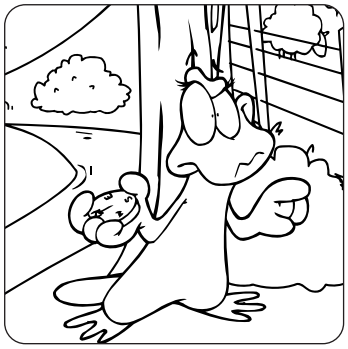


SOSE - Contents

In Days Gone By

I

FOCUS

- How have our waterways changed over time?
- What part have they played in the lives of locals?

OBJECTIVES

- Invite community members to visit the school
- Listen to memories of times spent at local waterways

CSF II LINKS

SOSE	4.2 History
	4.2 Geography
	4.3 Geography
ENGLISH	4.1 Speaking & Listening
	4.2 Speaking & Listening

BACKGROUND

Hearing personal accounts of river memories will help students when they undertake the English activity *'A River Recount'*. It also provides them with a side of history that they may not get from reading books. Waterways play an important role in many peoples lives, and almost everyone has memories of times spent by waterways.

NOTES

Guest speakers should be invited and briefed about their visit a few weeks before this activity. Invite people of varying ages and backgrounds, including traditional owners. They may recall the condition and features of the waterway in the past.

LEARNING TASKS

1 Prior to the visits by community members you may wish to engage students interest in the upcoming event by sharing and discussing the poem 'Grandma, What is a River?'

2 Students could write and decorate invitations for each guest and hand deliver or post them.

3 Brainstorm to predict stories students think they might hear from the guests.
- How might our local waterway have changed?

4 Prepare students by discussing and reinforcing what good listeners do.
- look at the speaker
- keep hands and feet still
- show respect by not talking or interrupting
- ask well-structured and thoughtful questions.

5 Conduct your visitor sessions.

6 After the visits, students could:
- write a report.
- write a thank you letter to each guest.

MATERIALS

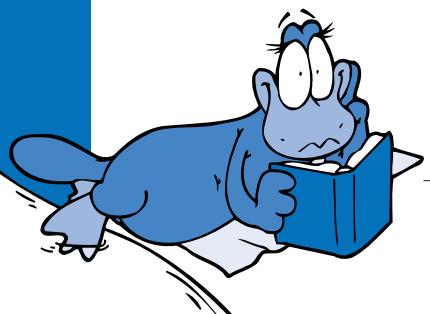
- ***'In Days Gone By'* Student Worksheet** (one large copy, or individual copies)

EXTENSION

Visit a local home for the aged or retirement village and encourage students to converse with residents about their memories of times spent at local waterways in days gone by. Conduct the English activity, *'A River Recount'* to document students' recent memories.

ASSESSMENT

What insights did students gain from listening to the memories of invited guests? Were they active listeners and did they ask informed and thoughtful questions?



In Days Gone By - Student Worksheet

Name _____

READ the following poem.

Grandma, what is a river?

I'd been gardening all day and cutting the hedge
and came inside for a drink.
My eyes were stinging from the gleaming sun
and my face was fading from pink.
Then a question my granddaughter asked
gave me a bit of a shiver.
She said, with no intention to hurt,
"Grandma, what is a river?"
My heart missed a beat, and I took a deep breath
as I remembered back fifty years.
To the strong flowing current and fish galore
that changed to the algae and carp I saw.
But how this change had caused so much,
leaving no fish or water as such.
The ways of the foolish affect us now,
the rivers have vanished and we all suffer somehow.

"What is a river?" she had asked,
a question so simple not meant to cause harm.
It brought back the memories I'd like to forget,
wanton destruction my generation left.
I remembered the strong gusts of wind
and the freezing water that gave me a quiver.
Then I heard the voice again,
"Grandma, what is a river?"
But how could I tell her of things that
caused great pain?
For the memories will stay forever.
But if I wanted to say something,
I had to say it now or never.

I remembered the blue-green algae and how it smelt.
The rocks and stones in the water and how they felt.
I saw the carp hunting for their prey,
and the chemicals that would never go away.
So I gulped and tried to stay calm,
but the words came tumbling out,
Not the words of pain or harm,
but the words that came from the heart.

I told her of the days we went fishing,
and how we bathed with the fish.
Skimming stones across water,
and the currents that made a loud swish.
She laughed as I told about small fish I caught.
And how I fell asleep with the rod I'd just bought.
So now she can grow up not knowing
the bad truth and lies.
I could see she knew enough by the look in her eyes.
I told her of things only she'd understand,
And that's all she needs to know of the rivers so grand.

