5 Discuss the requirements of frogs the potential impact of poor water quality on the frog population.



### Extension

Complete an annual survey of the site for frogs. Identify their preferred habitat and talk to the local council about ways to increase habitat at the lake for the frogs.

### Background

In 2001, a group of local residents, the Colac Otway Shire Council, Corangamite Waterwatch and the Social Justice Initiative Group got together and decided to rehabilitate the Lake Colac wetlands. Wetland vegetation was planted along the edges by local school children, residents and the Social Justice Initiative Group.

Much of the town's stormwater runoff flows through the wetlands before it flows into the lake.

Trees are now starting to grow into larger structures, water plants are developing their habitat in the water ponds, animals of a range of species are taking up residence and breeding in this newly developed natural environment.

There are a variety of frogs in the wetland. You may be able to find the following frogs.

Growling Grass Frog - *Litoria raniformis*  
Call - "crawark - crawark crok crok"

Pobblebonk (Banjo) Frog - *Limnodynastes dumerilli*  
Call - "bonk bonk bonk bonk"

Southern Brown Tree Frog - *Litoria ewingi*  
Call - "creeee creee creee cree cree cree"

Spotted Marsh Frog - *Limnodynastes tasmaniensis*  
Call - "click" or "plock"

Striped Marsh Frog - *Limnodynastes peroni*  
Call - "tock" or "poc"

## Stormwater Case Studies

### Summary

Look at various case studies of Councils, community groups, schools and EPA Victoria staff who work in the field of urban stormwater management.

### CSF Learning Outcomes

Science	4.1 Biological Science
	5.2 Biological Science
SOSE	4.2 Society and Environment
	4.2 Geography
	4.3 Geography
	5.2 Geography
	5.4 Geography

### Aim

Students learn about initiatives which are being undertaken to improve stormwater quality.

### Materials

- Photocopy the comprehension case studies on the following pages.

### Advanced preparation

Contact your local council for further information about these initiatives.

### Activity

- 1 There are four comprehension case studies for students to complete. Students may complete these individually or in pairs.
- 2 Discuss the case studies as a class.
- 3 Review findings of each student / pair.

### Extension

Visit your local council office and meet some of the staff involved in managing stormwater, this includes those working in infrastructure, planning, local laws, environmental health and education roles.

Organise a speaker or a field trip.

Look at town maps, stormwater systems.

### Questions to ask:

- 1 What local laws have been developed to reduce stormwater pollution?
- 2 How many planning permits to build new homes are received each year?
- 3 Do you have litter traps on most drains?
- 4 Who is the officer responsible for the urban stormwater management plan?

### Background

While urban stormwater pollution has been recognised as an environmental concern since the early 1990's, a major initiative to combat the pollution only eventuated in Victoria in 1999. At this point the State Government of Victoria contributed \$22.5 million dollars to a program managed through the Environment Protection Authority to reduce the impacts of the pollution.

Over three years the money has been distributed to a variety of activities that identify and mitigate stormwater impacts. Councils throughout the Corangamite region have received funding to manage urban stormwater pollution.

Councils, Catchment Management Authorities, EPA Victoria, schools and the community are all working to improve the quality of urban stormwater. The ongoing management of urban stormwater pollution will continue to be a challenge for our communities as we work towards a sustainable future.

## Movers and Shakers

### Case Study 1

Corangamite Shire Council is located in South Western Victoria, 200 kilometres from Melbourne. There is one major urban centre, Camperdown as well as a number of smaller towns including Lismore, Skipton, Cobden, Timboon, Port Campbell, Derrinallum, Darlington, Princetown and Simpson.

The Council prepares a plan each year for allocating council budget to a wide variety of environmental issues. Initiatives set up by the Victorian Government presented Corangamite Shire Council with the opportunity to devise a Stormwater Management Plan. The plan was finalised in 2002 with the assistance of consultancy group Halliburton KBR Pty Ltd.

The Stormwater Management Plan was devised

Name: \_\_\_\_\_

with the consultation of a Project Steering Committee comprising representatives from Environment Protection Authority, Corangamite Catchment Management Authority, Parks Victoria, Corangamite Waterwatch, Glenelg Hopkins Catchment Management Authority, and Corangamite Shire Council.

The major project for the Council in 2002 was to install five litter traps in Port Campbell. Proposals have also been put forward to install litter traps in Camperdown in the near future.

The Council has been actively involved with Camperdown College stencilling drains, as well as supporting the Corangamite Waterwatch program with their monitoring of Cobden Lake and Creek with Cobden primary school.

