

CREIGHTON'S CREEK

WATER MONITORING REPORT 2003-2007



A monitoring program is important as:

- **An educational tool that introduces water quality issues to people who may not have shown interest without the program;**
- **A means of gathering base datasets to allow useful discussion of issues and provide some direction for future works;**
 - **A method of assessing the value of works completed.**

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Introduction

Waterwatch is a community water quality monitoring program that assists the community in monitoring their local waterway. The Program aims to:

- ➡ Increase community awareness and understanding of water quality issues;
- ➡ Increase community involvement in water management decisions; and,
- ➡ Generate useful data for community and agency use which complements that collected by Agency monitoring networks.

Monitoring networks across the Goulburn Broken Catchment have been formed to study water quality in their local areas. The networks are able to test a local stream for a range of parameters using equipment supplied by the Waterwatch Program. The parameters selected for testing in each area depend upon the water quality issues identified by the monitoring network. Monitors also record the date, time and rainfall to assist in the interpretation of the data.

Members of the Creighton's Creek Landcare Group are concerned with the water quality in Creighton's Creek and its tributaries. They began a monitoring program along the length of the waterway in 2003. The program includes sites on the major tributaries to Creighton's Creek.

During 2007, the network monitored 14 sites on a monthly basis for five parameters. They were:

1. Electrical Conductivity (Salinity)
2. Turbidity
3. pH
4. Temperature; and
5. Total Phosphorus.

Samples were taken every two months for phosphorus testing at four of the 14 sites.

This report contains the following information:

1. Summary of monitoring sites
2. Information about water quality parameters
3. A tabular summary of data collected at sites monitored by the Creighton's Creek Network.
4. Graphical representation of each parameter along the length of the waterway
5. Graphical representation of each parameter over the period of the monitoring program
6. Comparisons with data collected at other locations in the Goulburn Broken Catchment
7. Comparisons of local water quality data with State Environment Protection Policy (SEPP) guidelines
8. Macro-invertebrate surveys for 2004 to 2007.

The report provides a summary of testing results since 2003 and should be used to stimulate discussion on the state of water quality in Creighton's Creek and potential actions to improve water quality. There is the potential to use water quality data collected in the program to discover trends in water quality over time and to measure the effects of improvement works carried out in the sub-catchment.

Monitoring Sites

JOHN NIELSEN

CRE002 – MAP8024 E371627 N5911374
TRE010 – MAP 8024 E371634 N5911465
CRE003 – MAP8024 E371561 N5911533
CRE011 – MAP 8024 E 367983 N5919930

Creightons Creek u/s of Threlful Creek.
Threlful Creek at Creightons Creek.
Creightons Creek d/s of Threlful Creek.
Creightons Creek at Bartons Lane

DOUG BOTTCHE

RAM005 – MAP 8024 E369458 N5912828

Ramages Creek at Blue Hills.

BARRY AND ANNE NOYE

CRE007 – MAP 8024 E368879 N5915506
BAR010 – MAP 8024 E368784 N5915604
CRE008 – MAP 8024 E368838 N5915669

Creightons Creek u/s of Baronga Creek.
Baronga Creek at Creightons Creek.
Creightons Creek d/s of Baronga Creek.

DOUG MOSER

PEA010 – MAP 8024 E367800 N 5917573

Pearsons Creek on Longwood/Gobur Road.

JOHN GREAVES

CRE010 – MAP 8024 E369000 N5917140

Creightons Creek at Kellys Lane.

GARY FAY

CRE012 – MAP 8024 E 368044 N 5921924

Creightons Creek at Fay's.

JIM, ANN SHOVELTON

CRE015 - MAP 8024 E367473 N5924685
JIM010 - MAP 8024 E 367502 N 5925358

Creightons Creek at "Spring Leigh".
Jims Gully at "Spring Leigh"

WATERWATCH COORDINATORS

CRE014 – MAP 8024 E367883 N5923437
CRE020 – MAP 8024 E364830 N5926884

Creightons Creek at Longwood/Mansfield Road.
Creightons Creek at Hume Highway

Turbidity

Turbidity is the cloudiness in water and is the result of suspended material in the water. This suspended material decreases the ability of light to pass through and thus can limit plant growth. This in turn affects the fish and invertebrate communities which feed on and live in the plants. Turbidity may be caused by silt, micro-organisms, plant material, algae and chemicals. However, the most frequent cause of turbidity in rivers and other water bodies is inorganic material from soil weathering and erosion.

High levels of turbidity have a two-fold effect on water:

- The water loses its ability to support a large variety of aquatic organisms. Where there is less light penetrating the water, there will be less photosynthesis occurring and therefore a lower level of oxygen in the water.
- The water becomes warmer because the suspended material absorbs heat from the sun. This also decreases the amount of oxygen dissolved in water.

Turbidity can be controlled by the retention of vegetation along streams and farming practices such as contouring and stubble retention.

Turbidity in Creighton's Creek

Creighton's Creek and its tributaries have been tested for turbidity by members of the Creighton's Creek Landcare Group since January 2003 (Fig 1).