The Life And Times Of A Waterway

M

FOCUS

- What events have occurred in our waterway's history?
- What changes have occurred in our waterway's history?

OBJECTIVES

- Gather historical information within the community
- Construct and illustrate an historical timeline

CSF II LINKS

SOSE	4.1 History
	4.2 History
	4.2 Geography
	4.3 Geography
MATHS	4.1 Measurement

BACKGROUND

Before European settlement, Australia's waterways flowed naturally through catchments that were forested and diverse. Over time, land was cleared and water diverted for towns and agriculture. This has resulted in large changes to Australia's catchments and waterways.

NOTES

This activity is designed as a follow-up to the SOSE activity, *'In Days Gone By'* to record and display the interesting historical information gathered through the stories of community members. Additional or alternative methods of data collection are suggested below.

LEARNING TASKS

1 **Brainstorm to recall the information relayed by guest speakers about the history of your local waterway.**
- waterway uses (transport, agriculture, recreation, tourism)
- the health of the waterway, banks, aquatic plants and animals
- special community events at or near the waterway.

2 **Ask students to consider extra information that would be useful to construct an historical timeline, and complete the worksheet.**

3 **Seek information from your local council, historical society or the North Central Catchment Management Authority.**
- times of flood and drought
- evidence of Indigenous communities having used the waterway
- historical events such as visits by explorers, date of settlement
- changes to waterway flow or form.

4 **Use a variety of techniques to gather information.**
- Interview, telephone, search the internet or write to people.

5 **Plan the construction of an historical timeline.**
- Will information be communicated through words, pictures or both?

6 **Make and decorate your mural-sized timeline.**

MATERIALS

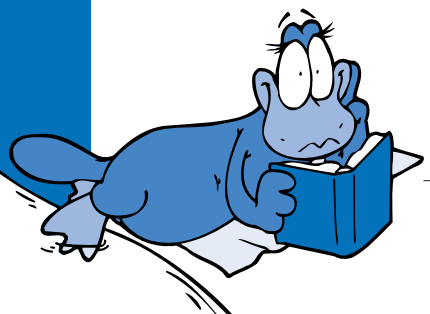
- **Whiteboard** or butcher's paper
- ***'Life And Of A Waterway'* Student Worksheet**
- **Computers** with internet access
- **Large sheets of paper**
- **Writing** / drawing / painting materials
- **Photos of waterways** (see 'Photos' on the CD)

EXTENSION

Display your timeline in the school's corridor, foyer or hall. Offer your timeline for display in your local library, town hall, council chambers or at the North Central Catchment Management Authority offices.

ASSESSMENT

What have students learnt about the people, places and events in the town's history? Do they appreciate the value of their local waterway in the life and times of their town?



The Life And Times Of A Waterway - Student Worksheet

Name _____

PLAN and construct a huge class mural-sized timeline!
USE the table below to help you plan your timeline.

The timeline could tell
- life in our local waterway
- special events that have occurred
- changes that have taken place throughout history
- good times and bad times.

WHAT we'd like to know	HOW we could find out

Community Questionnaire

M

FOCUS

- How is our local waterway used?
- What are the threats to the health of our waterway?

OBJECTIVES

- Survey and graph waterway uses and threats
- Complete and submit an online survey

CSF II LINKS

SOSE 4.3 Geography
HPE 4.2 Health of Individuals & Populations

BACKGROUND

The North Central Catchment Management Authority is responsible for developing strategies and prioritising works to protect waterways. Information about the health of waterways is compiled through scientific studies, onsite assessments and community surveys. The value that communities place on waterways is a major consideration when prioritising works.

NOTES

Begin this activity early in Water Week so that questionnaires can be constructed and distributed. By the time results have been gathered, their collation will serve as a valuable way of concluding the theme and gaining an overview of local issues.

LEARNING TASKS

1 **Discuss these questions.**
- 'Why are waterways important?'
- 'What do you value about local waterways?'
- 'What threatens the health our local waterway?'

2 **Explain that you will be surveying the community to determine.**
- The values they place on local waterways.
- What threats the local community believe impact on river health.

3 **Discuss and make decisions about the logistics of the questionnaire.**
- Who and how many people will be questioned?
- How long will the data collection period be?

