THE OXFORDSHIRE POND SURVEY

A report to the World Wide Fund for Nature (WWF-UK)

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(APPENDICES)

Pond Action

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ENVIRONMENTAL PARAMETERS

A1.1 History of the Oxfordshire Pond Survey

A1.1.1 1987

The Oxfordshire Pond Survey (OPS) began in 1987 with help from WWF-UK, Hamlet Partnership (HP), Oxford Polytechnic (now Oxford Brookes University), and the Manpower Services Commission (MSC) under the Community Programme (CP).

One of the first pieces of work to be carried out was a study of aquatic macroinvertebrate sampling methodology, in order to finalise the methods to be used by the OPS. This was carried out before MSC funding commenced and facilitated the early commencement of surveying activities in 1988.

A1.1.2 1988

During 1988 four different types of pond surveying were employed.

Pond-by-pond survey of the Vale of White Horse

Staff on the MSC programme undertook the digitisation of the positions, sizes and altitudes of all ponds, lakes, wells and springs in the Vale of White Horse based on OS 1:25,000 series maps. Following this procedure, which was completed by Spring 1988, all these sites were visited by staff from the OPS in order to ascertain whether or not they were still present, and what their condition was.

Macroinvertebrate surveys of ponds

In 1988, 133 ponds around the county were visited. The ponds were chosen to represent a number of apparently different pond types. These included ponds which varied in size and permanence, management (e.g., duck ponds and fish ponds), surrounding landuse (e.g., disturbed landuse and undisturbed landuse), and surrounding geology (e.g., ponds in clay catchments and those predominantly in limestone catchments).

At each of these sites three macroinvertebrate samples were taken. These samples were used to gain a first impression of the range of aquatic macroinvertebrates present in the county, the range of biological pond types in the county, and to give personnel experience in sorting and identifying macroinvertebrates.

Botanical surveys of ponds

After the first month of survey work, the MSC team was joined by a botanist, who worked with the other members of the team to develop a strategy for the botanical mapping of ponds to be used in 1989.

Analytical chemistry

During 1988 techniques were developed, in-house, to analyse, rapidly, a number of the major chemical constituents of pond water.

A1.1.3 1989

At the end of 1988 all MSC funding (and 16 personnel) were lost. Five of the original team stayed on to carry out the main work of the OPS. From this time onwards the survey was funded partly by WWF-UK and partly by commercial contract work undertaken by Pond Action.

In early Spring 1989, 127 of the 133 ponds were visited in order to take water samples. These samples were analysed, using techniques developed in 1988, for a range of chemical determinands.

In 1989, the full botanical and macroinvertebrate survey of ponds began, with 34 of the 133 ponds of 1988 being chosen as being genuinely representative of the range of ponds in Oxfordshire. Triplicate macroinvertebrate samples were taken and full botanical maps made at each of the ponds visited. These surveys led to the first classification of ponds on the basis of plants and macroinvertebrates in any British county, and form the basis for most of the work presented in this report.

A1.1.4 1990

In 1990, macroinvertebrate samples were again taken from all the 34 ponds. This data allowed a comparison between the classifications derived for the two years (1989 and 1990). This comparison is important as it is necessary to know whether or not the results of macroinvertebrate sampling from one year are applicable in another year.

A1.2 Methods of assessment of physical variables

A.1.2.1 Area and circumference

The area and circumference of ponds and water, and the areas of plant stands and shading, were estimated by producing scale maps of the ponds and analysing these. The edge of the pond (i.e., the edge at high water) was judged by the surrounding vegetation structure or obvious changes in topography. Maps were produced in one of three ways:

i) By plane table;
ii) By plane table and tape measure (smaller ponds);
iii) By tape measure and compass.

Plane table

A baseline of known length was established such that the angle subtended by any point around the pond, by lines drawn from the ends of the baseline, was never greater than 150° nor less than 30°. The plane table was placed at one end of the baseline, and a point on the edge of the pond, or the water's edge (usually marked with a sight pole), was sighted with a sighting rule whose edge passed directly over a point on a sheet of paper on the plane table which denoted the end of the baseline. A thin pencil line was then drawn along the sighting rule. This procedure was performed for several points around the pond (usually about 20). Lines previously drawn were periodically resighted to check that the orientation of the table had not changed. The other end of the baseline was also sighted and drawn on in a similar manner.

The plane table was then moved to the far end of the baseline and oriented to face in exactly the same direction as it had at the first end. This was done by sighting its original position along the line already drawn on the paper. A second point was marked on the paper denoting this other end of the baseline, usually with an appropriate scaling factor, e.g., 5m of baseline to 1cm of the baseline on the paper. The mapping procedure was then repeated for all of the points around the pond, with the edge of the sighting rule directly over the second marked baseline on the paper. The intersections of the drawn lines to the points around the pond were then a scale representation of the pond. A selection of points close to (within 30m) the plane table were checked to test the accuracy of the map produced. The circumference of the pond was then drawn between these points whilst walking around the pond. This allowed a higher degree of interpretation of the fine structure of the pond edge.

Plane table and tape measure

This procedure was used at smaller sites where all points around the pond were no less than 30m from a single, common, point. This point was usuallly on the edge of the pond, but in some cases (e.g., in shallow wooded sites) was in the middle of the pond. The plane table was placed in position and points sighted and lines drawn to them as described above. The distance of each of these points from the plane table was also measured directly with a 30m tape and a scale measure of the distance plotted onto the lines. The circumference of the pond was filled in as described above.

Table A1.1 Location and Dates of Sampling of Sites in the Oxfordshire Pond Survey

Location	Name	Code	Grid Ref.	1988	1989	1990
Wilcote	Duck pond	WIDU	SP371152	9.2.88		
	Field pond	WIFI	SP370154	9.2.88		
The Pill		PILL	SP572141	8.3.88	23.8.89	30.7.90
High Cogges Farm		HICO	SP376091	14.3.88		
Beckley Manor		BECK	SP577120	28.3.88	16.11.89	29.7.90
River Ray		ORRA	SP558141	5.5.88		
Willow		WILL	SP565146	5.5.88		
Central		CENT	SP569145	4.5.88	15.8.89	11.7.90
Shotover	4	SHO4	SP578065	4.5.88		
Uffington		UFFI	SU306893	19.5.88	13.9.89	11.9.90
Mayhow		MAYH	SU272906	19.5.88		
Bourton		BOUR	SU239867	19.5.88		
East Challow		EACH	SU378882	26.5.88		
West Challow		WCHA	SU366866	26.5.88		
Blewbury Old Mill	1	BLE1	SU531864	31.5.88		
	2	BLE2	SU531864	31.5.88		
Parsonage Farm		PARS	SU533858	31.5.88		
Wendlebury	B	WENB	SP564184	31.5.88		
New River Ray		NRRA	SP558141	18.5.88	28.9.89	20.4.90
Honour's Pond		HONO		18.5.88		
Kingston Bagpuize	Marsh pond	KIMA	SP405012	7.6.88	20.9.89	19.4.90
	Ditch pond	KIDI	SP409011	6.6.88	20.9.89	19.4.90
	Typha pond	KITY	SP405008	6.6.88		
	Roadside pond	KIRO	SP408006	6.6.88		
Friars Court	Little Rudge	LRUD	SP289001	21.6.88	16.10.89	23.4.90
	Moat	FCMO	SP285009	21.6.88	16.10.89	23.4.90
	Wetland '83 (1)	FCLA	SP292004	21.6.88	16.10.89	23.4.90
	Wetland '83 (2)	FCSM	SP293004	21.6.88	16.10.89	23.4.90
Little Coxwell	Longcot Manor	LOMA	SU283933	23.6.88		
	Longcot House	LICO	SU278910	23.6.88		
	Great Tithe Barn	GRTY	SU269942	23.6.88		
	Brimstone Farm	BRIM		23.6.88		
Latchford Lane Fen	Woodland (A)	LAWA	SP654015	23.6.88		
	Woodland (B)	LAWB	SP654018	23.6.88		
Holton Park	L.S.C. College (A)	LSCA	SP600059	5.7.88		
	L.S.C. College (B)	LSCB	SP600059	5.7.88		
Wheatley Park Sch. Moat	Both halves	WHMT	SP598064	5.7.88		
Little Wittenham N.R.	Woodland upper	LWIU	SP571927	7.7.88	24.10.89	26.4.90
	Woodland bottom	LWIL	SP571927	7.7.88	24.10.89	26.4.90
	Manor house	LWMA	SP566933	7.7.88		
	Church meadow	LWCH	SP566935	7.7.88		
Nettlebed Heath	Sea pond	NESE	SU702871	14.7.88		
	Pond 2	NEP2	SU701872	14.7.88		
	Pond 3	NEP3	SU701872	14.7.88		
	Shaded pond	NESH	SU703870	14.7.88		
Wolvercote ponds	A	WOLA	SP492097	21.7.88		
	B	WOLB	SP494098	21.7.88		
Milton Pools	A	MPLA	SP655030	26.7.88	4.10.89	1.5.90
	B	MPLB	SP655031	26.7.88	4.10.89	1.5.90
	D	MIPD	SP653030	26.7.88		
Barford St John	Manor house moat	BAMO	SP432328	28.7.88		
	Cow pond	BACO	SP433318	28.7.88		
	Pond 4	BAP4	SP427317	28.7.88		
Cherwell D.C. visit	Oddington pond	ODDI	SP553150	2.8.88		
	Motorway pond	MOTW	SP550283	2.8.88		
	Wasp pond	WASP	SP609224	2.8.88		
Stadhampton	Ascott farm mud	ASMU	SU611981	9.8.88		
	Ascott farm field	ASFI	SU608980	9.8.88		
	Newells pond	NEWE	SU604988	9.8.88	6.11.89	1.5.90
Stanton Harcourt	Parsonage Hall moat	PAMO	SP414059	11.8.88		
Parsonage Hall pond	PAPO	SP415060	11.8.88			
Manor house	Great fish pond	GRFP	SP418056	11.8.88		
	Gazebo pond	GAZE	SP418057	11.8.88		
Stoke Row	Lily pond	SRLI	SU684832	16.8.88		
	Cherry orchard pond	SRCH	SU681841	16.8.88	4.8.89	14.4.90

(cont.)

Location	Name	Code	Grid Ref.	1988	1989	1990
Wootton	Youlbury pool	YOUL	SP479029	18.8.88		
	Foxcombe Hall O.U.	FOHA	SP490019	18.8.88		
	Foxcombe Drive	FODR	SP490017	18.8.88		
	Tea pond	SRTE	SU684837	16.8.88		
Kidlington	Mrs Clarke's pond	CLAR	SP479157	23.8.88		
	Mrs Weaver's pond	WEAV		23.8.88		
	Airport pond	AIRP	SP481151	23.8.88		
Dry Sandford Pit	1	DS1.	SU468996	6.9.88	14.6.89	12.4.90
	2	DS2.	SU469994	6.9.88	14.6.89	12.4.90
	3	DS3.	SU468993	6.9.88		
Cothill Fen		COTH	SU460996	6.9.88	6.6.89	30.3.90
Wychwood Forest	1	WW1.	SP339169	8.9.88	24.5.89	14.5.90
	2	WW2.	SP338169	8.9.88	24.5.89	14.5.90
	3	WW3.	SP338170	8.9.88	24.5.89	14.5.90
	4 (Sawmill Lake)	WW4.	SP334172	8.9.88		
Bernwood Meadow		BERN	SP610106	13.9.88		
Asham Meads		ASHM	SP595135	13.9.88	28.6.89	19.7.90
Whitecross Green Wood		WHIX	SP606142	13.9.88		
Marsh Baldon	School pond	MASC	SP563995	15.9.88		
	South pond (Mud)	MAMU	SP564991	15.9.88		
Henry Stephen	Greater pond	HSLA	SP560066	15.9.88		
	Lesser pond	HSLE	SP559065	15.9.88		
Coldharbour	Farm pond	COMR	SP479297	20.9.88		
	'Pingo'	COPI	SP479302	20.9.88		
Buttermilk Farm		BUTT	SP418323	20.9.88		
Nill Farm		NILL	SP371355	20.9.88	21.7.89	30.3.90
Marston Fields	3	MA03	SP781232	22.9.88		
	4	MA04	SP782238	22.9.88		
	7	MA07	SP781232	22.9.88		
	11	MA11	SP784244	22.9.88		
	22	MA22	SP781240	22.9.88		
Cassington Pit		CASS	SP455102	27.9.88	26.10.89	20.4.90
Cassington Nursery		CANU	SP457110	27.9.88		
Towersey	Manor duck pond	TODU	SP737051	27.9.88	6.7.89	14.4.90
	Manor garden pond	TOGA	SP738081	27.9.88		
Bucknell	Trigger pond	BTRI	SP559253	6.10.88		
	Pathetic pond	BPAT	SP562251	6.10.88		
	Ram pond	BRAM	SP572258	6.10.88		
Brasenose wood		BRNW	SP559055	11.10.88	6.7.89	14.4.90
Lashford Lane	1	LALA	SP468014	11.10.88	22.1.89	18.7.90
Matthew Arnold Field		MAAR	SP484023	11.10.88		
Cornwell Manor	Butyl Upper	CORU	SP274270	18.10.88		
	Butyl Middle	CORM	SP274271	18.10.88		
	Laughing	COLA	SP275270	18.10.88	31.8.89	30.3.90
	Silt trap pond	CORS	SP273271	18.10.88		
Swinbrook	Goose pond	SWGO	SP283134	20.10.88		
	Rat pond	SWRA	SP283133	20.10.88		
Widford	(Swan) lake	WILA	SP273119	20.10.88		
	Footer	WIFO	SP271119A	20.10.88		
	Irritation	WIIR	SP271119B	20.10.88		
Ashbury	Roadside	ASRO	SU260856	27.10.88		
	Duck	ASDU	SU266854	27.10.88		
	New	ASNE	SU253872	27.10.88	9.8.89	1.5.90
Swinbrook	Duck	SWDU	SP287142	1.11.88		
	Hillside	SWHI	SP285142	1.11.88		
	Doughnut	SWDO	SP287154	1.11.88		
	Valley	SWVA	SP285146	1.11.88		
Wroxton	Top pond	WRTO	SP417413	3.11.88	2.8.89	17.5.90
	Tennis court pond	WRBO	SP418414	3.11.88	2.8.89	11.2.90
	Ditch pond	WRDI	SP418415	3.11.88		
	Village pond	WRVI	SP414418	3.11.88		
Thames Water, Banbury		TWAB	SP461424	3.11.88		
Lewknor	Moat	LEMO	SU709979	8.11.88		
	Manor House	LEMA	SU710977	8.11.88		
	Watercress	LECR	SU715976	8.11.88		
South Oxford	Gizzel	GIZZ	SP582020	10.11.88	7.5.89	18.7.90
	Kennington pit	KENN	SP518033	10.11.88	7.5.89	18.7.90
	Radley School	RASC	SU524997	10.11.88		

Compass and tape measure

This method was adopted at sites where no two vantage points were available from which most of the pond could be seen. Starting from a given point around the pond's edge, another point was sighted, using a sighting compass, and a line to this drawn on paper. The distance to this point was measured and a scale of this measure marked on the line. Starting from this next point, another bearing was taken and the angle of this again put onto the map. The distance to this next bearing point was also scaled onto the map. This procedure was repeated until the surveyor returned to the original starting point. With care, the outlines produced in this way were quite accurate, and the final bearing taken mapped a point on the paper which coincided with the first point drawn. The fine detail was filled in afterwards as described above.

Mapping the water's edge

Where the water's edge was not far removed from that of the pond edge, this was drawn onto the map after measuring the distance between the two at various points around the pond. Where the two edges were far apart the water's edge was mapped using a plane tabled by one of the methods outlined above.

Mapping vegetation stands

Vegetation stands were usually drawn onto the map by eye, using reference points around the pond and a tape to measure stand size. In some cases, the edges of larger emergent stands were mapped by plane tabling. Density of plant stands (percentage cover) and species composition were estimated and the estimations annotated on the map. Density of submerged aquatic plants were either estimated by eye (from a boat where possible), or by grapnelling. The latter method was used only when the turbidity of the water prevented a more direct estimation.

Mapping overhanging vegetation

Overhanging vegetation was marked on the map whilst walking around the pond. A tape measure was used to measure distance overhung. This was the only estimate of shading made during the OPS. No reliable method of directly estimating shade could be found which did not require large amounts of survey time.

Parameters derived from the maps

Fourteen parameters were derived from the maps alone. These were:

Pond area
Water area
Pond circumference
Water circumference
Maximum dimension
Index of shoreline complexity
(pond circumference/pond area)
Area and % area covered by individual plant species
Area and % area covered by floating species
Area and % area covered by emergent species
Area and % area covered by submerged species
Pond area and % area overhung
Water area and % area over hung
Pond margin and % area overhung
Water margin and % area overhung

A1.2.2 Depth

Depths were measured using either a graduated wooden pole, or (for depths in excess of 1.5m) a graduated draining rod. Depths were measured from the water surface to the top of the silt and to the bottom of the pond. Where visibility was restricted, the top of the the silt was estimated as the the point where a rod with a rubber cleaning disc needed to be forced to go any further down. In ponds on clay or gravel, care was taken to measure the distance to the top of the clay or gravel, and not to a point below this.

In simply-shaped ponds, five points were chosen for depth measurements, one in the centre and four midway between the centre and the bank, with each point subtending a right angle to the centre with both neighbouring points. In ponds with more complex shapes extra depths were taken (up to 20) in order to better represent the overall depth. Mean

values for depths were later calculated by averaging all the depths taken. This could have led to problems with unevenness of pond base, and this was appreciated at the time of survey, and extra depths taken where necessary.

Parameters derived from the depth measurements

Nine parameters were derived from these measurements and from the maps. These were:

Maximum water depth
Mean water depth
Maximum sediment depth
Mean sediment depth
Maximum total depth
Mean total depth
Pond volume (mean total depth x area)
Sediment volume (mean sediment depth x pond area)
Index of mean sediment accumulation
(mean sediment depth/mean total depth)

A1.2.3 Permanence

The OPS took place during a time when the extent of drying of ponds was unusually high due to exceptionally dry summers and winters. No truly objective measure of permanence was applicable, so a subjective scale of permanence was used with four categories.

Table A1.2 Categories of Permanence

Category	Description
1	Dries completely every year
2	Dries completely occasionally and almost dries in most years
3	Almost dries in the driest of years
4	Fully permanent

A1.2.4 Water source

Water source was estimated in terms of type and volume.

Water source type

Six different categories of water source type were recognised.

Table A1.3 Water Source Type

Category	Description
Stream	Discrete stream inflows, except as below.
Spring	Either rising below the pond or rising within one pond length from the pond.
Ditch	Either with a direct connection to, or forming part of, a ditch system.
Flood	Seasonally fed by floodwater.
Surface water	Water running into the pond above the level of the ground water table, though not as a discrete, visible inflow.
Groundwater	Water which formed part of the permanent groundwater table.

Importance of water source

It was not practicable to measure groundwater flow, extent of floodwater etc. during the course of the survey. For this reason, each category was ranked according to its importance by an experienced geologist with a rank of zero indicating no importance. The importance of any individual type of water source was then estimated by dividing its rank by the sum of the ranks for that site.

Discrete inflows

Discrete inflows were noted as being present or absent and an estimation made of the flow. Flow estimates were the product of average depth of inflow, width of inflow, and flow category. Depth and width of inflow were measured with a metre rule (or tape for wider inflows) and flow was estimated to be in one of the categories below.

The categories were necessarily broad, any greater discrimination leading only to greater divergence of opinion between operators. The total inflow for the site was the sum of all the discrete inflows present.

Table A1.4 Inflow Categories

Category	Description
1	Imperceptible movement.
2	Slow.
3	Moderate.
4	Fast.

Nine separate parameters were derived from the above (and previous) measurements:

Inflow (presence/absence)
Inflow volume (category x m^2)
Turnover (inflow volume/(water area x water depth))
Stream inflow (relative importance)
Spring inflow (relative importance)
Ditch inflow (relative importance)
Floodwater inflow (relative importance)
Surfacewater inflow (relative importance)
Groundwater inflow (relative importance)

A1.2.5 Age

The age of more recent sites was discovered from local knowledge. The age of older sites was estimated by examination of early editions of Ordnance Survey maps. In practice, due to the limited number of full re-surveys by the Ordnance Survey, it was only possible to estimate two categories of age for the more established sites, i.e., 28-113 years or >114years. Some individual sites could be dated more accurately, but this would have led to a distortion of the data-set.

A1.2.6 Disturbance

As the age of a pond does not necessarily reflect how long it has been able to develop without interruption, a category of disturbance was also used. This was a dummy value (zero or one) indicating undisturbed or disturbed sites. Disturbed sites were those which were either new or had been severely managed, e.g., re-dug or scoured in the past 20 years.

A1.2.7 Turbidity

Turbidity was assessed by eye on a scale of one to four. Turbidity was usually due to either suspended clays or unicellular algae. More objective assessments of turbidity, such as the use of Secchi discs, were not practicable due to the shallow depth of many of the ponds in the survey.

Table A1.5 Turbidity Categories

Category	Description
1	Clear.
2	Relatively clear.
3	Relatively turbid.
4	Very turbid.

A1.2.8 Grazing

Grazing was estimated as a dummy value of zero (ungrazed) or one (grazed) based on knowledge of the surrounding landuse or by inspection of the margins.

A1.2.9 Surrounding landuse

Surrounding landuse was estimated in the field and from maps.

Field measurements

Field measurements were made of the percentage of several categories of landuse within 5m, between 5 and 25m, and between 25 and 100m of the edge of the pond. In addition, a derived value of total landuse (the sum of all categories) was made. This latter value emphasises the importance of landuse near to the pond. Landuse type and extent were estimated by eye whilst walking around the pond and over the neighbouring land.

The categories of landuse estimated were as described in Table A1.6. In addition, four summary categories (also described) were used.

Table A1.6 Landuse Categories

Category	**Description** (where necessary)
Deciduous woodland	Mature deciduous woodland.
Coniferous woodland	
Scrub woodland	Immature deciduous woodland.
Fen and marsh	
Ponds, bogs and lakes	Rivers, ponds, lakes, ditches and other open water features.
Unimproved grassland	Including rank vegetation.
Improved grassland	
Arable	
Parks and gardens	Domestic, cultivated areas likely to be subject to the use of fertilisers and pesticides.
Urban and roads	Concrete, asphalt surfaces, etc.
Summary category	
Wood and scrub	
Semi-natural	Deciduous woodland, scrub woodland, fen and marsh, water (as defined) and unimproved grassland (as defined).
Disturbed	Coniferous woodland, improved grassland, arable land, parks and gardens, urban, and roads (as defined).
All urban	

Map measurements

Map measurements were made of various aquatic features in the vicinity of the ponds studied. These measurements were made of the categories shown in the table below within 10m, between 10 and 250m and between 250 and 500m of the ponds. In addition a total category (the sum of the 10, 250 and 500m measurements) was also made.

Table A1.7 Aquatic Features around the Ponds

Category	Measurement
Ponds and lakes	By area
Fen and marsh	By area
Rivers	By length

A1.2.10 Geology

Various aspects of geology were estimated from Ordnance Survey solid and drift geological maps (1:50,000 scale). Five types of geology surrounding or underlying ponds in the Oxfordshire Pond Survey were recognised. These were limestone, sandstone, clay, gravels and peat.

Four estimations of each of the five types of geology were made for each pond.

Table A1.8 Geology

Category	Description
Surrounding geology	Per cent geological type within 100m of the pond.
Geology of pond base	Per cent geological type immediately beneath the pond. Note that this can be very different from the surrounding geology.
Geology of main water source	A dummy category of zero or one for each type of geology.
Geology of all water sources	Per cent geological type in the catchment of the pond. catchment was estimated by consideration of the geomorphology of the area.