Site Code	Site Description	TURBIDITY MEDIANS (NTU)				
		2003	2004	2005	2006	2007
CRE002	Creighton's Creek above Threlful Creek	14	15	14	16	17
TRE010	Threlful Creek at Creighton's Creek	16	14	16	16	15
CRE003	Creighton's Creek d/s of Threlful Creek	14	15	16	16	16
RAM005	Ramage's Creek	12	11	11	13	11
CRE007	Creighton's Creek between Ramage's and Baronga Creeks	12	10	10	11	16
BAR010	Baronga Creek at Creighton's Creek	11	11	10	13	19
CRE008	Creighton's Creek d/s of Baronga Creek	11	10	11	12	16
PEA010	Pearson's Creek on Longwood Gobur Road	9	8	8	14	14
CRE010	Creighton's Creek at Kelly's Lane	14	10	11	14	19
CRE011	Creighton's Creek at Barton's Lane	14	12	10	11	11
CRE012	Creighton's Creek at "Wirani"	15	11	11	11	17
CRE014	Creightons Creek at Longwood-Mansfield Road				12	14
CRE015	Creighton's Creek at Shovelton's	8	4	6	9	16
JIM010	Jim's Gully at Creighton's Creek	15	11	8	6	N/A

Rating:

<10NTU Excellent

<12.5NTU Good
<15NTU Fair
<22.5NTU Poor
>22.5NTU Degraded

Fig 1

Turbidity results in Creighton's Creek varied from good to poor in 2007 although there is little variation in results along the length of the waterway. None of the tributaries are showing any significant contribution to the turbidity in Creighton's Creek.

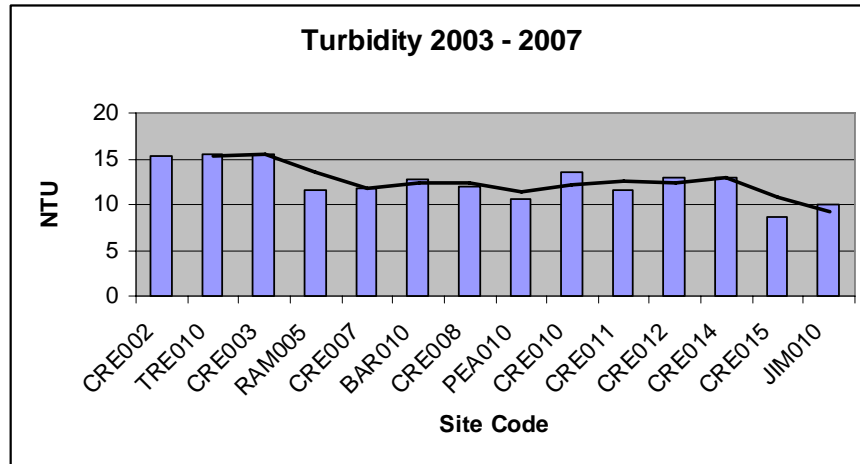


Fig 2

Figure 2 shows the average median turbidity at each site for the five year period that monitoring has been undertaken.

Turbidity has deteriorated very slightly since 2006 although all median results are still below 20 NTU. This can be seen in Fig 3 and Fig 4 below.