4 **Photocopy and distribute the questionnaire.**

5 **Collate the results and construct a graph to represent the data.**

6 **Pose the question, 'What management activities could reduce the threats to our local waterway?'.**

MATERIALS

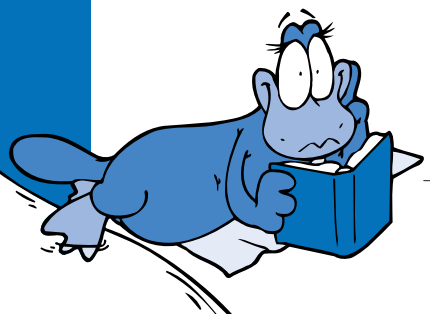
- **Blackboard**
- ***'Community Questionnaire'* Student Worksheet**
- **Large poster paper**
- **Coloured squares** or strips
- **Markers**
- ***'Community Questionnaire'* Alternate Resource** (see 'Resources' on the CD)

EXTENSION

The full NCCMA community survey can be found online at www.nccma.vic.gov.au/riverhealth/riverhealth.pdf and posted to NCCMA. Compare your results to those found at www.nccma.vic.gov.au/programs/waterways/manage/index.htm.

ASSESSMENT

Were students able to identify waterway values and threats? Could they collate the gathered information and draw conclusion from the trends that became apparent?



Community Questionnaire - Student Worksheet

USE the questions below to help you find out community feelings about local waterways.

Together, we can improve our region's waterways.

The purpose of this survey is to help us to identify values of and threats to waterways in your local area.

Stream name and location _____

1 Please rate these values of your local waterways. (circle 1 = low, 5 = high)

Values	Low	Medium	High
Shade and shelter for livestock	1	3	5
Native vegetation and wildlife habitat	1	3	5
Water quality (clear, clean or pure water)	1	3	5
Recreation in the waterways (e.g. swimming or fishing)	1	3	5
Social activities beside the waterways (e.g. walking or BBQ)	1	3	5
Access to water usage (stock and pump access)	1	3	5
Scenic appearance (landscape, visual looks)	1	3	5

2 Please rate the impact of these threats to your local waterways. (circle 1 = low, 5 = high)

Threats	Low	Medium	High
Stock access (grazing and stock wastes)	1	3	5
Erosion of stream banks (or gullies)	1	3	5
Native vegetation removal (e.g. loss of vegetation)	1	3	5
Pest plant (e.g. gorse, bathurst burr)	1	3	5
Pest animals (e.g. rabbits, introduced fish)	1	3	5
Recreation (on banks and in the waterway)	1	3	5
Altered stream flows (weirs, dams, diversions)	1	3	5
Poor land management (e.g. overgrazing, developments)	1	3	5
Poor water quality (e.g. salinity, colour, smell, algal blooms)	1	3	5

3 Your details (optional)

Which age group are you in? (cross)

- Under 20 ☐
- 20-39 ☐
- 40-59 ☐
- 60 or over ☐

Property type (cross)

- Urban ☐
- Rural residential ☐
- Rural ☐

Thank you for taking the time to complete this questionnaire.

Catchment News

C

FOCUS

- What positive steps are underway to improve waterway health?

OBJECTIVES

- Understand who protects waterways
- Develop a positive outlook for the future

CSF II LINKS

SOSE	4.2	Geography
	4.3	Geography
HPE	4.2	Health of Individuals & Populations

BACKGROUND

While many people treat waterways as drains, there are also those out there who are doing their bit to improve waterway health. This activity leads you to a website and articles where you can find out lots of information about positive actions improve the condition of waterways.

NOTES

It is important for students to acknowledge that scientific and technological advances in agriculture are changing the farming practices of the past and opening up a variety of new possibilities for reducing the impacts on waterways. As web pages constantly change, over time you may need to find alternate sites with salinity information.

LEARNING TASKS

1 **Three stories have been provided to give you accounts of how groups throughout North Central Victoria are developing ways to manage waterways.**
   - These stories can be photocopied and distributed to students or made into individual cards.

2 **Students read the articles and complete the student worksheet.**
   - You may undertake a jigsaw session where students are assigned one article and share their findings with the rest of their group.

3 **Students then form pairs and take on roles of interviewer and interviewee.**
   - Use the information they've gained from the articles to role-play.
   - Add personal comments about each article.

4 **Set individual research projects that encourage students to use the internet to search for other waterway stories.**
   - Students then write summaries of their findings, design posters or prepare powerpoint presentations to display their research.

