

## 8.72 Avoca macroinvertebrate survey results

### LAKE LALBERT

1997 Macroinvertebrate Data for Lake Lalbert							
				Water Quality		Vegetation	
	Collected by:	Ron Davies		pH	7.78	Red Gum Woodland	
	Date Collected:	17/12/97		Temp °C	22.8	with Black Box on	
	Identified by:	Lisa Cox		Cond.EC	3450	rises. Understorey of	
				DO mg/L	6.95	Tangled Lignum and	
				Turb.NTU	36	Cane Grass	
Results (% Abundance)							
Class/Order	Family	Site 1	Site 2	Site 3	Site 4	Site 5	Overall
Hirudinea	Glossiphonidae	0.3	0.0	0.0	0.0	0.0	0.1
Bivalvia	Hyriidae	0.0	0.0	0.0	0.3	0.0	0.1
Gastropoda	Ancylidae	0.0	0.0	0.0	0.0	1.0	0.2
	Lymnaeidae	21.7	0.0	0.0	0.0	0.0	4.3
	Planorbidae	13.7	12.0	1.0	3.3	12.0	8.4
	Physidae	4.0	10.3	0.3	11.3	8.7	6.9
Acarina	*	1.0	0.3	0.7	3.7	1.0	1.3
Cladocera	Daphniidae	0.7	0.3	1.3	15.0	6.0	4.7
Ostracoda	*	1.7	7.7	0.0	2.7	2.7	2.9
Calanoida	Boeckella	0.0	0.0	0.3	0.3	0.0	0.1
Decapoda	Atyidae	0.0	1.7	0.0	5.3	3.0	2.0
	Parastacidae	0.7	0.7	0.0	0.0	0.0	0.3
Coleoptera	Curculionodae	0.3	0.0	0.0	0.0	0.0	0.1
	Dytiscidae (A)	0.0	0.0	0.3	0.0	0.0	0.1
	Hydrophilidae (A)	0.7	0.0	0.0	0.0	0.0	0.1
Diptera	Chironimidae (L)	2.7	4.7	8.0	2.0	8.3	5.1
	Chironimidae (P)	0.3	0.3	2.7	2.0	0.7	1.2
	Muscidae	0.3	0.0	0.0	0.0	0.0	0.1
	Stratiomyidae	0.0	0.0	0.3	0.0	0.0	0.1
Ephemeroptera	Baetidae	4.7	10.7	2.0	5.0	4.0	5.3
	Caenidae	0.7	0.0	3.3	0.0	1.0	1.0
Hemiptera	Belostomidae	1.3	0.0	0.0	0.0	0.0	0.3
	Corixidae	11.7	1.3	62.0	14.0	1.3	18.1
	Notonectidae	0.3	0.0	0.0	0.0	0.0	0.1
Lepidoptera	Pyralidae	0.0	0.0	0.3	0.0	0.0	0.1
Anisoptera	Aeshnidae	1.3	1.0	0.0	1.0	2.3	1.1
	Corduliidae	1.7	2.3	1.3	1.0	2.3	1.7
	Libellulidae	0.7	8.0	0.0	0.0	0.0	1.7
Zygoptera	Coenogrigionidae	25.7	21.0	12.3	31.0	32.0	24.4
Trichoptera	Ecnomidae	0.0	0.0	0.7	0.0	0.3	0.2
	Hydroptilidae	0.0	0.3	0.0	0.0	2.3	0.5
	Leptoceridae	4.0	17.3	3.0	2.0	11.0	7.5
<b>Total Taxa</b>		23	16	16	15	17	31
<b>Total Percentage</b>		100	100	100	100	100	100

\* All specimens have been identified to Family level where practical.

Acarina, Cyclopoida and Ostracoda have been identified to a higher taxonomic level, usually Order.

