Wynn Vale Dam

Educational Classroom Booklet

CITY OF
TEA TREE GULLY
Naturally Better

PART ONE – BACKGROUND INFORMATION

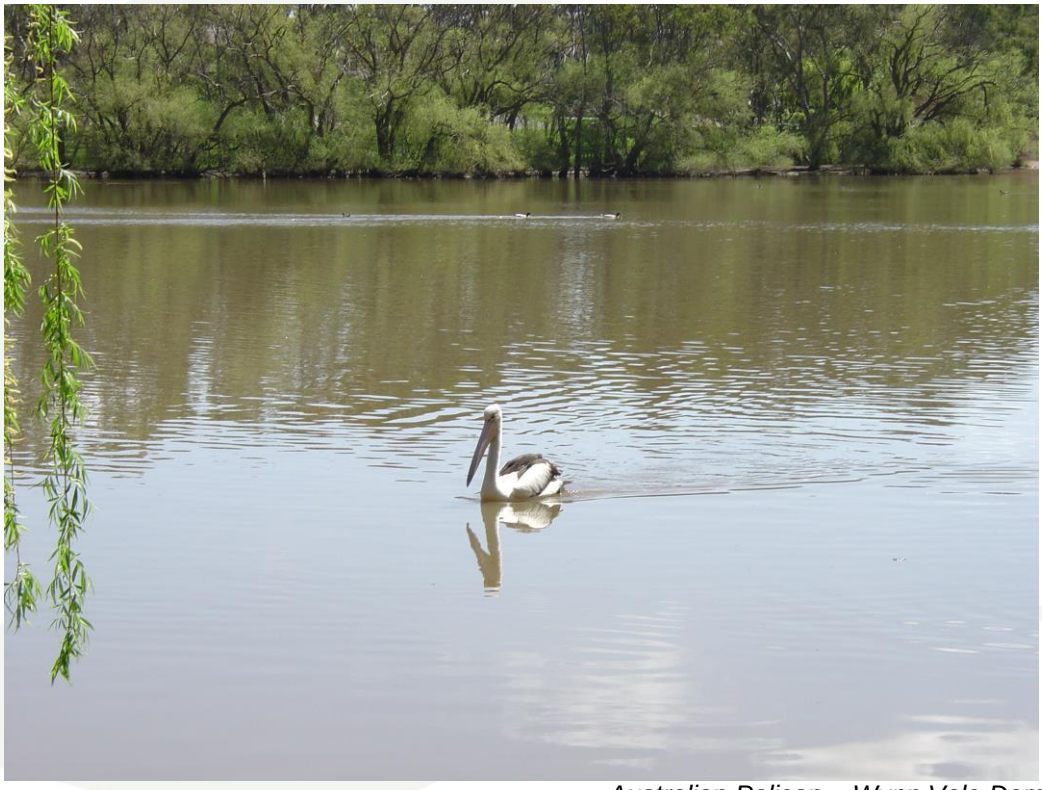
Introduction

This information pack focuses on an exploration of the Wynn Vale Dam wetland and is targeted at primary school students to explore and learn about the wetlands and how they can help to improve water quality in the Tea Tree Gully area.

Part 1 includes a brief history of Dry Creek and the Wynn Vale Dam and explains the objectives of the outdoor environmental classroom, together with guidelines for visits to the area.

Part 2 incorporates interactive activities in which students can engage. It is envisaged that these activity sheets will encourage students to explore, investigate, question and report findings to the Natural Resources Management Board (NRM Education).

Part 3 provides copies of NRM Education identification sheets for birds and wildlife and useful wetland website links.



Australian Pelican – Wynn Vale Dam
Photograph courtesy City of Tea Tree Gully

Aims

That students are able to:

- Describe the characteristics of a wetland
- Identify living and non-living things that can be found at the Wynn Vale Dam wetland
- Gather information about the natural and built environments
- Demonstrate an understanding of the relationship between environment and people
- Identify ways in which to help the natural environment
- Identify seasonal changes to the wetland environment
- Display curiosity about their environment
- Observe using all their senses
- Describe relationships between living things in a particular habitat
- Identify some benefits and problems associated with the human changes to the physical environment
- Make accurate observations, describe and record them in diagrams, tables and graphs
- Successfully use equipment such as a fishing net and bug collector
- Collect, record and interpret data related to the wetland
- Understand the importance of preserving our wetland areas
- Identify ways to keep our waterways healthy

Wynn Vale Dam History

The Wynn Vale Dam wetland is located on Park Lake Drive, Wynn Vale and has a capacity of approximately 100 Megalitres.

The dam was originally constructed in 1962 by winemakers, S Wynn & Company, to irrigate a portion of their Modbury Estate vineyards.

It consists of an earth embankment constructed across the Dry Creek Valley and fills from water running along Dry Creek; overflow is via a spillway on the western side of the dam wall.

Over the years, Wynn Vale Dam has been surrounded by residential housing providing an urban stormwater catchment area of approximately 11 square kilometres. Rain falling in the catchment area flows through a network of gutters, pipes and waterways into the wetland where it is stored.

