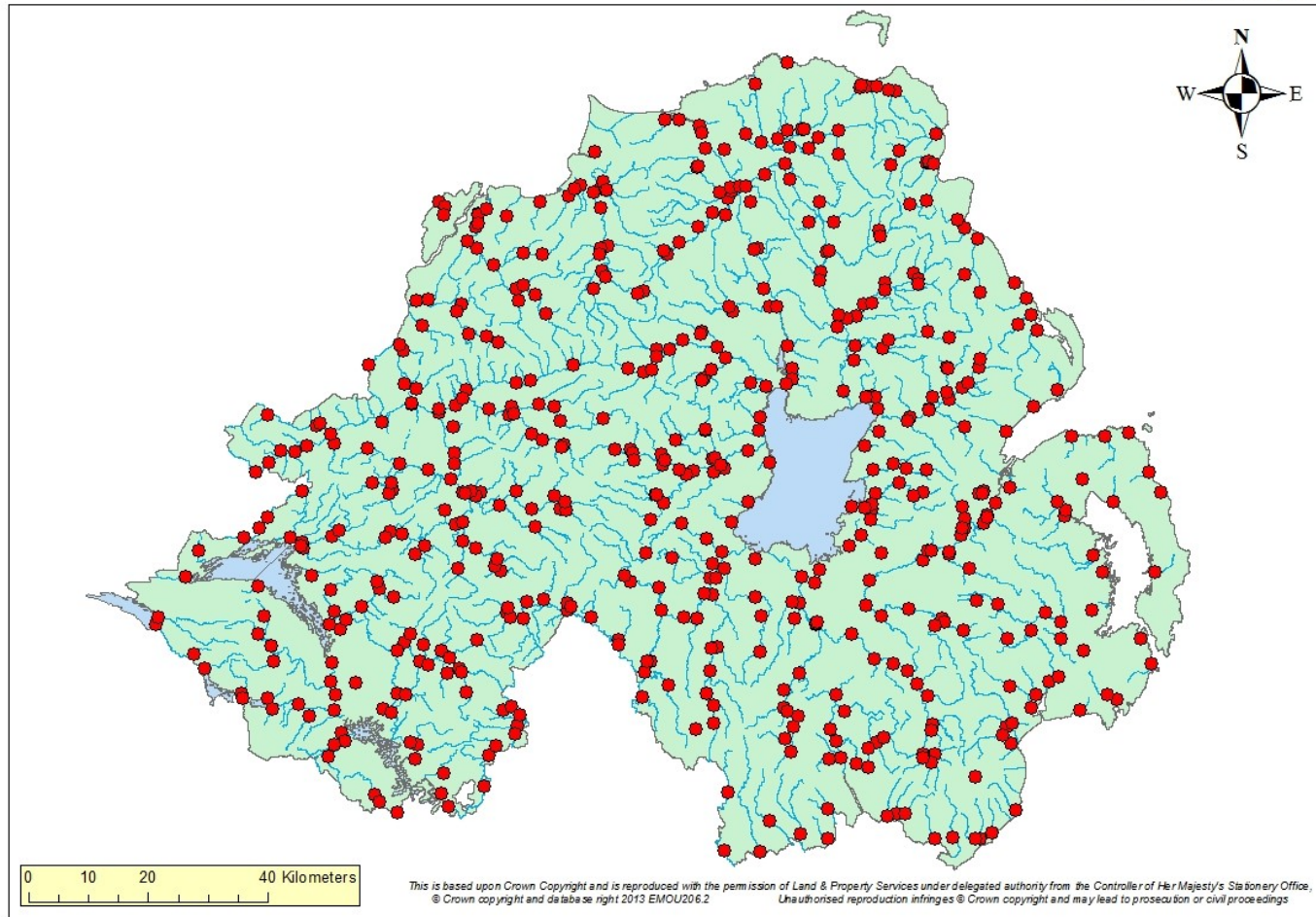


Good Bugs / Bad Bugs and Macrophytes as Water Quality Indicators

**Biological Monitoring in Rivers with
Freshwater Invertebrates and Plants**

Monitoring Sites in Northern Ireland

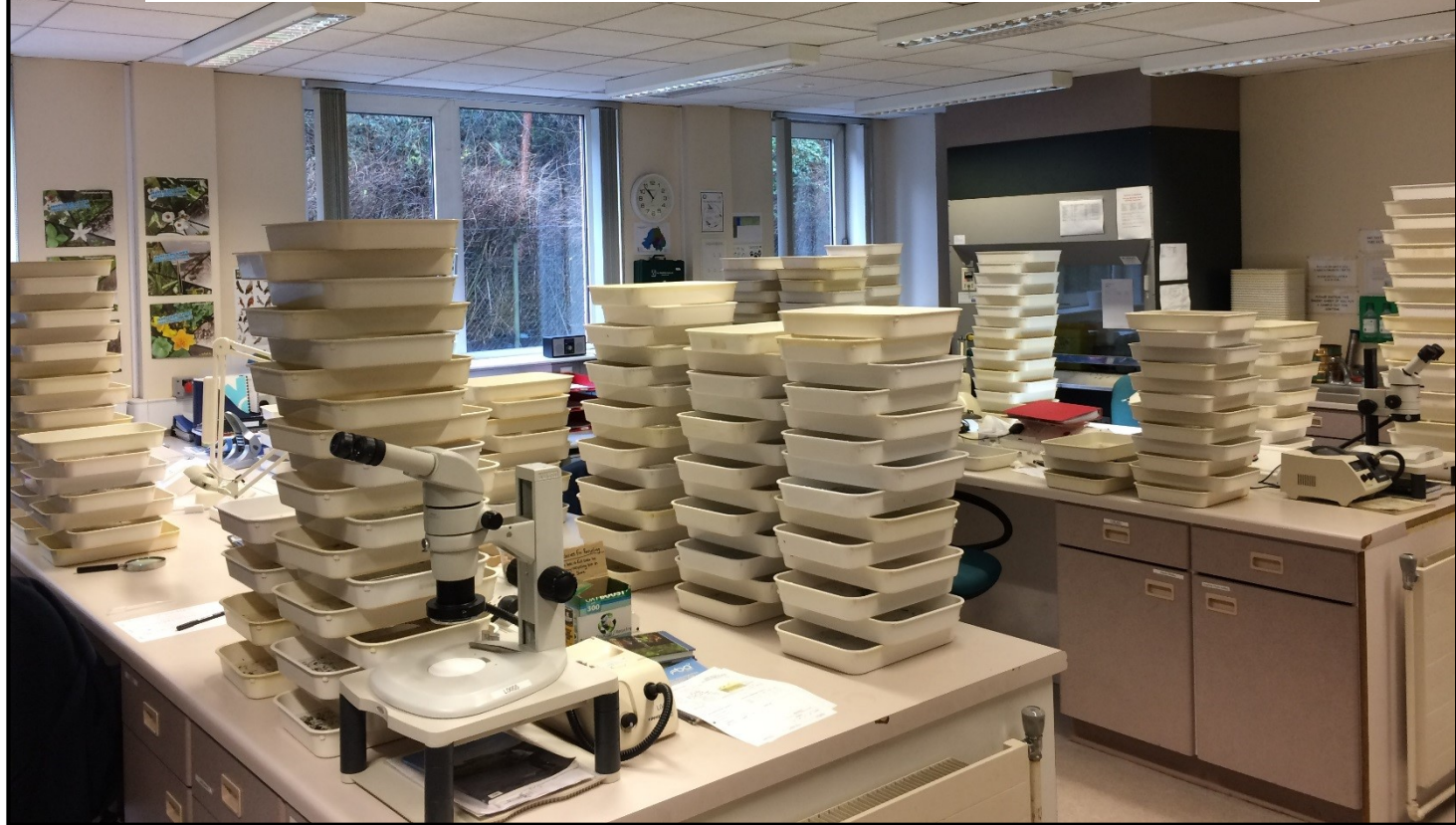
Coordinates: 278,971 , 377,750



Three Minute Kicksampling Technique



Live Sort of Invertebrates in the Laboratory



Fieldwork Survey Form

NIEA Water Management Unit, Lisburn 20__ Invertebrate Survey		N IRELAND (11) WHPT Invertebrate RECORDING FORM FOR M0056	
Season Sampled SPR <input type="checkbox"/> SUM <input type="checkbox"/> AUT <input type="checkbox"/> WIND <input type="checkbox"/>		Reported to EPH Y <input type="checkbox"/> N <input type="checkbox"/>	
Sample Date __ / __ / 20__		Sample Time __ : __	
Site Reference _____			
Watercourse _____			
Location _____			
Grid Reference ____			
Width ____ m	Average Depth ____ cm	Boulders/ Cobbles ____ %	Pebbles/ Gravel ____ %
Sand ____ %		Silt/Clay ____ %	