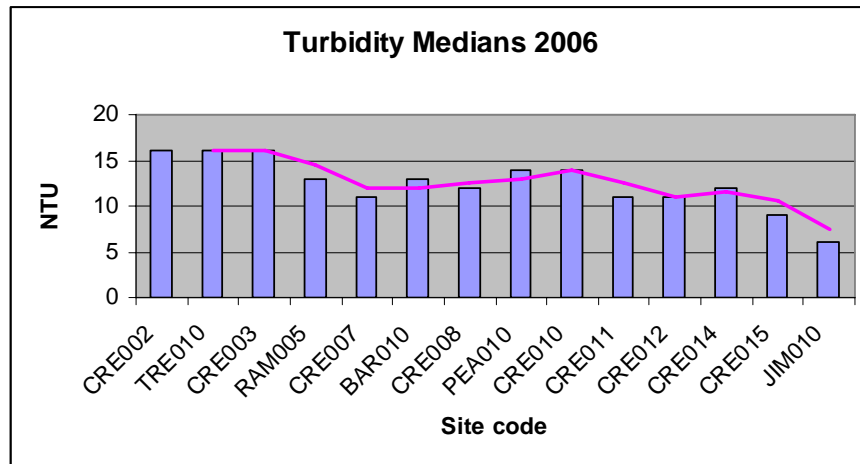


Fig 3

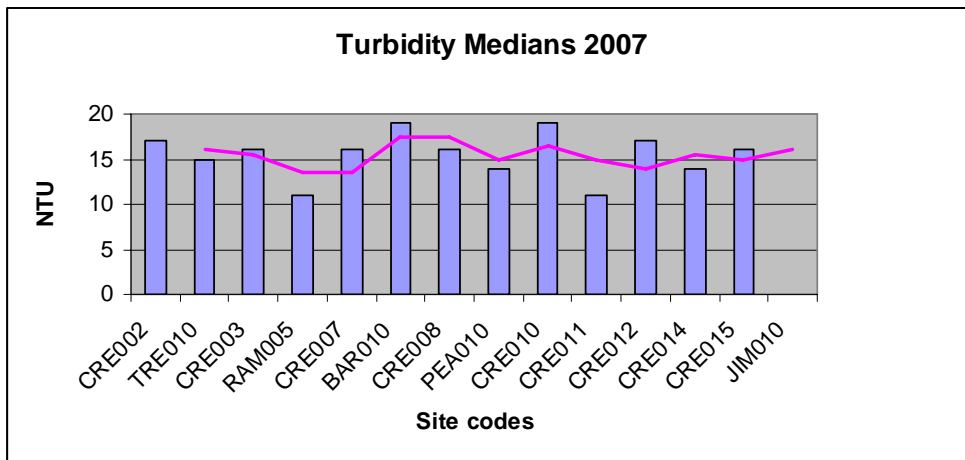


Fig 4

Generally, the turbidity levels in the Creighton's Creek sub-catchment are low and the variation in the results is minimal. In comparison, another site further upstream in the catchment, the Goulburn River above Jamieson, will typically record even lower turbidity levels than Creighton's Creek, ranging between 1 and 5 NTU in 2006. (Results for 2007 are not comparable due to the effects of the bushfires in that area since January 2007.) In contrast, a site on the Goulburn River at Shepparton can produce results as high as 50-70NTU or sometimes a lot more. All of these results are affected by such things as the presence of riparian vegetation along the waterways (the more vegetation - the cleaner the water) and local agricultural practices (land cleared for agricultural pursuits can contribute to turbidity if best practices aren't employed). Rain events inevitably cause an increase in turbidity in a waterway.

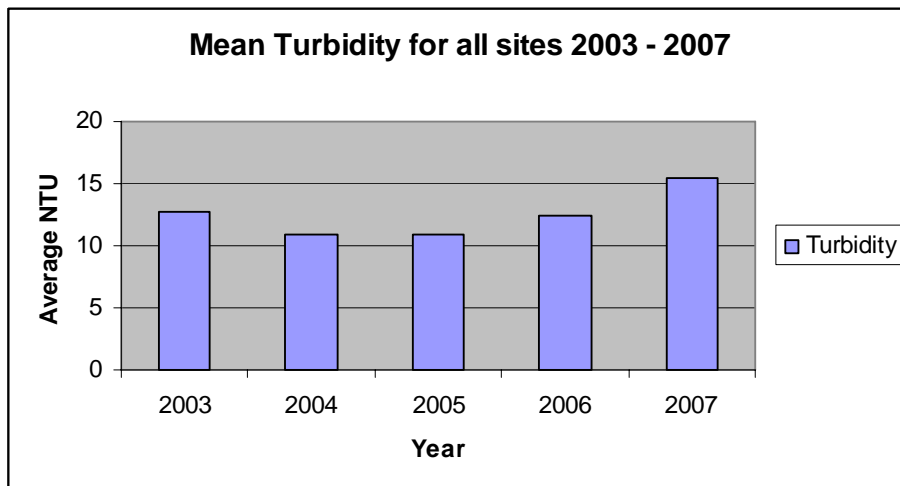


Fig 5

Fig. 5 represents the mean (average) of all turbidities taken at all sites in the testing years of 2003 to 2007. This graph is included to try and give an overall picture of the turbidity for the whole Creighton's Creek sub-catchment from year to year. As can be seen, there has been a minimal increase over the last two years, however only by approximately 5 NTU to a maximum mean turbidity of 16 NTU.

Salinity

Just as excess salt in our diets can be bad for our health, high salt levels in the environment negatively affect plants, animals and soils in and near waterways. Salinity is potentially the largest environmental problem facing Australia and is a major problem in northern and western Victoria. The most concentrated problem area is in the Murray-Goulburn Irrigation District, but dryland salting problems also occurs around and to the west of Seymour.

Dryland salinity is caused when deep rooted trees are replaced with seasonal crops or grasses that do not pump the water into the atmosphere as efficiently. If trees are cleared higher up in a catchment, this can lead to dramatic rises in watertables. Solutions to reduce salinity levels include revegetation of recharge areas and buffer strips along local streams.

The following outline helps to put salt levels in perspective.

0-800 EC

If you tested the water from your tap at home it would be within this range. This is good drinking water for people and suitable for all animals

When water of 300EC is used in overhead sprinklers by irrigation farmers plants that are sensitive to salt may develop leaf scorch.

800-2500 EC

People can drink water within this range but it would start to taste very salty. This water is still suitable for all animals.

Peas, apricots and grapes can't be grown with water over 1,500 EC. If this water is used for irrigation farming, special care must be taken with drainage and choosing plants that are tolerant to salt. For example, lucerne can be irrigated with water of 2,000 EC and white clover with water of 1,000 EC, provided they are grown on sandy soil with good drainage.

2,500-10,000 EC

Water in this range is not suitable for people and should only be drunk in an emergency. When water over 4,000 EC is given to laying hens it causes their eggs to crack. Water over 6,000 EC is unsuitable for pigs and poultry. Highly saline water may also contain a high level of magnesium which can be harmful to stock. A water sample should be sent to a laboratory for analysis and specific advice obtained. This water is generally not used for irrigation farming except on some crops that have a very high tolerance to salt.

Pears, apples and tomatoes could not be grown with water in this range.

Over 10,000 EC

Don't drink this water! Water over 10,000 EC has an extremely high salinity. This water is unsuitable for people and for most animals. Only beef cattle and adult sheep can survive on water in this range. Irrigation farming is not possible with such highly saline water. In dryland areas only salt tolerant pastures will survive.