In 2007 Wynn Vale Dam was selected as a site for stormwater harvesting as part of the Waterproofing Northern Adelaide Program. To meet the objectives of the project, selected areas of the dam required modification to increase water quality, maximise water harvesting potential and reduce the visual impact of reduced water levels caused by water harvesting activity.

In 2009 an innovative media filtration stormwater treatment plant with UV disinfection, was established here at Wynn Vale Dam.

The stormwater treatment plant at Wynn Vale Dam is the first of its kind in Australia. It makes use of an existing dam, as opposed to constructing new wetlands to clean water before storing it in aquifers. Stormwater is extracted from the dam and passes through pressure filtration units to remove sediments and organic materials from the water. The water is disinfected using ultra-violet technology and stored in fractured rock underground aquifers, with the potential to generate 400 ML annually of recycled water.

During the warmer months the water is extracted from the aquifer and used to irrigate Council's sporting ovals and nature reserves.

Although the dam is used primarily for stormwater harvesting and treatment, it also provides a valuable wildlife habitat and a pleasant recreational facility for the community.

The Dam and Signage/Markers

Numbered markers 1-6 appear on the interpretative signage located around the dam.

Welcome and Interpretive Signs are located around the dam

1. The boardwalk / Specimen collection
2. Wynn Vale Community Garden / Wynn Vale stormwater harvesting and re-use facility
3. The spillway / Aquatic animals found at Wynn Vale Dam
4. The willows / Common birds observed at Wynn Vale Dam
5. The island / The fountain
6. Elder Green Farm / River Red Gums at Wynn Vale Dam

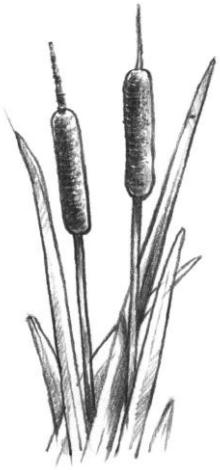
Ten suggestions for visiting the dam

When organising a visit to the dam it is suggested that you consider:

1. Recent and forecasted weather. Avoid extreme temperatures and wet weather where possible.
2. Keeping to the paths as much as practicable.
3. Being mindful of steep banks and bridge crossings.
4. Reading the interpretive signage located around the dam to explain how the wetland works and its role in stormwater management.
5. Linking the activity markers to the activity sheets for ideas on how to interact with the wetland.
6. Being mindful that the edges of the dam may be muddy and being careful not to slip.
7. Not disturbing the wildlife or damaging the vegetation.
8. Not feeding the ducks and geese.
9. Using the boardwalk as a water sampling site, due to its enclosed structure.
10. Taking only information and photographs and leaving nothing but footprints.

What should you take?

1. Hats, sunscreen, insect repellent
2. Drinking water
3. Camera
4. Binoculars
5. Magnifying glass
6. Pencils and paper
7. Macro-invertebrate, wildlife, plant and bird identification sheets
8. Fishing nets
9. Petri dishes and sampling trays
10. Plastic spoons
11. Tweezers
12. First Aid Kit



PART TWO – THINGS TO DO

There are many activity sheets that students and teachers can access and download from Waterwatch Adelaide and the Adelaide and Mount Lofty Ranges Natural Resources Management Board (NRM) and other sites located on the Internet. The following links will be useful.

http://nrmeducation.net.au/uploads/Engaging%20with%20Nature/Engaging%20with%20Nature%20-%20Teacher%20Information%20Pack.pdf

http://www.nrmeducation.net.au/

Activity Sheets to be used in conjunction with the signage	*Marker No.*
1. Exploring Wynn Vale Dam	**1**
2. Collecting Specimens	**1**
3. What is a Community Garden	**2**
4. Wynn Vale Stormwater Harvesting & Re-use Facility	**2**
5. Why does the dam have a spillway?	**3**
6. What aquatic animals can you see?	**3**
7. Introduced plant species	**4**
8. What wetland bird is that?	**4**
9. Why is the island important?	**5**
10. What does the fountain do?	**5**
11. Elder Green Farm	**6**
12. River Red Gums	**6**
13. Wetlands Find-a-Word	

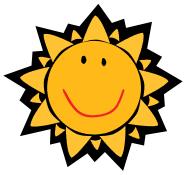
Identification sheets (attached in Part 3)

Wetland Birds of South Australia Identification sheet
Macro-invertebrate identification sheets
Frog ID sheet

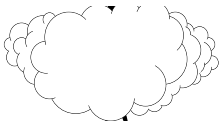
Activity Sheet 1 - Exploring Wynn Vale Dam

Today is **Monday** **Tuesday** **Wednesday** **Thursday** **Friday** **Saturday** **Sunday**

The weather is:


Sunny


Some Cloud


Cloudy


Raining


Other

Circle the words that best describe a wetland:

Pond	Lake	Billabong
Puddle	Swamp	Desert
Swimming Pool	River	Dam

Around the dam is: (circle all that apply)

Treed	lawn	grassy	rocky	muddy
steep	open	shrubs	sandy	farmland

Fill in the gaps:

It is important to protect our _____ habitats, because they provide _____ and _____ for the birds & animals.