L-Larva A-Adult P-Pupa

## 8.73 Loddon macroinvertebrate survey results

### TANG TANG SWAMP

1996 Macroinvertebrate Data for Tang Tang Swamp (Baseline survey)							
	Collected by:	A. Keleher		Red Gum Wetland with Northern Plains			
	Date Collected:	23/12/96		Grassland surrounding the swamp.			
	Identified by:	MAFRI		Understorey of introduced grasses			
				And sedges			
Results (% Abundance)							
Class/Order	Family	Site 1	Site 2	Site 3	Site 4	Site 5	Overall
Gastropoda	Planorbidae/Physidae	0.0	2.7	1.5	0.7	5.3	2.0
Oligochaeta	*	0.0	0.0	0.0	0.3	0.0	0.1
Araneae	*	0.3	0.0	0.6	1.7	0.3	0.6
Acarina	*	0.9	0.0	0.0	1.0	1.3	0.6
Cladocera	Daphniidae	4.7	9.4	15.6	6.9	0.7	7.6
Calanoida	Centropagidae	0.3	0.3	0.0	0.0	0.0	0.1
Ostracoda	*	12.3	19.7	16.9	11.2	18.2	15.7
Amphipoda	Ceinidae	0.6	0.0	0.0	0.0	2.3	0.6
Ephemeroptera	Baetidae	21.5	0.9	4.6	13.9	0.3	8.2
Odonata	Coenagrionidae	4.1	5.2	4.6	5.6	3.3	4.6
Odonata	Lestidae	1.9	1.5	1.2	9.6	3.3	3.4
Odonata	Aeshnidae	1.3	0.6	0.6	3.6	4.6	2.1
Hemiptera	Corixidae	9.8	6.1	3.7	1.7	10.3	6.3
Hemiptera	Notonectidae	15.1	11.8	12.0	8.6	14.6	12.4
Hemiptera	Mesoveliidae	1.6	2.1	0.0	0.0	0.0	0.8
Hemiptera	Veliidae	0.6	0.0	0.6	3.3	0.0	0.9
Coleoptera	Dytiscidae (L)	0.0	1.8	1.2	0.7	2.3	1.2
Coleoptera	Dytiscidae (A)	2.2	0.6	1.8	1.7	0.0	1.3
Coleoptera	Hydrophilidae (L)	2.2	2.7	0.3	2.3	0.7	1.6
Coleoptera	Hydrophilidae (A)	0.9	2.4	1.8	1.0	1.0	1.5
Coleoptera	Curculionidae (A)	0.0	0.0	0.3	0.0	0.0	0.1
Diptera	Chironomidae	8.5	24.8	23.6	7.6	24.5	17.9
Diptera	Culicidae	0.0	0.3	0.0	0.0	0.0	0.1
Diptera	Ceratopogonidae	0.6	0.0	0.0	0.0	0.0	0.1
Diptera	Ephydriidae	0.0	0.0	0.0	0.3	0.0	0.1
Diptera	Sciomyzidae	0.3	0.0	0.0	0.0	0.0	0.1
Diptera	Stratiomyidae	8.8	6.7	8.6	17.5	5.6	9.4
Trichoptera	Leptoceridae	0.6	0.0	0.0	0.7	0.0	0.3

Trichoptera	Hydroptilidae	0.0	0.3	0.0	0.3	1.3	0.4
Lepidoptera	Pyralidae	0.6	0.0	0.3	0.0	0.0	0.2
<b>Total Taxa</b>		<b>23</b>	<b>19</b>	<b>19</b>	<b>22</b>	<b>18</b>	<b>30</b>
<b>Totals</b>		<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

\* All specimens have been identified to Family level where practical.

Acarina, Cyclopoida and Ostracoda have been identified to a higher taxonomic level, usually Order.

L-Larva A-Adult P-Pupa

### **Interpretation**

Tang Tang Swamp has a relatively high taxa richness when compared to other wetlands across the state. Taxa present in Tang Tang Swamp included several families that are potentially sensitive to salinity and other pollutants suggesting a relatively high level of biological health.

(Table and interpretation taken from O'Brien and Kefford, May 1997)