Table A1.9 Oxfordshire Pond Survey: Environmental Variables - Raw Data

	Altitude (m)	Age group	Fish present/ absent	Fish stocked	Ducks present/ absent	Pond circum-ference (m)	Pond area (m2)	Maximum water depth (m)	Maximum sediment depth (m)	Maximum total depth (m)	Mean water depth (m)	Mean sediment depth (m)	Pond area over-hung (m2)	Pond margin over-hung (m)	Inflow presence/ absence	Inflow volume	Total emergent cover (m2)
PILL	58	114	1	0	0	893	6473	60	35	70	30	25	0	446.5	0	0	3178
BECK	65	114	1	1	1	215	547	120	100	150	70	50	10940	8600	1	•	159
CENT	59	114	1	0	0	82	390	125	90	215	124	73	0	0	0	0	23
UFFI	87.5	114	1	0	0	79	400	140	17	147	122	11	2000	2212	1	40	128
NRRA	60	7	0	0	0	128	690	105	5	107	91	2.5	2070	896	1	100	69
KIMA	63	7	1	0	0	297	2589	85	15	95	73	15	5178	12474	0	0	1657
KIDI	63	114	1	0	0	62	294	150	88	160	39	50	5586	2170	1	20000	238
LRUD	69	114	1	0	0	71	268	78	72	120	38	33	8308	4260	1	780	129
FCMO	69	114	1	1	1	490	1700	120	35	145	77	25	22100	14700	1	6000	0
FCLA	68	7	1	0	1	84	229	200	25	205	94	8	0	0	0	0	25
FCSM	68	7	1	0	1	25	27	66	28	72	41	9	0	0	0	0	4
LWIU	62.5	58	1	0	0	183	1541	125	60	118	67	43	9246	732	1	13	170
LWIL	62.5	7	0	0	0	132	973	150	80	180	100	40	7784	6336	1	25	29
MPLA	102.5	58	1	1	0	123	914	105	30	135	98	16	17366	7626	0	0	18
MPLB	102.5	58	1	1	0	249	2221	110	60	140	83	31	6663	3735	0	0	244
NEWE	57.5	114	1	0	1	363	2468	120	15	139	77	12	4936	3267	1	200	1283
SRCH	167.5	114	1	0	0	94	456	50	45	92	24	23	4104	2538	0	0	105
DS1.	77.5	58	1	0	0	227	1410	35	28	50	25	12	14100	9534	1	25	85
DS2.	75	58	0	0	0	48	113	35	20	36	19	10	904	480	0	0	8
COTH	77.5	114	1	0	0	240	3200	50	190	190	28	116	32000	2400	1	•	2432
WW1.	112.5	114	1	1	0	134	738	100	34	129	75	16	5904	4690	1	500	7
WW2.	110	114	1	1	0	218	1632	133	78	210	115	30	8160	3706	1	210	163
WW3.	110	114	1	1	0	320	3931	180	60	230	136	34	27517	18880	1	5000	275
ASHM	60	114	•	0	0	60	119	125	92	142	56	49	2380	2760	0	0	2
NILL	167.5	114	1	1	0	313	3395	230	110	300	107	41	54320	18467	1	•	0
CASS	65	58	0	0	0	284	3910	160	15	170	116	13	0	0	0	0	1408
TODU	72.5	7	0	0	1	111	708	30	80	110	23	65	19116	8769	0	0	0
BRNW	92.5	7	0	0	0	25	37	15	30	40	7	19	2442	1150	0	0	1
LALA	92.5	7	0	0	0	28	41	32	15	72	23	10	369	812	1	150	24
COLA	132.5	114	1	1	1	338	7490	220	15	225	128	8	37450	12844	1	465	0
WRTO	127.5	114	1	1	0	230	2119	140	70	210	113	40	42380	8740	1	115	424
WRBO	127.5	114	1	0	0	227	2842	190	70	260	152	34	2842	1589	1	•	256
GIZZ	100	270	1	0	0	78	263	85	35	95	55	7	3945	2418	1	630	71
KENN	55	58	1	0	0	620	5000	185	95	280	174	69	50000	13640	0	0	950

Table A1.9 (cont.)

	Total floating cover (m2)	Total submerged cover (m2)	No. of aquatic plant sp.	No. of emergent plant sp.	Calcium mg/l	Magnesium mg/l	Potassium mg/l	Sodium mg/l	Sulphate Sulphur mg/l	Nitrate Nitrogen mg/l	Nitrite Nigrogen mg/l	Chloride mg/l	pH	Alkalinity mg/l	Conductivity µS/cm	Alkaline phosphatase nkat/l	Deciduous woodland to 5m (%)
PILL	518	2764	9	31	35.9	2.5	2.2	10.4	10.4	0.015	0.01	21.2	6.7	13	294	197.25	0
BECK	0	142	6	11	•	•	•	•	31.0	3.41	0.02	24.2	8.1	40	608	115.20	0
CENT	12	•	11	11	82.3	5.0	2.7	14.4	19.5	3.93	0.035	26.3	7.4	30	508	161.84	0
UFFI	12	124	4	8	135.8	13.4	48.9	51.3	16.0	1.55	0.02	19.4	8.3	35	550	324.81	30
NRRA	393	0	3	16	101.2	6.3	3.4	15.9	8.6	4.98	0.035	26.2	7.6	35	593	87.94	0
KIMA	207	104	3	19	83.0	9.6	1.9	20.4	16.1	0.045	0.005	40.7	8.1	50	950	100.73	0
KIDI	0	0	1	4	76.3	5.6	5.7	21.2	27.4	12	0.01	45.5	7.9	45	695	209.89	0
LRUD	121	5	2	9	120.6	6.9	5.2	30.8	16.4	2.86	0.005	34.4	7.5	50	716	259.77	0
FCMO	187	629	3	8	85.7	1.8	0.7	13.5	21.6	8.6	0.04	38.2	8.4	45	715	230.97	15
FCLA	2	98	3	12	85.7	1.8	0.7	13.5	25.7	0	0	27.9	8.2	30	479	64.48	0
FCSM	0	12	4	10	91.0	2.2	0.0	13.2	8.5	0	0	21	8.1	25	502	490.59	0
LWIU	0	586	6	18	78.5	3.9	3.3	18.1	9.8	0.015	0	23.3	8.4	35	446	36.10	50
LWIL	944	341	3	16	69.8	3.3	3.5	14.5	9.4	0.015	0.01	31.4	8.3	35	458	181.37	50
MPLA	0	0	0	7	58.7	4.9	2.5	12.5	4.6	0.025	0	34.2	8.1	25	399	110.57	0
MPLB	0	0	3	10	50.8	3.8	9.0	13.6	12.5	0	0.005	24.3	8.7	25	350	213.54	0
NEWE	716	247	6	18	121.6	4.9	0.0	13.9	25.4	3.88	0.08	39.5	7.9	40	671	832.12	50
SRCH	9	50	2	18	5.2	0.8	3.5	2.2	4.0	0.03	0	4.2	6.5	5	71	220.01	0
DS1.	28	183	3	18	110.2	2.4	1.9	21.5	7.3	4.49	0.005	29.1	8.4	50	639	498.60	50
DS2.	0	9	1	5	94.6	2.4	1.1	17.0	7.3	0.015	0.005	28.7	8	45	582	245.72	0
COTH	0	0	3	19	130.6	2.9	2.7	16.4	18.0	3.39	0	34.6	8.2	45	700		0
WW1.	52	450	5	7	77.0	2.6	•	6.8	•	•	•	•	•	•	•	•	0
WW2.	0	816	7	15	70.1	2.0	•	5.8	•	•	•	•	•	•	•	•	14
WW3.	39	826	11	13	86.6	2.5	•	6.6	•	•	•	•	•	•	•	•	25
ASHM	43	0	4	18	43.8	5.5	8.6	16.4	2.5	0.015	0	20.8	8.7	25	332	273.67	0
NILL	34	0	4	17	92.2	3.2	3.5	6.9	7.2	5.15	0.03	20.9	7.7	20	449	54.79	0
CASS	0	1251	6	21	89.6	4.0	6.2	31.4	23.9	0.14	0.005	75	8.2	23.7	627	191.07	0
TODU	0	0	0	1	145.2	9.3	19.2	46.1	50.5	2.75	0.025	67.1	8	60	984	98.20	30
BRNW	24	20	2	9	102.9	4.3	1.8	18.4	14.6	0.14	0	38	7.3	40	591	26.27	80
LALA	0	15	2	13	•	•	•	•	7.7	1.66	0	25.6	7.9	55	678	94.97	0
COLA	0	3296	6	4	97.0	1.9	1.6	6.3	14.1	13.21	0.005	24.3	7.6	35	577	88.36	70
WRTO	0	42	2	9	107.4	5.1	3.3	8.3	6.6	5.7	0.02	22.3	8.1	30	487	95.11	50
WRBO	1279	171	6	15	93.6	4.8	1.4	9.1	7.0	3	0.025	23.1	8.1	30	433	45.65	30
GIZZ	145	0	6	10	142.0	10.1	33.1	37.1	19.3	13.81	0.005	64.2	7.4	45	946	28.66	0
KENN	1000	1500	11	33	109.2	6.7	5.5	23.8	10.6	2.95	0.02	54.2	8.9	25	563	113.18	0

Table A1.9 (cont.)

	Scrub to 5m (%)	Fen, marsh bog to 5m (%)	Unimproved grassland to 5m (%)	Improved grassland to 5m (%)	Ponds & lakes to 5m (%)	Arable to 5m (%)	Parks & gardens to 5m (%)	Urban & roads to to 5m	Wood & scrub 5m (%)	Semi-natural to 5m (%)	Disturbed to 5m (%)	All urban to 5m (%)	Deciduous woodland 5 to 25m (%)	Coniferous woodland 5 to 25m (%)	Scrub 5 to 25 m (%)	Fen, marsh bog 5 to 25m (%)	Unimproved grassland 5 to 25m (%)
PILL	0	0	100	0	0	0	0	0	0	100	0	0	0	0	0	0	100
BECK	15	0	0	30	0	0	40	15	15	15	85	55	0	0	20	0	40
CENT	0	0	100	0	0	0	0	0	0	100	0	0	0	0	0	0	100
UFFI	35	0	35	0	0	0	0	0	65	100	0	0	0	0	10	0	50
NRRA	0	15	85	0	0	0	0	0	0	100	0	0	0	0	0	15	75
KIMA	0	0	0	100	0	0	0	0	0	0	100	0	0	0	0	0	0
KIDI	0	100	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0
LRUD	50	0	0	0	0	50	0	0	50	50	50	0	0	0	5	0	0
FCMO	0	0	0	35	0	0	50	0	15	15	85	50	5	0	0	0	0
FCLA	0	20	80	10	0	0	0	0	0	100	10	0	5	0	10	0	20
FCSM	0	0	90	0	10	0	0	0	0	100	0	0	5	0	15	1	24
LWIU	50	0	0	0	0	0	0	0	100	100	0	0	91	0	1	0	0
LWIL	50	0	0	0	0	0	0	0	100	100	0	0	85	0	5	0	0
MPLA	0	0	0	70	0	0	0	30	0	0	100	30	0	0	0	0	0
MPLB	0	0	0	70	0	0	0	30	0	0	100	30	0	0	0	0	0
NEWE	10	0	39	1	0	0	1	0	60	99	2	1	10	0	0	0	0
SRCH	10	0	90	0	0	0	0	0	10	100	0	0	40	0	0	0	49
DS1.	50	0	0	0	0	0	0	0	100	100	0	0	0	0	0	25	75
DS2.	50	0	50	0	0	0	0	0	50	100	0	0	0	0	49	0	48
COTH	0	100	0	0	0	0	0	0	0	100	0	0	10	10	0	80	0
WW1.	50	0	45	0	0	0	0	5	50	95	5	5	40	0	30	0	20
WW2.	76	0	5	0	0	0	0	5	90	95	5	5	60	0	5	0	30
WW3.	50	0	15	0	0	0	0	10	75	90	10	10	38	0	37	0	20
ASHM	50	0	50	0	0	0	0	0	50	100	0	0	0	0	50	0	50
NILL	25	0	0	75	0	0	0	0	25	25	75	0	20	0	0	0	0
CASS	50	0	50	0	0	0	0	0	50	100	0	0	0	0	50	0	50
TODU	30	0	0	0	0	0	40	0	60	60	40	40	10	0	20	0	0
BRNW	0	0	20	0	0	0	0	0	80	100	0	0	80	0	15	0	5
LALA	50	20	30	0	0	0	0	0	50	100	0	0	0	0	40	0	20
COLA	0	0	30	0	0	0	0	0	70	100	0	0	69	0	0	0	25
WRTO	50	0	0	0	0	0	0	0	100	100	0	0	50	0	40	0	0
WRBO	0	0	20	0	0	0	50	0	30	50	50	50	40	0	0	0	0
GIZZ	0	0	66	0	0	0	34	0	0	66	34	34	0	0	0	0	0
KENN	75	25	0	0	0	0	0	0	75	100	0	0	0	0	65	5	0

Table A1.9 (cont.)

	Improved grassland 5 to 25m	Ponds & lakes 5 to 25m	Arable 5 to 25m	Parks & gardens 5 to 25m	Urban & roads 5 to 25m	Wood & scrub 5 to 25m	Semi-natural 5 to 25m	Disturbed 5 to 25m	All urban 5 to 25m	Deciduous woodland 25 to 100m	Coniferous woodland 25 to 100m	Scrub 25 to 100m	Fen, marsh bog 25 to 100m	Unimproved grassland 25 to 100m	Improved grassland 25 to 100m	Ponds & lakes 25 to 100m	Arable 25 to 100m
PILL	0	0	0	0	0	0	100	0	0	0	0	0	0	100	0	0	0
BECK	10	0	0	20	10	20	60	40	30	0	0	20	0	0	80	0	0
CENT	0	0	0	0	0	0	100	0	0	0	0	0	0	100	0	0	0
UFFI	0	0	0	10	30	10	60	40	40	0	0	0	0	0	0	0	0
NRRA	0	10	0	0	0	0	100	0	0	0	0	0	0	50	0	0	50
KIMA	100	0	0	0	0	0	0	100	0	0	0	0	0	0	98	1	0
KIDI	100	0	0	0	0	0	0	100	0	0	0	0	0	0	98	1	0
LRUD	0	0	95	0	0	5	5	95	0	0	0	1	0	0	0	0	100
FCMO	35	0	0	50	0	5	5	85	50	1	0	0	0	0	79	0	0
FCLA	40	5	20	0	0	15	40	60	0	0	0	0	0	10	50	10	30
FCSM	30	25	0	0	0	20	70	30	0	0	0	0	5	46	32	17	0
LWIU	0	8	0	0	0	92	100	0	0	98	0	1	0	0	0	1	0
LWIL	0	10	0	0	0	90	100	0	0	85	0	5	0	0	0	10	0
MPLA	74	25	0	0	1	0	25	75	1	0	0	0	0	0	50	10	0
MPLB	74	5	0	0	1	0	5	75	1	0	0	0	0	0	50	10	0
NEWE	55	0	35	0	0	10	10	90	0	10	0	0	0	0	55	0	35
SRCH	0	0	0	10	1	40	89	11	11	35	0	0	0	50	0	0	0
DS1.	0	0	0	0	0	0	100	0	0	0	0	50	0	50	0	0	0
DS2.	0	3	0	0	0	49	100	0	0	0	0	35	20	35	10	0	0
COTH	0	0	0	0	0	20	90	0	0	30	5	5	60	0	0	0	0
WW1.	0	10	0	0	0	70	100	0	0	90	0	0	0	0	10	0	0
WW2.	0	5	0	0	0	65	100	0	0	85	0	5	0	2	8	0	0
WW3.	0	5	0	0	0	75	100	0	0	38	0	37	0	15	0	10	0
ASHM	0	0	0	0	0	50	100	0	0	0	0	50	0	50	0	0	0
NILL	65	0	15	0	0	20	20	80	0	10	0	0	0	0	65	0	25
CASS	0	0	0	0	0	50	100	0	0	0	0	25	0	25	0	25	0
TODU	0	0	0	50	20	30	30	70	70	15	0	10	0	0	0	0	0
BRNW	0	0	0	0	0	95	100	0	0	60	0	35	0	5	0	0	0
LALA	0	0	0	0	0	40	60	0	0	0	0	50	40	10	0	0	0
COLA	0	5	0	0	1	69	99	1	1	40	0	0	0	0	55	5	0
WRTO	0	10	0	0	0	90	100	0	0	30	0	20	0	0	40	10	0
WRBO	20	0	0	40	0	40	40	60	40	30	0	0	0	0	40	0	0
GIZZ	•	•	•	•	•	0	•	•	•	•	•	•	•	•	•	•	•
KENN	0	10	0	0	20	65	80	20	20	0	0	25	0	25	0	15	0

Table A1.9 (cont.)

	Parks & gardens 25 to 100m (%)	Urban & roads 25 to 100m (%)	Wood & scrub 25 to 100m (%)	Semi-natural 25 to 100m (%)	Disturbed 25 to 100m (%)	All urban 25 to 100m (%)	Fen, marsh bog (map) to 10m (m2)	Ponds (map) to 10m (m2)	Rivers (map) to 10m (km)	Ditches (map) to 10m (km)	Fen, marsh bog (map) 10-250m (ha)	Ponds (map) 10-250m (ha)	Rivers (map) 10 to 250m (km)	Ditches (map) 10-250m (km)	Ponds (map) 250 to 500m (m2)	Rivers (map) 250 to 500m (km)	Ditches (map) 250 to 500m (km)
PILL	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0.04	0	1
BECK	0	0	20	20	80	0	0	0	0.01	0	0	0	0.45	0	0.1	0.5	0.65
CENT	0	0	0	100	0	0	0	0	0	0	0	0	0	0.3	0.65	0	0.9
UFFI	40	60	0	0	100	100	0	0	0.01	0	0	0	0	0	0	0	1
NRRA	0	0	0	50	50	0	0	0	0	0	0	0.05	0.5	0.9	0	0.5	2.25
KIMA	0	1	0	1	99	1	0	0	0	0	0	0	0.4	0.05	0.03	0.8	0.9
KIDI	0	1	0	1	99	1	0	0	0	0.02	0	0	0.5	0.3	0.15	0.7	0.2
LRUD	0	0	1	1	100	0	0	0	0	0.03	0	0	0	1.1	0	1.1	1.8
FCMO	20	0	1	1	99	20	0	0	0	0.03	0	0	0	1.3	0	0	1.6
FCLA	0	0	0	20	80	0	0	0	0	0	0	1	0.75	0.5	0.03	1.5	1.2
FCSM	0	0	0	68	32	0	0	0	0	0	0	1	0.75	0.5	0.03	1.5	1.2
LWIU	0	0	99	100	0	0	0	0	0.01	0	0	0.1	0.2	0	0	0.9	0
LWIL	0	0	90	100	0	0	0	0	0.01	0	0	0.1	0.2	0	0	0.9	0
MPLA	20	20	0	10	90	40	0	25	0	0	0	2	0	0.3	0	0	0.25
MPLB	20	20	0	10	90	40	0	25	0	0	0	2	0	0.3	0	0	0.25
NEWE	0	0	10	10	90	0	0	0	0.01	0	1	0	0.75	0	0.2	1.1	0.5
SRCH	14	1	35	85	15	15	0	0	0	0	0	0.1	0	0	0.25	0	0
DS1.	0	0	50	100	0	0	1000	0	0.01	0	1.5	0	0.4	0	0	0.9	0
DS2.	0	0	35	90	10	0	0	0	0	0	1.5	0	0.4	0	0	0.9	0
COTH	0	0	40	95	0	0	2500	0	0	0	10	0	0	0	0	0.25	0.3
WW1.	0	0	90	90	10	0	0	0	0.01	0	0	0.5	0.75	0	0.5	0.5	0
WW2.	0	0	90	92	8	0	0	0	0.01	0	0	0.5	0.75	0	0.5	0.5	0
WW3.	0	0	75	100	0	0	0	0	0	0	0	0.5	0.75	0	0.5	0.5	0
ASHM	0	0	50	100	0	0	0	0	0	0	0	0	0	0	0.15	0	0.5
NILL	0	0	10	10	90	0	0	0	0.02	0	0	0	0.35	0	0	0.35	0
CASS	12	13	25	75	25	25	0	0	0	0	1	1.5	0	0	0	1	0
TODU	60	20	25	25	80	80	0	0	0	0	0	0.1	0.1	0	0.1	0.7	0
BRNW	0	0	95	100	0	0	0	0	0	0	0	0	0.5	0	0	1.5	0
LALA	0	0	50	100	0	0	50	0	0.01	0	4.5	0	0.5	0.25	0	0.5	0
COLA	0	0	40	45	55	0	0	100	0.01	0	0	0.3	0.35	0	0.1	0.65	0
WRTO	0	0	50	60	40	0	0	0	0.01	0	0	0.15	0.25	0	0	0.5	0
WRBO	30	0	30	30	70	30	0	0	0.01	0	0	0.15	0.25	0	0	0.5	0
GIZZ	•	•	•	•	•	•	0	0	0.01	0	0	0.06	0	0	0.06	0	0
KENN	0	35	25	65	35	35	0	0	0	0.13	0	0	1.5	0	0	1.5	0

Table A1.9 (cont.)

	Perma-nence	SSSI	LNR	Pond base Gravel - % geol. type	Pond base Clay - % geol. type	Surr. geol. Sandstone % geol. type within 100m	Surr. geol. Gravel % geol. type within 100m	Surr. geol. Limestone % geol. type within 100m	Surr. geol. Clay % geol. type within 100m	Geol. main water source Gravel dummy cat.	Geol. main water source Limestone dummy cat.	Geol. main water source Clay dummy cat.	Geol. all wtr source Sandst % geol. type in catchment	Geol. all wtr source Gravel % geol. type in catchment	Geol. all wtr source Limest % geol. type in catchment	Geol. all wtr source Clay % geol. type in catchment	Turbidity
PILL	2	1	0	0	1	0	0	0	4	0	0	1	0	0	0	5	3
BECK	4	0	0	0	1	0	0	1	3	0	0	1	0.5	0	0.5	4	4
CENT	3	1	0	0	1	0	0	0	4	0	0	1	0	0	0	5	4
UFFI	4	0	0	0	1	1	0	0	3	0	0	1	1	0	1	3	4
NRRA	4	1	0	0	1	0	0	0	4	0	0	1	0.5	0	0.5	4	3.5
KIMA	1	0	0	0	1	0	2	0	2	1	0	0	0	4.5	0.5	0	2
KIDI	2	0	0	1	0	0	1	0	3	0	0	1	0	0	0	5	3
LRUD	4	0	0	0	1	0	1	0	3	0	0	1	2	0	0	3	3.5
FCMO	4	0	0	0.5	0.5	0	2	0	2	0.5	0	0.5	0	2.5	0.5	2	3
FCLA	4	0	0	1	0	0	1	0	3	1	0	0	0	4.5	0.5	0	2.5
FCSM	4	0	0	1	0	0	1	0	3	1	0	0	0	4.5	0.5	0	2.5
LWIU	4	0	1	0	1	2	0	1	1	0	1	0	3	0	2	0	3
LWIL	4	0	1	0	1	2	0	1	1	0	1	0	3	0	2	0	3
MPLA	4	0	0	1	0	•	•	•	•	1	0	0	0	4.5	0.5	0	4.5
MPLB	4	0	0	1	0	•	•	•	•	1	0	0	0	4.5	0.5	0	4.5
NEWE	4	0	0	1	0	0	2	0	2	1	0	0	0	3	0.5	1.5	3
SRCH	2	0	1	0	1	2	0	2	0	0	0	0.5	2.5	0	0	2.5	5
DS1.	4	1	0	0	1	1	0	2	1	0	1	0	2	0	3	0	1.5
DS2.	1	1	0	0	1	1	0	2	1	0	1	0	2	0	3	0	1.5
COTH	4	1	0	0	0	1	0	1	1	0	1	0	2	0	2	0	2.5
WW1.	4	1	0	0	1	0	0	0	2	0	1	0	1	0	3.5	0.5	1.5
WW2.	4	1	0	0	1	0	0	0	2	0	1	0	1	0	3.5	0.5	1.5
WW3.	4	1	0	0	1	0	0	0	2	0	1	0	1	0	3.5	0.5	1.5
ASHM	3	1	0	0	1	0	0	0	4	0	0	1	0	0	0	5	4
NILL	4	0	0	0	1	1	0	2	1	0	0.5	0	2	0	2	1	5
CASS	4	0	0	1	0	0	2	0	2	1	0	0	0	4.5	0.5	0	1.5
TODU	4	0	0	•	•	•	•	•	•	•	•	•	•	•	•	•	4.5
BRNW	2	1	0	0	1	0	0	0	4	0	0	1	0	0	0	5	4
LALA	4	1	0	0	1	1	0	2	1	0	1	0	1	0	2	2	1.5
COLA	4	0	0	0	1	0	0	2	2	0	1	0	1	0	2	2	1
WRTO	4	0	0	0	1	1	0	2	1	0	0	1	1	0	1.5	2.5	2.5
WRBO	4	0	0	0	1	1	0	2	1	0	0	1	1	0	1.5	2.5	2.5
GIZZ	4	0	0	0	1	1	0	1	2	0	0.5	0	2.5	0	2.5	0	2
KENN	4	0	1	1	0	0.5	1	0.5	2	1	0	0	0.5	3.5	1	0	3

Table A1.9 (cont.)