Wetland Trees Food Playgrounds Shelter Education Transport Water

Where in the wetland do the plants & animals below live?

a. Around the Wetland
b. On the surface
c. Under the water
d. On the bottom






Activity Sheet 2 – Specimen Collection

A great way to find out if a wetland is healthy is to count how many freshwater animals live in and around it.

Use your dip net to scoop a figure 8 in the water. Tip the contents of your dip-net into a container of water.

Complete the following activities, then, return the contents of your container back to the wetland.

DRAW AND DESCRIBE (2) SPECIMENS:

WE FOUND: **DRAW:**

Name: .....

Size: .....

Shape: .....

Colour: .....

Number: .....

WE FOUND: **DRAW:**

Name: .....

Size: .....

Shape: .....

Colour: .....

Number: .....

Macro-invertebrate monitoring is relatively simple and can be undertaken using a net that you make yourself. Alternatively you might like to borrow a macro monitoring kit from your local NRM Education Office. This kit contains 10 nets, viewers, trays and other useful equipment.

Use the NRM Junior Macroinvertebrate ID Chart and Advanced Macroinvertebrate ID Chart identification charts attached – further copies can be downloaded from the NRM website)

Remember to record and forward your data to the NRM Education site via this link (a copy of this sheet is attached).

http://nrmeducation.net.au/uploads/Engaging%20with%20Nature/Aquatic%20macro%20record%20sheet.pdf

Activity Sheet 3 – What is a community garden?

1. When did the community garden start?

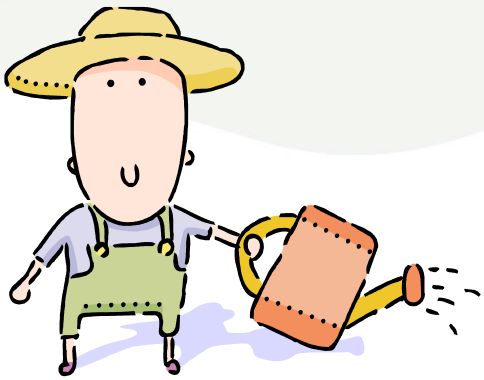
2. Who looks after the garden?

3. Why do people like to join community gardens?

4. What sort of things can you grow in a community garden?

5. Why is it important for the gardeners not to use harmful chemicals when growing their fruit and vegetables?

6. Draw a vegetable or fruit that you like to eat



Activity Sheet 4 – Wynn Vale Stormwater Harvesting and Re-use Facility

1. Why are the containers here?

2. Where does the water go after it has left the containers?

3. Why is there a dam here?

Activity Sheet 5 – Why does the dam have a spillway?

1. What would happen if there wasn't a spillway?

2. Where does the water go after it passes through the spillway?

3. How much water does the dam hold?

Activity Sheet 6 – What aquatic animals did you see?

1. Draw a picture of any aquatic animal you saw.

2. Name some introduced species to this area

Activity Sheet 7 – Introduced plant species

1. What types of trees can you see?

2. What is the difference between a native tree and an introduced tree?

3. How do willow trees affect the quality of the water?

Activity Sheet 8 – What wetland bird is that?

Wynn Vale Dam provides a home for many of the waterbirds found in the area. Smaller wetland areas along Dry Creek provide a haven for many waterbirds and bush birds.

Birds are an easy wildlife group to spot in wetlands and a great way to understand the importance of wetlands as a home for animals.

Wetland birds come in all shapes and sizes. They rely on wetlands for:

1. food (flying insects, plants, fish, frogs, aquatic insects)
2. water
3. making nests and raising their young
4. resting areas
5. shelter

Without wetlands some birds would not survive.

When looking for birds or watching them, it is important to stay quiet and approach slowly. Remember not to get too close and do not shout or throw things to try to attract their attention.

What birds did you see from the identification sheet?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Even if you don't know the bird, you can

Watch for interesting behaviours – nesting, preening, feeding, caring for young, courting, protecting their territory or other ways of escaping notice (diving underwater, camouflage, etc.)

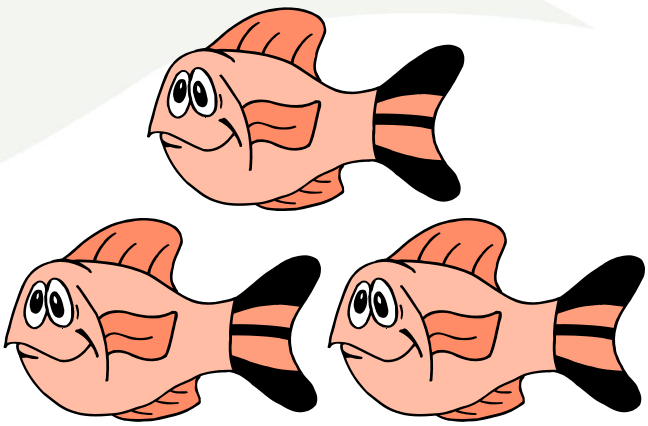
Activity Sheet 9 – Why is the island important?