1997 Macroinvertebrate Data for Tang Tang Swamp							
	Collected by:	A. Keleher		Red Gum Wetland with Northern Plains			
	Date Collected:	17/12/97		Grassland surrounding the swamp.			
	Identified by:	MAFRI		Understorey of introduced grasses			
				And sedges			
Class/Order	Family	Site 1	Site 2	Site 3	Site 4	Site 5	Overall
Gastropoda	Ancylidae	1.2	0.3	1.5	3.3	4.0	2.0
Gastropoda	Planorbidae/Physidae	12.4	12.3	13.1	5.9	10.2	10.9
Gastropoda	Planorbidae	0.0	0.9	0.6	2.6	1.8	1.2
Bivalvia	Hyriidae	1.2	0.9	0.0	0.0	0.3	0.5
Hirudinea		0.0	0.0	0.0	0.3	0.3	0.1
Oligochaeta		5.0	2.4	0.9	1.3	0.0	2.0
Araneae		0.3	0.3	0.6	0.0	0.6	0.4
Acarina		0.0	0.0	0.3	0.3	0.3	0.2
Cladocera	Daphniidae	1.2	0.3	0.3	0.3	0.9	0.6
Cyclopoida		0.0	0.3	0.0	1.3	0.9	0.5
Calanoida	Centropagidae	2.4	0.9	0.3	1.0	5.2	2.0
Ostracoda		8.2	14.7	16.3	19.1	11.7	13.9
Amphipoda	Ceinidae	0.6	0.0	0.0	0.0	0.0	0.1
Ephemeroptera	Baetidae	1.5	0.9	1.8	1.7	2.5	1.6
Odonata	Coenagrionidae	3.8	2.7	5.6	5.0	6.8	4.8
Odonata	Lestidae	0.9	0.6	0.3	1.0	0.6	0.7
Odonata	Aeshnidae	0.6	0.0	0.3	0.3	0.0	0.2
Hemiptera	Corixidae	8.8	11.1	23.4	22.4	16.0	16.2
Hemiptera	Notonectidae	3.2	8.7	13.1	7.6	4.3	7.4
Hemiptera	Mesoveliidae	0.0	0.0	0.0	0.0	0.6	0.1
Hemiptera	Veliidae	0.0	0.9	0.0	0.0	0.0	0.2
Coleoptera	Dytiscidae (L)	0.3	0.3	0.0	0.0	0.6	0.2
Coleoptera	Dytiscidae (A)	0.3	0.0	0.3	1.0	0.3	0.4
Coleoptera	Hydrophilidae (L)	5.9	4.8	4.2	10.9	11.7	7.4
Coleoptera	Hydrophilidae (A)	0.3	0.3	1.5	0.7	1.2	0.8
Coleoptera	Carabidae (A)	0.0	0.0	0.3	0.0	0.0	0.1
Coleoptera	Curculionidae (A)	0.0	0.3	0.0	0.0	0.0	0.1
Coleoptera	Hydraenidae (A)	0.0	0.0	0.3	0.3	0.0	0.1
Coleoptera	Staphylinidae (A)	0.0	0.0	0.3	0.3	0.0	0.1
Diptera	Chironomidae	32.9	32.3	10.4	9.2	14.8	20.2
Diptera	Chironomidae pupae	2.6	3.3	0.9	0.0	1.2	1.6
Diptera	Culicidae	0.0	0.3	0.0	0.0	0.0	0.1
Diptera	Ceratopogonidae	0.6	0.0	0.0	0.0	0.0	0.1
Diptera	Dolichopodidae	0.0	0.0	0.3	0.0	0.0	0.1
Diptera	Ephydriidae	0.0	0.3	0.0	0.0	0.0	0.1
Diptera	Stratiomyidae	5.3	0.3	3.0	4.0	3.1	3.1
Diptera	Thaumaleidae	0.0	0.0	0.3	0.0	0.0	0.1
Trichoptera	Leptoceridae	0.9	0.0	0.0	0.0	0.0	0.2
Trichoptera	Ecnomidae	0.3	0.0	0.0	0.0	0.0	0.1
<b>Total Taxa</b>		<b>24</b>	<b>24</b>	<b>26</b>	<b>23</b>	<b>24</b>	<b>39</b>
<b>Totals</b>		<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

\* All specimens have been identified to Family level where practical.

Acarina, Cyclopoida and Ostracoda have been identified to a higher taxonomic level, usually Order.

L-Larva A-Adult P-Pupa

## **Interpretation**

Tang Tang Swamp has a relatively high taxa richness when compared to other wetlands across the state, including several Families that are potentially sensitive to salinity and other pollutants. The Bivalvia-Hyriidae and all gastropods present are potentially sensitive to salinity. This includes new taxa of Gastropods (Ancylidae and Planorbidae) and Bivalvia not present in 1996 samples. Dipteran Families (except Chironomidae and Ceratopogonidae) and the Ephemeropteran-Baetidae are also sensitive to salinity and other pollutants. Some members of the Order Ostracoda and the Trichopteran Hydroptilidae are potentially sensitive to small increases in salinity, though they can be found in areas with high levels of salinity. Another taxa present potentially sensitive to salinity is Cladocera.

Odonates are generally regarded as being moderately tolerant to salinity. In general Families from the Orders Amphipoda, Hemiptera and Coleoptera are poor indicators of wetland health because they are found over a wide range of salinities. It must be noted that some Families are more tolerant than others, especially Ceinidae (Amphipoda), Hydrophilidae (Coleoptera) and Dytiscidae (Coleoptera).

The differences in assemblages between years such as the inclusion of Oligochaetes and exclusion of the Lepidopteran-Pyralidae may be due to lower water levels and subsequent habitat availability, since both Orders are known to have taxa tolerant to salinity. Tang Tang Swamp has a relatively high level of biological health.