MATERIALS

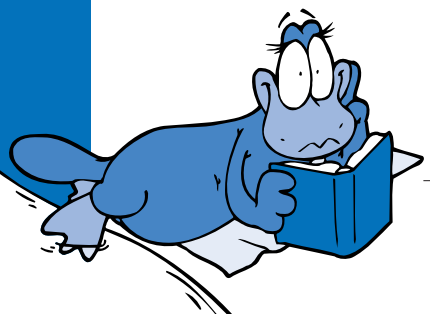
- ***'Catchment News'* Student Worksheets 1, 2 & 3** (enlarge Worksheet 1 to A3 or use student workbooks for extra space)
- **Computers** with internet access

EXTENSION

Invite a local Landcare member to talk about their waterway management experiences. Students can log on to www.abc.net.au/landline/ to look at current stories or 'archives' using the key words 'waterway management'.

ASSESSMENT

Were students able to locate information from the website and extract the necessary details to complete the table? Could they use the information as answers in an interview?



Catchment News - Student Worksheet 1

Name _____

COMPLETE the table below using the articles on Worksheets 2 & 3.

Article				
Which Catchment?				
Who is involved?				
What was the issue?				
How is the issue being addressed?				
Benefits?				
My comments				

Name

Streams suffering

A SURVEY of the region's waterways has described just four per cent of streams in the Loddon catchment as being in good condition.

The North Central Catchment Management Authority study found 28 per cent of streams in the Loddon region were considered marginal and 68 per cent were in poor to very poor condition.

In the Campaspe catchment, 46 per cent of waterways have been classified as in poor condition.

The survey was carried out over the past three years. It tested waterways in five variables: river flow, erosion, vegetation levels, water quality and the level of aquatic life.

NCCMA waterways unit manager Greg Peters said there had been a decline in the Loddon catchment since the previous survey in 1990.

"If there isn't any improvement we will need to change the way we look at systems, not for living but for survival."

Mr Peters said the biggest problem the region faced was altered flows.

"We have halted the movement of fish into the Murray" he said.

Mr Peters said a lack of understanding on how critical the river systems were for survival had led to such a heavy impact on the regions waterways.

"We need to gain a greater understanding of water management, more than just water control", he said

The benchmark study had been done to help develop river health plans for the four catchments in the region.

"The plans will provide a 10 year works program for the NCCMA's waterways unit that targets the major threats to river health", Mr Peters said

"This can only be achieved in partnership with the community".

The NCCMA has described the survey results as alarming, and has announced a series of public forums across the region to allow the community to have direct input into the future management of the waterways.

Article adapted from Bendigo Advertiser - February 20, 2002

Two Grants for Buloke

Buloke Shire has initiated a number of projects to improve the condition of local waterways by managing stormwater pollution.

Two projects underway are Stormwater Management Plan development and the installation of new pollution traps.

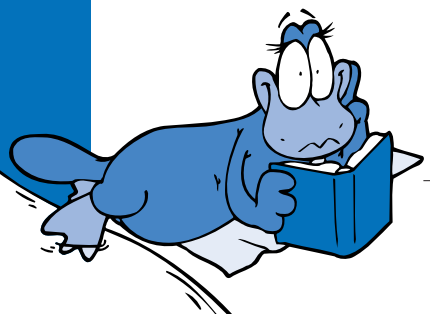
Funding is provided by EPA Victoria as part of the $22.5 Million Stormwater Action Program and is a Bracks Government election commitment.

The Stormwater Action Program involves EPA Victoria working with Local Government and communities to improve water quality through better stormwater management.

"The program is built around a partnership, particularly with local government as well as Catchment Management Authorities, industry and the community." Minister Garbutt said.

The Buloke projects will cost $42,000 in total.

Article adapted from North Central News - July 4, 2001



Name

Local platypus sought

The North Central Catchment Management Authority (NCCMA) is seeking help from residents in Castlemaine and surrounding districts for a program to evaluate the platypus population in the waterways of the Goldfields region.

The call for information on platypus populations follows a recent survey carried out by the Australian Platypus Conservancy in conjunction with the Friends of Campbells Creek.

That survey, which was co-ordinated by the NCCMA, was part of a program to evaluate the health of Campbells Creek and resulted in four platypus being trapped at sites downstream from Castlemaine.

The NCCMA Riverine Officer coordinating the program, Jon Leevers, said that although the survey was carried out on only one night, the results were encouraging that platypus still exist in the stream.

Work currently being carried out on the creek is expected to improved the health of the stream and the habitat for all riverine animals, including fish.

"We need as much evidence as possible to get a greater understanding of the platypus numbers, their feeding habits and their movements," Mr Leevers said.

Article adapted from Midland Express - June 19, 2001

What is a catchment?