Sampling Method ____	Sampler Initials ____	Watch No ____	Chemical Sample for alkalinity (tick Y/N) Y <input type="checkbox"/> N <input type="checkbox"/>
WHPT Results Scoring Families ____		Poaching (Looking from bridge) Left Bank <input type="checkbox"/> Right Bank <input type="checkbox"/>	
Biotic Score ____		U/S <input type="checkbox"/> D/S <input type="checkbox"/>	
WHPT ASPT ____			
Macrophyte Indicator Species %		Bacterial Tufts/Sewage Fungus %	
Diatomaceous Algae ____		Above stones 0 <input type="checkbox"/> <5 <input type="checkbox"/> 5-30 <input type="checkbox"/> 31-60 <input type="checkbox"/> >60 <input type="checkbox"/>	
Leptodictyum riparium ____		Below stones 0 <input type="checkbox"/> <5 <input type="checkbox"/> 5-30 <input type="checkbox"/> 31-60 <input type="checkbox"/> >60 <input type="checkbox"/>	
Cladophora ____			
Vaucheria ____			
COMMENTS		Other Taxa	
		Abundances (A = 1-9, B = 10-99, C = 100-999, D = ≥1,000)	
		Category	
		A	B
		C	D
		TOTAL	
User Ref: F0479		Revision: 1.01	Status: ISSUED
Author: C Connolly		Date issued: 15/06/2017	Page 1 of 2