	DOME	Total invert spp.	No. of flatworm spp.	No. of snail spp.	No. of leech spp.	No. of spider spp.	No. of crayfish spp.	No. of shrimp spp.	No. of slater spp.	No. of mayfly spp.	No. of stonefly spp.	No. of dragonfly spp.	No. of bug spp.	No. of beetle spp.	No. of alderfly spp.	No. of caddisfly spp.	No. of invert. families
PILL	8.3	65	1	11	6	0	0	2	2	2	0	1	10	27	1	2	22
BECK	8.7	61	3	7	5	0	0	1	1	1	0	4	8	29	1	1	25
CENT	8.9	73	0	8	4	0	0	1	2	2	0	2	14	35	1	4	21
UFFI	8.9	45	2	6	4	0	0	2	2	1	0	3	3	20	1	1	18
NRRA	9.5	49	0	9	5	0	0	1	2	1	0	0	3	27	0	1	13
KIMA	8.1	22	0	4	0	0	0	2	1	0	0	0	3	12	0	0	9
KIDI	9	30	0	7	1	0	0	1	2	3	0	2	4	9	0	1	19
LRUD	•	53	3	18	4	0	0	2	2	0	0	1	4	16	1	2	20
FCMO	9.6	43	2	14	5	0	0	0	1	1	0	2	7	11	0	0	16
FCLA	9	54	0	8	4	0	0	1	1	4	0	6	8	17	1	4	23
FCSM	8.1	55	0	8	1	0	0	1	1	4	0	5	8	23	1	3	20
LWIU	9.2	67	3	9	3	0	0	1	1	4	1	5	11	16	1	12	25
LWIL	9.5	55	2	6	3	0	0	1	1	3	1	1	8	23	0	6	24
MPLA	•	52	0	5	4	0	0	1	1	4	0	4	10	17	0	6	24
MPLB	9.6	55	3	8	2	0	0	1	1	2	0	6	10	13	1	8	27
NEWE	8.7	59	0	8	3	0	0	2	0	3	0	3	10	25	0	5	21
SRCH	6.6	35	0	2	1	0	0	1	0	1	0	1	5	18	1	5	15
DS1.	8.1	47	0	4	0	0	0	1	2	4	0	6	7	18	1	4	20
DS2.	7.3	38	0	4	1	0	0	0	0	1	1	3	2	22	1	3	15
COTH	6.1	51	0	12	2	1	0	1	1	3	0	6	6	15	1	3	24
WW1.	8.7	47	0	2	3	0	0	2	1	3	0	2	6	20	1	7	22
WW2.	8.2	49	1	5	4	0	0	1	1	3	2	4	8	10	1	9	28
WW3.	8.4	60	1	9	5	0	0	1	1	4	0	3	9	19	1	7	26
ASHM	8.3	55	0	3	1	0	0	1	1	1	0	4	13	27	1	3	19
NILL	8.3	50	1	3	5	0	0	0	1	3	0	3	6	22	1	5	22
CASS	8.2	61	3	7	3	0	0	2	0	2	1	5	13	18	1	6	28
TODU	•	10	0	0	1	0	0	1	0	1	0	0	2	5	0	0	7
BRNW	8.8	35	3	4	0	0	0	1	2	0	1	1	4	18	0	1	15
LALA	7.3	45	1	2	2	0	0	1	1	1	2	3	7	19	1	5	21
COLA	8.6	37	3	7	4	1	0	1	1	1	0	2	8	7	1	1	20
WRTO	8.1	49	3	9	5	0	0	1	1	3	0	5	5	7	1	9	27
WRBO	8.4	65	4	11	3	0	1	1	2	3	0	7	6	17	1	9	28
GIZZ	8.5	34	4	6	2	0	0	2	2	0	0	0	1	13	1	3	17
KENN	8.8	71	3	19	8	1	0	1	1	3	0	7	6	14	1	7	30

Table A1.9 (cont.)

	BMWP	ASPT	Distur-bance	Grazing	Ground water	Spring water	Running water	Stream water	Ditch water	Flood water
PILL	107	4.9	0	1	0.67	0.00	0.00	0.00	0.00	0.33
BECK	119	4.8	0	0	0.00	0.00	0.67	0.33	0.00	0.00
CENT	100	4.8	0	1	0.67	0.00	0.00	0.00	0.00	0.33
UFFI	77	4.3	0	0	0.67	0.33	0.00	0.00	0.00	0.00
NRRA	57	4.4	1	0	0.14	0.00	0.43	0.14	0.00	0.29
KIMA	38	4.2	1	0	1.00	0.00	0.00	0.00	0.00	0.00
KIDI	96	5.1	0	0	0.25	0.00	0.50	0.00	0.25	0.00
LRUD	88	4.4	0	0	0.33	0.00	0.50	0.00	0.17	0.00
FCMO	67	4.2	0	0	0.00	0.00	0.00	0.00	1.00	0.00
FCLA	128	5.6	1	0	0.33	0.00	0.67	0.00	0.00	0.00
FCSM	107	5.3	1	0	1.00	0.00	0.00	0.00	0.00	0.00
LWIU	132	5.3	1	0	0.33	0.00	0.50	0.17	0.00	0.00
LWIL	123	5.1	1	0	0.33	0.00	0.50	0.17	0.00	0.00
MPLA	129	5.4	0	0	0.33	0.00	0.67	0.00	0.00	0.00
MPLB	149	5.5	0	0	0.33	0.00	0.67	0.00	0.00	0.00
NEWE	107	5.1	1	0	0.17	0.00	0.50	0.33	0.00	0.00
SRCH	77	5.1	0	1	0.67	0.00	0.33	0.00	0.00	0.00
DS1.	109	5.5	1	0	0.50	0.50	0.00	0.00	0.00	0.00
DS2.	77	5.1	0	0	0.50	0.00	0.50	0.00	0.00	0.00
COTH	117	4.9	0	0	0.50	0.00	0.00	0.50	0.00	0.00
WW1.	119	5.4	0	0	0.00	0.00	0.00	1.00	0.00	0.00
WW2.	153	5.5	0	0	0.00	0.50	0.00	0.50	0.00	0.00
WW3.	132	5.1	0	0	0.00	0.00	0.00	1.00	0.00	0.00
ASHM	93	4.9	0	1	0.33	0.00	0.67	0.00	0.00	0.00
NILL	115	5.2	0	0	0.25	0.00	0.50	0.25	0.00	0.00
CASS	144	5.1	0	0	0.33	0.00	0.67	0.00	0.00	0.00
TODU	30	4.3	0	0	0.50	0.00	0.50	0.00	0.00	0.00
BRNW	70	4.7	1	0	0.33	0.00	0.67	0.00	0.00	0.00
LALA	111	5.3	1	0	0.67	0.00	0.00	0.33	0.00	0.00
COLA	93	4.7	0	0	0.00	0.00	0.00	1.00	0.00	0.00
WRTO	138	5.1	0	0	0.00	0.00	0.67	0.33	0.00	0.00
WRBO	151	5.4	0	0	0.00	0.00	0.67	0.33	0.00	0.00
GIZZ	77	4.5	1	0	0.00	0.33	0.67	0.00	0.00	0.00
KENN	155	5.2	0	0	0.33	0.00	0.00	0.00	0.00	0.67

APPENDIX 2

WETLAND PLANTS

A2.1 Plant methods

A2.1.1 Recording wetland plant species

The wetland plant species present at each pond were recorded during Summer 1989. The sites were revisited and the species lists checked for a second time during Summer 1991.

At each pond a species list was compiled of all 'wetland plant species' growing within the 'outer edge' of the pond.

The outer edge was defined as the uppermost level at which water stood for more than three months of the year. This level was usually marked by a perceptible change in the vegetation structure - usually by a rapid decline in the abundance of wetland vegetation, or by the occurrence of indicative species (such as a fringe of *Juncus effusus* or *Juncus inflexus*).

Plants which were included as 'wetland species' are defined by the Pond Action Wetland Plant List (see Table A2.1). This list is based on the NCC wetland plant list, with modifications suggested by Dr Margaret Palmer and Dr Tim Rich. The Wetland List is divided into two sections: aquatic plants (i.e., floating-leaved or submerged species) and marginal/emergent plants.

Marginal/emergent and floating-leaved plant species were recorded from the pond edge. Submerged plant species were gathered using a grapnel. In large or inaccessible ponds, plants were surveyed from a boat.

Where possible, plant species were identified in the field. Critical species (e.g., fine-leaved *Potamogetons*) were identified in the laboratory using a dissecting microscope. Several plants could not be systematically recorded to species level. These included species of batrachian *Ranunculus* and *Callitriche* where flowering and fruiting material were not present. These specimens were, therefore, recorded to genus level only.

A2.1.2 Recording plant abundance

Plant abundance was recorded in the field by plotting the distribution of major stands of wetland vegetation onto a base map of the pond (see Section A1.2). The data was abstracted from the maps to give the percentage abundance of plants in three categories: emergent, submerged and floating-leaved.

A2.2 Plant conservation value

The conservation value of the plant community was assessed on the basis of:
(i) the number of wetland plant species;
(ii) the presence of nationally uncommon plant species.

A2.2.1 Assessing the number of wetland plant species

There are, currently, no systematic surveys of ponds for Britain as a whole. Therefore, the 'number of plant species' cannot be used as part of a national assessment of conservation value. Comparison was, therefore, made internally and with the few other published studies which exist.

A2.2.2 Assessing the number of nationally uncommon plant species

The conservation value of the plant communities of Oxfordshire ponds was also assessed on the basis of the presence of nationally uncommon species (i.e., local, Nationally Scarce or Red Data Book species). Definitions of these terms are given in Table A6.3. A rarity index was then calculated to describe the average rarity of the plants in the community of each pond. This was done for aquatic plant communities and emergent plant communities (see Table A2.1 for species listed as emergent or aquatic). A fuller explantion of rarity indices is given in Appendix 6.

Table A2.1 Pond Action Wetland Plant List

Aquatic plants

Apium inundatum
Aponogeton distachyos
Azolla filiculoides
Callitriche hamulata
Callitriche hermaphroditica
Callitriche obtusangula
Callitriche platycarpa
Callitriche stagnalis
Callitriche truncata
Callitriche sp. (undetermined)
Ceratophyllum demersum
Ceratophyllum submersum
Crassula helmsii
Egeria densa
Elatine hexandra
Eleogiton fluitans
Elodea canadensis
Elodea nuttallii
Glyceria fluitans
Groenlandia densa
Hippuris vulgaris
Hottonia palustris
Hydrocharis morsus-ranae
Isoetes lacustris
Juncus bulbosus
Lagarosiphon major
Lemna gibba
Lemna minor
Lemna minuscula
Lemna polyhriza
Lemna trisulca
Littorella uniflora
Lobelia dortmanna
Luronium natans
Menyanthes trifoliata
Myriophyllum alterniflorum
Myriophyllum aquaticum
Myriophyllum spicatum
Myriophyllum verticillatum
Nuphar lutea
Nymphaea alba
Nymphoides peltata
Oenanthe aquatica
Oenanthe fluviatilis
Potamogeton alpinus
Potamogeton berchtoldii
Potamogeton coloratus
Potamogeton crispus
Potamogeton friesii
Potamogeton gramineus
Potamogeton lucens
Potamogeton natans
Potamogeton obtusifolius
Potamogeton perfoliatus
Potamogeton pectinatus
Potamogeton polygonifolius
Potamogeton praelongus
Potamogeton pusillus
Potamogeton trichoides
Potamogeton hybrid(s)
Ranunculus aquatilis
Ranunculus baudotii
Ranunculus circinatus
Ranunculus fluitans
Ranunculus hederaceus
Ranunculus omiophyllus
Ranunculus peltatus
Ranunculus penicillatus
Ranunculus trichophyllus
Sagittaria sagittifolia
Sparganium angustifolium
Sparganium emersum
Sparganium minimum
Stratiotes aloides
Subularia aquatica
Utricularia australis
Utricularia intermedia
Utricularia minor
Utricularia vulgaris
Wolffia arriza
Zannichellia palustris

Bryophytes:
Fontinalis antipyretica
Riccia fluitans
Ricciocarpus natans
Sphagnum sp.

Algae:
Chara sp.
Nitella sp.
Tolypella sp.

Marginal and emergent plants

Achillea ptarmica
Acorus calamus
Agrostis stolonifera
Alisma lanceolatum
Alisma plantago-aquatica
Alopecurus aequalis
Alopecurus geniculatus
Anagallis tenella
Andromeda polifolia
Angelica archangelica
Angelica sylvestris
Apium nodiflorum
Baldellia ranunculoides
Barbarea intermedia
Barbarea vulgaris
Berula erecta
Bidens cernua
Bidens tripartita
Blysmus compressus
Butomus umbellatus
Calamagrostis canescens
Calamagrostis epigejos
Caltha palustris
Cardamine amara
Cardamine pratensis
Carex acuta
Carex acutiformis
Carex curta
Carex demiss
Carex diandra
Carex disticha
Carex flacca
Carex hostinana
Carex laevigata
Carex lasiocarpa
Carex lepidocarpa
Carex nigra
Carex otrubae
Carex panicea
Carex paniculata
Carex pendula
Carex pseudocyperus
Carex pulicaris
Carex riparia
Carex rostrata
Carex spicata
Carex vesicaria
Catabrosa aquatica
Cicuta virosa
Cirsium dissectum
Cirsium palustre
Cladium mariscus
Conium maculatum
Crepis paludosa
Cyperus longulus
Dactylorhiza fuchsii
Damasonium alisma
Deschampsia caespitosa
Drosera rotundifolia
Eleocharis acicularis
Eleocharis multicaulis
Eleocharis palustris
Eleocharis quinqueflora
Equisetum fluviatile
Equisetum palustre
Epilobium hirsutum
Epilobium nerteroides
Epilobium obscurum
Epilobium palustre
Epilobium parviflorum
Epilobium tetragonum
Epipactis palustris
Erica tetralix
Eriophorum angustifolium
Eriophorum latifolium
Eriophorum vaginatum
Eupatorium cannabinum
Filipendula ulmaria
Galium boreale
Galium palustre
Galium uliginosum
Geum rivale
Glyceria declinata
Glyceria fluitans
Glyceria maxima
Glyceria plicata
Hydrocotyle vulgaris
Hypericum elodes
Hypericum tetrapterum
Impatiens capensis
Impatiens glandulifera
Impatiens noli-tangere
Iris pseudacorus
Isolepis cernua
Isolepis setacea
Juncus acutiflorus
Juncus articulatus
Juncus bufonis agg.
Juncus compressus
Juncus conglomeratus
Juncus inflexus
Juncus subnodulosus
Juncus effusus
Lotus uliginosus
Lychnis flos-cuculi
Lycopus europaeus
Lysimachia nemorum
Lysimachia nummularia
Lysimachia vulgaris
Lythrum hyssopifolia
Lythrum portula
Lythrum salicaria
Mentha aquatica
Mimulus guttatus
Mimulus luteus
Molinia caerulea
Montia fontans
Myosotis laxa
Myosotis scorpioides
Myosotis secunda
Myosoton aquaticum
Myrica gale
Narthecium ossifragum
Nasturtium microphyllum
Nasturtium officinale
Oenanthe aquatica
Oenanthe crocata
Oenanthe fistulosa
Oenanthe lachenalii
Osmunda regalis
Parnassia palustris
Pedicularis palustris
Petasites hybridus
Phalaris arundinacea
Phragmites australis
Pilularia globulifera
Pinguicula vulgaris
Polygonum amphibium
Polygonum hydropiper
Polygonum lapathifolium
Polygonum persicaria
Potentilla erecta
Potentilla palustris
Pulcaria dysenterica
Ranunculus flammula
Ranunculus lingua
Ranunculus sceleratus
Rhynchospora alba
Rorippa amphibia
Rorippa palustris
Rorippa sylvestris
Rumex hydrolapathum
Rumex maritimus
Rumex palustris
Sagina procumbens
Saggittaria sagittifolia
Schoenoplectus lacustris
ssp lacustris
ssp tabernaemontani
Schoenus nigricans
Scrophularia auriculatas
Scutellaria galericulata
Senecio aquaticus
Senecio fluviatilis
Sium latifolium
Solanum dulcamara
Sparganium erectum
Stachys palustris
Stellaria alsine
Stellaria palustris
Symphytum officinale
Thalictrum flavum
Thelypteris palustris
Tofieldia pusilla
Tricophorum cespitosum
Triglochin palustris
Typha angustifolia
Typha latifolia
Valeriana dioica
Veronica anagallis-aquatica
Veronica beccabunga
Veronica catenata
Veronica scutellata
Viola palustris

Trees and shrubs:
Alnus glutinosa
Frangula alnus
Populus sp.
Salix sp.

A2.3 Notes on the national distribution of local and uncommon plant species recorded during the Oxfordshire Pond Survey

Terminology used to describe rarity is given in Appendix 6. Information on plant distribution presented here is from Clapham, Tutin and Moore (1987), Croft, Preston and Forrest (1991) and T. Rich (pers. comm.).

Species are arranged in alphabetical order within three groups: Nationally Notable B, local aquatic species and local emergent species.

(Note: References to 'Britain' are to mainland Britain and do not include Ireland.)

Nationally Notable B species

***Potamogeton coloratus* (NAJADALES: Potamogetonaceae). Fen Pondweed.**

Nationally scarce in Britain. Found in ponds and pools, often in fen peat; also in ditches and slow streams: usually in shallow, calcareous water. Often grows with *Chara* spp., and is sometimes semi-terrestrial on damp fenland moss.

***Potamogeton praelongus* (NAJADALES: Potamogetonaceae). Long-stalked Pondweed.**

Nationally scarce in Britain. Typically found in deep, clear water on substrata not very rich in organic matter, in lakes, ditches, canals, slow streams etc.; northwards from Essex, Surrey, Berkshire and Radnor; also the East Anglian Broads. Frequent in some of the deeper English Lakes and reaching northernmost Scotland. Has decreased markedly in England since 1950.

Local aquatic species

***Callitriche hamulata* (MYRTALES: Callitracheae). Intermediate Water-starwort.**

Found in lakes, reservoirs, pools, ditches and slow streams, in both deep and shallow water, throughout the British Isles. Sometimes grows terrestrially at the water's edge.

***Callitriche obtusangula* (MYRTALES: Callitracheae). Blunt-fruited Water-starwort.**

Locally frequent in the south of England, but rare in the north: in calcareous or eutrophic ponds, ditches, lakes and streams.

***Ceratophyllum demersum* (RANUNCULALES: Ceratophyllaceae). Rigid Hornwort.**

Local in eutrophic or brackish, still, shallow waters. Often present in dense masses, almost completely filling small ponds and ditches. Scattered throughout England, but rare in Wales and Scotland.

***Hippuris vulgaris* (MYRTALES: Hippuridaceae). Mare's Tail.**

Occurs as an emergent species in swamps and shallow waters, but as a true aquatic in lakes and slow sections of rivers, often growing at considerable depth in clear calcareous lakes. Local throughout Britain.

***Hottonia palustris* (PRIMULALES: Primulaceae). Water-violet.**

Found in calcareous water in ponds, ditches, marshes, streams and pools. (Capable of surviving terrestrially for part of the year where water levels are variable.) Locally common in the eastern half of England as far north as Yorkshire, but rarer in central and western England, and almost absent from Wales and the North.

***Hydrocharis morsus-ranae* (ALISMATALES: Hydrocharitaceae). Frogbit.**

Locally common in shallow parts of calcareous ponds and ditches, and bays of lakes, though it has declined markedly in grazing marshes. (Occasionally survives as a land-form in dry seasons.) Scattered throughout England from Devon and Kent to south Lancashire and North-east Yorkshire, around coastal areas of Wales, but almost completely absent from Scotland.

***Lemna gibba* (ARALES: Lemnaceae). Fat Duckweed.**

A species of duckweed which has 'gibbous', swollen leaves. Locally abundant on ditches, ponds and canals, also occasionally at the edge of slow-flowing streams and rivers. Absent from the extreme south-west, but otherwise throughout England as far as north-east Yorkshire and south Lancashire; in the eastern half of Wales; almost absent from Scotland.

***Lemna polyrhiza* (ARALES: Lemnaceae). Greater Duckweed.**

Local on still waters in ditches, ponds, canals and sluggish rivers, where it is often found floating amongst other *Lemna* spp. Almost completely confined to the Midlands and the south in England (though absent from the south-west), the eastern half of Wales, and a handful of sites in Scotland; it is "rather uncommon throughout most of its range".

***Oenanthe fluviatilis* (UMBELLALES: Umbelliferae). River Water-dropwort.**

Found in ponds, ditches, streams and canals, but grows most abundantly in clear, calcareous streams and rivers with a moderate to rapid flow. Its range in mainland Britain is limited to south-east England, where it is very local.

***Potamogeton berchtoldii* (NAJADALES: Potamogetonaceae). Small Pondweed.**

Locally common throughout Britain, in lakes, ponds, canals, streams, ditches, etc., "even turning up in transient water bodies such as cattle troughs"; in very calcareous to very acid waters, but absent from the most oligotrophic sites.

***Potamogeton crispus* (NAJADALES: Potamogetonaceae). Curled Pondweed.**

Common but decreasing in lowland lakes, ponds, slow streams, canals, etc. Found throughout Great Britain, but very local in Wales and absent from much of Scotland.

***Potamogeton lucens* (NAJADALES: Potamogetonaceae). Shining Pondweed.**

Found in lakes, ponds, canals and slow streams on nutrient-rich inorganic substrata, commonly in calcareous water where the leaves become chalk-encrusted. Locally common in the south and east of England (but not Devon and Cornwall), very local in Wales and north-west England, and thinly scattered northwards. One of the largest-leaved of British pondweeds.

***Potamogeton pectinatus* (NAJADALES: Potamogetonaceae). Fennel Pondweed.**

Almost cosmopolitan: found in a wide range of habitats. Abundant in base-rich waters of the lowland zone, including brackish waters, throughout Britain, but absent from the mountainous districts of Wales, northern England and Scotland. One of the most pollution-tolerant of *Potamogeton* species.

***Potamogeton pusillus* (NAJADALES: Potamogetonaceae). Lesser Pondweed.**

Found in lakes, ponds, canals and streams, especially in shallow, highly calcareous or even brackish waters. Not uncommon throughout Britain, but very local in Scotland. A frequent early colonist of flooded sand and gravel pits.

***Ranunculus peltatus* (RANUNCULALES: Ranunculaceae). Pond Water-crowfoot.**

Locally frequent in shallow to moderately deep, generally somewhat eutrophic, waters, in a wide range of aquatic habitats. Found throughout lowland Britain as far north as Ross.

***Ranunculus trichophyllus* (RANUNCULALES: Ranunculaceae). Thread-leaved Water-crowfoot.**

Found in at least moderately nutrient-rich ponds, ditches and slow streams, usually in shallow water. Throughout Britain, but most frequent in south-east England; at present becoming very local in the west and north.

***Sagittaria sagittifolia* (ALISMATALES: Alismataceae). Arrowhead.**

Found in still or slowly flowing, usually calcareous, ponds, ditches, canals and streams; usually growing on muddy substrata in shallow water, but sometimes present in larger, deeper rivers as strap-shaped submerged leaves. Scattered locally throughout England and eastern Wales, but rarer in the north; absent from Scotland.

***Utricularia vulgaris* (SOLANALES: Lentibulariaceae). Greater Bladderwort.**

A carnivorous plant which occurs in standing, often relatively deep, water, including ditches, ponds, lakes and canals. Scattered locally throughout Britain.

***Zannichellia palustris* (NAJADALES: Zosteraceae).Horned Pondweed.**

Appears to occur in a number of distinct habitats: clear water in shallow streams over chalk and limestone, eutrophic ditches, ponds and lakes, and also brackish waters. Found throughout Britain, but much more frequent in England.

Local emergent species

***Butomus umbellatus* (ALISMATALES: Butomaceae). Flowering-rush.**

Found in ditches, ponds and canals; also on river margins. Rather local in England, rare in Wales, and not native in Scotland.

***Calamagrostis epigejos* (POALES: Gramineae). Wood Small-reed.**

Grows in ditches and fens, and in damp woods. Widely distributed in England but local in Wales and Scotland, where it occurs as far north as Sutherland.

***Carex riparia* (CYPERALES: Cyperaceae). Greater Pond-sedge.**

By slow-flowing rivers and in ditches and ponds, and also (though more rarely) on drier ground. Common and very generally distributed in the south of England and the Midlands, but more local in the west and north as far as Fife.

***Epilobium tetragonum* (MYRTALES: Onagraceae). Square-stalked Willow-herb.**

Limited to lowland areas where it grows in damp woodland clearings and hedgebanks, stream, pond and ditch-sides, and on cultivated ground. Locally common in the south, but rare in the north, as far as Inverness and Argyll. (There are several subspecies, of which one, *E. tetragonum lamyi*, is much less frequent and appears to be more or less confined to the southern half of Britain.)