At 50,000 EC water has the same salinity as the sea. This water can be used for making concrete and flushing toilets as long as they are able to resist corrosion.

Salinity in Creighton's Creek

Creighton's Creek and its tributaries have been tested for salinity by the Creighton's Creek Landcare Group since January 2003 (Fig 4).

Site code	Site Description	Salinity Medians (EC Units)				
		2003	2004	2005	2006	2007
CRE002	Creighton's Creek above Threlful Creek	120	108	103	110	120
TRE010	Threlful Creek at Creighton's Creek	148	129	124	149	170
CRE003	Creighton's Creek d/s of Threlful Creek	133	116	111	122	130
RAM005	Ramage's Creek	93	84	82	90	110
CRE007	Creighton's Creek between Ramage's and Baronga Creeks	164	144	130	150	190
BAR010	Baronga Creek at Creighton's Creek	121	121	108	120	150
CRE008	Creighton's Creek d/s of Baronga Creek	159	136	125	140	180
PEA010	Pearson's Creek on Longwood Gobur Road	163	166	134	156	190
CRE010	Creighton's Creek at Kelly's Lane	155	145	131	152	180
CRE011	Creighton's Creek at Barton's Lane	163	177	164	175	240
CRE012	Creighton's Creek at "Wirani"	163	177	162	192	240
CRE014					236	260
CRE015	Creighton's Creek at Shovelton's	222	223	213	225	260
JIM010	Jim's Gully at Creighton's Creek	420	435	439	521	N/A

Rating:

<80EC Excellent, <240EC Good, <400EC Fair, <600EC Poor, >600EC Degraded

Fig 6

Results taken monthly reveal a "good" level of salinity in the creek upstream of Kelly's Lane. Median results downstream from here show a slight elevation on previous year's results. Overall "Jim's Gully" has been significantly higher (between 420EC-520EC) with results showing a "poor" rating. Due to drought conditions insufficient samples were able to be collected for this site in 2007. Although slightly higher than 2006, Ramage's Creek was still shown to have the lowest salt levels with a median of 110 EC.

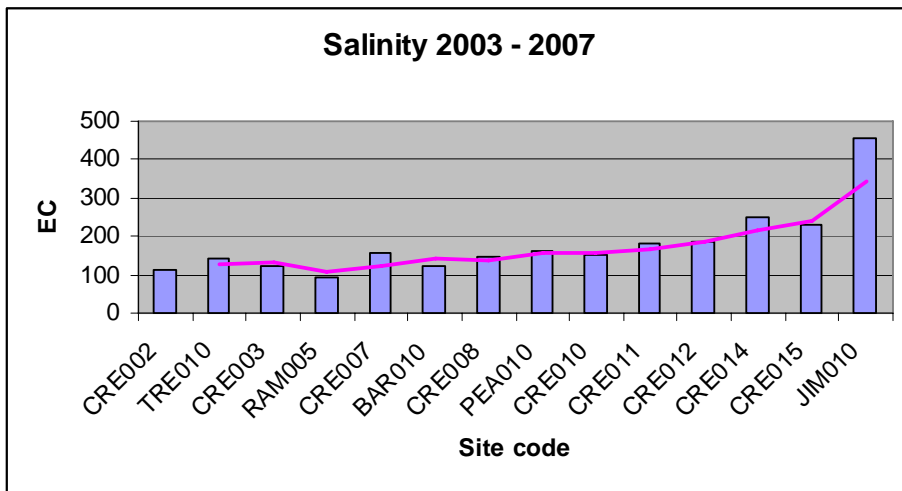


Fig 7

Figure 7 shows the average median salinity at each site for the period 2003 to 2007. In general, salinity levels can be expected to rise as a waterway moves through a catchment. This has been demonstrated here with the median salinity levels at each site rising marginally as the Creek moves down the catchment. Note the computer generated trend line shown in pink on the graph.

These are pleasing results as the salt levels are generally low. This information also becomes our baseline data, with the consistent results making it easy for Creighton's Creek monitors to detect a problem should one arise.

It can also be seen in Fig 8 below that salinity in the Creighton's Creek area had decreased slightly over the first three years of testing, however as the graph shows, salinity has risen in the last two years, most likely due to the dry conditions.