1. What animals can you see on the island?

2. Why do they live on the island?

3. Name some introduced species to this wetland?

4. Why do we consider carp to be a nuisance to Wynn Vale Dam?



Activity Sheet 10 – What does the fountain do?

1. Why is there a fountain in the dam?

2. What is aeration?

3. Why is it important to the water?

4. Name 3 ways to reduce pollution to the dam?

Activity Sheet 11 – Elder Green Farm

1. How old is the farm?

2. What was planted on the land in the early years?

3. Who built the farmhouse and cottages?

Activity Sheet 12 – River Red Gums

1. How many River Red Gums did you count, or were there too many?

2. Draw a picture of something that would live in a River Red Gum tree.

Activity Sheet 13 – Wetlands Find-a-Word

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

RAMSAR
WETLAND
INSECT
OWL
BILLABONG
WATER
SAND
FISH
ESTUARY

KAKADU
TREE
FROG
REDGUM
CROCODILE
SWAMP
DUCK
MOSQUITO
NUTRIENT

COAST
ENVIRONMENT
TURTLE
MANGROVE
IBIS
PLATYPUS
PLANT
BROLGA
TADPOLE

Source:
http://www.environment.gov.au/water/publications/environmental/wetlands/pubs/wetlands-word-games.pdf

PART THREE – NRM Education Identification Sheets

Wetland Birds of South Australia Identification Sheet

Wetland Birds of South Australia Identification Sheet sourced from the NRM Education site. Download copies from:

http://nrmeducation.net.au/uploads/Engaging%20with%20Nature/Wetland%20Birds%20of%20SA_ID%20Chart%20(simplified%20footer).pdf

Wetland Birds of South Australia

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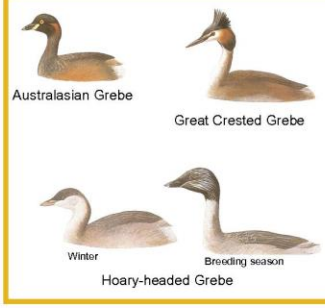
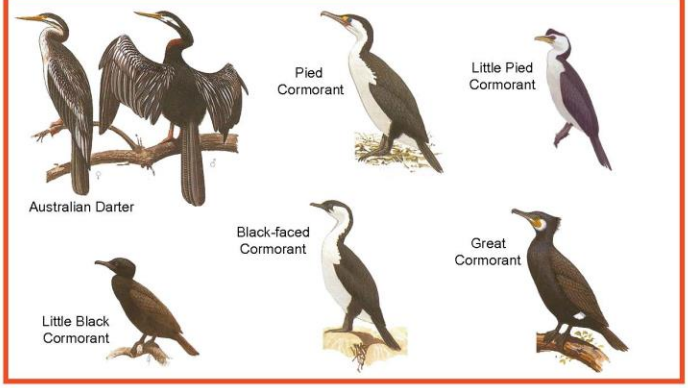
Ducks

Water Fowl

Little Birds



Cormorants and Darter



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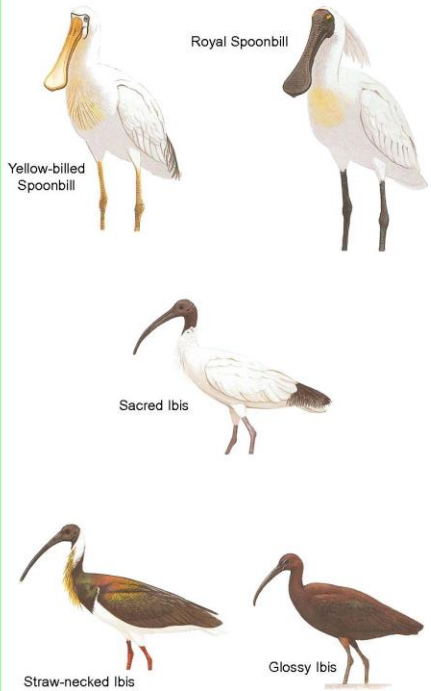
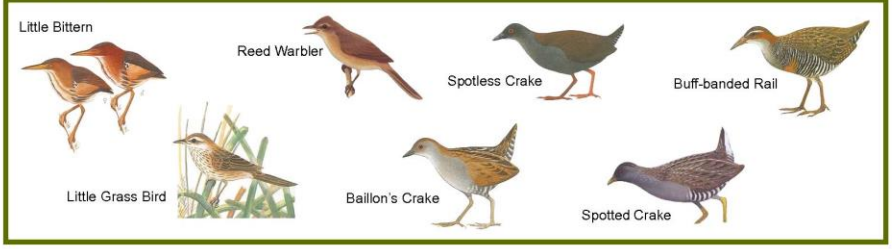
Large Birds

Egrets and Herons

Spoonbills and Ibis



Birds that Hide



Sincere thanks to Mr Frank Knight for giving NRM Education permission to use his images in this educational resource.