***Epipactis palustris* (ORCHIDALES: Orchidaceae). Marsh Helleborine.**

Characteristically found in fens and dune-slacks; decreasing but at present still locally frequent through much of England and Wales, with 'a few localities' in south-east Scotland as far north as Fife.

***Eriophorum latifolium* (CYPERALES: Cyperaceae).Broad-leaved Cottongrass.**

Found in bogs and other damp places on base-rich or calcareous soil. Scattered locally throughout Britain, but much less frequent than *E. angustifolium*, Common Cotton-grass, which it resembles.

***Juncus subnodulosus* (LILIALES: Juncaceae). Blunt-flowered Rush.**

Grows in fens, marshes and dune-slacks with basic groundwater, often on calcareous peat. Locally abundant in England and Wales, and in south-west Scotland as far north as Angus. (In parts of East Anglia, it is dominant over large areas.)

***Lysimachia nummularia* (PRIMULALES: Primulaceae). Creeping Jenny.**

Found in hedgebanks and grassy places which are moist for most of the year (though not entirely intolerant of drought). Scattered throughout England, Wales and southern Scotland: it is rare further north than this, where if it occurs it is usually an escape from cultivation.

***Lysimachia vulgaris* (PRIMULALES: Primulaceae). Yellow Loosestrife.**

Beside rivers and lakes and in fens; scattered throughout most of Britain, north to Argyll. Locally common.

***Lythrum portula* (MYRTALES: Lythraceae). Water-purslane.**

Sometimes in open communities, but more often on bare ground, at the muddy margins of pools and puddles. Locally common; scattered throughout England, Scotland and Wales but never occurring where the soil is calcareous.

***Oenanthe aquatica* (UMBELLALES: Umbelliferae). Fine-leaved Water-dropwort.**

Found in slow-flowing or stagnant water in marshes, ponds, ditches, and at the edges of streams and rivers, sometimes attaining great size in nearly dry fen ditches. Also occurs as an aquatic, but is never found in the more rapidly-flowing waters favoured by *O. fluviatilis* (see above). Locally common in England, eastern Wales and south-east Scotland, but apparently absent from most of Scotland and the extreme south-west of England.

***Oenanthe fistulosa* (UMBELLALES: Umbelliferae). Tubular Water-dropwort.**

Occurs in shallow water and marshy places, mainly in the eastern half of England; very local in Scotland and Wales.

***Ranunculus lingua* (RANUNCULALES: Ranunculaceae). Greater Spearwort.**

"A local plant of the reed-swamp zone of marshes and 'mixed fens' bordering streams, lakes and ponds where some

silt is deposited" (Clapham, Tutin and Moore). Its present decrease is due to widespread land drainage. Scattered throughout England, but sparse in the south-west and in Wales, and rare in most of Scotland.

Rorippa amphibia (PAPAVERALES: Cruciferae). Great Yellow-cress.

Grows by ponds, ditches and streams. (May very occasionally grow under water, when the leaves may be variable in shape.) Locally frequent from Somerset and Kent as far north as Lancashire and north-east Yorkshire, though it may occasionally be found, probably adventively, further north.

Schoenoplectus lacustris (CYPERALES: Cyperaceae). Common Club-rush.

Found, usually where there is abundant silt, in rivers, lakes and ponds; scattered throughout Britain although commonest in south-east England. (Although in general a freshwater plant, there is a subspecies, *S. lacustris tabernaemontani*, also scattered locally in Britain, which prefers brackish waters and usually occurs near the coast.)

Schoenus nigricans (CYPERALES: Cperaceae). Black Bog-rush.

Occurs in damp, usually peaty, base-rich places; in general, especially associated with areas which are near the sea (sometimes occurring in salt marshes). Locally abundant and widely distributed throughout Britain from Cornwall northwards, but entirely absent from some parts of the country which are remote from the coast; occasionally, however, it is found inland.

Table A2.2 Plant Data of the Oxfordshire Pond Survey

		PILL	BECK	CENT	UFFI	NRRA	KIMA	KIDI	LRUD	FCMO	FCLA	FCSM	LWIU	LWIL	MPLA	MPLB	NEWE	SRCH	DS1.	DS2.	COTH	WW1.
	Total number of species	40	17	22	12	19	22	5	11	11	15	14	24	19	7	13	24	20	21	6	22	12
	Aquatic species	9	6	11	4	3	3	1	2	3	3	4	6	3	0	3	6	2	3	1	3	5
	Emergent species	31	11	11	8	16	19	4	9	8	12	10	18	16	7	10	18	18	18	5	19	7
Status	**AQUATIC**																					
	Azolla filiculoides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
local	Callitriche hamulata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
local	Callitriche obtusangula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Callitriche stagnalis	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Callitriche spp.	+	-	+	+	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	+
local	Ceratophyllum demersum	-	-	-	+	+	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-
	Elodea nuttallii	-	-	+	+	-	-	-	-	+	-	-	+	-	-	+	-	-	-	-	-	+
local	Hippuris vulgaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Hottonia palustris	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Hydrocharis morsus-ranae	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Lemna gibba	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lemna minor	+	+	+	-	+	+	+	-	+	+	+	+	+	-	+	+	-	+	-	-	-
	Lemna minuscula	-	-	-	-	-	-	-	+	-	-	+	-	+	-	-	-	-	-	-	-	-
local	Lemna polyhriza	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lemna trisulca	+	+	+	-	-	-	-	-	-	-	-	+	+	-	+	+	-	-	-	-	-
	Myriophyllum spicatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+
	Nymphaea alba	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Oenanthe fluviatilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Polygonum amphibium	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Potamogeton berchtoldii	-	-	+	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
Scarce B	Potamogeton coloratus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-
local	Potamogeton crispus	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Potamogeton lucens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Potamogeton natans	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
local	Potamogeton pectinatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scarce B	Potamogeton praelongus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Potamogeton pusillus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Ranunculus peltatus	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Ranunculus trichophyllus	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ranunculus Spp.	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Sagittaria sagittifolia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sparganium emersum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Stratiotes aloides	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
local	Utricularia vulgaris	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A2.2 (cont.)

Status		PILL	BECK	CENT	UFFI	NRRA	KIMA	KIDI	LRUD	FCMO	FCLA	FCSM	LWIU	LWIL	MPLA	MPLB	NEWE	SRCH	DS1.	DS2.	COTH	WW1.
	Total number of species	40	17	22	12	19	22	5	11	11	15	14	24	19	7	13	24	20	21	6	22	12
	Aquatic species	9	6	11	4	3	3	1	2	3	3	4	6	3	0	3	6	2	3	1	3	5
	Emergent species	31	11	11	8	16	19	4	9	8	12	10	18	16	7	10	18	18	18	5	19	7
Status	**AQUATIC (continued)**																					
local	Utricularia Spp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
local	Zannichellia palustris	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BROPHYTES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fontinalis antipyretica	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	STONEWORTS (ALGAE)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chara sp.	-	-	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	+	+	+	+
	Nitella sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	EMERGENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agrostis stolonifera	+	+	+	+	+	+	-	-	+	+	+	+	+	-	-	+	+	-	-	-	-
	Alisma plantago-aquatica	+	-	+	-	+	+	+	-	-	+	-	-	-	-	-	+	+	+	-	-	-
	Alopecurus geniculatus	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anagallis tenella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Angelica sylvestris	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Apium nodiflorum	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Berula erecta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Butomus umbellatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Calamagrostis epigejos	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Caltha palustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Cardamine pratensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
	Carex acutiformis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carex otrubae	+	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-
	Carex paniculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Carex pendula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Carex riparia	+	+	-	+	+	+	-	+	-	-	-	+	-	-	-	+	-	-	-	-	+
	Cirsium palustre	+	-	-	-	-	-	-	-	-	-	-	+	+	-	+	-	+	-	-	+	-
	Deschampsia caespitosa	-	+	-	-	+	+	-	-	-	-	-	+	+	-	-	-	+	-	-	-	-
	Eleocharis palustris	+	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
	Equisetum fluviatile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Equisetum palustre	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+	-	-	+	-	+	-
	Epilobium hirsutum	+	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+
	Epilobium parviflorum	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-

Table A2.2 (cont.)

		PILL	BECK	CENT	UFFI	NRRA	KIMA	KIDI	LRUD	FCMO	FCLA	FCSM	LWIU	LWIL	MPLA	MPLB	NEWE	SRCH	DS1.	DS2.	COTH	WW1.
	Total number of species	40	17	22	12	19	22	5	11	11	15	14	24	19	7	13	24	20	21	6	22	12
	Aquatic species	9	6	11	4	3	3	1	2	3	3	4	6	3	0	3	6	2	3	1	3	5
	Emergent species	31	11	11	8	16	19	4	9	8	12	10	18	16	7	10	18	18	18	5	19	7
Status	**EMERGENT (continued)**																					
local	Epilobium tetragonum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
local	Epipactis palustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
local	Eriophorum latifolium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Eupatorium cannabinum	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	+	-
	Filipendula ulmaria	-	+	-	-	+	-	-	-	+	-	-	-	-	-	-	+	-	-	-	+	-
	Galium palustre	+	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Glyceria fluitans	+	-	+	-	+	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-
	Glyceria maxima	+	+	-	+	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-
	Glyceria plicata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydrocotyle vulgaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Hypericum tetrapterum	-	-	-	-	-	-	-	-	+	-	-	+	+	-	-	-	-	-	-	+	+
	Impatiens capensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Impatiens glandulifera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Iris pseudacorus	+	-	-	-	-	+	+	-	-	-	-	-	-	+	+	-	-	-	-	-	-
	Juncus acutiflorus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Juncus articulatus	+	-	-	-	+	+	-	-	-	+	+	-	+	-	-	-	+	+	-	-	-
	Juncus inflexus	+	-	+	+	+	+	-	-	+	+	+	+	+	-	+	+	-	+	+	-	-
local	Juncus subnodulosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-
	Juncus effusus	+	-	+	+	+	-	-	-	+	-	-	+	+	+	+	+	+	+	-	-	-
	Lotus uliginosus	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lycopus europaeus	+	-	+	-	+	-	-	+	+	+	-	+	+	+	+	+	-	+	-	-	-
local	Lysimachia nummularia	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Lysimachia vulgaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Lythrum portula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Lythrum salicaria	-	-	-	-	-	+	-	-	-	-	-	+	+	-	-	-	-	-	-	+	-
	Mentha aquatica	+	+	-	-	-	+	-	-	-	+	+	-	-	-	-	+	-	+	-	+	+
	Mimulus guttatus	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Molinia caerulea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Myosotis scorpioides	+	+	+	-	-	+	-	-	-	+	-	+	-	-	+	+	+	-	-	-	-
	Myosotis secunda	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nasturtium officinale	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	-	+
local	Oenanthe aquatica	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
local	Oenanthe fistulosa	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pedicularis palustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-

Table A2.2 (cont.)

		PILL	BECK	CENT	UFFI	NRRA	KIMA	KIDI	LRUD	FCMO	FCLA	FCSM	LWIU	LWIL	MPLA	MPLB	NEWE	SRCH	DS1.	DS2.	COTH	WW1.
	Total number of species	40	17	22	12	19	22	5	11	11	15	14	24	19	7	13	24	20	21	6	22	12
	Aquatic species	9	6	11	4	3	3	1	2	3	3	4	6	3	0	3	6	2	3	1	3	5
	Emergent species	31	11	11	8	16	19	4	9	8	12	10	18	16	7	10	18	18	18	5	19	7
Status	EMERGENT (continued)																					
	Phalaris arundinacea	-	-	-	+	-	+	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-
	Polygonum hydropiper	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Polygonum lapathifolium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
	Polygonum persicaria	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Potentilla erecta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pulcaria dysenterica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Ranunculus flammula	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Ranunculus lingua	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
	Ranunculus sceleratus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
local	Rorippa amphibia	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rorippa palustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rumex hydrolapathum	+	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
local	Schoenoplectus lacustris	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
local	Schoenus nigricans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-
	Scrophularia auriculata	-	+	-	-	-	-	-	+	-	+	+	+	-	-	-	+	-	-	-	-	+
	Scutellaria galericulata	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Solanum dulcamara	-	+	-	-	-	+	-	+	+	-	-	+	+	+	-	+	+	+	-	+	+
	Sparganium erectum	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
	Stachys palustris	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Stellaria alsine	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Symphytum officinale	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-
	Triglochin palustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Typha latifolia	-	-	+	-	+	-	-	-	-	+	+	-	-	+	+	+	-	+	+	-	-
	Veronica anagallis-aquatica	-	-	-	-	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Veronica beccabunga	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Veronica scutellata	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A2.2 (cont.)

		WW2.	WW3.	ASHM	NILL	CASS	TODU	ARQU	BRNW	LALA	COLA	ASNE	WRTO	WRBO	GIZZ	KENN
	Total number of species	22	24	22	21	27	1	16	11	15	10	14	11	21	16	44
	Aquatic species	7	11	4	4	6	0	1	2	2	6	3	2	6	6	11
	Emergent species	15	13	18	17	21	1	15	9	13	4	11	9	15	10	33
Status	**AQUATIC**															
	Azolla filiculoides	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
local	Callitriche hamulata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Callitriche obtusangula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Callitriche stagnalis	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
	Callitriche spp.	+	+	+	-	-	-	-	-	-	+	-	-	-	+	+
local	Ceratophyllum demersum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Elodea nuttallii	-	+	-	-	-	-	-	+	-	+	-	-	-	+	+
local	Hippuris vulgaris	+	+	-	-	+	-	-	-	-	-	-	-	-	-	+
local	Hottonia palustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Hydrocharis morsus-ranae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Lemna gibba	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lemna minor	+	+	+	+	+	-	-	-	-	-	-	-	+	+	+
	Lemna minuscula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Lemna polyhriza	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lemna trisulca	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Myriophyllum spicatum	+	+	+	-	+	-	-	-	-	+	-	+	+	+	+
	Nymphaea alba	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+
local	Oenanthe fluviatilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Polygonum amphibium	-	+	-	+	-	-	-	-	-	-	+	-	+	-	-
local	Potamogeton berchtoldii	+	+	-	-	+	-	-	-	+	-	-	-	-	-	-
Scarce B	Potamogeton coloratus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Potamogeton crispus	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
local	Potamogeton lucens	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Potamogeton natans	-	+	+	+	-	-	-	-	-	-	+	-	+	-	-
local	Potamogeton pectinatus	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
Scarce B	Potamogeton praelongus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
local	Potamogeton pusillus	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-
local	Ranunculus peltatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Ranunculus trichophyllus	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Ranunculus Spp.	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-
local	Sagittaria sagittifolia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Sparganium emersum	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+
	Stratiotes aloides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Utricularia vulgaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A2.2 (cont.)

		WW2.	WW3.	ASHM	NILL	CASS	TODU	ARQU	BRNW	LALA	COLA	ASNE	WRTO	WRBO	GIZZ	KENN
	Total number of species	22	24	22	21	27	1	16	11	15	10	14	11	21	16	44
	Aquatic species	7	11	4	4	6	0	1	2	2	6	3	2	6	6	11
	Emergent species	15	13	18	17	21	1	15	9	13	4	11	9	15	10	33
Status	**AQUATIC (continued)**															
local	Utricularia Spp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Zannichellia palustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BROPHYTES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fontinalis antipyretica	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	STONEWORTS (ALGAE)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chara sp.	+	+	-	-	+	-	-	-	+	-	-	+	-	-	-
	Nitella sp.	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	EMERGENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agrostis stolonifera	-	-	+	+	-	-	+	-	-	-	+	-	+	-	+
	Alisma plantago-aquatica	-	+	+	-	+	-	-	-	+	-	-	-	-	-	+
	Alopecurus geniculatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anagallis tenella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Angelica sylvestris	-	-	-	+	-	-	-	-	-	-	-	-	+	-	+
	Apium nodiflorum	-	-	+	+	+	-	-	-	+	-	+	-	-	+	-
	Berula erecta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
local	Butomus umbellatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
local	Calamagrostis epigejos	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-
	Caltha palustris	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Cardamine pratensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Carex acutiformis	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
	Carex otrubae	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	Carex paniculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Carex pendula	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
local	Carex riparia	-	+	-	-	+	-	-	-	-	-	-	-	-	-	+
	Cirsium palustre	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-
	Deschampsia caespitosa	+	-	-	-	-	-	-	+	-	-	+	-	-	-	+
	Eleocharis palustris	-	-	+	-	+	-	+	-	-	-	-	-	-	-	-
	Equisetum fluviatile	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+
	Equisetum palustre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Epilobium hirsutum	+	-	+	+	+	-	+	+	-	+	-	+	+	+	+
	Epilobium parviflorum	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-

Table A2.2 (cont.)

		WW2.	WW3.	ASHM	NILL	CASS	TODU	ARQU	BRNW	LALA	COLA	ASNE	WRTO	WRBO	GIZZ	KENN
	Total number of species	22	24	22	21	27	1	16	11	15	10	14	11	21	16	44
	Aquatic species	7	11	4	4	6	0	1	2	2	6	3	2	6	6	11
	Emergent species	15	13	18	17	21	1	15	9	13	4	11	9	15	10	33
Status	**EMERGENT (continued)**															
local	Epilobium tetragonum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Epipactis palustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Eriophorum latifolium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Eupatorium cannabinum	-	-	-	-	+	-	-	-	+	-	-	-	-	-	+
	Filipendula ulmaria	-	-	+	+	-	-	-	-	+	-	+	-	-	-	+
	Galium palustre	-	-	+	-	+	-	+	-	-	-	-	-	-	-	+
	Glyceria fluitans	-	-	+	+	-	-	+	+	-	-	-	-	+	-	-
	Glyceria maxima	-	-	-	-	-	-	+	+	-	-	+	+	-	+	-
	Glyceria plicata	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Hydrocotyle vulgaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hypericum tetrapterum	+	+	-	+	+	-	-	-	-	-	+	-	+	-	+
	Impatiens capensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Impatiens glandulifera	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
	Iris pseudacorus	+	+	-	-	-	-	-	-	-	-	-	-	-	+	+
	Juncus acutiflorus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Juncus articulatus	+	-	+	-	+	-	-	-	+	-	+	-	-	-	+
	Juncus inflexus	-	+	+	+	+	-	-	-	+	-	+	-	-	+	+
local	Juncus subnodulosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Juncus effusus	+	+	+	+	+	-	-	+	+	-	+	+	+	-	+
	Lotus uliginosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lycopus europaeus	+	+	-	-	+	-	-	-	-	-	-	-	+	-	+
local	Lysimachia nummularia	+	-	+	-	-	-	-	-	-	-	-	-	-	-	+
local	Lysimachia vulgaris	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
local	Lythrum portula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lythrum salicaria	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+
	Mentha aquatica	+	+	+	+	+	-	+	-	+	-	-	+	+	-	+
	Mimulus guttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Molinia caerulea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Myosotis scorpioides	+	+	-	+	+	-	-	-	-	-	-	-	-	-	+
	Myosotis secunda	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Nasturtium officinale	+	-	+	+	-	-	+	+	+	-	-	-	-	+	+
local	Oenanthe aquatica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
local	Oenanthe fistulosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pedicularis palustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A2.2 (cont.)

		WW2.	WW3.	ASHM	NILL	CASS	TODU	ARQU	BRNW	LALA	COLA	ASNE	WRTO	WRBO	GIZZ	KENN
	Total number of species	22	24	22	21	27	1	16	11	15	10	14	11	21	16	44
	Aquatic species	7	11	4	4	6	0	1	2	2	6	3	2	6	6	11
	Emergent species	15	13	18	17	21	1	15	9	13	4	11	9	15	10	33
Status	**EMERGENT (continued)**															
	Phalaris arundinacea	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Polygonum hydropiper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Polygonum lapathifolium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Polygonum persicaria	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Potentilla erecta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pulcaria dysenterica	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Ranunculus flammula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
local	Ranunculus lingua	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Ranunculus sceleratus	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
local	Rorippa amphibia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rorippa palustris	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Rumex hydrolapathum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
local	Schoenoplectus lacustris	-	-	-	-	+	-	-	-	-	-	-	-	+	-	+
local	Schoenus nigricans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Scrophularia auriculata	+	+	-	+	-	-	-	+	+	+	-	+	+	+	-
	Scutellaria galericulata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Solanum dulcamara	+	+	+	+	-	+	+	+	+	+	-	+	-	-	+
	Sparganium erectum	-	-	-	-	-	-	-	-	-	-	+	+	+	-	+
	Stachys palustris	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+
	Stellaria alsine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Symphytum officinale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Triglochin palustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Typha latifolia	-	+	-	-	+	-	-	-	+	-	-	-	-	-	+
	Veronica anagallis-aquatica	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	Veronica beccabunga	+	+	+	+	-	-	-	-	-	-	-	+	+	-	-
	Veronica scutellata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX 3

AQUATIC MACROINVERTEBRATES

A3.1 Macroinvertebrate survey methodology

A3.1.1 Groups of macroinvertebrates surveyed

Table A3.6 contains a full checklist of all species included in the survey. Inclusion in the list does not indicate that the species was recorded during the OPS. Table A3.1 gives a summary of the groups of invertebrates identified to species level. These groups were chosen because they were relatively easy to identify and because their habitat and distributions are relatively well known.

Table A3.1 Groups of Aquatic Macroinvertebrates Identified to Species Level During the Oxfordshire Pond Survey

Group	English name	Comments
Tricladida	Flatworms	Aquatic species. As defined in Reynoldson, T.B (1978).
Gastropoda	Snails and limpets	Aquatic species. As defined in Macan, T.T. (1977).
Hirudinea	Leeches	
Malacostraca	Freshwater shrimps, slaters and crayfish	Aquatic freshwater species as defined in Gledhill, T. *et al.* (1976).
Araneae	Spiders	One species, *Argyroneta aquatica* (The Water Spider).
Ephemeroptera	Mayflies	Larvae.
Odonata	Dragonflies	Larvae. All larvae >12mm body length. All species except*Coenagrion puella* and *C. pulchellum* which were treated as an aggregate.
Plecoptera	Stoneflies	Larvae. All larvae >5mm.
Hemiptera	Water bugs	Adults of aquatic species. As defined in Savage, A.A. (1989).
Megaloptera	Alderflies	Larvae.
Coleoptera	Water beetles	Adults of all species dealt with in Friday, L.E. (1988). (This excludes determination of the females of some species.)
Trichoptera	Caddisflies	Larvae. At the stages of maturity defined in Wallace, I.D. *et al.* (1990).

A3.1.2 Sampling aquatic macroinvertebrates

Objectives

The objective of the macroinvertebrate sampling was to obtain a representative species list, with abundance data, for each pond. The methodology was so designed that the number of species obtained was maximised within the broad objective of obtaining a representative species list.

Selection of microhabitats for sampling

Microhabitats were selected following a brief walk around the pond. For the purpose of the OPS, any of the examples in Table A3.1 could constitute a separate microhabitat.

Methods of survey

The number of microhabitats available (usually less than 10) was tallied and the available sampling time (three minutes) was divided equally between these microhabitats. e.g., for six microhabitats, each was sampled for 30 seconds. The sampling was timed with a stopwatch. Where a microhabitat was large or fragmented, the sampling time was divided between different areas of the microhabitat. For example, 30 seconds of sampling of a large stand of Common Reed might be divided into three periods of 10 seconds each.

Precise methods of sampling varied according to microhabitat type. The five types of sampling in Table A3.3 were the most common.

Table A3.2 Defining Microhabitats

Microhabitat	Examples
Stands of different species of plants	E.g., Bulrush (*Typha latifolia*) or Common Reed (*Phragmites australis*).
Areas of different plant mosaics	E.g., two stands of Broad-leaved Pondweed (*Potamogeton natans*) and Articulated Rush (*Juncus articulatus*) might be considered different microhabitats if dominance of the species differed markedly between the stands.
Areas with different plant structure	E.g., a stand of Floating Sweetgrass (*Glyceria fluitans*) growing in shallow water might be different in structure from a stand of the same species growing in deeper water, and hence might be considered to be a separate habitat.
Areas of other, non-plant, habitat	E.g., gravel substrates, open water over silt, leaf litter, etc.
Composite habitats	E.g., inflow areas, shaded areas, etc.

Notes: 1. Deep mud and silt were not sampled as part of the survey, but sweeps in the water just above the mud or silt surface yielded most of the animals living on or near the surface.

2. Areas which fitted into one of the above categories but which were, nevertheless, very small, were not termed microhabitats but were sampled whilst sampling other microhabitats.