Taxa List for Northern Ireland		Season	Analysis date/time				Prep by				Sorted by				Checked by				AQC Check			
		AB1 = 1 to 9 AB2 = 10 to 99 AB3 = 100 to 999 AB4 ≥ 1000 (or/le appropriate abundance score)																				
GROUP 1		AB 1	AB 2	AB 3	AB 4	GROUP 6 cont.	AB 1	AB 2	AB 3	AB 4	GROUP 9	AB 1	AB 2	AB 3	AB 4							
<i>Rediidae</i>	12.6	13.0	13.0	13.0	<i>Hydrochilidae</i>	5.8	8.8	8.8	8.8	<i>Sphaeriidae</i>	4.4	3.5	3.4	2.3								
<i>Chironomidae</i>	11.4	12.2	12.2	12.2	<i>Dryopidae</i>	6.0	6.0	6.0	6.0	<i>Bitonidae</i>	3.6	3.8	3.3	3.3								
<i>Tanictocorydidae</i>	11.0	11.9	12.1	12.1	<i>Leptoceridae</i>	6.7	6.9	7.1	7.1	<i>Desmidae</i>	3.7	3.7	3.7	3.7								
<i>Siphonuridae</i>	11.3	12.2	12.2	12.2	<i>Molanidae</i>	6.5	7.6	7.6	7.6	<i>Acrobolidae</i>	3.6	3.8	3.8	3.8								
<i>Phlebotomidae</i>	11.2	11.1	11.1	11.1	<i>Limnephilidae (sc)</i>	5.9	6.9	6.9	6.9	<i>Lymanidae</i>	3.6	2.5	1.2	1.2								
<i>Odontoceridae</i>	11.1	10.3	10.3	10.3	<i>Agonidae</i>	6.1	6.5	6.5	6.5	<i>Valvatidae</i>	3.3	3.1	2.7	2.7								
SUB-TOTAL TAXA	____				<i>Hydroscaphidae</i>	5.8	7.2	7.4	7.4	<i>Panorpidae</i>	3.2	3.0	2.4	2.4								
GROUP 2					<i>Caenidae</i>	6.5	6.5	6.5	6.5	<i>Cranononyctidae</i>	3.8	4.0	3.6	3.6								
<i>Rediidae</i>	10.5	11.5	11.5	11.5	<i>Nectidae</i>	6.4	6.5	6.9	6.9	<i>Muscidae</i>	4.0	2.6	2.6	2.6								
<i>Leuctidae</i>	9.3	10.6	10.6	10.6	<i>Hydroscaphidae</i>	6.4	6.4	6.4	6.4	<i>Stratiomyidae</i>	3.6	3.6	3.6	3.6								
<i>Lepidostomatidae</i>	9.9	10.3	10.2	10.2	<i>Nichgardiidae</i>	6.3	6.3	6.3	6.3	<i>Sciomyzidae</i>	3.4	3.4	3.4	3.4								
SUB-TOTAL TAXA	____				<i>Aariidae</i>	5.9	6.2	6.2	6.2	<i>Chaoboridae</i>	3.0	3.0	3.0	3.0								
GROUP 3					SUB-TOTAL TAXA	____				<i>Coleidae</i>	3.7	3.9	3.7	3.7								
<i>Cordulegasteridae</i>	9.8	9.8	9.8	9.8	GROUP 7					<i>Notonectidae</i>	3.4	3.9	3.9	3.9								
<i>Heteroceridae</i>	8.5	10.3	11.1	11.1	<i>Tipulidae (sc)</i>	5.4	6.9	6.9	7.1	<i>Hydrobiidae</i>	3.8	3.8	3.8	3.8								
<i>Capniidae</i>	9.7	9.4	9.4	9.4	<i>Limoniidae & Fesicidae</i>	5.5	6.1	5.8	3.9	<i>Halictidae</i>	3.6	3.4	3.4	3.4								
<i>Nemouridae</i>	8.7	10.7	10.7	10.7	<i>Simuliidae</i>	5.4	5.5	5.5	5.5	<i>Noteridae</i>	3.2	3.2	3.2	3.2								
<i>Rhaconidae</i>	9.6	9.6	9.6	9.6	<i>Corophidae</i>	5.7	5.8	5.8	5.8	<i>Coenagrionidae</i>	3.4	3.8	3.8	3.8								