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Macroinvertebrate Identification Sheet

Macroinvertebrate identification sheets are sourced from the NRM Education site. Download copies from:

Junior
http://nrmeducation.net.au/uploads/Engaging%20with%20Nature/Junior%20Aquatic%20macro%20ID%20Chart.pdf

Advanced
http://nrmeducation.net.au/uploads/Engaging%20with%20Nature/Advanced%20ID%20Key%202010%20(NRM%20larger%20key).pdf

Aquatic Macroinvertebrate ID Key

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Legs, tails or feelers


caddisfly larva (8)


stonefly larva (10)

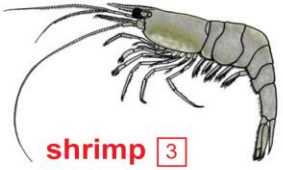

mayfly larva (9)


yabby [4]


dragonfly larva (3)


damselfly larva (3)

Swims fast


shrimp [3]

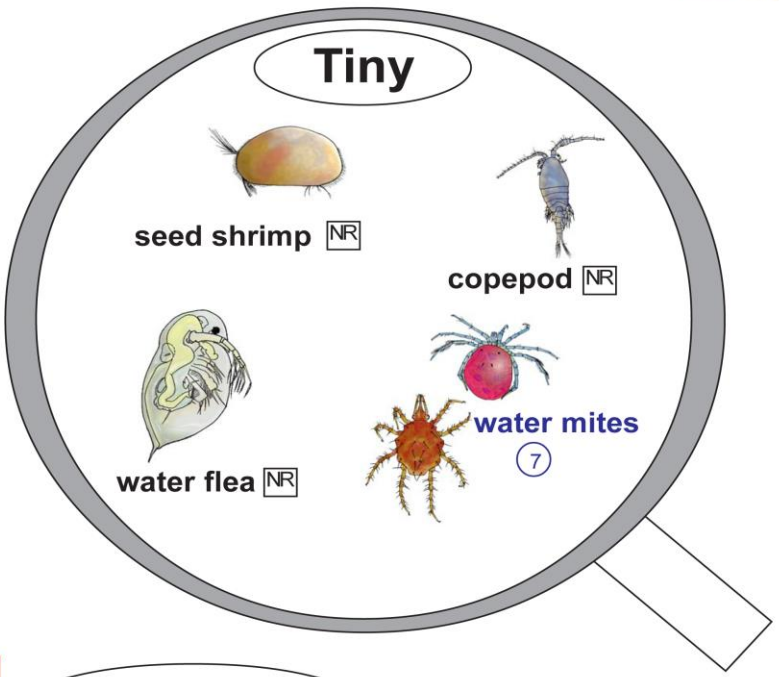

diving beetle [2]


water boatman [2]


back swimmer [1]

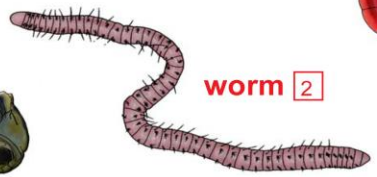

scud [3]

Tiny



Wriggles


non-biting midge larva [3]


worm [2]


mosquito pupa [1]


biting midge larva [4]


mosquito larva [1]

Slides


freshwater snail [1]


leech [1]


flatworm [2]

Pollution Sensitivity*:

NR	Not rated
10–8	Very sensitive
7–6	Sensitive
5–4	Tolerant
3–1	Very tolerant

Sensitivity ratings from SIGNAL2 system in "New sensitivity grades for Australian river macroinvertebrates. Bruce C. Chessman. Marine and Freshwater Research, 2003, 54, 95-103."

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Aquatic Macroinvertebrate ID Key

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1 Microscopic
Bigger than microscopic — go to 2

Green, white or black	Teardrop shape, jerking movement	Swims with a jerk using antennae
		
Seed Shrimp (NR)	Copepod (NR)	Water Flea (NR)

2 Shell — OR — No shell — go to 3

Single shell

Flattened shell with small hump	Spiral shell, opening on left	Spiral shell, opening on right
		
Freshwater limpet (4)	Pouch Snail (1)	Gilled Snail (1)

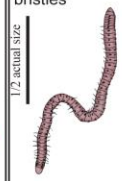
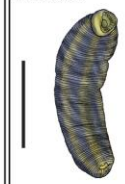
Double shell

Small, pale delicate shell	Small, darker shell with ridges
	
Pea shell (5)	Little basket shell (4)

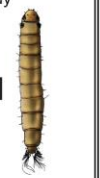
3 go to 4 over page

No legs — OR — OR

Worm-like

Green to red, twisting	Segmented, no suckers, +/- bristles	Long, very thin, swims in 'S' shape, can't coil	Suckers, expands and contracts	Hair-like, swims in "S" shape	Slides along bottom
					
Non-biting midge larva (3)	Segmented worm (2)	Biting midge larva (4)	Leech (1)	Round worm (3)	Flatworm (2)

Tentacles, brushes or tails

Six fleshy lobes at end of body	Breathing tube at rear	Large head, wriggles	Grub-like with no obvious head	Sucker on end of body, waves head	Slender, with tentacles, attached to solid surface	Hangs from surface by ring of hairs
						
Cranefly larva (5)	Mosquito larva (1)	Mosquito pupa (1)	March fly larva (3)	Blackfly larva (5)	Hydra (2)	Soldier fly larva (2)

Mat-like

Simple, multi-cellular colony.