Table A3.3 Hand Netting Methodology

Habitat type	Sampling method
Most vegetation stands	These habitats were netted vigorously with a motion designed to dislodge invertebrates present. The net was occasionally swept quickly through the disturbed area to catch dislodged invertebrates.
Mud and silt	The net was swept quickly backwards and forwards through the water above the silt. The aim was to disturb the surface of the mud or silt, bringing invertebrates into the water column where they were picked up by the net.
Sands and gravels	Sand and gravel substrates were kicked with the heel whilst the net was swept through the area around the disturbance created.
Very shallow water	Very shallow water, where the substrate was relatively hard, was sampled by dragging the net over the substrate whilst pressing the net down.
Habitats with no water	Many aquatic species prefer habitats where no standing water is present, but where the vegetation is saturated with water. In these situations the vegetation was trampled to produce open water and this was then sampled with the net.

After each individual netting the contents of the net were placed in a white ten-litre bucket. The lid of the bucket was kept on whilst the survey was in progress in order to prevent invertebrates escaping. When all samples had been taken the bucket was drained of excess water and sealed before transport back to the laboratory. Samples were sorted as soon as possible. When this was not possible immediately after return from the field, samples were kept in cold storage. All samples were sorted within three days of being taken.

A3.1.3 Extraction of macroinvertebrates from samples

Objectives

To remove, or identify, every macroinvertebrate on the OPS checklist in the sample taken, and estimate the abundance of each species.

Subsampling

As numerical information on invertebrate abundance was required, a process of subsampling was sometimes employed in order to limit the amount of time taken in removing immediately identifiable invertebrates. Samples were divided into one-quarter and three-quarters on a white tray before placing each moiety in a different bucket. Most samples were too large to be subsampled at once and so the division process was performed on several portions of the sample.

Note. Though the samples were often subsampled, *all* invertebrates which could not be identified were removed from both the quarter and three-quarter samples.

Washing samples

Samples were washed by taking a portion of the sample and either placing this on a sieve (0.5mm mesh) and running water gently through it, or by mixing the portion with a large amount of water in a bucket before straining through a sieve.

Sorting samples

A handful of sample was placed along one edge of a large white tray with an amount of tap water sufficient to create about a 5mm depth. The vegetation and debris was gradually teased apart and pulled towards the sorter. Most invertebrates revealed were removed and placed in 70% industrial methylated spirits (IMS). Exceptions to this form of preservation were leeches and flatworms which were identified immediately (these two groups do not preserve well), and any other species which could be identified reliably by eye. Species and abundance of easily recognisable species, leeches and flatworms were noted for inclusion in the final lists. Following preservation, invertebrates were stored for later identification.

A3.1.4 Identification of macroinvertebrates

Specimens from those groups listed in Table A3.4 were identified to species level using the keys listed in References (Vol. 1). Most specimens were identified in-house, though some specimens were sent to suitable referees for confirmation/identification. We would like to acknowledge the following for their help with identification of critical specimens:

Michael Kerney	Natural History Museum/British Conchological Society	Gastropoda
Alan Savage	Keele University	Heteroptera
David Bilton	Balfour-Browne Club	Coleoptera
Garth Foster	Balfour-Browne Club	Coleoptera
I. and B.Wallace	City of Liverpool Museum	Trichoptera

A3.2 Efficacy of sampling methods

A3.2.1 The 1987 trials

In 1987, in order to evaluate the proposed methods for the OPS, seven samples were taken from Central Pond on Otmoor. The results of this sampling are shown in Figure A3.1. The top line in the figure represents the accumulation of species over the course of the seven samples, and columns below show the number of species in each of the individual samples.

It can be seen from the figure that the number of species in each sample is relatively constant (mean 45.3 ± 2.0). By the end of the sampling the number of species can be seen to be tailing off. A 'jackknife' estimate of final species richness (Heltsche and Forrester, 1983) gives a value of 72, with confidence limits RDB3 to 81.

After one sample, then, it appeared that approximately 63% of all the species at the site had been captured, and after three samples 79% of the species had been captured. After the first sample, 77% of the species recorded from the first three samples had been taken. This allows a comparison with the results of other workers. The figure of 77% capture is much higher than that found by the IFE (50%) during their work on rivers (Furse *et al.*, 1984), and by Verdonschodt (55%) in his work on a variety of aquatic habitats in Holland (Veronschodt, 1990). These workers went on to build successful classifications based on samples with this percentage of the species present. It was, therefore, decided that a single three-minute sample should suffice for the purposes of the OPS.

A3.2.2 The 1989 post-sampling appraisal

During 1989, 34 sites were sampled in triplicate. This allows us to appraise retrospectively the constancy of the sampling technique used. Over the 34 triplicate samples the average deviation from the mean of the three samples was 12.4% ± 9.4%; i.e., on average, the number of species from one sample in any triplicate deviated from the mean of the number of species in the triplicate by 12.4% of the mean. The standard deviation of this average deviation was 9.4% of the mean. This compares with an average 18.1% deviation from the mean found by the IFE.

On average the first sample in any triplicate collected 63% of the species which were found after all three samples had been taken (it is not possible to reliably estimate the final total of species from just three samples). This is less than the 77% figure which was found during the 1987 trials, but higher than that found by other workers.

It might be expected that a time-limited sampling method would be expected to yield a smaller proportion of the species from large sites. If this were the case we might expect the additional accumulation of species in the second and third samples to be higher for large sites than for small sites. A correlation (Spearman's Rank) of the additional accumulation (total species in all three samples/average number of species) against the size of the site shows that there is no correlation between the two (r= -0.17). It is, of course, possible that the accumulation curve would carry on for longer in a larger site, but this is not testable with the data here.

The additional accumulation is a measure of how 'difficult' it is to get a full species list from a site. It would be useful to know which types of site were 'easy' and which 'difficult' to sample. To discover this, additional accumulation (total species in all three samples/average number of species) was correlated aginst all environmental variable (see Table A3.4).

Most of the correlations point to the fact that there is less additional accumulation in fen ponds, i.e., that a single sample from these sites will give a better approximation of true species numbers than will samples from other types of site. The correlation is strong with respect to the first DECORANA axis of the aquatic plant analysis, which is itself correlated with unenriched fen ponds. The enzyme alkaline phosphatase would be expected to be maximal in these situations as there would be little free phosphate in the water.

It would seem, therefore, that the sampling methods employed during the OPS have proved effective in achieving a relatively constant number of species from any one site, and a relatively constant proportion of the species from sites, this proportion being largely independent of size of site.

Figure A3.1 Accumulation Curve for Macroinvertebrates Recorded from Central Pond, Otmoor: July 1987

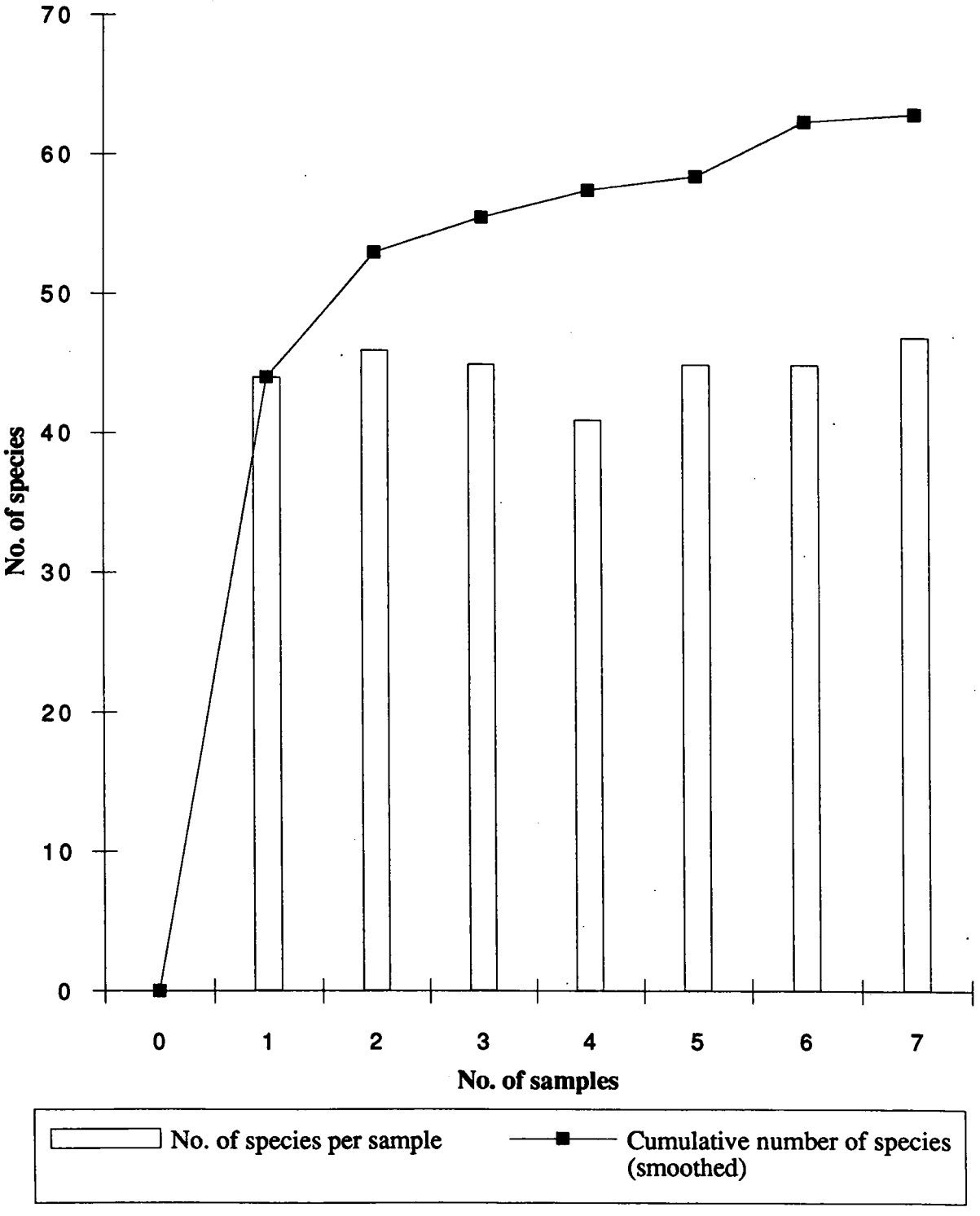

Table A3.4 Correlations of Additional Accumulation with Environmental Variables

Variable	Additional accumulation (probabilities from Spearman's Rank correlation)
Chemistry	
Alkalinity	-
Alkaline phosphatase	-
Landuse	
Scrub woodland - 5m	-
Urban and roads - 25m	-
Fen Marsh and Bog -10m	-
Fen Marsh and Bog - 250m	-
Fen Marsh and Bog - total	-
Invertebrates	
% flatworms	+
Average species 1989	—
DECORANA	
Wetland axis 1	—
Aquatic axis 1	—
(probabilities from Mann-Whitney U)	
Wetland group 4	-
Aquatic group 2	+
Aquatic group 3	-

+=positive correlation, - =negative correlation.
Level of significance: +<0.05, ++<0.001, +++<0.005, ++++<0.001

A3.3 Comparison of DECORANA analyses from four sets of data

A3.3.1 Introduction

During 1989, triplicate samples were taken from 34 Oxfordshire ponds. During 1990 a single sample was taken from each of the same 34 ponds. Surveys were carried out in a different season in 1990 from those in 1989 (see Table A1.1 for sampling dates). Each of these four sets of data (three from 1989 and one from 1990) were analysed using DECORANA. In addition to these four ordinations, ordinations were also performed on the combined samples from 1989 (one composite species list from each site - 89.All), all four samples combined (89/90.All/1) and a combination of replicate 1 from 1989 and the 1990 sample (89/90.1/1). In order to estimate how constant the ordination of the 34 ponds was, the DECORANA axes were cross-correlated with each other. The results of these correlations are shown in Table A3.5.

Note that as the axes are expected to be correlated, the probabilities quoted are lower (i.e., the significance higher) than for other tables in this report. In the table, • represents an invalid correlation; i.e. a self correlation such as 1989 rep 1 axis 1 against itself.

A3.3.2 Cross-correlating DECORANA axes

DECORANA has no external reference against which to compare a particular data set. Whether a correlation is positive or negative, therefore, is arbitrary and all correlations, positive or negative, are treated in the same way. Also, with no external reference against which a data set is judged, the interpretation of variation within a data set can vary quite markedly between very similar databases. This is particular true of higher axes and especially so when the eigenvalues are similar. Quite simply, if the eigenvalues of, say, the second and third axes are similar, then which is to be interpreted as the second, and which the third, axis will be very sensitive to small changes in the database. It is, therefore, quite normal to see strong correlations between the second and the third axes. It is also possible to see the variation of the second axis of a data set being apportioned between the second and third axis of a second data set. This latter problem makes the correlation of ordination axes not strictly appropriate (Digby and Kempton, 1987). Or rather, significant correlations will indicate that the ordinations are similar but lack of correlation should not be used to infer that the ordinations are dissimilar.

A3.3.3 The OPS axes

In the table, it can be seen that all the first axes are highly significantly correlated. On axis 2 all 1989 reps are also highly significantly correlated with each other, but not with the 1990 data. There is, however, some correlation of the 89 results with the 89/90.1/1 dataset and, likewise, this is correlated with the 1990 data set. In several cases, where there is no correlation between the two second axes, there is a correlation between the second and the third axes. For example, the second axis of 89/90.1/1 is not correlated with the second axis of 89/90.All/1 but is highly correlated with its third axis. These two data sets are very similar, the latter being, essentially, the former with two extra datasets (89.2 and 89.3) added to it, illustrating the problems of comparing these axes.

On the third axes there is some correlation between 89 rep 1 and both other 89 axes, but not between 1989 rep 2 and 1989 rep 3. There is also correlation between 89 rep 2 and both 89/90.All/1 and 90.1.This weakening of correlation with decreasing axis significance is to be expected in any data set.

From these findings it seems that the interpretation of the *major* variation in the community structure of Oxfordshire ponds (i.e., axis 1) is relatively constant, and largely independent of yearly and seasonal changes. The second major variation, however, appears to be affected by some element or yearly of seasonal difference, though it is not possible from this analysis to say how large this difference is.

In order to simplify any descriptions of ordination analyses it was decided to use a single data set. The data set chosen was the 89/90.1/1 data set for three reasons:

i) The data set combines results from two seasons of data and therefore more information than that from one season;

ii) The amount of information from each season is similar (i.e., one replicate from each);

iii) There is a direct correlation between the second axis of this data set and some of the second axes of the 1989 data and the 1990 data.

In order, also, to be internally consistent, the only TWINSPAN classification considered in the text is that based on the 1989/90.1/1 data set.

Table A3.5 Intercorrelation of DECORANA Axes

Year(s)			89	89	89	89	90	89 90	89 90	89	89	89	89	90	89 90	89 90	89	89	89	89	90	89 90	89 90
Replicate(s)			1	2	3	All	1	1/1	All/1	1	2	3	All	1	1/1	All/1	1	2	3	All	1	1/1	All/1
Axis			1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3
89	1	1	•	+++	+++	+++	+++	+++	+++	n	n	n	n	n	n	n	n	n	n	n	n	n	n
89	2	1	+++	•	+++	+++	+++	+++	+++	n	n	n	n	n	+	n	n	n	n	n	n	n	n
89	3	1	+++	+++	•	+++	+++	+++	+++	n	n	n	n	n	n	n	n	n	n	n	n	n	n
89	All	1	+++	+++	+++	•	+++	+++	+++	n	n	n	n	n	n	n	n	n	n	n	n	n	n
90	1	1	+++	+++	+++	+++	•	+++	+++	n	n	n	n	n	n	n	n	n	n	n	n	n	n
89/90	1/1	1	+++	+++	+++	+++	+++	•	+++	n	+	n	n	n	n	n	n	n	n	n	n	n	n
89/90	All/1	1	+++	+++	+++	+++	+++	+++	•	n	+	n	n	n	n	n	n	n	n	n	n	n	n
89	1	2	n	n	n	n	n	n	n	•	+++	+++	+++	n	++	n	n	n	n	n	n	n	++
89	2	2	n	n	n	n	n	+	+	+++	•	+++	+++	n	n	n	n	n	n	n	n	n	n
89	3	2	n	n	n	n	n	n	n	+++	+++	•	+++	n	n	+	n	n	n	n	n	n	n
89	All	2	n	n	n	n	n	n	n	+++	+++	+++	•	n	+	n	n	n	n	n	n	n	++
90	1	2	n	n	n	n	n	n	n	n	n	n	n	•	++	n	n	n	+	++	n	n	+
89/90	1/1	2	n	+	n	n	n	n	n	++	n	n	+	++	•	n	n	n	n	n	n	n	+++
89/90	All/1	2	n	n	n	n	n	n	n	n	n	+	n	n	n	•	n	+++	n	n	+++	n	n
89	1	3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	•	+	+	n	+	n	n
89	2	3	n	n	n	n	n	n	n	n	n	n	n	n	n	+++	+	•	n	n	++	n	+
89	3	3	n	n	n	n	n	n	n	n	n	n	n	+	n	n	+	n	•	+	n	n	n
89	All	3	n	n	n	n	n	n	n	n	n	n	n	++	n	n	n	n	+	•	n	n	n
90	1	3	n	n	n	n	n	n	n	n	n	n	n	n	n	+++	+	++	n	n	•	n	n
89/90	1/1	3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	•	n
89/90	All/1	3	n	n	n	n	n	n	n	++	n	n	++	+	+++	n	n	+	n	n	n	n	•

Key		
	+	p<0.005
	++	p<0.0005
	+++	p<0.00005
	n =	not significant

Note:

Levels of significance used in this table are higher than those used elsewhere in this report.
Significance quoted is irrespective of whether the correlation is positive or negative.

Table A3.6 Macroinvertebrate Recording List

Rarity Score*	Species Name	Rarity Score	Species Name
	TRICLADIDA		**Planorbidae**
	Planariidae & Dugesiidae		Planorbis carinatus
4	Planaria torva		Planorbis planorbis
	Polycelis felina		Anisus leucostoma
	Polycelis nigra		Anisus vortex
	Polycelis tenuis	32	Anisus vorticulus
	Phagocata vitta		Bathyomphalus contortus
	Phagocata woodworthi	32	Gyraulus acronicus
	Crenobia alpina		Gyraulus albus
2	Dugesialugubris	4	Gyraulus laevis
	Dugesia polychroa		Armiger crista
	Dugesia tigrina		Hippeutis complanatus
	Dendrocoelidae	64	Segmentina nitida
8	Bdellocephala punctata		Planorbarius corneus
	Dendrocoelum lacteum		Menetus dilatatus
	GASTROPODA		**Ancylidae & Acroloxidae**
	Neritidae		Ancylus fluviatilis
	Theodoxus fluviatilis		Ferrissia wautieri
	Viviparidae		Acroloxus lacustris
2	Viviparus contectus		**BIVALVIA**
	Viviparus viviparus		**Margaritiferidae**
	Valvatidae		Margaritifera margaritifera
	Valvata cristata		**Unionidae**
32	Valvata macrostoma		Unio pictorum
	Valvata piscinalis	2	Unio tumidus
	Hydrobiidae & Bithyniidae		Anodonta anatina
8	Hydrobia neglecta		Anodonta cygnea
	Hydrobia ulvae	4	Pseudanodonta complanata
8	Hydrobia ventrosa		**Dreissenidae**
64	Pseudamnicola confusa		Dreissena polymorpha
	Potamopyrgus jenkinsi		**HIRUDINEA**
16	Marstoniopsis scholtzi		**Piscicolidae**
	Bithynia leachii		Piscicola geometra
	Bithynia tentaculata		**Glossiphoniidae**
	Assimineidae	32	Haementeria costata
4	Assiminea grayana		Theromyzon tessulatum
	AQUATIC PULMONATA	2	Hemiclepsis marginata
	Physidae		Glossiphonia complanata
2	Aplexa hypnorum	2	Glossiphonia heteroclita
	Physa acuta	4	Batracobdella paludosa
	Physa fontinalis	8	Boreobdella verrucata
	Physa gyrina		Helobdella stagnalis
	Physa heterostropha		**Hirudinidae**
	Lymnaeidae	16	Hirudo medicinalis
	Lymnaea auricularia		Haemopis sanguisuga
32	Lymnaea glabra		**Erpobdellidae**
	Lymnaea palustris		Erpobdella octoculata
	Lymnaea peregra	2	Erpobdella testacea
	Lymnaea stagnalis	4	Dina lineata
	Lymnaea truncatula	2	Trocheta bykowskii
64	Myxas glutinosa		Trocheta subviridis

(cont.)

*Scores were as assessed on 6/6/93 and are those used in calculation of SRIs (see Appendix 6).

Table A3.6 (cont.)

Rarity Score	Species Name	Rarity Score	Species Name
	ARANEAE		Gammarus oceanicus
	Argyroneta aquatica		Gammarus pulex
	ANOSTRACA		Gammarus salinus
	Artemiidae		Gammarus zaddachi
64	Artemia salina		**Niphargidae**
	Chirocephalidae	16	Niphargellus glenniei
32	Chirocephalus diaphanus	2	Niphargus aquilex
	NOTOSTRACA	2	Niphargus fontanus
	Triopsidae	2	Niphargus kochianus
64	Triops cancriformis		**EPHEMEROPTERA**
	BATHYNELLACEA		**Siphlonuridae**
	Bathynellidae	4	Siphlonurus alternatus
2	Bathynella natans	2	Siphlonurus armatus
2	Bathynella stammeri	2	Siphlonurus lacustris
	DECAPODA		Ameletus inopinatus
	Palaemonidae		**Baetidae**
	Palaemonetes varians	2	Baetis atrebatinus
	Palaemon longirostris	2	Baetis buceratus
	Crangonidae	4	Baetis digitatus
	Crangon crangon		Baetis fuscatus
	Grapsidae		Baetis muticus
	Eriocheir sinensis		Baetis niger
	Astacidae		Baetis rhodani
4	Austropotamobius pallipes		Baetis scambus
	MYSIDACEA		Baetis tenax
	Mysidae		Baetis vernus
64	Mysis relicta		Centroptilum luteolum
	Neomysis integer	2	Centroptilum pennulatum
	ISOPODA		Cloeon dipterum
	Asellidae	2	Cloeon simile
	Asellus aquaticus		Procloeon bifidum
	Asellus cavaticus		**Heptageniidae**
	Asellus communis	2	Rhithrogena germanica
	Asellus meridianus		Rhithrogena semicolorata
	Janiridae	8	Heptagenia fuscogrisea
	Jaera nordmanni		Heptagenia lateralis
	Sphaeromatidae	64	Heptagenia longicauda
	Sphaeroma hookeri		Heptagenia sulphurea
	Sphaeroma rugicauda	64	Arthroplea congener
	AMPHIPODA		Ecdyonurus dispar
	Corophiidae	2	Ecdyonurus insignis
	Corophium curvispinum		Ecdyonurus torrentis
	Corophium insidiosum		Ecdyonurus venosus
16	Corophium lacustre		**Leptophlebiidae**
	Corophium multisetosum		Leptophlebia marginata
	Corophium volutator		Leptophlebia vespertina
	Talitridae		Paraleptophlebia cincta
2	Orchestia cavimana		Paraleptophlebia submarginata
	Gammaridae & Crangonyctidae	16	Paraleptophlebia werneri
	Crangonyx pseudogracilis		Habrophlebia fusca
2	Crangonyx subterraneus		**Potamanthidae**
2	Echinogammarus berilloni	32	Potamanthus luteus
	Gammarus chevreuxi		**Ephemeridae**
8	Gammarus duebeni		Ephemera danica
2	Gammarus lacustris	32	Ephemera lineata
	Gammarus locusta		Ephemera vulgata

Table A3.6 (cont.)

