

Macroinvertebrate Survey

Instructions

1. write your group name, water site name and date at the bottom of this page
2. tick the image of each different type of macroinvertebrate collected
3. **Biodiversity**: add up the number of different types of macroinvertebrates and write it in the space for **total number of types** in the table below
4. **Ecological health**: work out which group had the most number of different types of macroinvertebrates and write it in the space for **dominant group** in the table below
5. **Ecological health**: add up the SIGNAL grades on each ticked image and write it in the space for **total site score** in the table below
6. look at the rating table below for **total site score** and circle the quality rating for the water surveyed
7. look at the rating table below for **total number of types** and circle the quality rating for the water surveyed

Biodiversity		
How many different types of macroinvertebrates?	Total Number of Types	
Ecological health		
Which group had the most types of macroinvertebrates?	Dominant Group	
Add the grades for each macroinvertebrate type.	Total Site Score	

rating tables

Total Number of Types	
0-5	poor
6-10	fair
11-15	good
16-23	very good
24+	excellent

Total Site Score	
0-44	poor
45-55	fair
56-73	good
74-110	very good
111+	excellent

name of group		date	
name of water site			

May 2005



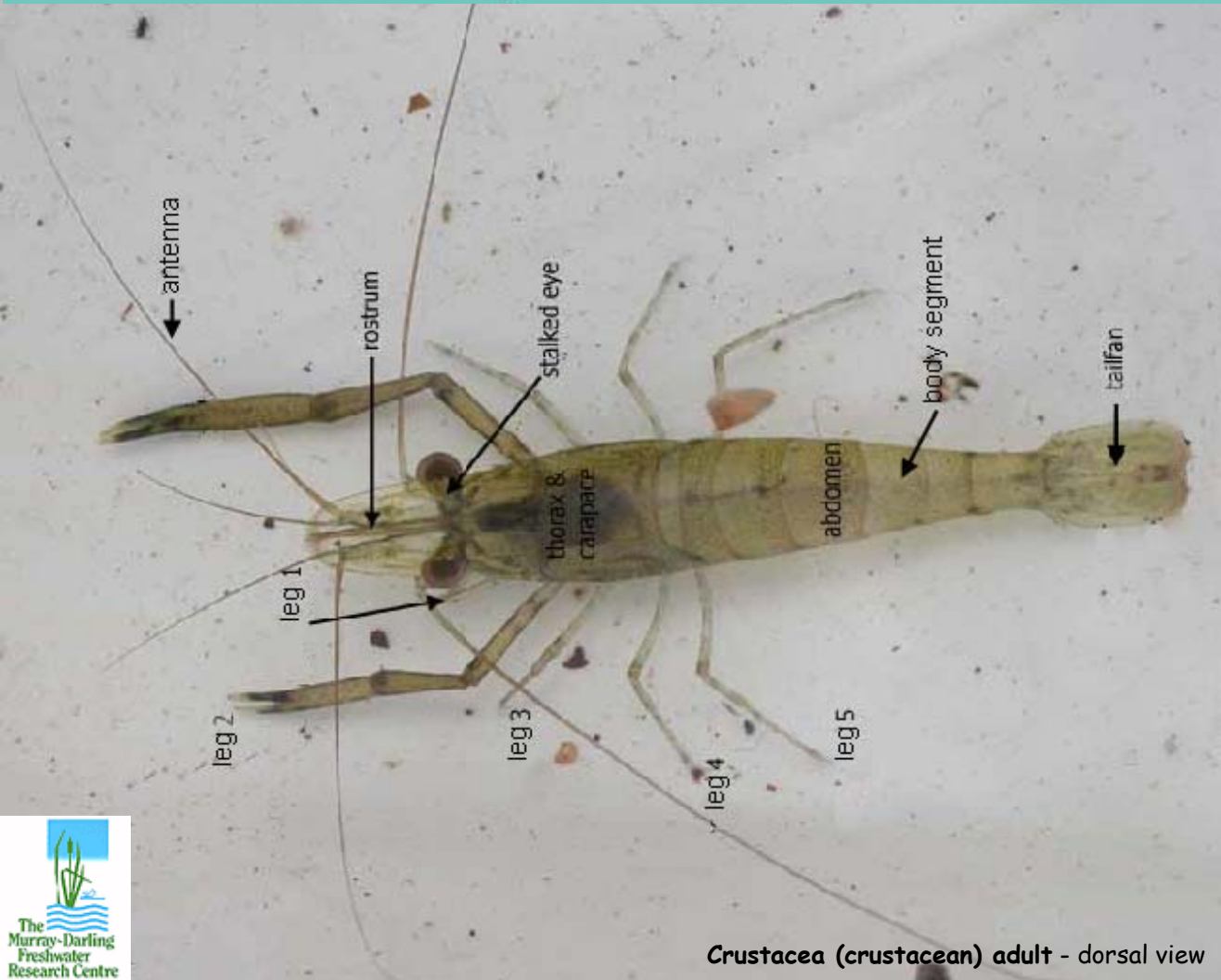
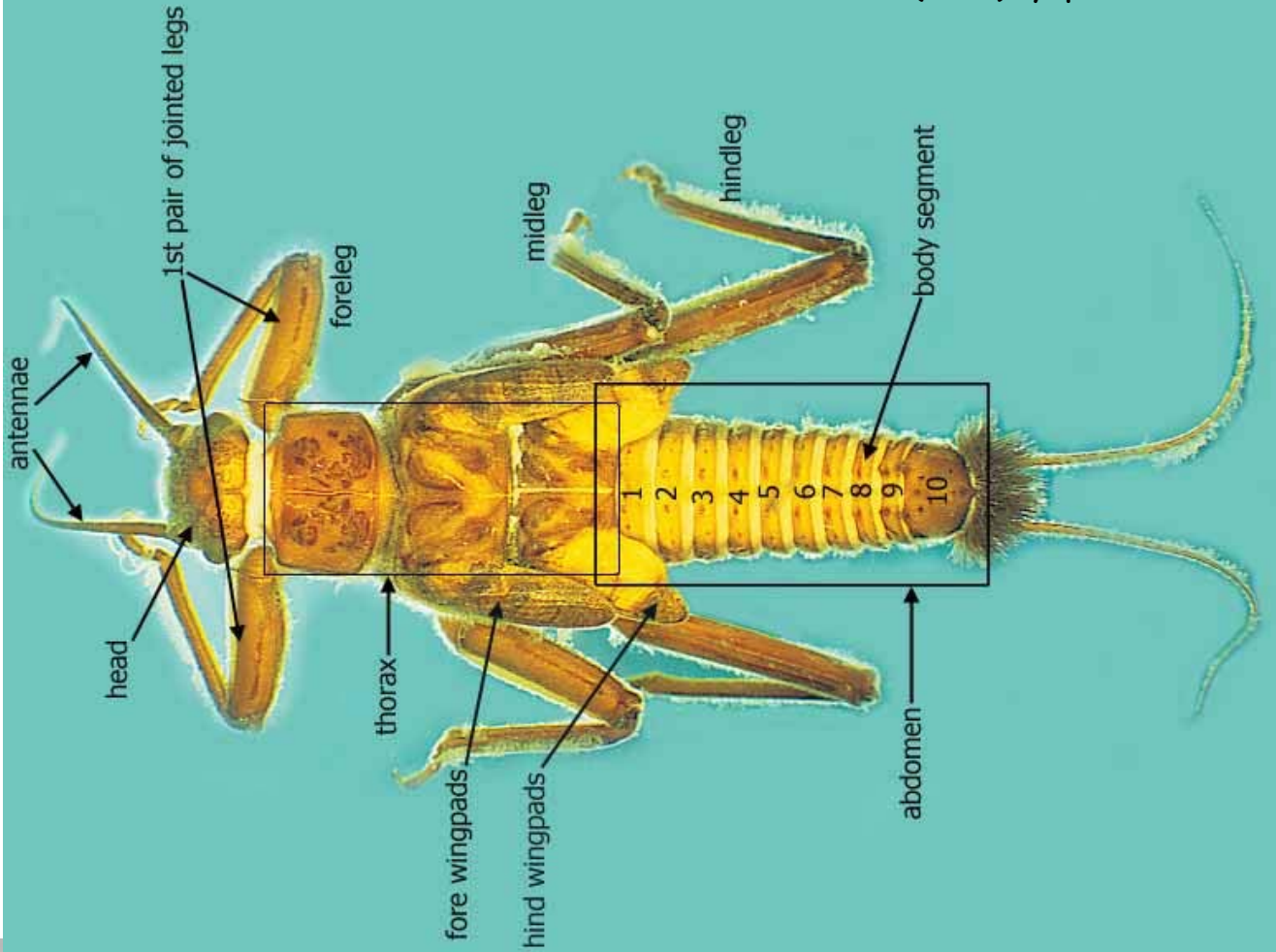
Definitions

- Macroinvertebrate: an animal without a backbone that is visible by eye, without a microscope
- Biodiversity: the variety of animals living in an area
- SIGNAL grade: a number given to each type of macroinvertebrate that indicates its pollution tolerance or intolerance.
 - A SIGNAL grade of 10-8 indicates a high sensitivity to pollution.
 - A SIGNAL grade of 7-5 indicates a greater tolerance to pollution.
 - A SIGNAL grade of 4-3 indicates a tolerance to pollution.
 - A SIGNAL grade of 2-1 indicates a greater tolerance to pollution.
- Ecological health: the ability of an area to sustain animal life. A diverse community of high grade types indicates a healthy ecosystem. A community with high numbers of a few low grade types indicates a degraded aquatic ecosystem.