<i>Atheridae</i>	9.3	9.5	9.5	9.5	<i>Psychomyiidae</i>	5.8	5.7	5.7	5.7	<i>Glossichironidae</i>	3.4	2.5	0.8	0.8								
<i>Sarcotomidae</i>	8.9	9.4	9.5	9.5	<i>Vesperiidae</i>	5.2	6.7	6.7	6.7	<i>Ecnobellidae</i>	3.6	2.0	-0.8	-0.8								
SUB-TOTAL TAXA	____				<i>Acroidea</i>	5.8	5.5	5.5	5.5	<i>Dendrocoelidae</i>	3.0	2.6	2.6	2.6								
GROUP 4					<i>Unioidea</i>	5.2	6.8	6.8	6.8	SUB-TOTAL TAXA	____											
<i>Hydraenidae</i>	8.5	10.5	10.5	10.5	<i>Sisuridae</i>	5.7	5.7	5.7	5.7	GROUP 10												
<i>Goniatidae</i>	8.1	9.0	9.0	9.0	<i>Baetidae</i>	3.6	5.9	7.2	7.5	<i>Drepanidae</i>	2.8	3.1	3.1	3.1								
<i>Leptocleptidae</i>	8.8	9.1	9.2	9.2	<i>Phnganiidae</i>	5.5	5.5	5.5	5.5	<i>Nacidae</i>	2.9	2.9	2.9	2.9								
<i>Echeteridae</i>	8.3	8.8	9.4	9.4	<i>Phacoleptidae</i>	5.2	4.9	4.9	4.9	<i>Asellidae</i>	4.0	2.3	0.8	-1.6								
<i>Ephemerellidae</i>	7.9	8.5	9.0	9.0	<i>Cercidae</i>	5.2	5.5	5.5	5.5	<i>Glyptotendidae</i>	3.6	2.3	1.4	-0.6								
<i>Gonidae</i>	8.8	8.8	9.4	9.4	SUB-TOTAL TAXA	____				<i>Phoridae</i>	2.7	2.0	0.4	0.4								
<i>Beraeidae</i>	8.8	7.3	7.3	7.3	GROUP 8					<i>Culiidae</i>	2.0	1.9	1.9	1.9								
<i>Aphelocheridae</i>	8.6	8.5	8.0	8.0	<i>Panorhiidae</i>	4.7	5.4	5.4	5.4	SUB-TOTAL TAXA	____											
<i>Rhyacophilidae</i>	8.1	9.2	8.3	8.3	<i>Dolichopteriidae</i>	4.9	4.9	4.9	4.9	GROUP 11												
<i>Polycentropodidae</i>	8.2	8.1	8.1	8.1	<i>Ephydriidae</i>	4.4	4.4	4.4	4.4	<i>Synbiidae</i>	1.9	1.9	1.9	1.9								
SUB-TOTAL TAXA	____				<i>Ephydriidae</i>	4.5	3.0	3.0	3.0	<i>Cosmonidae</i>	1.2	1.3	-0.9	-0.9								
GROUP 5					<i>Aeabidae</i>	4.7	4.7	4.7	4.7	SUB-TOTAL TAXA	____											
<i>Asiatidae</i>	7.9	7.9	7.9	7.9	<i>Libellulidae</i>	4.1	4.1	4.1	4.1	GROUP 12												
<i>Glossosomatidae</i>	7.8	7.6	7.2	7.2	<i>Veliidae</i>	4.5	3.9	3.9	3.9	<i>Hirudinae</i>	-0.8	-0.8	-0.8	-0.8								
<i>Empoidea</i>	7.0	7.6	7.6	7.6	<i>Hydrozetidae</i>	4.3	4.3	4.3	4.3	SUB-TOTAL TAXA	____											
<i>Tabacidae</i>	7.1	7.3	7.3	7.3	<i>Dytiscidae</i>	4.5	4.6	4.8	4.8													
<i>Dolidae</i>	7.0	7.0	7.0	7.0	<i>Garonnidae</i>	4.2	4.5	4.6	3.9													
SUB-TOTAL TAXA	____				<i>Salicidae</i>	4.2	4.4	4.4	4.4	Total Taxa	____											
GROUP 6					<i>Hydrobiidae</i>	4.1	4.2	4.6	3.7	Biotic Score	____											
<i>Soridae</i>	6.9	6.6	6.6	6.6	SUB-TOTAL TAXA	____				ASPT	____											
<i>Elmidae</i>	5.3	7.4	8.3	8.3																		