Rarity Score	Species Name	Rarity Score	Species Name
	Ephemerellidae		**ODONATA**
	Ephemerella ignita		ZYGOPTERA
8	Ephemerella notata		**Platycnemididae**
	Caenidae	4	Platycnemis pennipes
8	Brachycercus harrisella		**Coenagriidae**
	Caenis horaria		Pyrrhosoma nymphula
	Caenis luctuosa		Ischnura elegans
2	Caenis macrura	8	Ischnura pumilio
	Caenis rivulorum		Enallagma cyathigerum
2	Caenis robusta	64	Coenagrion armatum
4	Caenis pusillus	32	Coenagrion hastulatum
	PLECOPTERA	64	Coenagrion lunulatum
	Taeniopterygidae	16	Coenagrion mercuriale
4	Taeniopteryx nebulosa		Coenagrion puella
8	Rhabdiopteryx acuminata	4	Coenagrion pulchellum
16	Brachyptera putata	16	Coenagrion scitulum
	Brachyptera risi	4	Ceriagrion tenellum
	Nemouridae	2	Erythromma najas
	Protonemura meyeri		**Lestidae**
4	Protonemura montana	32	Lestes dryas
2	Protonemura praecox		Lestes sponsa
4	Amphinemura standfussi		**Calopterygidae**
	Amphinemura sulcicollis		Calopteryx splendens
	Nemurella picteti	2	Calopteryx virgo
	Nemoura avicularis		ANISOPTERA
	Nemoura cambrica		**Gomphidae**
	Nemoura cinerea	8	Gomphus vulgatissimus
8	Nemoura dubitans		**Cordulegasteridae**
2	Nemoura erratica		Cordulegaster boltonii
	Leuctridae		**Aeshnidae**
	Leuctra fusca	4	Brachytron pratense
	Leuctra geniculata	4	Aeshna caerulea
	Leuctra hippopus		Aeshna cyanea
	Leuctra inermis		Aeshna grandis
2	Leuctra moselyi	64	Aeshna isosceles
	Leuctra nigra		Aeshna juncea
	Capniidae	2	Aeshna mixta
4	Capnia atra		Anax imperator
2	Capnia bifrons		**Corduliidae**
8	Capnia vidua	4	Cordulia aenea
	Perlodidae	16	Somatochlora arctica
32	Isogenus nubecula	4	Somatochlora metallica
	Perlodes microcephala	64	Oxygastra curtisii
	Diura bicaudata		**Libellulidae**
	Isoperla grammatica	2	Orthetrum cancellatum
64	Isoperla obscura	2	Orthetrum coerulescens
	Perlidae		Libellula depressa
	Dinocras cephalotes	16	Libellula fulva
	Perla bipunctata		Libellula quadrimaculata
	Chloroperlidae	16	Sympetrum flaveolum
64	Chloroperla apicalis	16	Sympetrum fonscolombei
	Chloroperla torrentium		Sympetrum nigrescens
	Chloroperla tripunctata	4	Sympetrum sanguineum
			Sympetrum scoticum
			Sympetrum striolatum

Table A3.6 (cont.)

Rarity Score	Species Name	Rarity Score	Species Name
	Libellulidae (cont.)		Corixa punctata
16	Sympetrum vulgatum	8	Corixa iberica
8	Leucorrhinia dubia		Hesperocorixa castanea
	HEMIPTERA		Hesperocorixa linnei
	Mesovelidae		Hesperocorixa moesta
2	Mesovelia furcata		Hesperocorixa sahlbergi
	Hebridae		Arctocorisa carinata
8	Hebrus pusillus		Arctocorisa germari
2	Hebrus ruficeps		Sigara dorsalis
	Hydrometridae	8	Sigara striata
16	Hydrometra gracilenta		Sigara distincta
	Hydrometra stagnorum		Sigara falleni
	Veliidae	16	Sigara fallenoidea
	Velia caprai		Sigara fossarum
	Velia saulii		Sigara scotti
8	Microvelia pygmaea		Sigara lateralis
	Microvelia reticulata		Sigara nigrolineata
16	Microvelia umbricola	2	Sigara concinna
	Gerridae		Sigara limitata
2	Gerris argentatus		Sigara semistriata
	Gerris costai		Sigara venusta
2	Gerris gibbifer		Sigara selecta
	Gerris lacustris		Sigara stagnalis
2	Gerris lateralis		**COLEOPTERA**
	Gerris odontogaster		**Haliplidae**
	Gerris thoracicus		Brychius elevatus
2	Gerris najas	4	Peltodytes caesus
8	Gerris paludum	4	Haliplus apicalis
4	Gerris rufoscutellatus		Haliplus confinis
	Nepidae		Haliplus flavicollis
	Nepa cinerea		Haliplus fluviatilis
2	Ranatra linearis		Haliplus fulvus
	Naucoridae	64	Haliplus furcatus
	Ilyocoris cimicoides	4	Haliplus heydeni
	Aphelocheiridae		Haliplus immaculatus
4	Aphelocheirus aestivalis	4	Haliplus laminatus
	Notonectidae		Haliplus lineatocollis
	Notonecta glauca		Haliplus lineolatus
	Notonecta maculata	8	Haliplus mucronatus
	Notonecta obliqua	2	Haliplus obliquus
	Notonecta marmorea		Haliplus ruficollis
	Pleidae	16	Haliplus variegatus
	Plea leachi	16	Haliplus varius
	Corixidae		Haliplus wehnckei
2	Micronecta scholtzi		**Hygrobiidae**
16	Micronecta minutissima		Hygrobia hermanni
	Micronecta poweri		**Noteridae**
2	Cymatia bonsdorffi		Noterus clavicornis
2	Cymatia coleoptrata	4	Noterus crassicornis
	Glaenocorisa propinqua		**Dytiscidae**
	Callicorixa praeusta		Laccophilus hyalinus
	Callicorixa wollastoni		Laccophilus minutus
2	Corixa affinis	32	Laccophilus variegatus
2	Corixa dentipes	8	Hydrovatus clypealis
2	Corixa panzeri		Hyphydrus ovatus

Table A3.6 (cont.)

Rarity Score	Species Name	Rarity Score	Species Name
	Dytiscidae (cont.)		Oreodytes septentrionalis
4	Hydroglyphus pusillus	16	Oreodytes alpinus
16	Bidessus minutissimus	4	Scarodytes halensis
64	Bidessus unistriatus	16	Laccornis oblongus
4	Hygrotus decoratus	2	Copelatus haemorrhoidalis
	Hygrotus inaequalis		Platambus maculatus
4	Hygrotus quinquelineatus		Agabus affinis
2	Hygrotus versicolor	2	Agabus arcticus
	Coelambus confluens	4	Agabus biguttatus
	Coelambus impressopunctatus		Agabus bipustulatus
4	Coelambus lautus	32	Agabus brunneus
4	Coelambus novemlineatus	4	Agabus chalconatus
4	Coelambus parallelogrammus	2	Agabus congener
8	Coelambus nigrolineatus	4	Agabus conspersus
	Hydroporus angustatus		Agabus didymus
8	Hydroporus cantabricus		Agabus guttatus
	Hydroporus discretus	4	Agabus labiatus
16	Hydroporus elongatus	4	Agabus melanarius
	Hydroporus erythrocephalus		Agabus melanocornis
4	Hydroporus ferrugineus		Agabus nebulosus
16	Hydroporus glabriusculus		Agabus paludosus
	Hydroporus gyllenhalii	32	Agabus striolatus
	Hydroporus incognitus		Agabus sturmii
4	Hydroporus longicornis	4	Agabus uliginosus
4	Hydroporus longulus	16	Agabus undulatus
4	Hydroporus marginatus	4	Agabus unguicularis
2	Hydroporus melanarius	4	Ilybius aenescens
2	Hydroporus memnonius		Ilybius ater
2	Hydroporus morio	4	Ilybius fenestratus
4	Hydroporus neglectus		Ilybius fuliginosus
	Hydroporus nigrita	4	Ilybius guttiger
	Hydroporus obscurus		Ilybius quadriguttatus
4	Hydroporus obsoletus	4	Ilybius subaeneus
	Hydroporus palustris	64	Rhantus aberratus
	Hydroporus planus		Rhantus exsoletus
	Hydroporus pubescens	4	Rhantus frontalis
32	Hydroporus rufifrons	4	Rhantus grapii
32	Hydroporus scalesianus	4	Rhantus suturalis
	Hydroporus striola	2	Rhantus suturellus
	Hydroporus tessellatus		Colymbetes fuscus
	Hydroporus tristis	64	Hydaticus continentalis
	Hydroporus umbrosus	4	Hydaticus seminiger
4	Stictonectes lepidus	16	Hydaticus transversalis
16	Graptodytes bilineatus	64	Graphoderus bilineatus
32	Graptodytes flavipes	16	Graphoderus cinereus
4	Graptodytes granularis	64	Graphoderus zonatus
	Graptodytes pictus	16	Acilius canaliculatus
2	Porhydrus lineatus		Acilius sulcatus
4	Deronectes latus	8	Dytiscus circumcinctus
2	Potamonectes assimilis	4	Dytiscus circumflexus
	Potamonectes depressus	16	Dytiscus dimidiatus
4	Potamonectes griseostriatus	4	Dytiscus lapponicus
	Stictotarsus duodecimpustulatus		Dytiscus marginalis
2	Oreodytes davisii		Dytiscus semisulcatus
	Oreodytes sanmarkii		Suphrodytes dorsalis

Table A3.6 (cont.)

Rarity Score	Species Name	Rarity Score	Species Name
	Hydropsychidae (cont.)		Limnephilus extricatus
16	Hydropsyche saxonica		Limnephilus flavicornis
	Hydropsyche siltalai	2	Limnephilus fuscicornis
	Diplectrona felix	16	Limnephilus fuscinervis
	Phryganeidae		Limnephilus griseus
64	Agrypnia crassicornis		Limnephilus hirsutus
	Agrypnia obsoleta	2	Limnephilus ignavus
4	Agrypnia pagetana		Limnephilus incisus
64	Agrypnia picta		Limnephilus lunatus
	Agrypnia varia		Limnephilus luridus
64	Hagenella clathrata		Limnephilus marmoratus
2	Oligotricha striata		Limnephilus nigriceps
	Phryganea bipunctata	64	Limnephilus pati
2	Phryganea grandis		Limnephilus politus
	Trichostegia minor		Limnephilus rhombicus
	Brachycentridae		Limnephilus sparsus
2	Brachycentrus subnubilus		Limnephilus stigma
	Lepidostomatidae	8	Limnephilus subcentralis
	Crunoecia irrorata	64	Limnephilus tauricus
4	Lasiocephala basalis		Limnephilus vittatus
	Lepidostoma hirtum	16	Nemotaulius punctatolineatus
	Limnephilidae	8	Phacopteryx brevipennis
32	Ironoquia dubia	2	Rhadicoleptus alpestris
16	Apatania auricula		**Goeridae**
4	Apatania muliebris		Goera pilosa
2	Apatania wallengreni	2	Silo nigricornis
	Drusus annulatus		Silo pallipes
	Ecclisopteryx guttulata		**Beraeidae**
	Allogamus auricollis		Beraea maurus
	Halesus digitatus		Beraea pullata
	Halesus radiatus	2	Beraeodes minutus
2	Hydatophylax infumatus	8	Ernodes articularis
2	Melampophylax mucoreus		**Sericostomatidae**
64	Mesophylax aspersus	2	Notidobia ciliaris
	Mesophylax impunctatus		Sericostoma personatum
	Micropterna lateralis		**Odontoceridae**
	Micropterna sequax		Odontocerum albicorne
	Potamophylax cingulatus		**Molannidae**
	Potamophylax latipennis		Molanna angustata
2	Potamophylax rotundipennis	2	Molanna palpata
	Stenophylax permistus		**Leptoceridae**
	Stenophylax vibex		Athripsodes albifrons
	Chaetopteryx villosa		Athripsodes aterrimus
	Anabolia nervosa		Athripsodes bilineatus
	Glyphotaelius pellucidus		Athripsodes cinereus
	Grammotaulius nigropunctatus	2	Athripsodes commutatus
64	Grammotaulius nitidus	2	Ceraclea albimacula
	Limnephilus affinis		Ceraclea annulicornis
	Limnephilus auricula		Ceraclea dissimilis
2	Limnephilus binotatus		Ceraclea fulva
2	Limnephilus bipunctatus		Ceraclea nigronervosa
4	Limnephilus borealis	4	Ceraclea senilis
	Limnephilus centralis	16	Leptocerus interruptus
	Limnephilus coenosus	32	Leptocerus lusitanicus
2	Limnephilus decipiens		Leptocerus tineiformi
	Limnephilus elegans		

Table A3.6 (cont.)

Rarity Score	Species Name	
	Mystacides azurea	
	Mystacides longicornis	
2	Mystacides nigra	
16	Adicella filicornis	
	Adicella reducta	
32	Erotesis baltica	
	Triaenodes bicolor	
8	Ylodes conspersus	
32	Ylodes reuteri	
16	Ylodes simulans	
2	Oecetis furva	
	Oecetis lacustris	
16	Oecetis notata	
	Oecetis ochracea	
2	Oecetis testacea	
16	Setodes argentipunctellus	
32	Setodes punctatus	

A3.4 Descriptions of the national distribution of Rare, Nationally Notable and 'local' macroinvertebrates recorded during the Oxfordshire Pond Survey, 1988-1990

Species are arranged into major groups (snails, crustacea etc.) and in taxonomic order within these groups. Terminology used in these notes is as follows:

RDB1 = 'Endangered': Species in danger of extinction and whose survival is unlikely if the causal factors continue operating; i.e., those whose numbers have been reduced to a critical level, or whose habitats have been so dramatically reduced that the species are deemed to be in immediate danger of extinction. Included in this category are species which (a) are known as only a single population within one 10-km square of the National Grid; (b) only occur in habitats known to be especially vulnerable; (c) have shown a rapid and continuous decline over the last 20 years and now exist in five or fewer 10km grid squares; (d) are believed extinct, but which, if rediscovered, would need protection.

RDB2 = 'Vulnerable': species believed likely to move into the 'Endangered' (RDB1) category in the near future; i.e., those of which most or all populations are decreasing or seriously depleted (e.g., because of habitat destruction, environmental disturbance etc.), or species with populations which may still be abundant but which are under threat from serious adverse factors throughout their range.

RDB3 = 'Rare': species with small populations not at present endangered or vulnerable, but at risk; not likely to exist in more than 15 10-km grid squares (or, in a few cases, more widespead but occupying small areas of especially vulnerable habitat).

Nationally Notable A: Scarce: recorded from only 15 - 30 10-km grid squares.

Nationally Notable B: Scarce: recorded from only 31 - 100 10-km grid squares.

Local: Species not falling into any of the above categories, but usually either (a) confined to certain limited geographical areas where they may, however, be present in large numbers; (b) of widespread distribution, but present only in small numbers where they occur; or (c) restricted to a very specialised habitat of which, however, the species may be a common component.

Note:
1. RDB species listed below are indicated with an asterisk*. References to 'Britain' are to mainland Britain, and do not include Ireland.
2. Local status has been assigned by Pond Action on the basis of known distribution and comments in the literature.

Tricladida: flatworms

Dugesia lugubris (TRICLADIDA: Dugesiidae). A flatworm.

Local. Often abundant on stones and vegetation in ponds, lakes and ditches, and in the quieter reaches of streams and rivers (tending to be restricted to water bodies which are rich in calcium, because of its dependence on snails as a food source). Its distribution and ecology are not at present fully known, since most earlier records of this species are now thought to belong to the commoner *D. polychroa*, with which it has, in the past, been confused. However, *D. lugubris* is believed to be less widespread than *polychroa*, and they may be competitors. (T.B. Reynoldson, 1978.)

Gastropoda: snails

Viviparus contectus (GASTROPODA: Viviparidae). Lister's River Snail.

Local. Found in rivers, and also in lakes and large ponds. Rather local, and restricted in range to the centre and east of England, with a few sites on the western English coast; completely absent from Wales, Scotland, the south-west and the southern coast of England. (T.T. Macan, 1977; M. Kerney, 1976.)

Aplexa hypnorum (GASROPODA: Physidae). The Moss Bladder Snail.

Local. A soft-water species; typically found in small ponds and ditches that dry up in summer, but sometimes found out of water; occasionally in larger water-bodies. Widespread but local in England and Wales, with a few sites in Scotland. (T.T Macan, 1977; Fitter and Manuel, 1986; M. Kerney, 1976.)

*Myxas glutinosa** (GASTROPODA: Lymnaeidae). The Glutinous Snail.

RDB1 and Schedule 5. Feared extinct in Britain until recorded in Kennington Pit during this survey, this snail occurs in spacious bodies of quiet, very clean water in slow rivers, canals, drainage ditches and lakes, usually in hard water. It is protected under Schedule 5 of the Wildlife and Countryside Act 1981. The species appears to be unusually sensitive to physical disturbance and to chemical pollution, and cannot survive for long in artificial conditions. It avoids turbid or weed-choked places and shows a preference for firm substrates rather than vegetation. (M. Kerney, 1991; Pond Action, 1992.)

Gyraulus laevis (GASTROPODA: Planorbidae). The Smooth Ramshorn.

Nationally Notable B. An uncommon and local species, recorded more frequently from Scotland and the north. Found in soft-water ponds and lakes (and also, occasionally, in hard waters). In the southern part of its range it is often found in new or immature gravel pits, where it prefers bare substrata. (T.T. Macan, 1977; M. Kerney, pers. comm.)

Leeches: Hirudinea

Glossiphonia heteroclita (HIRUDINEA: Glossiphoniidae). A leech.

Local. A predator of molluscs, oligochaetes and insect larvae which is found chiefly in lakes, ditches and ponds, but also among the marginal vegetation of slow-flowing streams and rivers (never occurring in fast-flowing waters). Widespread but local and uncommon in most of Britain, but apparently completely absent from northern Scotland. (Elliott and Mann, 1979; Elliott and Tullett, 1982.)

Hemiclepsis marginata (HIRUDINEA: Glossiphoniidae). A leech.

Local. A sanguivorous ectoparasite of fish and amphibian larvae, occurring in almost all types of water and often thriving in stagnant, weedy ponds. Widespread, but not common, throughout Britain. (Elliott and Mann, 1979; Elliott and Tullett, 1982.)

Erpobdella testacea (HIRUDINEA: Erpobdellidae). A leech.

Local. This species is restricted to England and Wales, where it is widespread but uncommon. Typically found in small, poorly-oxygenated and overgrown ponds, though it may occasionally be found in stagnant, overgrown sections of rivers. (J.M. Elliott and P. A. Tullett, 1982.)

Crustacea: freshwater shrimps and crayfish

Austropotamobius pallipes (DECAPODA: Astacidae). The Atlantic Stream or White-footed Crayfish.

Schedule 5. Typically found in clean flowing waters, but also in some sluggish rivers and, occasionally, lakes. Populations have declined in recent years, due largely to the introduction (now forbidden by law) and spread of other crayfish species, notably *Pacifastacus leniusculus* (the Signal Crayfish): these non-native species not only compete for food and habitat, but in addition carry a fungal disease (*Aphanomyces astaci*, the 'crayfish plague'), to which *A. pallipes* is extremely vulnerable. Agricultural pollution, urban run-off and effluents, and dredging and river-bank realignment are considered further significant threats to this species' survival. It is protected under Schedule 5 of the Wildlife and Countryside Act 1981. (Goddard and Hogger, 1986.)

Niphargus aquilex (AMPHIPODA: Niphargidae). A freshwater shrimp.

Local. A tiny, eyeless shrimp which lives in subterranean waters and interstitially amongst gravel within the water table: often found where ground water reaches the surface, e.g., wells and spring outlets, or in wet hollows on sandy heaths under *Sphagnum*. Widely distributed in southern England and a few areas of Wales. (Hynes, Macan and Williams, 1960; Fitter and Manuel, 1986.)

Cloeon simile (EPHEMEROPTERA: Baetidae). The Lake Olive.

Local. Widespread, but rather less common than *C. dipterum* (the Pond Olive) , although the two species are similar in appearance, and may occur together in some localities. The nymphs are found in the margins and pools of slow-flowing sections of streams and rivers, and in the deeper water of larger ponds and lakes. (J. Elliott, U. Humpesch and T.T. Macan, 1988.)

Caenis robusta (EPHEMEROPTERA: Caenidae). A mayfly ("angler's curse" or "white midge").

Local. The larvae are locally common and widespread, both in running and still waters. Found in the pools and margins of rivers and in ponds and canals, chiefly in mud or silt that is rich in organic matter. (J. Elliott, U. Humpesch and T.T. Macan, 1988.)

Nemoura erratica (PLECOPTERA: Nemouridae). A stonefly ("early brown").

Local. Scattered, local distribution around Britain: apparently absent over large parts of Scotland, Wales, and eastern and central England, the Oxfordshire area being one of the few places in this section of the country where it has been recorded. Although fairly rare, however, the species can be present in abundance where it does occur. Characteristically found in small stony streams, sometimes at high altitudes where a short-winged adult form occurs. (H.B.N. Hynes, 1984.)

Erythromma najas (ODONATA: Coenagrionidae). The Red-eyed Damselfly.

Local. Locally common, predominantly in the south of England. Generally associated with large ponds and lakes. (Hammond and Gardner, 1985.)

Sympetrum sanguineum (ODONATA: Libellulidae). The Ruddy Darter.

Nationally Notable B. This dragonfly species is restricted to eastern England, where it has been under threat from habitat loss. It favours well-reeded, marshy ponds. (Hammond and Gardner, 1985.)

***Mesovelia furcata* (HEMIPTERA: Mesoveliidae). (The Pondweed Bug.)**

Local. Though its distribution is at present poorly known, *M. furcata* is thought to be widespread but scarce, in low-altitude areas of Wales, the south and the Midlands. Requires some vegetation; found on floating leaves of pondweeds in still waters. (A.A. Savage, 1989; Fitter and Manuel, 1986.)

***Gerris argentatus* (HEMIPTERA: Gerridae). The Little Pond Skater.**

Local. Widespread over England and Wales, but scarce. Prefers still-water habitats, colonising areas of ponds and lakes with little aquatic plant cover. (A.A. Savage, 1989.)

***Ranatra linearis* (HEMIPTERA: Nepidae). The Water Stick Insect.**

Local. A frequent species in more southern counties (particularly the south-east), but scarce in Wales and the Midlands, and absent from the rest of Britain. Prefers ponds and lakes, but is also occasionally found in slow-flowing sections at the margins of rivers and streams. Requires plenty of emergent plant cover, since floating dead stems of, for example, bur-reed (*Sparganium* spp.) or bulrush (*Typha* spp.) are utilised as egg-laying sites. (A.A. Savage, 1989; P. Kirby, 1992; Pond Action, unpublished data.)

***Micronecta scholtzi* (HEMIPTERA: Corixidae). A lesser water boatman.**

Local. Limited in range to the south of England and the Midlands, where it is in general locally common. Found in both rivers and lakes at low altitudes, where it prefers little plant cover and a clean gravel or sand substratum. (A.A. Savage, 1989; Fitter and Manuel, 1986.)

***Cymatia bonsdorffi* (HEMIPTERA: Corixidae). A lesser water boatman.**

Local. A small, carnivorous water bug which occurs in still-water, often acidic and/or base-poor, habitats where there is plenty of aquatic and emergent plant cover. Distribution is scattered throughout Britain, but the species is somewhat more frequent in low-altitude areas of Wales and the north of England than in other regions. (A.A. Savage, 1989.)

***Cymatia coleoptrata* (HEMIPTERA: Corixidae). A lesser water boatman.**

Local. A small water bug, related to *C. bonsdorffi*, but much less widespread: found in the south of England and the Midlands, but the north-west Midlands are believed to be the northern limit of its range. (Records of the species from regions further north than this are now thought to have been misidentifications.) Found in lakes and ponds with moderate to large amounts of aquatic and emergent plant cover, at low altitude. (A.A. Savage, 1989.)

***Corixa dentipes* (HEMIPTERA: Corixidae). A lesser water boatman.**

Local. A scarce and local species occurring in most of Britain except south-western England. Found in lakes or, more frequently, ponds and pools, with large to very large amounts of plant cover. (A.A. Savage, 1989.)

***Corixa panzeri* (HEMIPTERA: Corixidae). A lesser water boatman.**

Local. A local species with a widespread distribution through mainland Britain, but scarce where it occurs; found only at low altitudes, in ponds or pools with a moderate amount of aquatic or emergent plant cover. (A.A. Savage, 1989.)

***Sigara concinna* (HEMIPTERA: Corixidae). A lesser water boatman.**

Local. Found throughout mainland Britain, particularly in the Midlands, but scarce where it occurs. Restricted to still waters, usually with some vegetation; often associated with new or disturbed sites. (A.A. Savage, 1989; Pond Action, unpublished data.)

Trichoptera: caddisflies

***Agraylea sexmaculata* (TRICHOPTERA: Hydroptilidae). A cased caddis fly.**

Local. Local and scarce throughout Britain in ponds, lakes and slow-flowing waters. The larva is dependent upon filamentous algae (blanket weed), from which it makes its case and upon which it feeds. Often shares its habitat with the more common *A. multipunctata*. (I.D. Wallace, 1991; Pond Action, unpublished data.)

***Beraeodes minutus* (TRICHOPTERA: Beraeidae). A cased caddis fly.**

Local. Found amongst exposed roots of marginal vegetation and trees, usually where these touch a mineral substratum. There have been comparatively few records of this species, but it is considered to be local rather than Notable in status since it may well have been overlooked due to its small size. Occurs throughout Britain. (I.D. Wallace, 1991.)

***Ecnomus tenellus* (TRICHOPTERA: Ecnomidae). A caseless caddis fly.**

Local. Found in slow sections of rivers, canals, ponds and large sections of lakes, often at considerable depth. Local in the southern half of England, but rarer elsewhere and absent north of Shropshire and Lincolnshire. (I.D. Wallace, 1991.)