(Table and report taken from Lieschke and O'Brien March 1997)

2001 Macroinvertebrate Data for Tang Tang Swamp							
	Collected by:	M.Waayers		Red Gum Wetland with Northern Plains			
	Date Collected:	19/01/01		Grassland surrounding the swamp.			
	Identified by:	MAFRI		Understorey of introduced grasses			
				And sedges			
Class/Order	Family	Site 1	Site 2	Site 3	Site 4	Site 5	Overall
Hemiptera	Notonectidae	10.3	19.9	17.2	17.3	18.2	16.4
Diptera	Chironomidae	22.1	12.3	7.9	12.0	12.3	13.6
Ostracoda	*	15.8	11.6	13.2	11.0	8.8	12.2
Hemiptera	Coroxidae	14.4	10.0	6.6	9.7	8.8	10.0
Diptera	Stratiomyidae	8.0	9.0	9.6	8.3	9.4	8.8
Odonata	Coenagrionidae	14.9	9.0	6.3	5.3	4.5	8.2
Coleoptera	Hydrophilidae (L)	2.3	4.0	5.6	10.3	9.7	6.3
Coleoptera	Hydraenidae (A)	0.9	7.6	6.9	10.3	6.2	6.2
Cladocera	Daphniidae	3.7	7.0	5.3	0.3	4.2	4.1
Odonata	Aeshnidae	1.4	2.7	1.7	0.7	2.6	1.8
Oligochaeta	*	1.4	1.3	1.3	2.0	1.9	1.6
Gastropoda	Physidae	0.0	1.0	3.3	1.3	2.6	1.6
Hemiptera	Veliidae	0.0	0.0	2.6	0.3	4.9	1.5
Coleoptera	Hydrophilidae (A)	0.6	0.3	2.3	2.7	1.6	1.5
Araneae	*	0.9	0.7	2.6	1.3	1.0	1.3
Acarina	*	0.0	0.0	1.3	3.3	0.6	1.0
Trichoptera	Leptoceridae	1.1	1.3	0.0	1.3	0.6	0.9
Coleoptera	Dytiscidae (A)	0.0	0.0	2.6	0.0	0.3	0.6
Coleoptera	Dytiscidae (L)	0.3	0.7	1.3	0.0	0.3	0.5
Diptera	Culicidae	0.3	0.7	1.0	0.3	0.3	0.5
Odonata	Lestidae	0.9	1.0	0.3	0.0	0.0	0.4
Cyclopoida	*	0.0	0.0	0.3	1.0	0.6	0.4
Diptera	Ephydriidae	0.6	0.0	0.3	0.0	0.0	0.2
Coleoptera	Curculionidae (A)	0.0	0.0	0.0	0.7	0.0	0.1
Hemiptera	Salididae	0.0	0.0	0.0	0.0	0.3	0.1
Hemiptera	Mesoveliidae	0.0	0.0	0.0	0.3	0.0	0.1
Odonata	Libellulidae	0.0	0.0	0.3	0.0	0.0	0.1
<b>Total Taxa</b>		<b>18</b>	<b>18</b>	<b>23</b>	<b>21</b>	<b>22</b>	<b>27</b>
<b>Total %</b>		<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

\* not identified further

## Interpretation

The predominant taxa at all five sites sampled were Notonectidae (Hemiptera) – Water boatmen or backswimmers, Chironomidae (Diptera) – Midge fly larvae, Ostracoda – Seed shrimps and Corixidae (Hemiptera) – Lesser water boatmen. The maximum of 23 taxa was found at site 3 and Tang Tang Swamp had a total of 27 taxa overall.

These results demonstrate that Tang Tang Swamp contains a relatively high taxa richness when compared to other wetlands across the State. Several families that are potentially sensitive to salinity and other pollutants were present at Tang Tang Swamp in all years of monitoring, suggesting a relatively high level of biological health. Although the total number of taxa in 2001 was less than that found in 1996 and 1997 monitoring events, possibly due to drier conditions in this season of sampling, taxa richness in all years remains high. The average conductivity and turbidity found in 2001 monitoring was an improvement compared to 1997 levels, however, this would not have appeared to affect the number of taxa found, as 1997 was recorded as having the highest number of taxa from all years of monitoring.

Comparison between the three years of sampling conducted at Tang Tang Swamp shows 1997 with the highest total taxa of 38 compared to 30 taxa in 1996 and 27 taxa in 2001 (refer to table X). Ten taxa found in the 1997 sampling, in relatively small numbers, were absent in the years 1996 and 2001. Libellulidae and Saldidae were the only taxa found in 2001 not present in previous years.