**Question 1:** Name some of the initiatives Corangamite Shire Council has undertaken to improve urban stormwater quality.

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**Question 2:** Why do you think the council has been so actively involved with the schools in the Corangamite Shire?

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**Extension 1:** If you were to move to Corangamite Shire what would you like to see included in their works plan?

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**Extension 2:** In a group to work out four ways your school could improve its urban stormwater management.

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## Setting A Trap

### Case Study 2

Colac Otway Shire Council has installed many gross pollutant traps (also called "litter" traps) in a number of towns within the shire's boundary. In 2001, two traps were installed in Apollo Bay. Traps such as these are designed to capture litter, vegetation and sediment from the urban centre.

One trap is located at the end of the Thomson Street outfall drain in the busy shopping centre of the town. The outfall drain feeds directly into Apollo Bay. The other litter trap was placed on the Mariners Lookout Rd drain, which also flows into the Bay. One of the traps was partly funded by the Corangamite Catchment Management Authority

Name: \_\_\_\_\_

and the other was installed as part of the requirements of a development proposal as a permit condition.

The traps are cleaned and serviced by Bell Environmental Services.

The Shire has also installed a litter trap in Colac to prevent pollutants entering Lake Colac. Due to the success of this GPT, the shire has begun designing a wetland and more litter traps in the Colac township to minimise wastes entering the lake.

**Question 1:** How many gross pollutant traps has Warrnambool City Council installed in Warrnambool?

\_\_\_\_\_

**Question 2:** Name the three main types of pollution the traps are designed to capture.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Question 3:** Where would the pollution have ended up in Apollo Bay and Colac if it had not caught in the litter traps?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Extension 1:** What can be done in your local area to reduce gross pollutants in the stormwater?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Celebrating Stormwater Successes

### Case Study 3

Name: \_\_\_\_\_

The Central Highlands Waterwatch program is bringing the message of waterways and urban stormwater quality protection to the schools in Central Victoria.

Canadian Lead Primary School is one school involved in the urban stormwater program.

With assistance from the Regional Waterwatch Coordinator, Andrew Harris, Years 3 and 4 students undertake a module on Water cycle or complete human impacts on the water cycle over a full term.

Canadian Lead Primary School are involved in activities relating to rubbish and stormwater. "As an introduction to this topic we did the river story and we discussed local creeks in the area and where student's live." says Andrew.

The students have created a collage of rubbish found around the school and used a brain



storming session to come up with solutions of ways to reduce the amount of rubbish around the school.

Andrew Harris said "The children found the activity challenging and exciting" "Which lead to the development of some fantastic work by the students."

The Waterwatch / urban stormwater education program is a fantastic opportunity to develop links between waste management groups, stormwater officers and water authorities as well as the schools..

A joint initiative between Central Highlands Region Waterwatch and the City of Ballarat is the PITS drain stencilling program. PITS stands for Pollution in the Streams. The program targets students from primary and secondary schools (gr.4 - yr.8) concerning Stormwater Education.

**Question 1:** Why do you think Schools in the Central Highlands Region are so active in improving their environment?

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**Question 2:** What changes to your local waterways have occurred since you have been at school?

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**Extension 1:** Walk around your schoolyard. Review the waste in each rubbish bin. Name some ways the waste could be avoided, reused or recycled.

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**Extension 2:** Visit [www.gouldleague.com.au](http://www.gouldleague.com.au) and read about becoming a 'Waste Wise School.'

## Because it is Our Home

### Case Study 3

Name: \_\_\_\_\_

Michelle Elford is the Geelong based VSAP coordinator for the Environment Protection Authority (EPA) in the South West region of Victoria. VSAP stands for the Victorian Stormwater Action Program. The main aim of this program is to improve the quality of



Victoria's water environments through management of urban stormwater. Michelle works from the Geelong office of the EPA and is the co-ordinator for the South West Region, which is bounded by Werribee in the East and the South Australian border in the West. This region includes Ararat, Colac, Warrnambool, Hamilton, Ballarat and Portland. Her main role is to be a point of contact within the EPA for the community, industry, local government, and other authorities on stormwater management issues within urban and rural areas.

The main parts of her job are involve:

- Managing and sharing knowledge on stormwater quality for all Victorians
- Working on a range of stormwater management projects with councils and industries in the South West region
- Answering questions and responding to complaints from members of the community about stormwater issues.
- Communicating and implementing VSAP principles to the South West Region.
- Co-ordinating the contributions made by the EPA to Stormwater Management Plans.
- Provide input on behalf of EPA on a range of committees including stream flow management planning, coastal action planning and catchment management strategy planning for waterways.