Freshwater Sponges (4)

**Sensitivity ratings from SIGNAL2 system in "New sensitivity grades for Australian river macroinvertebrates. Bruce C. Chessman. Marine and Freshwater Research, 2003, 54, 95-103."*

Invertebrate Size (—)
Average actual size unless stated otherwise.

Pollution Sensitivity*:
- (NR) Not rated
- (10–8) Very sensitive
- (7–6) Sensitive
- (5–4) Tolerant
- (3–1) Very tolerant

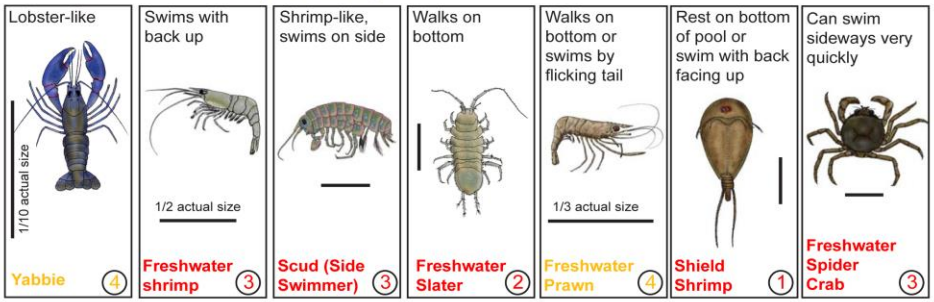
Acknowledgements
- This key was designed by Ron Simms and Amy Blaylock, 2002.
- Adapted by Steve Walker, 2011.
- Assistance was kindly provided by the following staff members of the South Australian Musuem: Dr. Errol Matthews, Dr. Chris Watts and Mr Robert Hamilton-Bruce.

4 >3 pairs legs

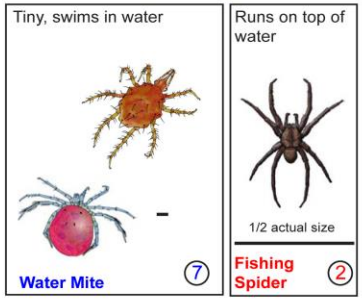
3 pairs legs go to 5

OR

>4 pairs of legs



4 pairs legs

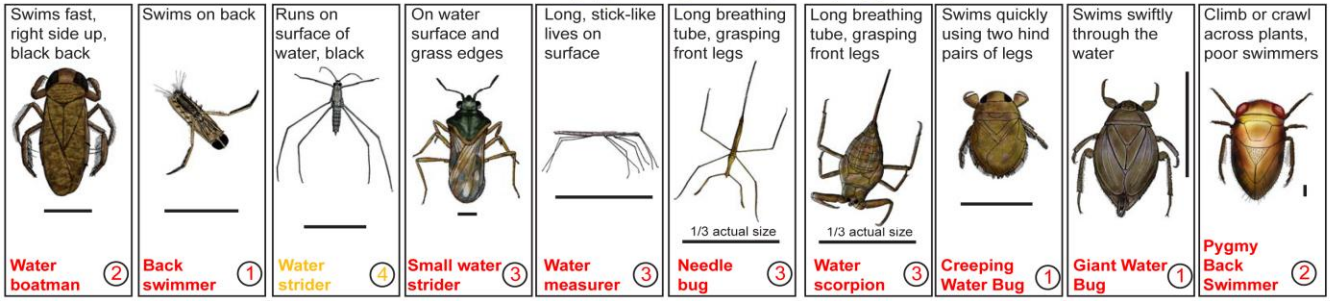


5 No wings Wings

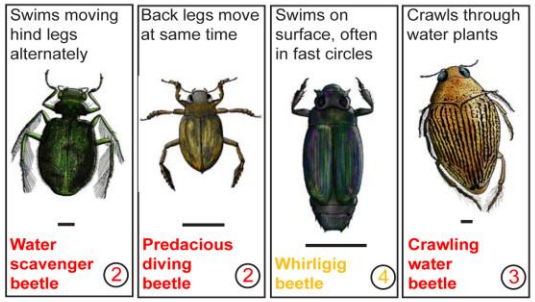
go to 6

OR

Soft wings, piercing mouth parts (bug)



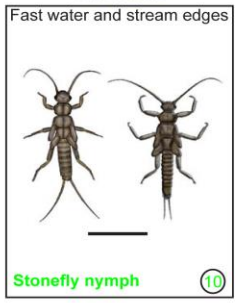
Hard wings, jaws (beetle)