Ever left a hose running a little too long and found a puddle in your back yard? After rain have you found water flowing across your yard? Little did you know you were living in a 'catchment'.

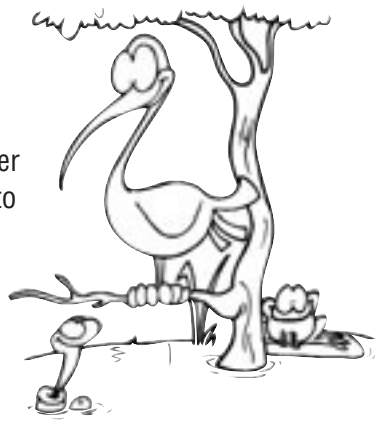
A catchment is an area of land, which 'catches' water and channels it to the lowest point, often called a 'waterway'. Water from several (sub) catchments can join together into a larger catchment or 'basin'.

Catchments can be tiny, like a section of road that drains to a puddle, or enormous, like the Murray Darling Basin, which catches water from Queensland, NSW and Victoria and drains into the Murray River.

'Upper catchments' provide the most water to a system. There are many hills and a naturally higher rainfall that is often captured in dams and reservoirs.

'Lower catchments' rely on water flowing from the upper catchment. The land is flat, rainfall is lower and water is pumped from streams and channels.

Waterways occur at the lowest point in a catchment and form an important part of our social lives.



The Echuca 'Southern 80', Charlton Fishing Contest and Bendigo's extensive linear park reserves all rely on water from their catchments to attract tourism and provide opportunities for recreation.

Next time you cross your local waterway consider the catchment it receives its water from and the people downstream who are relying upon clean water.

Article adapted from NCCMA media release - September 2002.

Potential Problems

C

FOCUS

- What actions can threaten waterway health?
- What impacts do they have?

OBJECTIVES

- Read about potential threats to waterways
- Fill the gaps using the words provided

CSF II LINKS

ENGLISH	4.1 Reading
	4.4 Reading
SCIENCE	4.1 Biological
	4.2 Biological
SOSE	4.3 Geography

BACKGROUND

Only 7% of the rivers and streams in the North Central region of Victoria are in good to excellent condition with 31% in moderate and 61% in poor to very poor condition. As our waterways degrade, we are losing a vital part of our natural infrastructure, risking the health of aquatic and riparian ecosystems, reducing biodiversity and robbing ourselves of beautiful places to visit.

NOTES

This activity can be conducted prior to undertaking a class debate. With knowledge of the processes that can threaten waterways, students will be able to debate a contentious issue regarding the use and conservation of a waterway.

LEARNING TASKS

1 **Conduct a brainstorming session to identify what students already know about potential threats to waterways.**
   - How can humans damage waterways?
   - What activities threaten the health of our waterways?
   - How does pollution affect water quality and the animals and plants that live in the water?
   - How might each threat, activity or addition affect waterways?

2 **Distribute the worksheet to students**
   - Work through the first paragraph together. Demonstrate the strategies of reading on beyond the gap, predicting an appropriate word, then choosing from the words provided.
   - Students may work individually or groups to complete the sheet.

3 **Upon completion, discuss the threats with students.**
   - Which of the threats are applicable in your local area?
   - Where have you seen damage created by these activities?
   - How could these threats be minimised or their affects reduced?

4 **Challenge students to complete the Extras activities, *'Link It All Together'* and *'Spot The Difference'*.**

MATERIALS

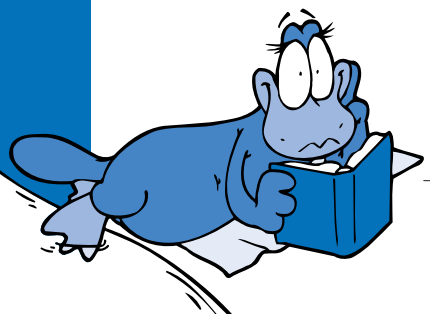
- **Whiteboard**
- ***'Potential Problems'* Student Worksheets 1 & 2** (photocopy back to back)
- ***'Link It All Together'* and *'Spot The Difference'* Student Worksheets** (see the Extras section)

EXTENSION

Use the English activity, *'Debating a Dilemma'* from the 'Salinity' Education Resource as a guide to conducting a debate about waterway management.

ASSESSMENT

Were students able to predict the likely threats to waterways and their possible impacts? Did students insert appropriate words to complete the information accurately?



Potential Problems - Student Worksheet 1

Name _____

FILL the gaps using the words in each box to reveal activities that threaten waterways.