Water quality averages at Tang Tang Swamp during 1997 and 2001 macroinvertebrate monitoring (no data available for 1996)

<b>Tang Tang Swamp</b>	<b>1997</b>	<b>2001</b>
Water Temperature (°C)	<b>20.1</b>	<b>28.7</b>
Conductivity (µS/cm)	<b>1730</b>	<b>762</b>
pH	<b>8.2</b>	<b>8.1</b>
Dissolved Oxygen (mg/l)	<b>4.3</b>	<b>15.2</b>
Turbidity (NTU)	<b>501.8</b>	<b>106.2</b>

Comparisons of average conductivity at Tang Tang Swamp in 1997 show a very high reading of 1730 µS/cm compared to 762 µS/cm in 2001. Turbidity in 1997 was also very high with an average reading of 501.8 NTU compared to 106.2 NTU in the 2001 monitoring. The average pH for both years was found to be similar.

(Tables and report taken from Crowther, McKay and Papas March 2001)

Percentage composition of taxa present at Tang Tang Swamp during 1996, 1997 and 2001 macroinvertebrate monitoring

<b>Class/Order</b>	<b>Family</b>	<b>1996</b>	<b>1997</b>	<b>2001</b>
Hemiptera	Notonectidae	12.4	7.4	16.4
Diptera	Chironomidae	17.9	20.2	13.6
Ostracoda	*	15.7	13.9	12.2
Hemiptera	Coroxidae	6.3	16.2	10.0
Diptera	Stratiomyidae	9.4	3.1	8.8
Odonata	Coenagrionidae	4.6	4.8	8.2
Coleoptera	Hydrophilidae (L)	1.6	7.3	6.3
Coleoptera	Hydraenidae (A)	0.0	0.1	6.2
Cladocera	Daphniidae	7.6	0.6	4.1
Odonata	Aeshnidae	2.1	0.2	1.8
Oligochaeta	*	0.1	2.0	1.6
Gastropoda	PlanorbidaePhysidae	2.0	12.0 <sup>1</sup>	1.6#
Hemiptera	Veliidae	0.8	0.2	1.5
Coleoptera	Hydrophilidae (A)	1.5	0.8	1.5
Araneae	*	0.6	0.4	1.3
Acarina	*	0.6	0.2	1.0
Trichoptera	Leptoceridae	0.3	0.2	0.9
Coleoptera	Dytiscidae (A)	1.3	0.3	0.6
Coleoptera	Dytiscidae (L)	1.2	0.2	0.5
Diptera	Culicidae	0.1	0.1	0.5
Odonata	Lestidae	3.4	0.6	0.4
Cyclopoida	*	0.0	0.5	0.4
Diptera	Ephydriidae	0.1	0.1	0.2
Coleoptera	Curculionidae (A)	0.1	0.1	0.1
Hemiptera	Salididae	0.0	0.0	0.1
Hemiptera	Mesoveliidae	0.7	0.0	0.1
Odonata	Libellulidae	0.0	0.0	0.1
Ephemeroptera	Baetidae	8.1	1.5	0.0
Amphipoda	Ceinidae	0.6	0.1	0.0
Trichoptera	Hydroptilidae	0.4	0.0	0.0
Lepidoptera	Pyralidae	0.2	0.0	0.0
Diptera	Sciomyzidae	0.1	0.0	0.0
Diptera	Ceratopogonidae	0.1	0.1	0.0
Calanoida	Centropagidae	0.1	2.0	0.0
Gastropoda	Ancylidae	0.0	2.0	0.0
Bivalvia	Hyriidae	0.0	0.5	0.0
Hirundinea	*	0.0	0.1	0.0
Hemiptera	Hebriidae	0.0	0.1	0.0
Coleoptera	Carabidae (A)	0.0	0.1	0.0
Coleoptera	Staphylinidae (A)	0.0	0.1	0.0
Diptera	Chironomidae pupae	0.0	1.6	0.0
Diptera	Dolichopodidae	0.0	0.1	0.0
Diptera	Thaumaleidae	0.0	0.1	0.0
Trichoptera	Ecnomidae	0.0	0.1	0.0
<b>Total Taxa</b>		<b>30</b>	<b>38</b>	<b>27</b>
<b>Total %</b>		<b>100</b>	<b>100</b>	<b>100</b>

- not identified further
- #Identified as Physidae in samples from 2001
- <sup>1</sup> Specimens as Planorbidae are now grouped with Phanorbidae/Physidae

**TANG TANG SWAMP HAS REMAINED DRY SINCE SEPTEMBER  
2002**