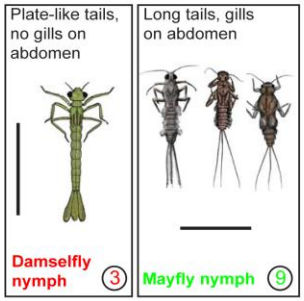
6 No obvious tail Tails

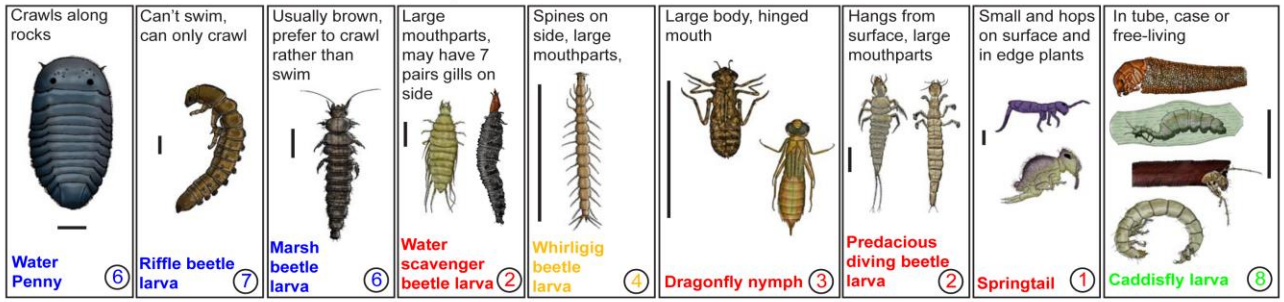
OR

Two tails



Three tails





All images on this ID Key are adapted by Steve Walker (2006) from the B&W images in 'Critter Catalogue: a guide to the aquatic invertebrates of South Australian inland waters (2004 EPA)' except for the crawling water beetle (Steve Walker 2006).

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AQUATIC MACROINVERTEBRATE RECORD SHEET

School:_____ **Date:**_____

Class conducting the survey:_____ **Start time:**_____

Site name:_____ **Site code:**_____

	Common Name	Pollution Sensitivity	Tick if present	Sensitivity Number
Very Sensitive	Stonefly Nymph	10		
	Mayfly Nymph	9		
	Caddisfly Larvae	8		
Sensitive	Riffle Beetle Larvae	7		
	Water Mite	7		
	Marsh Beetle Larvae	6		
Tolerant	Black Fly Larvae	5		
	Crane Fly Larvae	5		
	Pea Shell	5		
	Biting Midge Larvae	4		
	Freshwater Limpet	4		
	Freshwater Prawn	4		
	Little Basket Shell	4		
	Water Strider	4		
	Whirligig Beetle Adult / Larvae	4		
	Yabby	4		
Very Tolerant	Crawling Water Beetle	3		
	Damselfly Nymph	3		
	Dragonfly Nymph	3		
	Freshwater Shrimp	3		
	March Fly Larvae	3		
	Needle Bug	3		
	Non-biting midge Larvae	3		
	Round Worm	3		
	Scud	3		
	Small Water Strider	3		
	Water Measurer	3		
	Water Scorpion	3		
	Fishing Spider	2		
	Flatworm	2		
	Hydra	2		
	Isopod	2		
	Predacious Diving Beetle Adult / Larvae	2		
	Segmented Worm	2		
	Soldier Fly Larvae	2		
	Water Boatman	2		
	Water Scavenger Beetle Adult / Larvae	2		
	Backswimmer	1		
	Gilled Snail	1		
	Leech	1		
	Mosquito Larvae/Pupae	1		
	Pouch Snail	1		
	Springtail	1		
Other				
Not Rated	Copepod	NR		
	Seed Shrimp	NR		
	Waterflea	NR		
	TOTALS			

Count the number of macroinvertebrate types. This is the TAXA RICHNESS.

Add up all the sensitivity numbers to calculate the POLLUTION INDEX.

Interpreting your results:

Step 1

Calculate the Signal Score for your site:

☐ POLLUTION INDEX

÷ ☐ TAXA RICHNESS

Signal Score = ☐

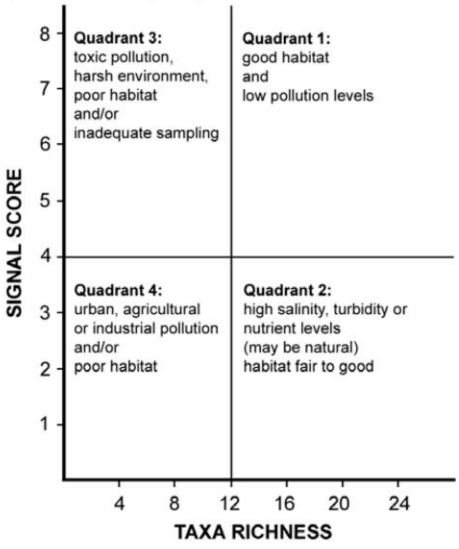
Step 2

Use the signal score to determine the pollution rating of your sampling site.