Blanket Weed (*Cladophora glomerata*)



Heavy Growth of Blanket Weed



Mole Pelt Algae (*Vaucheria*)



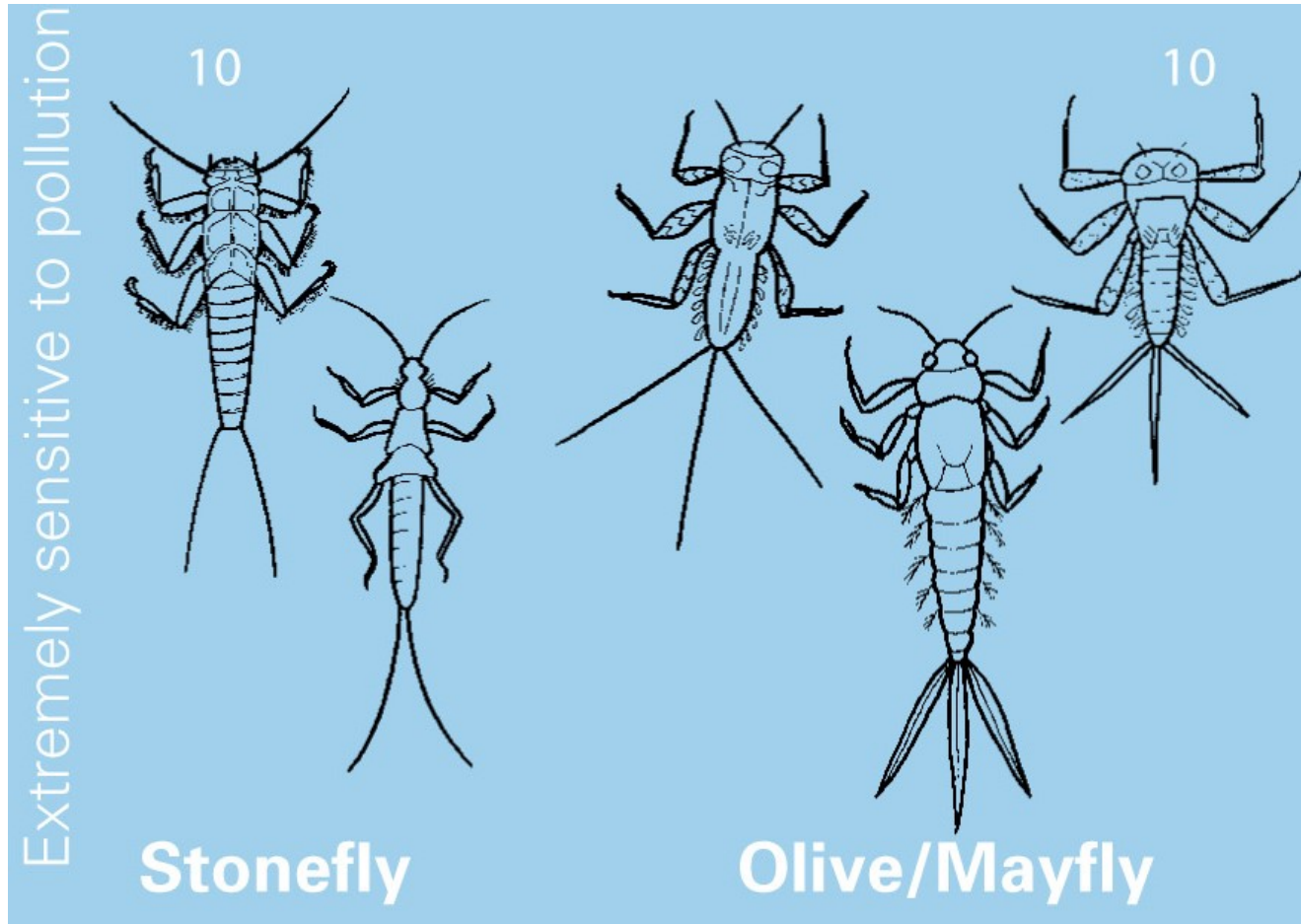
Branched Bur-reed (*Sparganium erectum*)