Alteration to natural flow patterns

In a normal year, natural seasonal rains result in high river levels in _____ and low river levels in _____ . We rely on rivers to give us a steady supply of water to use in our _____ and on our _____. Reservoirs and _____ have been constructed on our major rivers to supply our needs. These affect the natural flow patterns of waterways.

dams
farms
summer
winter
homes

Temperature changes

Water at the bottom of a dam is very _____ . When this water is released into waterways it _____ the natural water temperature.

If _____ vegetation is _____ , there is less _____ on the water and temperatures _____. Some aquatic plants and animals are very sensitive to temperature changes.

shade
rise
removed
lowers
cold
riparian

Removal or damage to riparian vegetation

Unfortunately _____ are often cleared to make way for _____ or urban _____ . Damage can be done to existing vegetation by _____ that eat young plants or by _____while walking or riding bikes. Exotic species such as _____ trees or weeds compete with native riparian trees.

willow
people
trees
agriculture
stock
development

Sedimentation

Although sediment is a _____ part of waterways, human activity can increase the amount entering waterways with _____ or rain. _____ can occur when riparian _____ is removed, when river _____ are over grazed or when unsealed _____ or building sites are located nearby. Sediment can clog the _____ of fish and smother underwater plants.

erosion
wind
natural
gills
banks
roads
vegetation

COVER AND COPY

summer, winter, homes, farms, dams.
cold, lowers, riparian, removed, shade, rise.
trees, agriculture, development, stock, people, willow.
natural, wind, erosion, vegetation, banks, roads, gills.

Potential Problems - Student Worksheet 2

Name _____

FILL the gaps using the words in each box to reveal activities that threaten waterways.

Toxic materials
Materials such as herbicides, pesticides, _____, oil and _____ can enter waterways with rain from _____ or agricultural areas. Sadly, they can also be _____ by thoughtless people. These materials can be _____ to plants, animals and humans.

dumped
petrol
urban
chemicals
deadly

Salinity
Salt may enter waterways with wastewater from _____ although the majority comes from groundwater. When deep-rooted _____ trees are removed and replaced by shallow-rooted _____, more rainfall seeps through to the _____. As groundwater levels rise, natural salts emerge on the surface and wash into our waterways.

crops
watertable
industries
native

Removal of woody debris
Trunks and _____ from streamside vegetation often fall into the water. These 'snags' are often seen as a _____ and have been removed in the past to improve stream _____ and reduce danger to water users. Snags should be left in the water as they provide _____ for fish and _____ for birds.

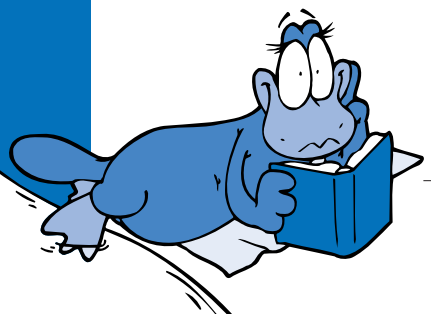
perches
nuisance
branches
flow
shelter

Instream barriers
Most Victorian river systems have been modified to control water resources. Dams, _____ and weirs have been built for water _____. Culverts and _____ have been built so that people can cross waterways. These _____ do not allow fish to move freely upstream and _____. Many fish need to migrate to breed, so barriers can limit fish _____.

barriers
reservoirs
bridges
numbers
downstream
storage

Exotic species
Australia has a disastrous history of deliberately introducing exotic _____. Fish like carp and _____ and plants such as willows and _____ have all had a major impact on our waterways. Without any _____, exotic species can quickly dominate a waterway. They compete with _____ species for _____ and can spread foreign _____ .

native
blackberries
species
food
diseases
trout
predators



COVER AND COPY

chemicals, petrol, urban, dumped, deadly.
industries, native, crops, watertable.
branches, nuisance, flow, shelter, perches.
reservoirs, storage, bridges, barriers, downstream, numbers.
species, trout, blackberries, predators, native, food, diseases.

Indigenous Heritage

C

FOCUS

- In what ways were /are waterways important to Indigenous Australians?
- What do artifacts tell us about traditional life?

CSF II LINKS

SOSE	4.1 History
	4.3 Geography
ENGLISH	4.1 Reading

OBJECTIVES

- Learn about typical Indigenous artifacts
- Complete comprehension exercises and review.