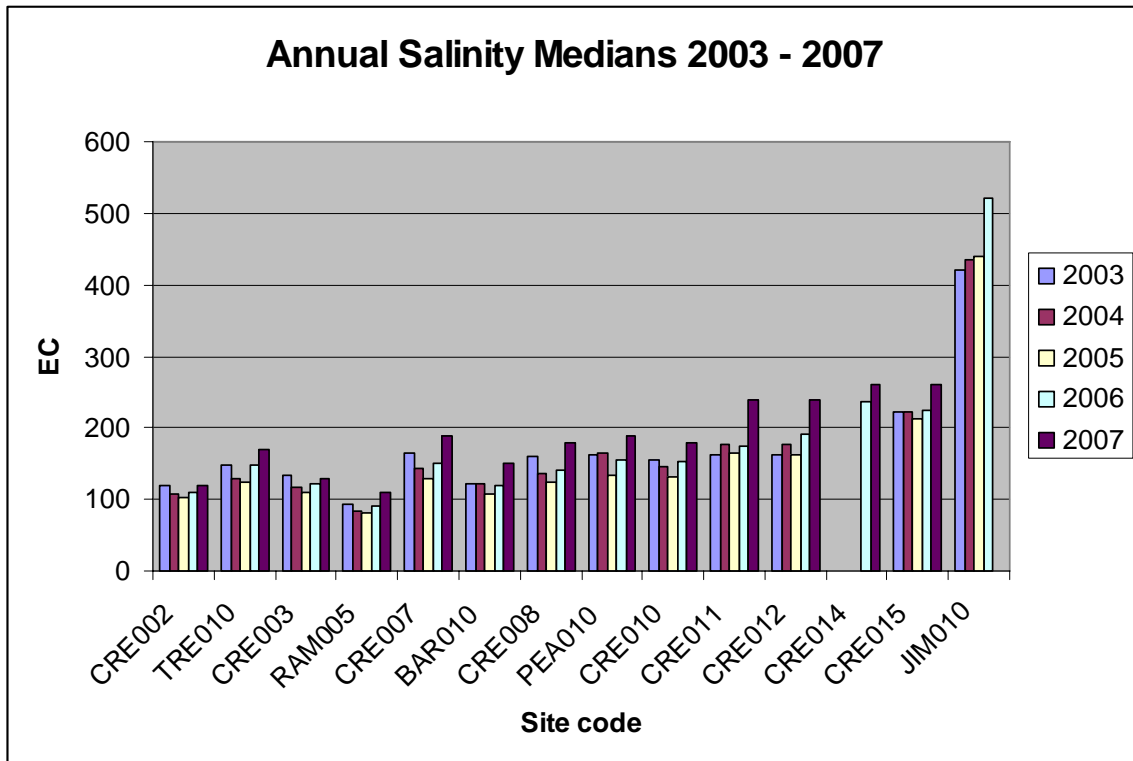


Fig 8

Fig. 9 represents the mean (average) of all salinity readings taken at all sites in the testing years of 2003 to 2007. This was done by combining the data for all sites in Creighton's Creek and calculating an annual mean for each of the five years. This graph is included to try and give an overall picture of the salinity for the whole Creighton's Creek catchment from year to year. Electrical conductivity results had dropped to an average of 155 EC in 2005, but have increased over the last two years, most likely due to the dry conditions. The levels for 2006 and 2007 are still considered to be low.

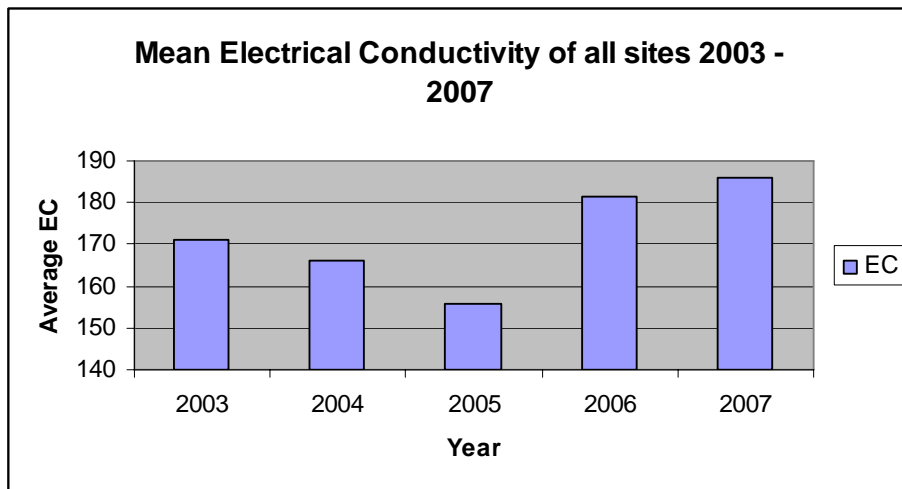


Fig 9

Phosphorus

Phosphorus is a nutrient that occurs naturally at low concentrations in water and it is essential for all forms of life. It comes from processes like the weathering of rocks and from the decomposition of organic matter such as plant litter. Other sources of phosphorus entering river systems include:

- sewage treatment works
- runoff from agricultural land
- stormwater drains
- runoff from forests
- irrigation drains intensive agricultural industries

An increase in phosphorus levels in streams may result from erosion, discharge of sewage, detergents, urban stormwater and rural runoff that contains fertilisers and animal and plant material. When the phosphorus concentration becomes too high, problems such as algal blooms, excessive growth of aquatic weeds and the loss of species diversity can occur.

Nutrients in waterways (particularly phosphorus) became an important parameter to monitor when deciding the quality of water in a waterway when the Water Quality Strategy was produced for the Goulburn Broken Catchment. Phosphorus is also a parameter included in the chemical sub-index as part of the Victorian Index of Stream Condition rating system for measuring the condition of a waterway. Total phosphorus is used rather than soluble (reactive) phosphorus, as it includes all forms of phosphorus present in a waterway rather than the soluble component.

Phosphorus in Creighton's Creek

Creighton's Creek Landcare group began testing Creighton's Creek and its' tributaries for total phosphorus in 2006. A review of the 2006 baseline data resulted in a reduction of the number of sites and frequency of testing for 2007.