***Limnephilus decipiens* (TRICHOPTERA: Limnephilidae). A cased caddis fly.**

Local. A species of rich waters where there is plenty of vegetation: found in ponds, lakes, canals, dykes and slowly flowing rivers. Except for the Cheshire Meres (where it "should be regarded as one of the special insects of those sites"), the distribution of this caddis species is limited to southern England (excluding the south-west), East Anglia, Lincolnshire and extreme south-east Derbyshire. (I.D. Wallace, 1991.)

***Phryganea grandis* (TRICHOPTERA: Phryganeidae). A cased caddis fly.**

Local. A local species of weedy ponds, lakes, canals and very slowly flowing rivers. It has been recorded from all areas throughout Britain; the "general paucity of records" is thought, perhaps, to be due to "its fairly short flight period and a most elusive larva". Nevertheless, the species is believed to merit a local status. (I.D. Wallace, 1991.)

Coleoptera: beetles

***Haliplus heydeni* (COLEOPTERA: Haliplidae). A water beetle.**

Nationally Notable B. Local and uncommon. Completely absent in modern times from Scotland and Wales; in the north of England, where there are a few scattered sites, the habitat is usually in fens or mosses, sometimes in association with fen carr. In southern and eastern England, however, the species is a little more widely distributed (the majority of recorded sites being clustered in the extreme south), and is often common in small weedy or grassy ponds and ditches in partial shade. (G. Foster,1981; L. Friday, 1988.)

***Haliplus laminatus* (COLEOPTERA: Haliplidae). A water beetle.**

Nationally Notable B. The distribution pattern shows this species to be confined to the south-eastern quarter of England, pre-1950 records suggesting that it has declined drastically in the west during the latter half of this century. Found in canals, rivers and silt ponds. (G. Foster, 1981; L. Friday, 1988.)

***Haliplus obliquus* (COLEOPTERA: Haliplidae). A water beetle.**

Local. Widespread but local, occurring throughout Britain except in the Scottish Highlands. Usually a species of permanent base-rich waters, it is often found in ponds or ditches where the aquatic vegetation includes *Chara* sp. (stonewort), with which it appears to be associated (although this is as yet incompletely studied). (G. Foster, 1981; G. Foster and M.D. Eyre, 1992.)

***Peltodytes caesus* (COLEOPTERA: Haliplidae). A water beetle.**

Nationally Notable B. A beetle of fenland drains and quarry ponds. "This appears to be a declining fenland species, but it is still common where it occurs." Its range, however, has receded since 1950 to a few sites in the far south of England. (G. Foster, 1981.)

***Agabus chalconatus* (COLEOPTERA: Dytiscidae). A diving beetle.**

Nationally Notable B. Found in shaded ponds, ditches etc. in stagnant or slow-flowing, often acid, waters, tending to be associated with temporary habitats. Locally common (though not necessarily abundant where they occur) throughout southern England, but uncommon in the north and apparently absent altogether from Scotland. (L. Friday, 1988; Pond Action, unpublished data).

***Agabus labiatus* (COLEOPTERA: Dytiscidae). A diving beetle.**

Nationally Notable B. A flightless species which lives in stagnant water, mostly in relict fen areas. It is often associated with ponds that dry out, but also sometimes occurs in permanent, highly acid ponds where there are no fish, and it is thought to be an important relict species of such pools. Its range extends from the north-east of Scotland through a sparse scattering of sites down to the east of England and the south coast: post-1950 records from the western half of Britain are rare. (G. Foster, 1983; G. Foster and M. Eyre, 1992.)

***Agabus uliginosus* (COLEOPTERA: Dytiscidae). A diving beetle.**

Nationally Notable B. Local and uncommon (but see below) in marshy and temporary pools. Its distribution resembles that of *A. labiatus* (with which it is often found in relict fen sites in Norfolk), but it is even less widespread, being entirely absent from most of Scotland and, apart from sites near Cardiff and Bristol, from the western half of Britain. (Since it was recently - in 1992 - 'demoted' from Nationally Notable A, however, this species is clearly less uncommon than had been previously thought.) (G. Foster, 1983; L. Friday, 1988; G. Foster and M. Eyre, 1992.)

***Copelatus haemorrhoidalis* (COLEOPTERA: Dytiscidae). A diving beetle.**

Local. A warmth-loving species, capable of flight; rather common in stagnant, often shaded, ponds, ditches and drains, etc. in the southern half of Britain, and in particular in the south-east. (G. Foster, 1983; Pond Action, unpublished data.)

***Hydroglyphus pusillus* (COLEOPTERA: Dytiscidae). A diving beetle.**

Local. Found in heath pools, mossy ditches, and (most characteristically, and sometimes in abundance) in new,

man-made ponds, where it is often one of the earliest colonisers (as at Pinkhill Meadows in Oxfordshire). Locally distributed in the south of England, where it is fairly common, and the Midlands. (G. Foster, 1981; L. Friday, 1988; Pond Action, unpublished data.)

Hydroporus marginatus (COLEOPTERA: Dytiscidae). A diving beetle.

Nationally Notable B. Found in both running and still water, often on chalk or limestone (but with some exceptions on base-rich rocks). Once believed to be semisubterranean, although this is now thought to have been an over-simplification: it may retreat underground into subterranean water in dry conditions, but it has been recorded in chalk and shingle pits without groundwater. Restricted in range to southern England and Wales, where, though scarce, it is less rare than was previously thought, having been 'demoted' in 1992. (It was formerly Nationally Notable A.) (G. Foster, 1984; L. Friday, 1988; G. Foster and M. Eyre, 1992.)

Hydroporus memnonius (COLEOPTERA: Dytiscidae). A diving beetle.

Local. Widely distributed in Britain, but "rarely considered common": found in very shallow, stagnant ponds, ditches, etc. where there are large amounts of dead leaves. An interesting feature of this species is the fact that the female has two distinct forms which appear to be quite decisively separated geographically: 'shining' (occurring in Scotland and stopping almost on the Border), and 'matt' (var. *castaneus*) (the only form known from nearly all of England and Wales). The reasons for this distribution of the female forms are not at present fully understood. (G. Foster, 1984.)

Hygrotus versicolor (COLEOPTERA: Dytiscidae). A diving beetle.

Local. Usually found in association with thin vegetation over bare substrate, in deep permanent waters, either stagnant or slow-flowing; mainly in clay pits and fen drains, but the natural habitat is presumed to be the slower stretches of base-rich rivers. The distribution of this species, scattered locally through parts of southern Yorkshire and Lancashire, the Midlands, Wales, and eastern and southern England, is thought to reflect an association with man's activities. (G. Foster, 1981; G. Foster and M. Eyre, 1992.)

Ilybius fenestratus (COLEOPTERA: Dytiscidae). A diving beetle.

Nationally Notable B. A species of slow or stagnant permanent open water with relict populations in lakes in south-west Scotland, but which otherwise, in the east and south-east of England, occurs in older artificial ponds and canals. Despite its apparent flightlessness, it often appears in recently man-made pits and lakes. Also found in ponds, rivers and marshes. Locally common. (G. Foster, 1983; G. Foster *et al.*, 1989; L. Friday, 1988; G. Foster and M. Eyre, 1992.)

Ilybius subaeneus (COLEOPTERA: Dytiscidae). A diving beetle.

Nationally Notable B. Found in detritus ponds. Its distribution is largely centred in the north of England, but there is a cluster of sites around the south-east. In all other parts of Britain it is either rare or entirely absent. It is thought that the species may have extended its range during this century; but there is little hard evidence for this. (L. Friday, 1988; G. Foster, 1983.)

Porhydrus lineatus (COLEOPTERA: Dytiscidae). A diving beetle.

Local. Locally scattered throughout most of Britain, excluding the north of Scotland, west Wales, and Devon and Cornwall. The species is said to be characteristic of lowland "Atlantic" lakes, and particularly favours muddy ponds and ditches. (G. Foster, 1983; L. Friday, 1988; G. Foster and M. Eyre, 1992.)

***Scarodytes halensis* (COLEOPTERA: Dytiscidae). A diving beetle.**

Nationally Notable B. A pioneer species characteristic of recently cleared drains in the East Anglian fens, but in the Midlands it has extended its range by occupying natural, slow-flowing rivers and streams.Also found in silt ponds. Its distribution is very much limited to central eastern England, where it is, moreover, scarce where it occurs. (G. Foster, 1983; L. Friday, 1988; G. Foster and M. Eyre, 1992.)

***Gyrinus bicolor* (COLEOPTERA: Gyrinidae). A whirligig beetle.**

Nationally Notable A. (Also known as *G. paykulli*.) The specialised habitat of this species is reedbeds in ancient lake and fen areas, particularly on the surface among the reeds at the edge of open water. Reflecting this requirement, the species is scarce, with only a few sites sparsely scattered around the east coast of England, East Anglia, Cheshire, and one in Scotland. (G. Foster, 1985; L. Friday, 1988.)

***Gyrinus suffriani** (COLEOPTERA: Gyrinidae). A whirligig beetle.**

RDB3. Found at the edges of pools, in a very few locations in south-eastern England, with one site in Anglesey. "Apart from *G. natator*..., [this] is our rarest [*Gyrinus*] species, probably by a margin greatly in excess of what might be construed from the maps." (Foster.) *G. suffriani* was recently (1992) 'promoted' to RDB3 from Nationally Notable A, and is therefore now officially designated Rare. (G. Foster, 1985; P.S. Hyman and M.S. Parsons, 1992.)

***Riolus cupreus* (COLEOPTERA: Elmidae). A riffle beetle.**

Nationally Notable B. A species characteristic of base-rich running waters, but also found in lakes. A widespread but rather sparse distribution throughout Britain; rarely found in large numbers where it occurs. (L. Friday, 1988.)

***Riolus subviolaceous* (COLEOPTERA: Elmidae). A riffle beetle.**

Nationally Notable B. An uncommon and rare species of base-rich waters, more confined to running-water habitats than *R. cupreus*. Distribution very widespread, though sparse, over mainland Britain. (L. Friday, 1988.)

***Anacaena bipustulata* (COLEOPTERA: Hydrophilidae). A water scavenger beetle.**

Nationally Notable B. Frequent in the south of England and in the eastern part of the Midlands, with a few sites in the extreme south of Wales; completely absent from the rest of Britain. Occurs in streams, rivers and pits. (L. Friday, 1988; G. Foster, 1987.)

***Berosus signaticollis* (COLEOPTERA: Hydrophilidae). A water scavenger beetle.**

Nationally Notable B. A scarce species, apparently limited in range to the south and west of England. Typically found in shallow, muddy and silty ponds, where it appears to be tolerant of intense fouling by livestock: perhaps influenced by occasional brackish conditions. "An important part of the southern heathland community."...."Even in the deep south, any *Berosus* species makes the day a little more cheerful." (Foster.) (G. Foster, 1987; G. Foster and M. Eyre, 1992.)

***Cercyon convexiusculus* (COLEOPTERA: Hydrophilidae). A water scavenger beetle.**

Nationally Notable B. Unlike many of the *Cercyon* species, the five mentioned here are all true aquatics. (Tested by "the inability to survive a trip in the hold of a boat to America", according to Foster!) *C. convexiusculus* is typical of fen litter. Not at all uncommon: scattered distribution throughout Britain, excluding the north of Scotland, but mainly in eastern England. (G. Foster, 1987; L. Friday, 1988.)

Cercyon marinus (COLEOPTERA: Hydrophilidae). A water scavenger beetle.

Local. Found in damp places. Probably less common than *C. convexiusculus*, at least in eastern England: widespread, but scarce, throughout Britain. (L. Friday, 1988.)

Cercyon sternalis (COLEOPTERA: Hydrophilidae). A water scavenger beetle.

Nationally Notable B. A species of fen litter. Very local and scarce: a few scattered sites on both sides of the Severn estuary, but otherwise limited to the south and south-east of England; entirely absent from the rest of England, Wales, and the whole of Scotland. (G. Foster, 1987; L. Friday, 1988.)

Cercyon tristis (COLEOPTERA: Hydrophilidae). A water scavenger beetle.

Nationally Notable B. Found in bogs and fens. Widespread, but sparsely distributed and scarce, throughout mainland Britain. (G. Foster, 1987; L. Friday, 1988.)

Cercyon ustulatus (COLEOPTERA: Hydrophilidae). A water scavenger beetle.

Nationally Notable B. Found in wet mud at the edges of ponds, where it appears to be associated with wet decaying organic matter. Scarce, but widespread throughout Britain. (L. Friday, 1988; G. Foster, 1985.)

Chaetarthria seminulum (COLEOPTERA: Hydrophilidae). A water scavenger beetle.

Nationally Notable B. A minute beetle (which may perhaps sometimes have been overlooked). Occurs amongst moss and mud in fens and bogs. Very widespread in Britain, but scarce where it occurs. (L. Friday, 1988.)

Cymbiodyta marginella (COLEOPTERA: Hydrophilidae). A water scavenger beetle.

Local. Found in stagnant waters (ponds, ditches, etc.) with aquatic vegetation. Its range covers most of England excluding the extreme south-west, eastern Wales and southern Scotland, but it is only really common in the south-east: throughout its range, its distribution is very much concentrated in lowland areas. (L. Friday, 1988; G. Foster, 1987.)

Enochrus coarctatus (COLEOPTERA: Hydrophilidae). A water scavenger beetle.

Local. Prefers pools with rich vegetation. Widespread distribution throughout England, but only very occasionally found in Scotland. The species was recently 'demoted' in status from Nationally Notable B, and is now considered to be local. (L. Friday, 1988; Hyman and Parsons, 1992.)

*Enochrus isotae** (COLEOPTERA: Hydrophilidae). A water scavenger beetle.

RDB3. This species was recorded for the first time in Britain in 1984 (Foster); its range at present appears to be limited to the south of England, where its typical habitat appears to be fens. The species is rare. (L. Friday, 1988.)

Enochrus melanocephalus (COLEOPTERA: Hydrophilidae). A water scavenger beetle.

Nationally Notable B. Usually a coastal species frequenting brackish water in southern England (though it may occasionally be found in the north of England), but in south-east England it may occur, locally, inland. (D. Bilton, pers. comm.; L. Friday, 1988.)

***Enochrus ochropterus* (COLEOPTERA: Hydrophilidae). A water scavenger beetle.**

Nationally Notable B. Found in detritus pools and drains. Local, sparse distribution throughout Britain. (L. Friday, 1988.)

***Enochrus testaceus* (COLEOPTERA: Hydrophilidae). A water scavenger beetle.**

Local. A 'coastal refugia' species, which occurs in dykes and ponds from mid-Scotland southwards. It is only really common in eastern England, but, though scattered in the west, it is "often common there in some lowland areas with plenty of standing water". (G. Foster, 1987.)

***Helochares lividus* (COLEOPTERA: Hydrophilidae). A water scavenger beetle.**

Nationally Notable B. Typically found in ponds with some aquatic plant cover. More likely to occur in the south-east than in other parts of Britain, and apparently absent altogether from Scotland. May well have been under-recorded in the past, since the two less rare *Helochares* species (i.e., *H. lividus* and *H. punctatus*) are by no means always easy to distinguish, and may, very occasionally, occur together. (L. Friday, 1988; Pond Action, unpublished data.)

***Helophorus dorsalis* (COLEOPTERA: Hydrophilidae). A water scavenger beetle.**

Nationally Notable B. A species of shady, still-water habitats, preferring small woodland pools. Apart from a coastal record near Durham, distribution is southern, centred around Gloucestershire and the Midlands. However, the species has plainly been seriously under-recorded in the past since, although previously designated RDB3 (Rare), it was in 1992 'demoted' to Nationally Notable B. (G. Foster, 1987; L. Friday, 1988; G. Foster and M. Eyre, 1992.)

***Helophorus granularis* (COLEOPTERA: Hydrophilidae). A water scavenger beetle.**

Local. A tiny *Helophorus* species, typically preferring shallow,grassy ponds. Widespread, but very local in distribution. Although not frequently found, when it does occur it may do so in considerable abundance, often sharing its habitat with large numbers of *Helophorus* of one or more different species. (L. Friday, 1988; Pond Action, unpublished data).

***Helophorus griseus* (COLEOPTERA: Hydrophilidae). A water scavenger beetle.**

Nationally Notable B. In general a species of permanent, stagnant waters, found in grassy ponds; in fen areas, however, it may also be found in temporary waters. Common in the south-east of England, and infrequent in the north and south-west. Absent from Scotland. (L. Friday, 1988; G. Foster and M. Eyre, 1992.)

***Helophorus nanus* (COLEOPTERA: Hydrophilidae). A water scavenger beetle.**

Nationally Notable B. Usually an acid water species; "mainly found in the early spring in relict fens but also in some fenland drains and in fish ponds". Its range is limited to the south, and in particular East Anglia. (In 1992 it was 'demoted' from Nationally Notable A.) (G. Foster, 1987; G. Foster and M. Eyre, 1992.)

***Laccobius biguttatus* (COLEOPTERA: Hydrophilidae). A water scavenger beetle.**

Local. Found in coastal drains, and also silt ponds inland. Local and scarce throughout Britain except in the south-east, where it is more common. (L. Friday, 1988.)

***Laccobius sinuatus* (COLEOPTERA: Hydrophilidae). A water scavenger beetle.**

Nationally Notable B. A species of slow-flowing drains and, often, of new ponds, where it may be an early

coloniser, being particularly associated with muddy habitats. Much less widespread in distribution than *L. biguttatus*: locally scarce in England but absent from Scotland, and nowhere common (although it is sometimes present in large numbers where it does occur). (L. Friday, 1988; G. Friday and M. Eyre, 1992; Pond Action, unpublished data.)

Hydraena britteni (COLEOPTERA: Hydraenidae). A water beetle.

Local. A widespread but local species, typically associated with fens. In Scotland and the north of England it is common and abundant, but it is much scarcer in the rest of the country. In the south of its range it is more likely to occur in grassy streams. (L. Friday, 1988.)

Hydraena testacea (COLEOPTERA: Hydraenidae). A water beetle.

Nationally Notable B. Found in stagnant water or muddy streams. Widespread distribution, but commoner in the south of England than in other regions. (L. Friday, 1988.)

Limnebius nitidus (COLEOPTERA: Hydraenidae). A water beetle.

Nationally Notable B. Found in marsh drains and muddy streams and ponds throughout Britain, but scarce everywhere except in southern England where it is locally common. (L. Friday, 1988.)

Limnebius papposus (COLEOPTERA: Hydraenidae). A water beetle.

Nationally Notable B. Absent from Scotland and rare in England and Wales, except for the south-east, where it is commoner. A species normally associated with fen drains. (L. Friday, 1988; G. Foster and M. Eyre, 1992.)

Ochthebius bicolon (COLEOPTERA: Hydraenidae). A water beetle.

Nationally Notable B. Found typically in mud by running water; may occur in ponds with a spring or inlet. Widespread, but scarce and rare. (L. Friday, 1988; Pond Action, unpublished data.)

Table A3.7 Macroinvertebrate Lists by Sample for 1989/90

Status		Site	PIL	PIL	PIL	PIL	BEC	BEK	BEK	BEK	CEN	CEK	CET	CET	UFT	UFI	UFI	UFI	NRA	NRA	NRA	NRA	KIM	KIM	KIM	KIM	KMD	KID	KID	KID	LUD	LUD	LUD	LUD	FMO	FMO	FMO	FMO	CMA	CAA	CAA	CAA	CSM	CSM	CSM	CSM	FIU	FIU	FIU	FIU	LWL	LWL	LWL	LWL	LWL	LWL	LWL	LWL	MLA	MLA	MLA	MLA	MPB
		Year	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89
		Season	su	su	su	sp	au	au	au	su	su	su	su	su	au	au	au	su	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au
		Replicate	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1
		Total Species	44	44	44	47	19	20	26	57	51	40	40	47	26	29	22	31	38	35	40	38	8	8	8	17	11	11	11	24	31	27	30	44	30	32	32	33	39	32	30	29	49	33	32	23	44	38	42	51	22	21	19	52	15	21	19	48	26
	TRICLADIDA																																																																							
	Planariidae & Dugesiidae																																																																			
	Polycelis felina		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Polycelis nigra		-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Polycelis tenuis		-	-	-	-	-	-	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	+	-	+	-	+	+	-	-	-	-	-	-	-	-
Local	Dugesia lugubris		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dugesia polychroa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
	Dugesia tigrina		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dendrocoelidae																																																																			
	Dendrocoelum lacteum		-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	+	+	-	+	-	-	-	-	-	-	-	-	-
	GASTROPODA																																																																		
	Viviparidae																																																																	
	Viviparus viviparus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Valvatidae																																																																		
	Valvata cristata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Valvata piscinalis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydrobiidae & Bithynidae																																																																		
	Potamopyrgus jenkinsi		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	+	+	+	+	-	-	-	+	-	-	-	-	+	+	+	+	+	+	-	+	-	-	-	-	+	+
	Bithynia leachi		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bithynia tentaculata		+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	-	+	-	-	-	-	-	+	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Physidae																																																																		
Local	Aplexa hypnorum		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Physa acuta		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Physa fontinalis		+	+	+	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lymnaeidae																																																																	
	Lymnaea auricularia		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lymnaea palustris		+	+	+	+	-	-	-	-	+	-	-	-	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	-	-	-	+	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Lymnaea peregra		+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	+	+	+	+	-	-	-	-	+	+	+	+	+	+	+	+	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-
	Lymnaea stagnalis		-	-	-	-	-	-	-	+	-	-	-	-	+	+	+	+	-	+	+	+	-	-	-	-	-	-	-	+	-	+	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lymnaea truncatula		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
RDB1	Myxas glutinosa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Planorbidae																																																																		
	Planorbis carinatus		+	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	+	+	+	+	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Planorbis planorbis		+	+	+	+	+	+	+	-	+	+	+	+	-	+	-	-	+	+	+	+	+	+	+	+	-	-	-	+	+	+	+	+	+	+	+	+	-	-	+	-	-	-	-	+	+	+	+	+	+	+	-	+	-	-	-	-	-	-	-	-	+
	Anisus leucostoma		-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	+	+	+	+	-	-	-	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anisus vortex		+	+	+	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bathyomphalus contortus		+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gyraulus albus		-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	+	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Table A3.7 (cont.)