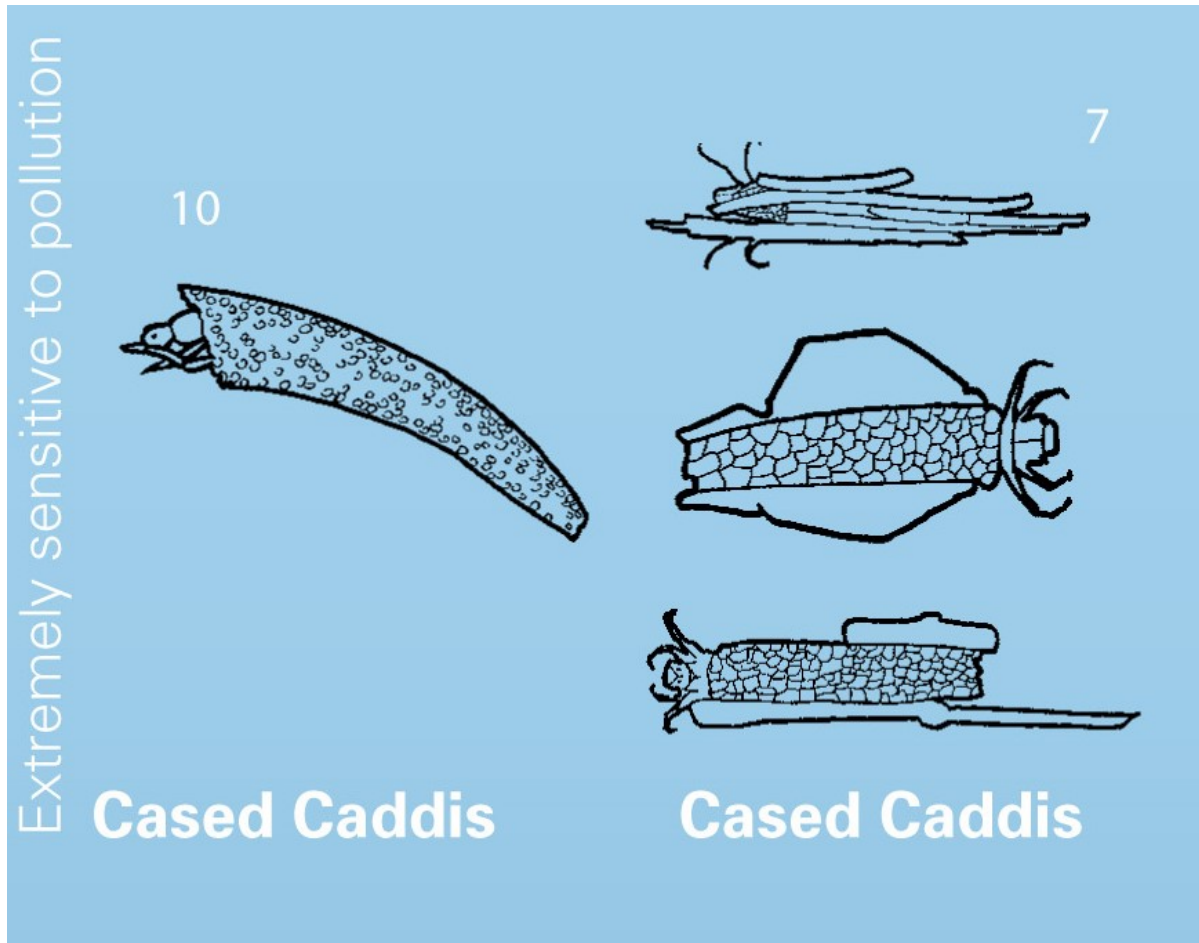
Sewage Fungus



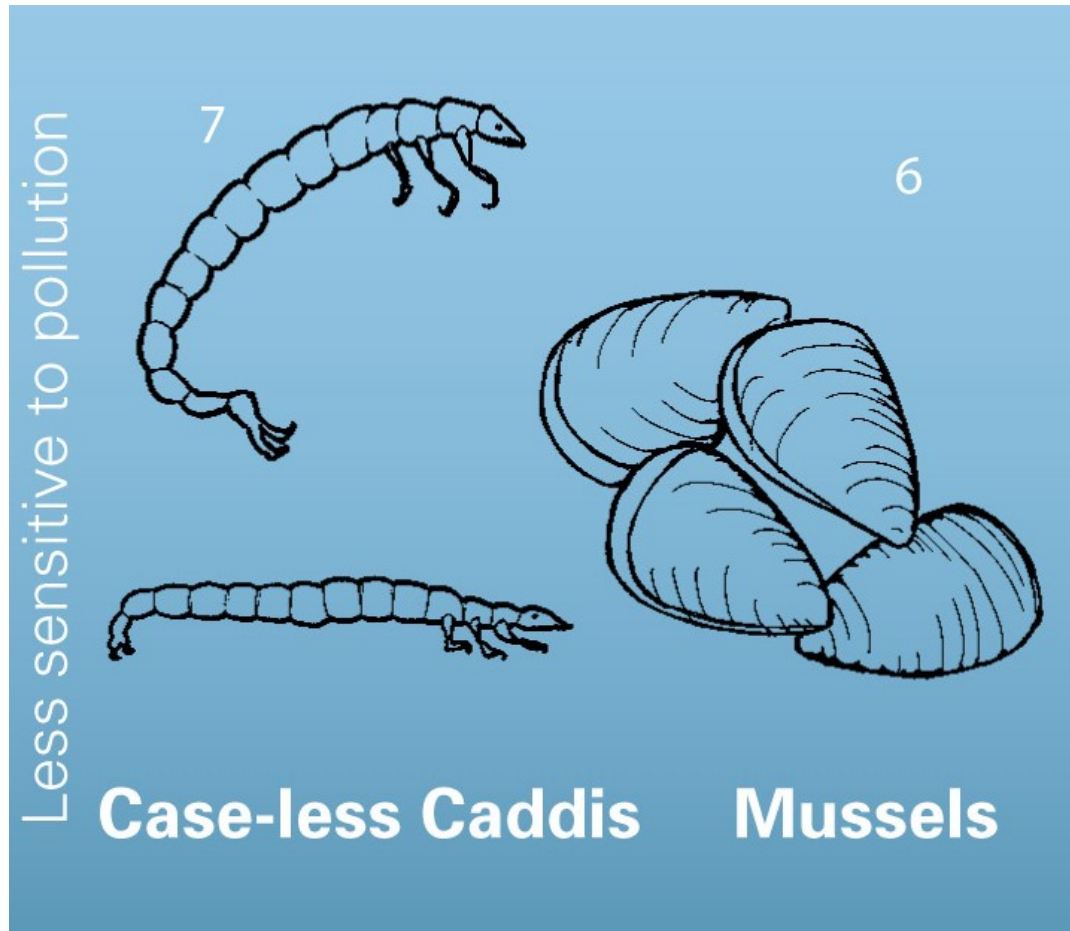
Invertebrate Biological Indicators (Good Bugs)