BACKGROUND

'Indigenous heritage places are landscapes, sites and areas that are particularly important to Indigenous people as part of their customary law, developing traditions, history and current practices.'* Artifacts provide fragile evidence about what past generations of Indigenous people used to eat, their way of life and provide a cultural link to past associations with waterways and nearby lands. *Text from 'Ask First' Australian Heritage Commission, 2002

NOTES

This activity provides an overview of traditional Aboriginal life from the past. The location and values associated with these sites may be culturally sensitive. It is recommended when undertaking these activities that you invite a traditional landowner or local tribe Elder to the classroom.

LEARNING TASKS

1 Discuss with students their understanding of indigenous Australians and their interaction with waterways.

2 Distribute the comprehension paper.
- You may like to complete reading as a class and discuss any unfamiliar terms.

3 Allow time for students to complete the questions on worksheet 2.

4 Discuss the results of students work.

5 Review the Challenge on worksheet 2 with students.
- Heritage sites do not necessarily have artifacts associated with them, especially as artifacts are fragile, and all 'Indigenous heritage places' have 'Indigenous heritage values'.
- Explain to studnts that all Indigenous heritage places are protected in Australia by legislation.

6 Discuss the similarities between Indigenous cultural values and student's own values associated with waterways.

MATERIALS

- ***'Indigenous Heritage'* Student Worksheet 1 & 2**
- **Dictionaries**
- **Other resources** may be available from Indigenous cultural organisations to support this activity.

EXTENSION

Read creation stories to students. Reflect on the spirituality values of the sites described. Undertake a field trip to an Indigenous cultural heritage site with the support of a tribal Elder.

ASSESSMENT

Were students able to identify the typical features of the science report and explain the purpose of each element? Could they locate and scan information on the internet? Did they use several strategies to interpret key information including the use of diagrams?

Indigenous Heritage - Student Worksheet 1

Name _____

READ the following information.

Indigenous Heritage Places

'Indigenous heritage places are landscapes, sites and areas that are particularly important to Indigenous people as part of their customary law, developing traditions, history and current practices.' *

*Text adapted from 'Ask First' Australian Heritage Commission, 2002

Artifacts from Aboriginal life provide fragile evidence about what Aboriginal people used to eat, their way of life and provides a cultural link to past associations with waterways and nearby lands.

Aboriginal scarred trees
Aboriginal people removed bark for canoes, containers, shields and temporary shelters which left scars on the trees. They are found all over Victoria on mature native trees, especially box and red gums. The trees are usually over 200 years old. Fire, land clearing and natural tree aging are threats to scarred trees.

Oven mounds
Places where Aboriginal people camped over long periods of time lead to the creation of oven mounds. Mounds were used for cooking food in and can contain charcoal, burnt clay, animal bones, stone tools and Aboriginal burials. They usually occur near waterways. Rabbits, ploughing and any disturbance to land are threats to oven mounds.

Freshwater middens
Middens are accumulations of shells discarded by Aboriginal people after cooking and eating freshwater shellfish. The shells may be the remains of one meal or meals eaten over thousands of years.

Quarries
Aboriginal people collected stone from rocky outcrops to make chipped or ground stone tools. Quarries are often found on the slopes above waterways where rock is exposed. Clearing and construction can destroy these sites.

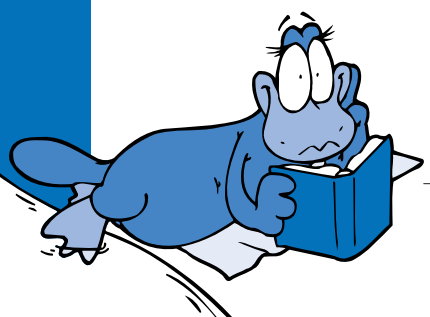
Tools
Tools are often associated with sites of Aboriginal occupation, including mounds and middens near waterways. Tools include stone-flaked tools made by hitting a piece of stone with a 'hammerstone' to remove a sharp 'flake'. Grinding stones and ground edge axes have been found. Tools can be lost to collectors who do not understand that they must in the cultural landscape to retain their cultural value.

Burials
Aboriginal burials are normally exposed during ground disturbance. They often occur in sand dunes near waterways. The bones deteriorate rapidly if exposed to air, wind or water.

Surface scatters
Scatters are the surface remains of materials from past Aboriginal activities. No two sites are the same. They may include remanents of tool making, shelters or social and spiritual activities. Mining, and road building can threaten these sites.

Axe grinding grooves
Flat, low outcrops of fine-grained sandstone were used for shaping and sharpening stone axes. This process results in grooves in the sandstone. Because the sandstone is soft, weathering, erosion and trampling by animals gradually wear it away.