Identifications

- Insecta (insect adults, nymphs, larvae): 3pairs of legs; divided into head, thorax, abdomen; with or without wings; size up to 110 mm
- Collembola (springtail): 3pairs of legs; divided into head, thorax, abdomen; no wings; size up to 3mm
- Acariformes (water mite): 4 pairs of legs; body round, not divided; size up to 5 mm
- Crustacea (crustacean): 5 pairs of legs; distinct head; body segmented; with or without soft shell; size up to 400 mm
- Gastropoda (snail): no legs; single hard shell; size 3 -30 mm
- Bivalvia (freshwater mussel): no legs; 2 hinged hard shells; size 5 – 200 mm
- Insecta (insect larvae): no legs; no shell; body long, round, segmented; head hard, dark; size 2 – 25 mm
- Hirudinea (leech): no legs; no shell; body long, round, segmented; no head visible; with suckers; size up to 80 mm
- Oligochaeta (segmented worm): no legs; no shell; body long, round, segmented; no head visible; no suckers; size 1 - 100 mm
- Nematoda (round worm): no legs; no shell; body long, round, not segmented; size up to 4 mm
- Tricladia (flat worm): no legs; no shell; body long, flat, not segmented; size up to 20 mm
- Hydrozoa (hydra): no legs; no shell; with tentacles; attached to other objects; size up to 15 mm

Insecta (insect) nymph - dorsal view



Crustacea (crustacean) adult - dorsal view

Very Sensitive Macroinvertebrates

Insecta (insects)



Plecoptera
(stonefly nymph)



Ephemeroptera
(mayfly nymph)



Trichoptera - case making
(caddisfly larva)



Trichoptera
(caddisfly larva)

Sensitive Macroinvertebrates

Insecta (insects)



Coleoptera: Elmidae
(riffle beetle larva)



Coleoptera: Elmidae
(riffle beetle adult)



Odonata: Epiproctophora
(dragonfly larva)



Odonata: Zygoptera
(damselfly larva)



Megaloptera: Corydalidae
(dobsonfly larva)



Megaloptera: Sialidae
(alderfly larva)



Diptera: Tipulidae
(cranefly larva)

Crustacea (crustaceans)



Decapoda: Atyidae
(freshwater shrimp)



Decapoda: Parastacidae
(yabby)



Isopoda
(freshwater slater)

others



Acariformes
(water mite)



Bivalvia
(freshwater mussel)

Tolerant Macroinvertebrates

Insecta (insects)



4

Hemiptera: Nepidae
(water scorpion)



4

Hemiptera: Corixidae
(water boatman)



4

Hemiptera: Notonectidae
(backswimmer)



4

Hemiptera: Gerridae
(water strider)



3

Hemiptera: Hydrometridae
(water measurer)



4

Coleoptera: Dytiscidae
(diving beetle larva)



4

Coleoptera: Dytiscidae
(diving beetle adult)



4

Coleoptera: Gyrinidae
(whirligig beetle larva)



4

Coleoptera: Gyrinidae
(whirligig beetle)



4

Diptera: Stratiomyidae
(soldierfly larva)

Crustacea (crustaceans)



4

Copepoda
(copepod)



4

Ostracoda
(seed shrimp)



3

Amphipoda
(sandhopper)

others



4

Hydrozoa
(hydra)



3

Tricladia
(flatworm)



3

Nematoda
(round worm)



3

Gastropoda
(snail)



3

Hirudinea
(leech)



Very Tolerant Macroinvertebrates

Insecta (insects)



Diptera: Simuliidae
(blackfly larva)



Diptera: Chironomidae
(midge larva)



Diptera: Chironomidae
(blood worm)



Diptera: Culicidae
(mosquito larva)

others



Collembola
(springtail)



Oligochaeta
(segmented worm)

Waterwatchers Macroinvertebrate Relationships			
major group	minor group/order	sub order	family
Hydrozoa (hydra)			
Tricladia (flatworms)			
Nematoda (round worms)			
Oligochaeta (segmented worms)			
Hirudinea (leeches)			
Gastropoda (snails)			
Bivalvia (mussels)			
Acariformes (water mites)			
Collembola (springtails)			
Crustacea (crustaceans)			
	Copepoda (copepods)		
	Cladocera (water fleas)		
	Ostracoda (seed shrimps)		
	Isopoda (water slaters)		
	Amphipoda (sandhoppers)		
	Decapoda (yabbies, shrimps)		
			Parastacidae (yabbies)
			Atyidae (shrimp)
Insecta (insecta)			
	Ephemeroptera (mayflies)		
	Plecoptera (stoneflies)		
	Trichoptera (caddisflies)		
	Odonata (damselflies, dragonflies)		
		Epiproctophora (dragonflies)	
		Zygoptera (damselflies)	
	Megaloptera (alderflies, dobsonflies)		
			Corydalidae (dobsonflies)
			Sialidae (alderflies)
	Hemiptera (bugs)		
			Corixidae (water boatmen)
			Gerridae (water striders)
			Hydrometridae (water measurers)
			Nepidae (water scorpions)
			Notonectidae (backswimmers)
	Coleoptera (beetles)		
			Dytiscidae (diving beetles)
			Gyrinidae (whirligig beetles)
	Diptera (true flies)		
			Chironomidae (midges, blood worms)
			Culicidae (mosquitoes)
			Simuliidae (blackflies)
			Stratiomyidae (soldierflies)
			Tipulidae (craneflies)