Signal Score	Pollution Rating
Higher than 5	Healthy Habitat
More than 4 and up to 5	Mild Pollution
Between 3 and 4	Moderate Pollution
Less than 3	Severe Pollution

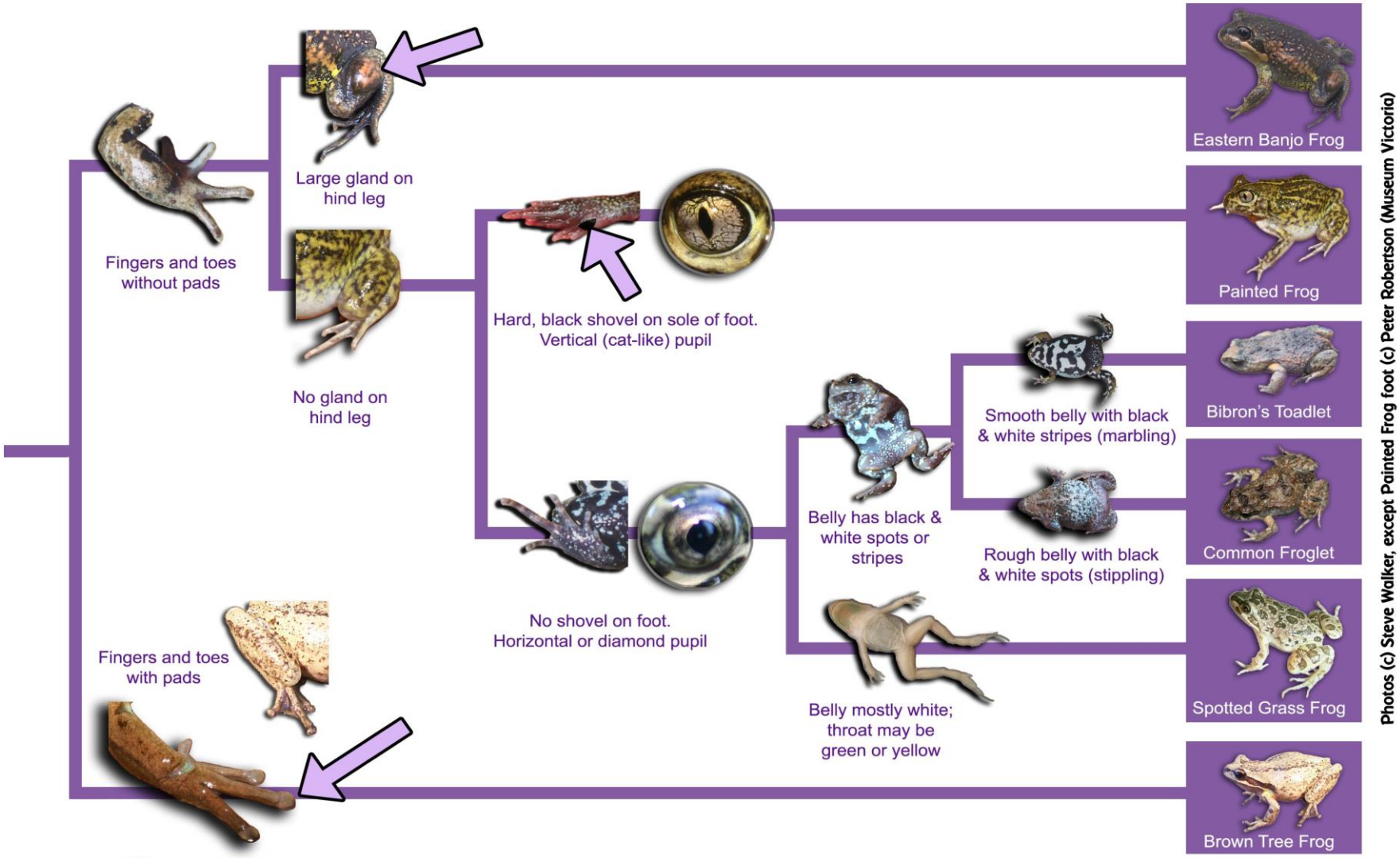
Step 3

The pollution indicator graph can suggest possible sources of pollution. Use your SIGNAL SCORE and TAXA RICHNESS to plot a point on the graph. In which quadrant does your plot fall?



Frog ID Key

NRM Education
climate change biodiversity water food air waste transport purchasing



Photos (c) Steve Walker, except Painted Frog foot (c) Peter Robertson (Museum Victoria)

KEY

Government of South Australia
Adelaide and Mount Lofty Ranges Natural Resources Management Board

AuSSI-SA SUSTAINABLE SCHOOLS

WATERWATCH South Australia

The Adelaide and Mount Lofty Ranges Natural Resources Management Board's NRM Education program delivers the Australian Sustainable Schools Initiative - South Australia and Waterwatch. The support of KESAB environmental solutions is acknowledged.

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