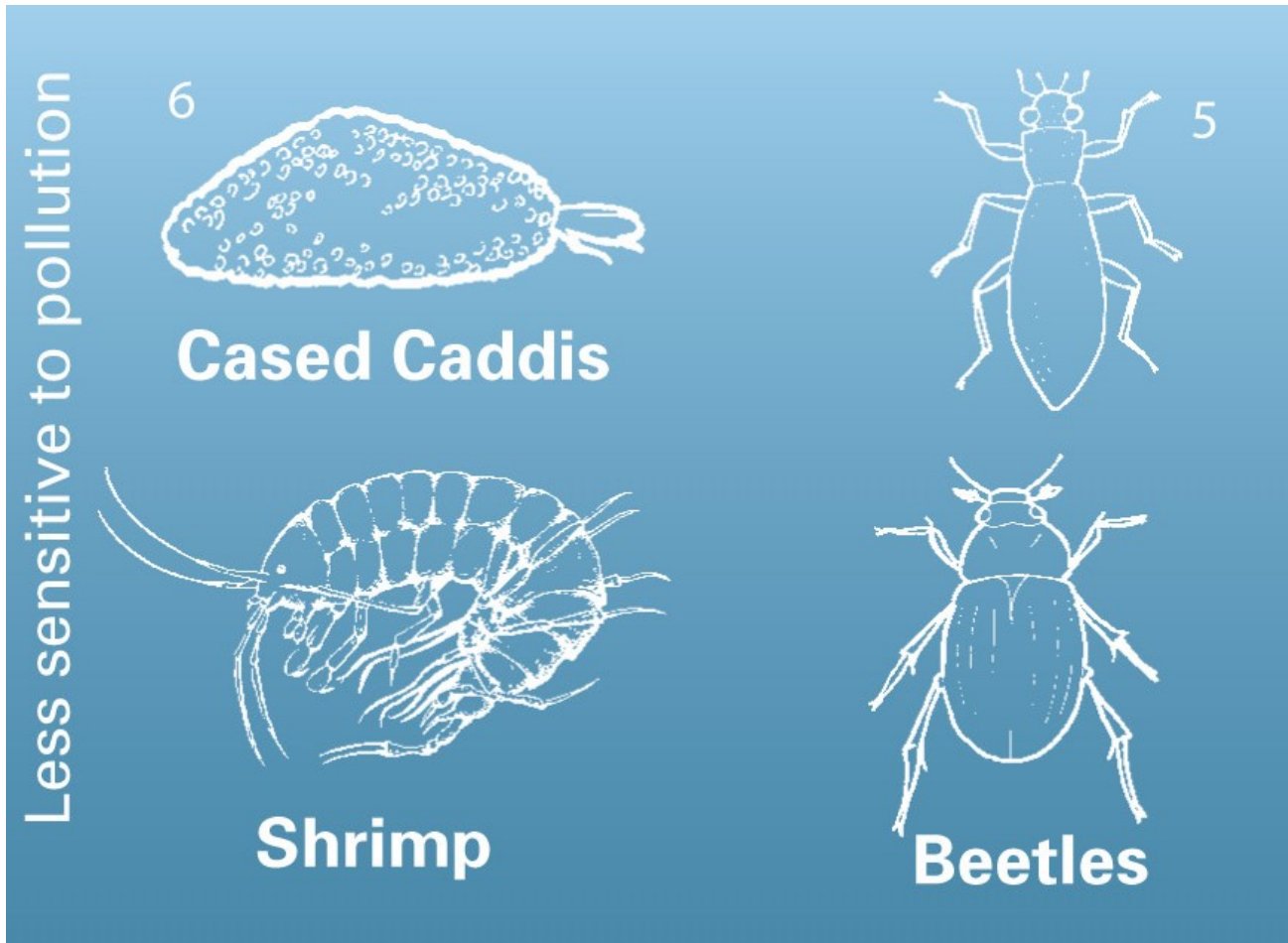
Invertebrate Biological Indicators (Good Bugs)



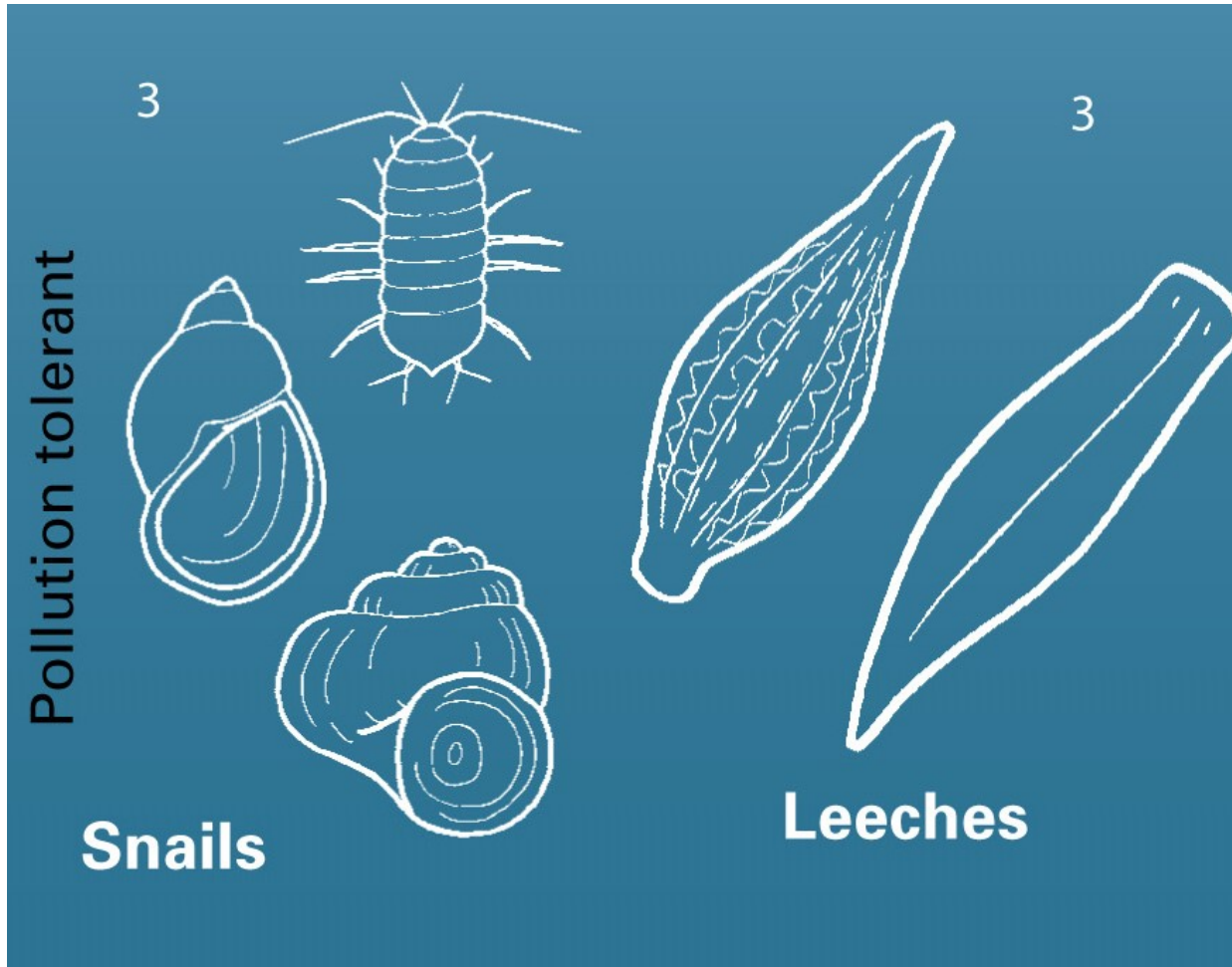
Invertebrate Biological Indicators (Good-ish Bugs)