Site Code	Site Description	TOTAL PHOSPHORUS MEDIANS (µg/L)	
		2006	2007
CRE002	Creighton's Creek above Threlful Creek	40	N/A
<i>TRE010</i>	<i>Threlful Creek at Creighton's Creek</i>	90	N/A
CRE003	Creighton's Creek d/s of Threlful Creek	40	85*
<i>RAM005</i>	<i>Ramage's Creek</i>	80	N/A
CRE007	Creighton's Creek between Ramage's and Baronga Creeks	70	N/A
<i>BAR010</i>	<i>Baronga Creek at Creighton's Creek</i>	50	N/A
CRE008	Creighton's Creek d/s of Baronga Creek	50	40
<i>PEA010</i>	<i>Pearson's Creek on Longwood Gobur Road</i>	20	N/A
CRE010	Creighton's Creek at Kelly's Lane	80	40
CRE011	Creighton's Creek at Barton's Lane	40	N/A
CRE012	Creighton's Creek at "Wirani"	50	N/A
CRE014	Creightons Creek at Longwood-Mansfield Road	40	60*
CRE015	Creighton's Creek at Shovelton's	40	N/A
<i>JIM010</i>	<i>Jim's Gully at Creighton's Creek</i>	45	N/A

Ratings: Total Phosphorus for the Mountains, Valleys and Plains-

<0.01 mg/L Excellent, **<0.025mg/L Good**, **<0.05mg/L Fair**, **<0.1mg/L Poor**, **>0.1mg/L Degraded**

*Note: results in italic with * indicate <5 data sets used to interpret results*

Fig 10

2006 was the first year total phosphorus was tested for in Creighton's Creek and its tributaries. Data was assessed and the program amended in 2007 to only include four sites, sampled every second month, rather than every site every month. As can be seen in Fig 10, total phosphorus results in Creighton's Creek in 2007 ranged from fair to poor. Since only two years of data have been obtained to date, it is recommended that further testing for total phosphorus be included in the 2008 program.

Fig 11 shows Total phosphorus results for 2006 for all sites, as well as the four sites monitored in 2007. HODGY – might want to add some comment here.....why would two sites be higher and two lower than 2006? Farming practices?

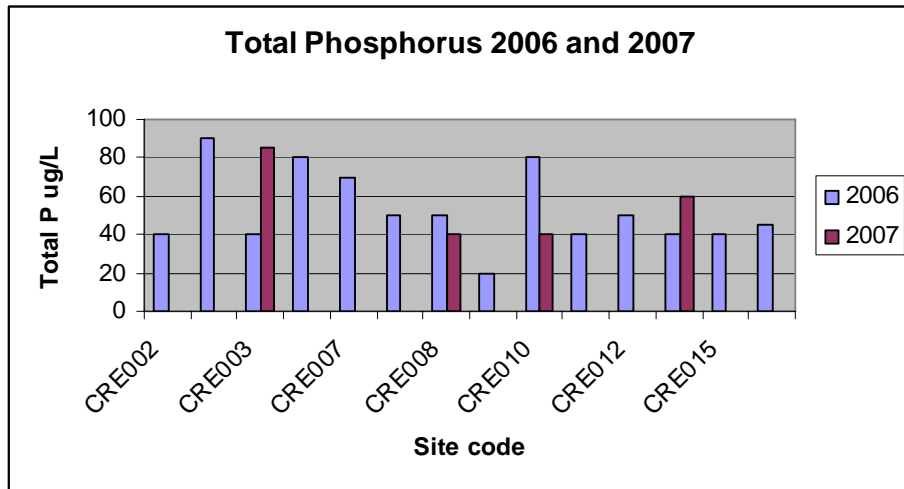


Fig 11

SEPP (WoV) Environmental Quality Objectives for Rivers and Streams – water quality

These results are for 2007 data only.

Colours highlight the SEPP (WoV) segments and objectives applicable within the Goulburn Broken CMA region.

SEGMENT	INDICATOR							
	Total phosphorus (ug/L)	Total nitrogen (ug/L)	Dissolved oxygen % saturation		Turbidity (NTU)	Electrical conductivity (uS/CM)	pH (pH units)	
	75 th percentile	75 th percentile	25 th percentile	maximum	75 th percentile	75 th percentile	25 th percentile	75 th percentile
• mid-reaches of Ovens, Goulburn and Broken catchments	≤25	≤600	≥85	110	≤10	≤500	≥6.4	≤7.7

Results at Creighton's Creek (below) to be compared with these SEPP objectives – water quality