**Question 1:** What is the main aim of the Victoria Stormwater Action Program?

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**Question 2:** List the four groups that Michelle is a point of contact for within the EPA. What types of issues do these groups need to talk to her about?

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**Extension 1:** Devise a short urban stormwater message (that would give the community a background to its source, destination and potential impact). Try a number of different slogans, and see what your friends and family think of each.

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**Extension 2:** Michelle receives a complaint from a resident about rubbish in a stormwater drain near their house. Work with a partner to establish a result that satisfies the resident, of the environment and helps to reduce the likelihood of an ongoing problem.

## Corporate Clean Up

### Summary

Students will focus on community action in partnership with local businesses / industries.

### CSF Learning Outcomes

SOSE 4.3 Geography  
5.3 Geography

### Aim

Students lead a community urban stormwater awareness program in Terang.

### Materials

- Clipboard, pencils
- Surveys from the Statewide “Waterwatch Victoria Urban Stormwater Industry Booklet” (see ‘Local Contacts’ Corangamite Waterwatch)

### Advanced preparation

Contact a facilitator from Corangamite shire or Waterwatch to assist with this activity (see ‘Local Contacts’).

Invite parent helpers to assist on the field trip. Contact Terang business owners to be involved in the activity and plan an excursion to their businesses.

Photocopy the Business Surveys in the Waterwatch Victoria Urban Stormwater Industry Booklet.

Note: Only allow students to access businesses which you have previously ‘briefed’ on the project.

**SAFETY:** Review the “Waterwatch Victoria Urban Stormwater OH&S Booklet” (see ‘Resources’)

### Activity

- 1 Lead the class along one street block in town. Encourage students to take note of the types of business and the land use in this area.
- 2 In small working groups the students should select a business or land use manager to focus on.

- 3 Each group should approach a business to discuss their impacts (positive and negative) on urban stormwater pollution.
- 4 Groups use the surveys to work with the businesses and identify urban stormwater impacts.
- 5 Develop a stormwater management plan with the Terang businesses.
- 6 Work with the businesses to implement their urban stormwater management plan.

### Extension

Develop practical ways to deliver urban stormwater messages to the wider community. You may wish to design flyers, letters, a webpage, posters or bookmarks.

Contact the Trans West Regional Waste (see ‘Local Contacts’).

### Background

The local aboriginal tribe, Giraiwurung, was the first to discover Terang’s natural wealth. Camps were set up beside Lake Terang, which was home to an abundance of fish, bird, reptile and mammal life. This provided the tribe with food and water.

The first European dwelling was a slab hut, erected in 1840 on the eastern bank of the lake by Donald McNicol.

Terang was surveyed in 1858 and land sales followed. The town slowly grew - houses and businesses were built and public facilities were funded through fund raising and donations.

Today, Terang is a modern, well established town with a population of about 2000. It is centred in a dairying and mixed farming area of south-western Victoria, 215 km west of Melbourne.

## Meet the Challenge

### Summary

The Colac Region Drain Stencilling Program provides hands on activities that your class can undertake as part of the Corangamite Waterwatch Program.

### CSF Learning Outcomes

- SOSE 4.3 Geography
- 5.3 Geography
- 5.4 Geography

### Aim

Understand the link between the drain and local waterways and to inform the public about stormwater issues.

### Materials

- All materials for this activity are supplied by Corangamite Waterwatch (see 'Local Contacts').

### Advanced preparation

- You will need to contact the regional Waterwatch Coordinator at least 10 weeks prior to undertaking this intensive activity.
- This lesson should only be undertaken with a Waterwatch facilitator present.
- Make sure all students are supervised during this activity.
- Organise transport, permission forms and information for students prior to the day.
- Allocate a 1/2 day session to undertake this activity.

**SAFETY:** Review the "Waterwatch Victoria Urban Stormwater OH&S Booklet" (see 'Resources')

### Activity

- The Waterwatch facilitator will lead your class through classroom and field based sessions. This activity is extremely flexible and will vary between schools.

### Extension

- Design a flyer to distribute to the residents in the area to inform them about urban stormwater issues.
- When the flyers have been designed and approved, the students could deliver these as a class activity.
- Design a bookmark to give as a present with five tips on preventing stormwater pollution.
- Monitor changes in water quality or pollution over time.