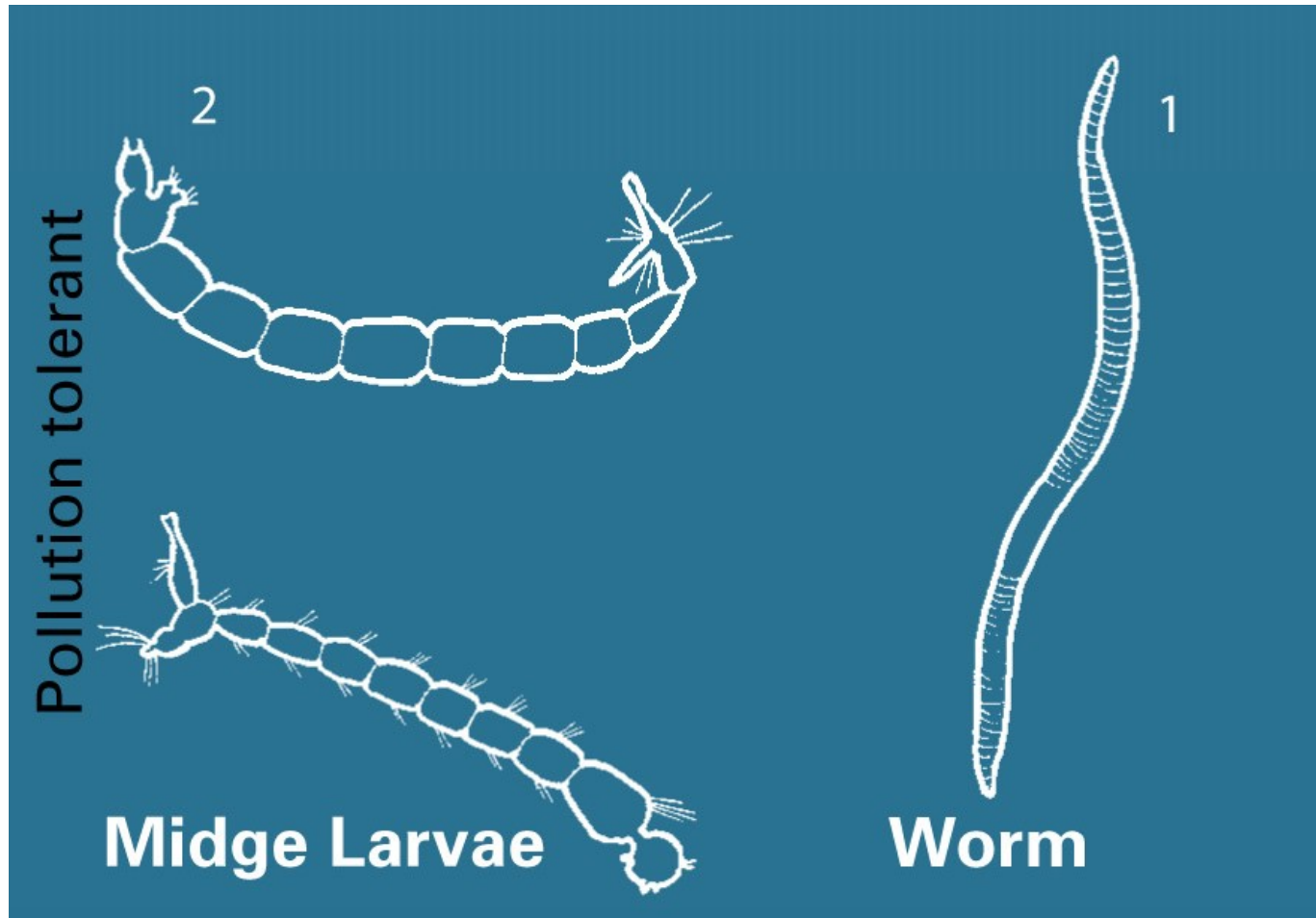
Invertebrate Biological Indicators (Good-ish Bugs)



Invertebrate Biological Indicators (Bad Bugs)



Invertebrate Biological Indicators (Bad Bugs)



Water Pollution Hotline

0800 80 70 60