SEGMENT	INDICATOR							
	Total phosphorus (ug/L)	Total nitrogen (ug/L)	Dissolved oxygen % saturation		Turbidity (NTU)	Electrical conductivity (uS/CM)	pH (pH units)	
	75 th percentile	75 th percentile	25 th percentile	maximum	75 th percentile	75 th percentile	25 th percentile	75 th percentile
CRE002 <i>Creightons Creek u/s of Threlful</i>	N/A				24	140		
TRE010 <i>Threlful Creek</i>	N/A				16	210		
RAM005 <i>Ramages Creek</i>	N/A				15	128		
CRE003 <i>Creighton's Creek d/s of Threlful Creek</i>	130				18	160		
CRE007 <i>Creighton's between Ramages & Baronga</i>	N/A				17	220		
BAR010 <i>Baronga Creek</i>	N/A				23	168		
CRE008 <i>Creighton's Creek d/s of Baronga Creek</i>	70				17	208		
PEA010 <i>Pearsons Creek</i>	N/A				14	210		
CRE010 <i>Creightons Creek at Kellys Lane</i>	50				20	220		
CRE011 <i>Creightons Creek at Bartons Lane</i>	N/A				12	310		
CRE014 <i>Creighton's Ck at Longwood Mansfield Rd</i>	80				16	303		
CRE015 <i>Creightons Creek at Shoveltons</i>	N/A				21	335		

75% of readings at each site should not exceed the 75th percentile.

Note: SEPP objectives are long term theoretical goals for water quality. It is not expected that waterways will comply at this stage

Macroinvertebrates

Why do a Macro-invertebrate Survey?

Macro-invertebrates are animals without backbones that live at least a part of their life in water. One reason for studying macro-invertebrates (or waterbugs) is that they can be useful indicators of the ecological health of freshwater habitats. Some aquatic invertebrates are more tolerant to pollution than others.

If a stream is polluted, tolerant bugs will usually be found in larger numbers than the intolerant or sensitive ones. However, if a habitat is close to pristine, or in its natural state, tolerant types of bugs will be found alongside the more sensitive bugs which will be in equal or greater numbers than the tolerant.

How is a sample taken?

Kick samples in a riffle area and Sweep samples from the vegetation overhanging the creek.

What does the SIGNAL score of a site indicate?

SIGNAL stands for - Stream Invertebrate Grade Number—Average Level

By using the SIGNAL grade for every family present in the sample, a SIGNAL score can be calculated for a site and used to form an objective opinion about the health of a stream.

As a general guide SIGNAL scores of -
>6 indicates a healthy habitat
5-6 indicates mild pollution
4-5 indicates moderate pollution
<4 indicates severe pollution.

Goulburn Broken Waterwatch Macroinvertebrate survey results in Creighton's Creek in 2007

Sites and habitats within the Creighton's Creek Catchment were assessed against the SEPP WoV biological objectives (State Environmental Protection Policy – Waters of Victoria), outlined in Appendix 1. Biological regions from the SEPP (WoV) are as follows

1. **Cleared Hills and Coastal Plains (B4)** – lowland region with low rainfall, gradients and altitude. Substantial clearing for intensive agriculture has resulted in poor riparian vegetation. Warm water streams with high alkalinity and low to moderate turbidity and salinity. Stream substrate is predominately moderate to fine grained particles.

1. Sampling, identification and data collation

Sampling was conducted in accordance with the Victorian Rapid Bio-assessment (VRBA) sampling protocol (Victorian EPA). This involved collecting water quality data and sampling aquatic invertebrates from available stream habitats. Sampling was undertaken in autumn 2007 and spring 2007. Samples were collected from 'riffle' habitat i.e. slow to fast areas where the water breaks over the substrate and 'edge' habitat i.e. slow to no flow areas which can include pool, undercut banks and backwaters. Riffle samples (also known as kick samples) were collected using a fine mesh net held downstream and kicking the substrate for a total of ten metres at each site. Edge samples (also known as sweep samples) were taken using a fine mesh net and sweeping the net through the water as well as in amongst the vegetation in the edge and pool sections of the stream for approximately ten metres. Both habitats were sampled where present. Each sample was emptied into a white sorting tray and aquatic invertebrates were picked from the sample for 30 minutes and placed in 70% ethanol for preservation and later identification in the laboratory.

Aquatic invertebrates were identified in the laboratory to Family level where possible with the exception of Acarina (mites), identified to Class level, and Chironomidae (midges) identified to Sub Family.

The Waterwatch sites for 2007 are

1. Creighton’s Creek at John Nielsen;s property– Waterwatch code CRE003

2. Results

Table 1. Biotic indices results for one site in the Goulburn Broken Waterwatch Program 2007 assessed against SEPP WoV objectives for biological indicators of environmental quality.

Site code/ year	Site location	Biological Region	Habitat	Number of families score	SIGNAL index score	EPT	Key families Combined Habitat score	Site Pass Fail
CRE003 2007	Creighton’s Creek at John Nielsens	B4	Riffle	26	6.5	N/O	24	Pass
CRE003 2007	Creighton’s Creek at John Nielsens	B4	Edge	25	6.1	N/O	24	Fail

Marginal value

Fail

N/O No objective set for that indicator in that SEPP (WoV) region

3. Discussion

The data provided for Creighton’s Creek at John Nielsen’s property shows that Creighton’s Creek is meeting the SEPP biological objectives for the riffle but narrowly missing out for the edge samples in 2007.

The number of families for the edge is 25 (SEPP minimum is 26) so it is just one family below the minimum and all the other factors are compliant.

Appendix 1:

All of the following written information has been reproduced from the SEPP WoV (Victorian Environment Protection Authority 2003). The objectives for biological indicators of environmental quality are given for each of the biological regions and habitats covered by this report.

To meet objectives, sites assessed must return values equal to or greater than the values given in Table A1.1.