### Background

Many people are not aware of the connection between stormwater and pollutants in the rivers and creeks. Often when people see rubbish the response is that people have littered at the site. Usually this is not so.

When it rains, rubbish that is in our streets and in the drains, wash down side entry pits and flows underground in the urban stormwater pipes. Anything that washes into the stormwater system, including pollutants, drains into our waterways.

## From Your Street to Your Creek

Shire	Town	Drains To
<b>Colac Otway</b>	Apollo Bay	Anderson Creek to Barham River and Milford Creek to Apollo Bay and Southern Ocean
	Beeac	Lake Beeac
	Colac	Barongarook Creek, Lake Colac
	Forrest	Barwon River West Branch
	Gellibrand	Gellibrand River
	Kennett River	Kennett River to Ocean
	Marengo	Southern Ocean
	Skenes Creek	Skenes Creek to Southern Ocean
Wye River	Wye River to Ocean	
<b>Corangamite</b>	Camperdown	Lake Colongulac
	Cobden	Town Dam, Cobden Creek, Curdies River
	Derrinallum	Lake Tooliorook
	Lismore	Browns Waterhole Creek, Mundy Gully Creek, Lake Gnarpurt
	Noorat	Noorat School natural soakage into groundwater
	Peterborough	Curdies River to Ocean
	Port Campbell	Port Campbell Creek and the Southern Ocean
	Princetown	Gellibrand River, Latrobe Creek and the Southern Ocean
	Simpson	Storage dam and Ross Creek
	Skipton	Mt Emu Creek
	Terang	Pejark Drain, Mt Emu Creek
Timboon	Powers Creek, Port Campbell Creek	
<b>Golden Plains</b>	Batesford	Moorabool River
	Inverleigh	Leigh River to Barwon River
	Lethbridge	Bruce Creek
	Linton	Woody Yalock River
	Meredith	Coolebarghurk Creek
	Smythesdale	Smythes Creek
<b>Surf Coast</b>	Aireys Inlet	Painkalac Creek to Bass Straight
	Anglesea	Anglesea River to Bass Straight
	Fairhaven	Painkalac River to Bass Straight
	Lorne	Erskine River and Cherry Tree Creek to Ocean
	Torquay	Deep Creek, Spring Creek to Zeally Bay
	Winchelsea	Barwon River

## Pollution - Unseen and In-Between

Name: \_\_\_\_\_

C	T	S	N	H	P	I	L	L	N	T	S	L	N	E
A	T	D	O	C	O	D	E	A	U	N	R	I	O	L
L	N	N	I	A	L	A	A	K	T	E	I	T	I	L
O	E	A	T	R	L	C	V	E	R	M	N	T	T	E
C	M	L	C	W	U	R	E	C	I	N	K	E	A	H
E	H	T	U	A	T	E	S	O	E	R	E	R	T	E
K	C	E	R	S	I	E	S	R	N	E	O	T	E	I
A	T	W	T	H	O	K	T	A	T	V	L	R	G	M
L	A	O	S	L	N	S	A	N	S	O	A	A	E	R
K	C	S	N	I	A	R	D	G	F	G	Y	P	V	V
E	C	N	O	W	R	A	B	A	R	L	P	Y	S	V
O	L	A	C	D	O	G	S	M	O	A	D	I	W	E
R	U	B	B	I	S	H	C	I	G	C	A	T	E	R
S	L	O	O	H	C	S	S	T	S	O	O	S	E	S
S	T	O	R	M	W	A	T	E	R	L	W	U	P	Y

BARWON  
CARWASH  
CATCHMENT  
CONSTRUCTION  
CREEKS  
DOGS  
DRAINS  
FROGS

LAKE COLAC  
LAKE CORANGAMITE  
LEAVES  
LITTER TRAP  
LOCAL GOVERNMENT  
MICHELLE  
NUTRIENTS  
PITS

POLLUTION  
RUBBISH  
RIVERS  
SCHOOLS  
STORMWATER  
SWALE  
SWEEP  
VEGETATION

WETLANDS  
WOADY YALOK

Complete the word search to find the hidden stormwater message:

\_\_\_\_\_

## Local Contacts

### Local Government

#### Colac Otway Shire

2 - 6 Rae St Colac 3250

Phone 5232 9400

Fax 5232 1046

#### Corangamite Shire Council

PO Box 84 Camperdown 3260

Phone 5593 7100

Fax 55932695

#### Surf Coast Shire

PO Box 350 Torquay 3228

Phone 5261 0610

Fax 5261 4527

#### Golden Plains Shire

2 Pope St Bannockburn

Phone 52220 7111

Fax 5220 7100

### Environment Protection Authority

#### South West Regional Office

Little Malop Street Geelong 3220

Phone 5226 4825

Fax

### Catchment Management Authority

#### Corangamite Catchment Management Authority

64 Dennis St Colac 3250

Phone 5232 9100

Fax 5232 2759

### Urban Water Authorities

#### Barwon Water - Geelong

61 Ryrie St Geelong 3220

Phone 5226 2500

#### Barwon Water - Colac

PO Box 201 Colac 3250

Phone 5231 6133

Fax 5221 8236

### Rural Water Authorities

#### Southern Rural Water

88 Johnson St Maffra VIC 3860

Phone 5139 3100

Fax 5139 3150

### Department of Sustainability and Environment

#### Anglesea Office

69B Harvey St Anglesea

Phone 5263 3712

#### Colac Office

83 Gellibrand St Colac 3250

Phone 5233 5581

Fax 5231 3823

#### Camperdown Office

194 Manifold St Camperdown 3266

Phone 5557 5888

Fax 559 3367

### Waterwatch

#### Corangamite Waterwatch

Barwon Water

P.O Box 659 Geelong 3220

Phone 5226 9268

Fax 5229 3495

#### Corangamite Waterwatch Colac Region

P.O Box 201 Colac 3250

Phone 5231 6944

#### Central Highlands Waterwatch

P.O Box 152 Ballarat 3353

Phone 5320 3199

Fax 5320 3299

### Waste Management Group

#### Trans West Waste Management Services

PO Box 30 Colac 3250

Phone 5232 2448

Fax 5232 2596

## Resources

### Definition of Stream Types

#### Lowland (use ratings on page 11)

Generally slow moving water. There is a gentle fall of the streambed along the length. There may be fine sands depositing and the stream may be wide and shallow.

#### Upland (use ratings below)

Moderate to fast moving water. There is a steeper fall of the streambed with riffle and pool sequences. Coarse sediments can be found in the bed and there may be bank erosion.

## Water Quality Rating Table

**Table 3 - *Water Quality Ratings for Upland Streams*** (Adapted from the Index of Stream Condition Reference Manual 1999)

Parameter	Units	Rating (out of 4)				
		4	3	2	1	0
		Excellent	Good	Average	Poor	Degraded
Conductivity	US/cm	<50	50 - <150	150 - <300	300 - <500	>500
pH	-	6.5 - 7.5	6.0 - 6.5 or 7.5-8.0	5.5 - <6.0 or >8.0 - 8.5	4.5 - <5.5 or 8.5 - 9.5	<4.5 or >9.5
Turbidity	NTU	<5	5 - <7.5	7.5 - <10	10 - <12.5	>12.5
Phosphorus	Mg/L	<0.01	0.01 - <0.02	0.02 - <0.03	0.03 - <0.4	> 0.4

Available from Corangamite Waterwatch (see "Local Contacts")

- Waterwatch Victoria Urban Stormwater Industry Booklet
- Waterwatch Victoria Urban Stormwater OH&S Booklet

## Resources (continued)

### Posters

- What is happening in our catchment?

### Teacher Notes

- "Cigarette butts don't just damage your health."
- "Keep everything but your car off the driveway."
- "Keep chemicals away from the drain."
- "Your garden. It's time to make a clean sweep of it."
- "We don't want to deter you from using detergent. Just use it carefully."
- "The drain is just for rain."
- "Wash your car and keep the environment clean."
- "Keep our waterways healthy. Keep fertiliser in the garden."
- "The only place your garden soil should be is in your garden."
- "Rake up the leaves and leave the environment healthier."
- "Put litter in its place. Put it in the bin."
- "Even unwanted oils have a home."
- "After decorating, clean up paint and rollers the right way."
- "You shouldn't be a pest with pest control."
- "Your pets can't tell the difference between the street and a toilet."
- "Save rainwater and you'll help save the environment."
- "Don't feed the drains with your roof run-off, feed the gardens instead."
- "Don't let soil wash down the drain. Grass or replant the soil."
- "Don't cause a stink. Repair all leaking sewer pipes."
- "Soil and stormwater. Make sure they don't mix."
- "Here's a sweeping comment."
- "Local waterways need more than just our help. They need yours too."

### Waterwatch Folder

- Waterwatch Brochure
- Drain Stenciling Information
- Starting a Waterwatch Group
- Preparing a Waterwatch Action Plan
- Waterwatch Code of Practice
- Safety Guideline