Information from Aboriginal Affairs Victoria miniposters. Miniposter are free and can be printed from the AAV website.



Indigenous Heritage - Student Worksheet 2

Name _____

USE Worksheet 1 to help you complete the following questions about Indigenous heritage places.

Indigenous Heritage Places

1 What does fragile mean?

_____

_____

2 Why are many artifacts from Aboriginal cultural sites fragile?

_____

_____

3 What did Aboriginal people use trees for?

_____

_____

4 What food do you think Aboriginal people collected and prepared with their tools?

_____

_____

5 Why are many sites found near waterways?

_____

_____

6 What is one way you think we could reduce threats to these valuable cultural sites?

_____

_____

7 Can you name a place or an item from your past that is special to you?

_____

_____

CHALLENGE Do you think that there are sites that do not contain artifacts that are still Indigenous heritage places? Discuss your thoughts with classmates, the teacher and an Elder.

Wetland Wonders

C

FOCUS

- What are the characteristics of a wetland?

OBJECTIVES

- Construct a food web for wetland.
- Gain an understanding of the relationships in a wetland ecosystem.

CSF II LINKS

SOSE	4.3 Geography
SCIENCE	4.1 Biological
	4.2 Biological
ENGLISH	4.4 Writing
THE ARTS	4.1 Art

BACKGROUND

In North Central Victoria we have a many wetlands. The plant and animal species that live in these wetlands have adapted over hundreds of years to survive in these often unpredictable environments. Each part of the ecosystem is interdependent, and the benefits of these wetlands span continents (including migratory birds which travel from South East Asia!).

NOTES

This activity can be modified to become an introductory lesson if the lesson incorporates food webs only. Wetlands are extremely dynamic systems, they make great places to attend on a field trip.

LEARNING TASKS

1 **Discuss with students how wetlands form.**
   - What plants and animals may be found in wetland environments?
   - What adaptations have they got to cope with fluctuating water levels and quality?

2 **Allow time for students to review the characteristics of living features of a wetland ecosystem on the worksheet.**
   - Note that illustrations are not to scale.

3 **Students then cut out the images and use them to make a food web as an introduction to wetland ecosystems.**

4 **Each student is then required to complete a research assignment on one of the following wetland ecosystem topics.**
   - What are some impacts of draining wetlands?
   - How might introduced species affect the systems?
   - If it is a drought, how do living things survive?
   - What adaptations to the species have?
   - What Indigenous cultural values are associated with wetlands?
   - What Industries have economic benefits from wetlands?

5 **Provide time for students to report their research results to the class.**

MATERIALS

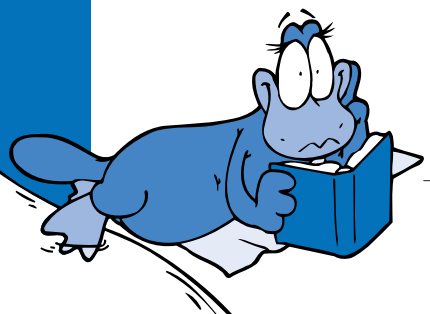
- ***'Wetland Wonders'*** **Student Worksheet**
- **Reference materials**
- **Poster paper**
- **Computers** (with internet access)

EXTENSION

Visit a wetland ecosystems. Organise a guest speaker and complete plant, animal and water quality surveys. Identify the food webs at the wetland.

ASSESSMENT

Were students able to design a food web that reflected accurate interactions in wetlands? Did students make thoughtful analyses of their webs and contribute to class discussion on wetland ecosystems?



Wetland Wonders - Student Worksheet

Name _____

LOOK at the plants and animals that can be found in and around a wetland (not to scale).
CUT out the pictures.
MAKE a food web using the pictures.

Wetland plants and animals

Frog

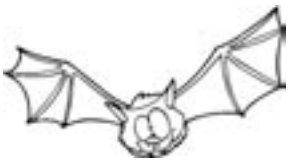
Swan

Reeds

Duck

Water flea

Snake

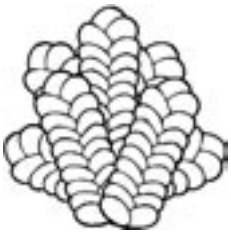


Bat

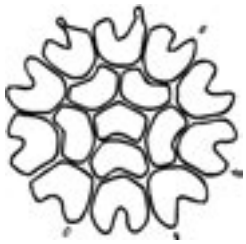
Water rat

Tortoise

Mussels



Floating plant
(azolla)



Microscopic algae

Water ribbons

Kite

Fish