All three objectives should be met in region B4 and failure to meet any one of the objectives should trigger further investigation.

Table A1.1 Objectives for biological indicators of environmental quality as listed in the SEPP WoV (Victorian Environmental Protection Authority 2003)

Indicators Region & Habitat	No of Families	SIGNAL index score	EPT index score	Key families combined habitat
B4 riffle	23	5.5	N/A	22
B4 edge	26	5.5	N/A	22

N/A Not applicable in that region

TABLE A1.2

Families present in combined autumn and spring surveys for
 CRE003 – Creighton’s Creek at John Nielsen’s property Biological Region B4 Riffle
 Shaded boxes represent Key Families for Key Families Combined Habitat score.

Order	Family	SIGNAL GRADE SEPP	Common name
Coleoptera	Ptilidactylidae	10	Beetle larva
Ephemeroptera	Leptophlebiidae	10	Mayfly nymph
Ephemeroptera	Oniscigastridae	10	Mayfly nymph
Trichoptera	Calocidae	8	Sand case caddis larva
Trichoptera	Conoesucidae	8	Hooped case caddis larva
Trichoptera	Philorheithridae	8	Stocky sand caddis larva
O. Odonata SO Ephemeroptera	Gomphidae	7	Dragonfly nymph
Plecoptera	Gripopterygidae	7	Stonefly nymph
Trichoptera	Hydrobiosidae	7	Free swimming caddis larva
Coleoptera	Elmidae	7	Riffle beetle + larva
O. Odonata SO Ephemeroptera	Synthemistidae (Corduliidae)	7	Dragonfly nymph
Ephemeroptera	Caenidae	7	Mayfly nymph
Trichoptera	Leptoceridae	7	Stick caddis larva
Decapoda	Parastacidae	7	Yabbie
Diptera	S.F. Tanypodinae	6	Non biting midge larva
Diptera	S.F. Chironominae	6	Non biting midge larva
Diptera	Ceratopogonidae	6	Pog larva
C. Gastropoda	Ancylidae	6	Limpet
Coleoptera	Psephenidae	5	Water penny larva
Diptera	Tipulidae	5	Crane fly larva
Ephemeroptera	Baetidae	5	Mayfly nymph
Hemiptera	Corixidae	5	Water boatman
Diptera	Simuliidae	5	Blackfly larva
Diptera	S.F. Orthoclaadiinae	5	Non biting midge larva

Hemiptera	Veliidae	4	Water cricket
Oligochaeta		1	Worms
	No of Families 26	Total 169	
		SIGNAL index score 6.5	

TABLE A1.3

Families present in spring surveys for

CRE003 – Creighton’s Creek at John Nielsen’s Biological Region B4 - Edge

Shaded boxes represent Key Families for Key Families Combined Habitat score.

Order	Family	SIGNAL GRADE SEPP	Common name
Ephemeroptera	Leptophlebiidae	10	Mayfly nymph
Ephemeroptera	Oniscigastridae	10	Mayfly nymph
Trichoptera	Philorheithridae	8	Sand case caddis larva
Trichoptera	Limnephilidae	8	Untidy case caddis larva
Trichoptera	Conoesucidae	8	Sand case caddis larva
Trichoptera	Calamoceratidae	8	Sleeping bag caddis larva
Diptera	Dixidae	8	U bent fly larva
O. Odonata S.O Zygoptera	Synlestidae	7	Damselfly nymph
Coleoptera	Elmidae	7	Riffle beetle larva
O. Odonata S.O. Epiroctophora	Gomphidae	7	Dragonfly nymph
O. Odonata S.O Zygoptera	Megapodagrionidae	7	Damselfly nymph
Trichoptera	Leptoceridae	7	Stick caddis larva
Hemiptera	Gelastocoridae	6	Toad bug
Diptera	S.F. Tanypodinae	6	Non biting midge larva
Diptera	Ceratopogonidae	6	Pog larva
Diptera	S.F.Chironominae	6	Non biting midge larva
Ephemeroptera	Baetidae	5	Mayfly nymph
Diptera	S.F. Orthoclaadiinae	5	Non biting midge larva
Diptera	Simuliidae	5	Blackfly larva
Hemiptera	Corixidae	5	Water boatmen
Hemiptera	Veliidae	4	Water cricket

P. Platyhelminthes	Dugesiiidae	3	Flatworm
Gastropoda	Planorbidae	3	Pond snail left coil
C. Hirudinea	Glossiphoniidae	3	Black leech
C. Oligochaeta		1	Worms
	No of Families 25	Total 153	
		SIGNAL index score 6.1	

Monitoring for Creighton's Creek in 2008

The Creighton's Creek Monitoring Group is encouraged to continue their monitoring program in 2008. Results for 2007 show that the sub-catchment has elevated levels of turbidity when compared with the SEPP objective for a waterway in this part of the catchment. Similarly, total phosphorus levels are above the objective. However, Electrical Conductivity is well under the SEPP objectives.

Similar sampling sites are recommended for 2008, and a continuation of the reduced sampling program for total phosphorus.

Electrical conductivity results from this monitoring program are being forwarded to the Commonwealth Bureau of Rural Sciences for inclusion in the two year Community Stream Sampling Program.