	Site	P	P	P	P	B	B	B	B	C	C	C	C	U	U	U	U	N	N	N	N	K	K	K	K	K	K	K	K	L	L	L	L	F	F	F	F	F	F	F	F	F	F	F	F	L	L	L	L	L	L	L	L	M	M	M	M	M
		I	I	I	I	E	E	E	E	E	E	E	E	F	F	F	F	R	R	R	R	I	I	I	I	I	I	I	I	R	R	R	R	C	C	C	C	C	C	C	C	C	C	C	C	W	W	W	W	W	W	W	W	P	P	P	P	P
		L	L	L	L	C	C	C	C	N	N	N	N	F	F	F	F	R	R	R	R	M	M	M	M	D	D	D	D	U	U	U	U	M	M	M	M	L	L	L	L	S	S	S	S	I	I	I	I	I	I	I	I	L	L	L	L	L
		L	L	L	L	K	K	K	K	T	T	T	T	I	I	I	I	A	A	A	A	A	A	A	A	I	I	I	I	D	D	D	D	O	O	O	O	A	A	A	A	M	M	M	M	U	U	U	U	L	L	L	L	A	A	A	A	B
	Year	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89
	Season	su	su	su	sp	au	au	au	su	su	su	su	su	au	au	au	su	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au
	Replicate	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1
Status	Total Species	44	44	44	47	19	20	26	57	51	40	40	47	26	29	22	31	38	35	40	38	8	8	8	17	11	11	11	24	31	27	30	44	30	32	32	33	39	32	30	29	49	33	32	23	44	38	42	51	22	21	19	52	15	21	19	48	26
	GASTROPODA (continued)																																																									
	Armiger crista	+	+	+	+	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-	+	-	+	+	+	-	-	+	-	-	-	+	-	-	-	-	+	+	+	+	+	+	+	+	-	-	-	+	-
	Hippeutis complanatus	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Planorbarius corneus	+	+	+	+	-	-	-	-	-	+	-	-	-	-	-	+	+	+	-	+	-	-	-	-	-	-	-	-	+	+	+	+	+	+	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ancylidae & Acroloxidae																																																									
	Ancylus fluviatilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acroloxus lacustris	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	+	-	-	-	-	+
	HIRUDINEA																																																									
	Piscicolidae																																																									
	Piscicola geometra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+
	Glossiphoniidae																																																									
	Theromyzon tessulatum	+	+	+	+	-	-	-	+	-	+	+	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	+	+	-	-	-	-	+	-	+	-	-	-	-
Local	Hemiclepsis marginata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
	Glossiphonia complanata	+	+	+	+	-	-	+	+	+	+	+	+	+	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-	+	-	-	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-
Local	Glossiphonia heteroclita	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	+	+	+	+	-	-	+	-	-
	Helobdella stagnalis	+	+	+	-	-	-	-	+	+	+	-	-	-	+	-	+	+	+	+	+	-	-	-	-	+	+	+	+	+	-	-	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+	+	-	+	+	+	+	+	+	-	+	+
	Erpobdellidae																																																									
	Erpobdella octoculata	+	+	+	-	-	+	+	+	+	+	+	+	-	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Erpobdella testacea	+	+	+	+	-	-	-	-	-	+	+	+	+	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	ARANEAE																																																									
	Argyroneta aquatica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DECAPODA																																																									
	Astacidae																																																									
Schedule	Austropotamobius pallipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ISOPODA																																																									
	Asellidae																																																									
	Asellus aquaticus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Asellus meridianus	-	-	-	+	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	AMPHIPODA																																																									
	Gammaridae & Crangonyctidae																																																									
	Crangonyx pseudogracilis	+	+	+	+	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	+	+	+	+	+	+	+	+	+	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Gammarus pulex	-	-	-	+	+	+	+	+	-	-	-	+	+	-	-	-	+	-	-	+	-	-	-	-	-	-	-	+	+	-	+	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	EPHEMEROPTERA																																																									
	Baetidae																																																									
	Cloeon dipterum	+	+	+	-	+	+	+	+	+	+	-	+	-	+	-	+	-	-	-	+	-	-	-	-	-	-	-	+	-	-	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	+	+	+	-	-	+	+	+	+	+
Local	Cloeon simile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ephemeridae																																																									
	Ephemera danica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

Status	Site																																																								
		P	P	P	P	B	B	B	B	C	C	C	C	U	U	U	U	N	N	N	N	K	K	K	K	K	K	K	K	L	L	L	L	F	F	F	F	F	F	F	F	F	F	F	F	L	L	L	L	L	L	L	L	M	M	M	M	M
		I	I	I	I	E	E	E	E	E	E	E	E	F	F	F	F	R	R	R	R	I	I	I	I	I	I	I	I	R	R	R	R	C	C	C	C	C	C	C	C	C	C	C	C	W	W	W	W	W	W	W	W	P	P	P	P	P
		L	L	L	L	C	C	C	C	N	N	N	N	F	F	F	F	R	R	R	R	M	M	M	M	D	D	D	D	U	U	U	U	M	M	M	M	L	L	L	L	S	S	S	S	I	I	I	I	I	I	I	I	L	L	L	L	L
		L	L	L	L	K	K	K	K	T	T	T	T	I	I	I	I	A	A	A	A	A	A	A	A	I	I	I	I	D	D	D	D	O	O	O	O	A	A	A	A	M	M	M	M	U	U	U	U	L	L	L	L	A	A	A	A	B
	Year	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89
	Season	su	su	su	sp	au	au	au	su	su	su	su	su	au	au	au	su	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au
	Replicate	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1
Status	Total Species	44	44	44	47	19	20	26	57	51	40	40	47	26	29	22	31	38	35	40	38	8	8	8	17	11	11	11	24	31	27	30	44	30	32	32	33	39	32	30	29	49	33	32	23	44	38	42	51	22	21	19	52	15	21	19	48	26
	EPHEMEROPTERA (continued)																																																									
	Ephemera vulgata	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	·	·	·	·	·	·	·	·	+	+	+	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	·
	Caenidae																																																									
	Caenis horaria	+	+	+	·	·	·	·	·	+	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	·	·	+	·	+	+	+	+	·	+	+	+	+	+	+	+	·	+	+	+	·	+	+
	Caenis luctuosa	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	·	·	·	·	·	+	·	·	+	+	·	+	+	·	·	+	+	·	+	·	·	+	·	·	·	+	·	·	·
Local	Caenis robusta	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	·	+	·	+	·	·	·	+	·
	PLECOPTERA																																																									
	Nemouridae																																																									
	Nemurella picteti	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	·	·	·	·	·	·	·	·	·
	Nemoura cinerea	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	·	·	·	·	·
Local	Nemoura erratica	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
	ODONATA																																																									
	Coenagriidae																																																									
	Pyrrhosoma nymphula	·	·	·	·	·	·	·	+	·	·	·	·	·	+	+	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	+	+	+	·	·	+	+	+	+	·	+	+	+	·	·	·	·	·	·	·	·	·	·	·	·	·	+
	Ischnura elegans	·	·	·	·	·	·	·	+	·	·	·	·	·	·	+	+	·	·	·	·	·	·	·	·	·	·	·	+	·	·	·	·	·	·	·	+	+	+	+	+	+	+	+	+	+	+	·	+	·	·	·	·	+	+	+	+	+
	Enallagma cyathigerum	·	·	·	·	·	+	·	·	·	·	·	·	+	+	+	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	+	·	+	+	·	·	+	·	·	·	+	+	+	+	·	·	+	·	+	+	+	+	·
	Coenagrion puella	·	·	·	·	·	+	+	·	+	+	·	·	+	+	+	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	·	+	·	+
Local	Erythromma najas	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	·	·	·	·	+	+	·	+	+
	Aeshnidae																																																									
	Aeshna cyanea	·	·	·	·	·	·	·	+	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	+	+	·	·	·	·	·	·	·	·	·	+	+	·	·	·	·	·	·	+	·	·	·	·	·	·	·	·	·	·	·	·
	Aeshna grandis	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+
	Libellulidae																																																									
	Libellula depressa	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	+	+	+	·	·	·	·	·	·	·	·	·	·	·	·	·	·
	Libellula quadrimaculata	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
	Sympetrum striolatum	·	·	·	+	·	·	·	+	·	·	·	+	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
	HEMIPTERA																																																									
	Mesoveliidae																																																									
Local	Mesovelia furcata	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
	Hydrometridae																																																									
	Hydrometra stagnorum	·	·	·	·	·	·	·	+	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	+	+	+
	Veliidae																																																									
	Velia caprai	·	·	·	·	+	·	·	+	·	·	·	·	·	·	·	+	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	+	·	·	·	·	·	·	·	·	·
	Microvelia reticulata	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
	Gerridae																																																									
Local	Gerris argentatus	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
	Gerris lacustris	·	·	·	·	·	·	·	+	·	·	+	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	+	·	·	·	+	·
	Gerris odontogaster	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
	Gerris thoracicus	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·

Table A3.7 (cont.)

Status	Site	PILL	PILL	PILL	PILL	BECK	BECK	BECK	BECK	CENT	CENT	CENT	CENT	UFFI	UFFI	UFFI	UFFI	NRRA	NRRA	NRRA	NRRA	KIMA	KIMA	KIMA	KIMA	KIDI	KIDI	KIDI	KIDI	LRUD	LRUD	LRUD	LRUD	FCMO	FCMO	FCMO	FCMO	FCLA	FCLA	FCLA	FCLA	FCSM	FCSM	FCSM	FCSM	LWIU	LWIU	LWIU	LWIU	LWIL	LWIL	LWIL	LWIL	MPLA	MPLA	MPLA	MPLA	MPLB
	Year	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89
	Season	su	su	su	sp	au	au	au	su	su	su	su	su	au	au	au	su	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au
	Replicate	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1
Status	Total Species	44	44	44	47	19	20	26	57	51	40	40	47	26	29	22	31	38	35	40	38	8	8	8	17	11	11	11	24	31	27	30	44	30	32	32	33	39	32	30	29	49	33	32	23	44	38	42	51	22	21	19	52	15	21	19	48	26
	HEMIPTERA (continued)																																																									
	Nepidae																																																									
	Nepa cinerea	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Ranatra linearis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Naucoridae																																																									
	Ilyocoris cimicoides	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Notonectidae																																																									
	Notonecta glauca	-	-	-	+	-	+	+	+	+	-	+	+	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	+	+
	Notonecta maculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	Notonecta marmorea	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Pleidae																																																									
	Plea leachi	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Corixidae																																																									
Local	Micronecta scholtzi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cymatia bonsdorffi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-
Local	Cymatia coleoptrata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	-	+	-	-	-	+	-
	Callicorixa praeusta	-	-	-	+	-	-	-	-	-	+	+	+	-	-	+	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-
Local	Corixa dentipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Corixa panzeri	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	+	-	-	-	+	+	+	+	-	-	-	-	-	-	-	+	-
	Corixa punctata	+	+	+	+	-	-	-	-	-	+	+	+	-	-	-	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hesperocorixa linnei	-	-	-	+	-	+	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hesperocorixa sahlbergi	+	+	+	-	+	-	+	+	+	-	-	-	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Arctocorisa germari	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sigara dorsalis	-	-	-	-	+	-	+	+	-	-	+	+	-	-	-	-	-	+	-	+	+	+	+	-	-	-	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	+	-	+	+	+	-
	Sigara distincta	+	+	+	+	-	+	-	-	+	+	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	-	+	-	+	+	+	-	+	-	+	+	+	+	-	-	-	+	-	+	+	-	-
	Sigara falleni	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+	+	+	-	-	+	+	+	+	+	+	-	-	+	-	-	-	+	-	+	+	+	+
	Sigara fossarum	-	-	-	-	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+	+	+	+	-	+	+	+	+	-	-	+	+	+	+	-	-	-	+	-	-	-	-	-
	Sigara lateralis	+	+	+	-	-	-	-	-	-	+	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	+	-	-	+	+	+	-	+	-	-	-	-	-	-	-	-	-	-
	Sigara nigrolineata	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Sigara concinna	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sigara limitata	+	+	+	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	COLEOPTERA																																																									
	Haliplidae																																																									
	Brychius elevatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Peltodytes caesus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus confinis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-
	Haliplus flavicollis	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-	+	-	-	-	-	+	-	-	-	-	-	-	-	+	-
	Haliplus fluviatilis	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

	Site	PILL	PILL	PILL	PILL	BECK	BECK	BECK	BECK	CENT	CENT	CENT	CENT	UPFI	UPFI	UPFI	UPFI	NRRA	NRRA	NRRA	NRRA	KIMA	KIMA	KIMA	KIMA	KIDI	KIDI	KIDI	KIDI	LRUD	LRUD	LRUD	LRUD	FCMO	FCMO	FCMO	FCMO	FCLA	FCLA	FCLA	FCLA	FCSM	FCSM	FCSM	FCSM	LWIU	LWIU	LWIU	LWIU	LWIL	LWIL	LWIL	LWIL	MPLA	MPLA	MPLA	MPLA	MPLB
	Year	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89
	Season	su	su	su	sp	au	au	au	su	su	su	su	su	au	au	au	su	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au
	Replicate	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1
Status	Total Species	44	44	44	47	19	20	26	57	51	40	40	47	26	29	22	31	38	35	40	38	8	8	8	17	11	11	11	24	31	27	30	44	30	32	32	33	39	32	30	29	49	33	32	23	44	38	42	51	22	21	19	52	15	21	19	48	26
	COLEOPTERA (continued)																																																									
NN b	Haliphus heydeni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliphus immaculatus	+	+	+	+	-	-	-	-	+	+	+	-	+	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-
NN b	Haliphus laminatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliphus lineatocollis	+	+	+	-	+	+	+	+	-	+	-	+	+	+	+	+	+	-	+	-	-	-	-	-	+	+	+	-	+	+	+	+	+	-	+	+	+	+	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Haliphus lineolatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Haliphus obliquus	-	-	-	-	+	-	-	-	+	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliphus ruficollis	+	+	+	+	-	-	-	+	+	+	+	+	+	+	+	-	-	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-
	Haliphus wehnckei	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	+	-	+	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hygrobiidae																																																									
	Hygrobia hermanni	+	+	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dytiscidae & Noteridae																																																									
	Noterus clavicornis	+	+	+	+	-	-	-	-	+	+	+	-	+	+	+	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-
	Laccophilus hyalinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Laccophilus minutus	-	-	-	-	-	-	-	-	-	-	+	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-
	Hyphydrus ovatus	+	+	+	+	-	-	-	+	-	-	-	+	-	-	-	-	+	-	+	+	-	-	-	-	+	+	+	-	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	+	+	+	+	+	-	-	-	-	-
NN b	Hydroglyphus pusillus	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-
	Hygrotus inaequalis	+	+	+	+	-	-	-	+	+	+	+	+	-	+	-	+	+	+	+	+	+	+	+	-	+	+	+	-	-	-	-	-	-	-	-	-	+	+	+	-	-	+	-	-	+	+	+	+	+	+	-	+	-	-	-	+	-
Local	Hygrotus versicolor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	Coelambus confluens	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coelambus impressopunctatus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus angustatus	-	-	-	+	-	-	-	-	+	-	+	+	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-
	Hydroporus discretus	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus erythrocephalus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Local	Hydroporus memnonius	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus nigrita	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus palustris	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	-	+	+	+	+	+	-	+	+	+	-	-	-	+	+	-	-	-	-	+	+	+	-	-	-	+	+	+	+	+	+	-	+	+	+	-	-	-	-	-
	Hydroporus planus	+	+	+	+	-	+	-	+	+	-	-	-	+	+	-	+	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-
	Hydroporus pubescens	+	+	+	+	-	-	+	+	-	-	+	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus tessellatus	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Graptodytes pictus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
Local	Porhydrus lineatus	+	+	+	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Potamonectes depressus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Stictotarsus duodecimpustulatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Copelatus haemorrhoidalis	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Platambus maculatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus bipustulatus	-	-	-	-	+	-	-	+	-	+	+	-	-	-	+	-	+	+	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-
NN b	Agabus chalconatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

Status	Site	PILL	PILL	PILL	PILL	BECK	BECK	BECK	BECK	CENT	CENT	CENT	CENT	UFPI	UFPI	UFPI	UFPI	NRRA	NRRA	NRRA	NRRA	KIMA	KIMA	KIMA	KIMA	KIDI	KIDI	KIDI	KIDI	LRUD	LRUD	LRUD	LRUD	FCMO	FCMO	FCMO	FCMO	FCLA	FCLA	FCLA	FCLA	FCSM	FCSM	FCSM	FCSM	LWIU	LWIU	LWIU	LWIU	LWIL	LWIL	LWIL	LWIL	MPLA	MPLA	MPLA	MPLA	MPLB
	Year	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89
	Season	su	su	su	sp	au	au	au	su	su	su	su	au	au	au	au	su	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au
	Replicate	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1
Status	Total Species	44	44	44	47	19	20	26	57	51	40	40	47	26	29	22	31	38	35	40	38	8	8	8	17	11	11	11	24	31	27	30	44	30	32	32	33	39	32	30	29	49	33	32	23	44	38	42	51	22	21	19	52	15	21	19	48	26
	COLEOPTERA (continued)																																																									
	Agabus didymus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus guttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus melanocornis	-	-	-	+	-	-	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus nebulosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus paludosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus sturmii	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-	+	+	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-
	Ilybius ater	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Ilybius fenestratus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-
	Ilybius fuliginosus	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ilybius quadriguttatus	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rhantus exsoletus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Colymbetes fuscus	-	-	-	-	-	-	-	+	+	+	-	+	+	-	-	-	+	+	+	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Acilius sulcatus	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Dytiscus marginalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dytiscus semisulcatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Suphrodytes dorsalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gyrinidae																																																									
	Gyrinus marinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gyrinus substriatus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
RDB3	Gyrinus suffriani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydrophilidae & Hydraenidae																																																									
	Helophorus aequalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Helophorus grandis	-	-	-	+	+	-	+	-	+	-	-	+	-	-	-	+	-	-	-	+	-	-	-	+	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-
	Helophorus brevipalpis	-	-	-	+	+	-	+	+	+	-	+	+	-	+	-	+	+	+	+	+	-	-	-	+	-	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	+	-	-	-	+	-	-	+	+	+	-	+	-	+	-	+	-
NN b	Helophorus dorsalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Helophorus granularis	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
NN b	Helophorus griseus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Helophorus minimus	+	+	+	+	-	-	-	-	+	-	-	+	-	-	-	+	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	+	-
NN b	Helophorus nanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Helophorus obscurus	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	+	-
	Hydrobius fuscipes	-	-	-	+	-	-	-	+	+	+	-	-	+	-	+	+	-	+	+	+	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	+	-
NN b	Anacaena bipustulata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anacaena globulus	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	+	-
	Anacaena limbata	-	-	-	+	-	-	+	+	+	-	+	-	-	+	+	-	+	+	+	+	-	-	-	+	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	+	+	+	+	-	-	-	+	-
	Anacaena lutescens	-	-	-	+	-	+	-	+	+	+	+	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-
Local	Laccobius biguttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Laccobius minutus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	+	+	-

Table A3.7 (cont.)

Status	Site	PILL	PILL	PILL	PILL	BECK	BECK	BECK	BECK	CENT	CENT	CENT	CENT	UFFI	UFFI	UFFI	UFFI	NRRA	NRRA	NRRA	NRRA	KIMA	KIMA	KIMA	KIMA	KIDI	KIDI	KIDI	KIDI	LRUD	LRUD	LRUD	LRUD	FCMO	FCMO	FCMO	FCMO	FCLA	FCLA	FCLA	FCLA	FCSM	FCSM	FCSM	FCSM	LWIU	LWIU	LWIU	LWIU	LWIL	LWIL	LWIL	LWIL	MPLA	MPLA	MPLA	MPLA	MPLB
	Year	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89
	Season	su	su	su	sp	au	au	au	su	su	su	su	su	au	au	au	su	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au
	Replicate	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1
Status	Total Species	44	44	44	47	19	20	26	57	51	40	40	47	26	29	22	31	38	35	40	38	8	8	8	17	11	11	11	24	31	27	30	44	30	32	32	33	39	32	30	29	49	33	32	23	44	38	42	51	22	21	19	52	15	21	19	48	26
	COLEOPTERA (continued)																																																									
	Laccobius bipunctatus	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+
	Laccobius striatulus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Helochares lividus	+	+	+	-	-	-	-	-	+	+	+	+	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Enochrus coarctatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RDB3	Enochrus isotae	-	-	-	+	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Enochrus melanocephalus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Enochrus ochropterus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Enochrus testaceus	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	+	-	-	-	-	-
Local	Cymbiodyta marginella	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Chaetarthria seminulum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
NN b	Berosus signaticollis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Cercyon convexiusculus	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
Local	Cercyon marinus	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Cercyon sternalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Cercyon tristis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Cercyon ustulatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Ochthebius bicolon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ochthebius dilatatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ochthebius minimus	-	-	-	+	-	-	-	+	+	-	-	+	-	+	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-
	Hydraena riparia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-
NN b	Hydraena testacea	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
NN b	Limnebius nitidus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-
NN b	Limnebius papposus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnebius truncatellus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Elmidae																																																									
	Elmis aenea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Oulimnius tuberculatus	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Riolus cupreus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MEGALOPTERA																																																								
	Sialidae																																																								
	Sialis lutaria	+	+	+	-	+	+	+	-	-	+	+	+	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	+	+	-	+	+	+	-	+	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-	+
	TRICHOPTERA																																																								
	Hydroptilidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Agraylea sexmaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Psychomyiidae & Ecnomidae																																																								
	Lype reducta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tinodes waeneri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

Status	Site	PILL	PILL	PILL	PILL	BECK	BECK	BECK	BECK	CENT	CENT	CENT	CENT	UFFI	UFFI	UFFI	UFFI	NRRA	NRRA	NRRA	NRRA	KIMA	KIMA	KIMA	KIMA	KIDI	KIDI	KIDI	KIDI	LRUD	LRUD	LRUD	LRUD	FCMO	FCMO	FCMO	FCMO	FCLA	FCLA	FCLA	FCLA	FCSM	FCSM	FCSM	FCSM	LWIU	LWIU	LWIU	LWIU	LWIL	LWIL	LWIL	LWIL	MPLA	MPLA	MPLA	MPLA	MPLB
	Year	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89
	Season	su	su	su	sp	au	au	au	su	su	su	su	su	au	au	au	su	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au	au	au	sp	au
	Replicate	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1
Status	Total Species	44	44	44	47	19	20	26	57	51	40	40	47	26	29	22	31	38	35	40	38	8	8	8	17	11	11	11	24	31	27	30	44	30	32	32	33	39	32	30	29	49	33	32	23	44	38	42	51	22	21	19	52	15	21	19	48	26
	TRICHOPTERA (continued)																																																									
Local	Ecnomus tenellus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
	Polycentropodidae																																																									
	Cyrnus flavidus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+
	Cyrnus trimaculatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.
	Holocentropus dubius	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	+	.	.	.	.	.	.
	Holocentropus picicornis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
	Plectrocnemia conspersa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Plectrocnemia geniculata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Phryganeidae																																																									
	Agrypnia varia	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Phryganea bipunctata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	+	+	+	.	+	+	+	.	.	.	.	.	.	.	.	+	.
	Lepidostomatidae																																																									
	Crunoecia irrorata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Limnephilidae																																																									
	Halesus radiatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.
	Microptema lateralis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Anabolia nervosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	.
	Glyphotaelius pellucidus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.
	Limnephilus affinis	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Limnephilus auricula	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Local	Limnephilus decipiens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.
	Limnephilus extricatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Limnephilus flavicornis	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	.	.
	Limnephilus lunatus	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	+	.
	Limnephilus marmoratus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Limnephilus vittatus	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Beraeidae																																																									
	Beraea pullata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Local	Beraeodes minutus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
	Molannidae																																																									
	Molanna angustata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
	Leptoceridae																																																									
	Athripsodes aterrimus	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	+	.	.	+	+	+	+	.	.	.	.	+	+	+	+	+
	Leptocerus tineiformis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
	Mystacides longicornis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	+	+
	Triaenodes bicolor	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.
	Oecetis lacustris	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Table A3.7 (cont.)

Status		Site	MPLB	MPLB	MPLB	NWEE	NWEE	NWEE	NWEE	SRCH	SRCH	SRCH	SRCH	DS1.	DS1.	DS1.	DS1.	DS2.	DS2.	DS2.	DS2.	CO2T	CO2T	CO2T	CO2T	CW1H	WW1H	WW1H	WW1H	WW2H	WW2H	WW2H	WW2H	WW3H	WW3H	WW3H	WW3H	WS3H	AS3M	AS3M	AS3M	AS3M	NI3L	NI3L	NI3L	NI3L	CA3S	CA3S	CA3S	CA3S	TO3U	TO3U	TO3U	TO3U	BR3W	BR3W	BR3W	BR3W	LA3L	LA3A
		Year	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89
		Season	au	au	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	sp	su	sp	sp	sp	su	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su
		Replicate	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2
		Total Species	26	23	46	37	22	26	46	16	17	8	29	38	33	33	33	28	28	28	20	33	33	32	35	29	29	24	37	29	29	27	42	36	48	49	52	38	42	42	34	24	20	22	38	39	40	37	43	9	6	10	2	20	14	16	26	32	33
	TRICLADIDA																																																																	
	Planariidae & Dugesiidae																																																														
	Polycelis felina		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Polycelis nigra		.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	+	.	.	.	.	.	.	+	+	+	+	.	.	.	.	+	+	-	+	+	-
	Polycelis tenuis		.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	+	+	+	+	+	+	+	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.
Local	Dugesia lugubris		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.
	Dugesia polychroa		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
	Dugesia tigrina		.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Dendrocoelidae																																																														
	Dendrocoelum lacteum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	GASTROPODA																																																													
	Viviparidae																																																														
	Viviparus viviparus		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Valvatidae																																																													
	Valvata cristata		.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
	Valvata piscinalis		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	+	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
	Hydrobiidae & Bithyniidae																																																													
	Potamopyrgus jenkinsi		+	+	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	+	+	+	+	+	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.	.	+	.	.	.	.	+
	Bithynia leachi		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Bithynia tentaculata		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Physidae																																																													
Local	Aplexa hypnorum		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Physa acuta		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Physa fontinalis		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Lymnaeidae																																																													
	Lymnaea auricularia		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Lymnaea palustris		.	+	.	.	.	+	.	.	.	.	.	.	.	.	+	+	+	+	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+
	Lymnaea peregra		+	+	+	+	+	+	+	.	.	.	.	+	+	+	+	+	+	+	.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.	.	+	.	+	+	+	+
	Lymnaea stagnalis		+	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	+	.	+	+	+	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.	.	+	+	+	.	.	.
	Lymnaea truncatula		.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
RDB1	Myxas glutinosa		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Planorbidae																																																													
	Planorbis carinatus		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Planorbis planorbis		.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.
	Anisus leucostoma		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Anisus vortex		.	.	.	+	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Bathyomphalus contortus		.	.	+	+	+	+	+	.	.	.	.	+	.	.	.	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
	Gyraulus albus		+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	+	+	+	+	+	+	+	.	.	.	.	.	+	+	+	+	+	+	+	+	.	.	.	.	.	.	.	.	.	.

Table A3.7 (cont.)

Status		Site	MPL B	MPL B	MPL B	NWE E	NWE E	NWE E	NWE E	SRC H	SRC H	SRC H	SRC H	DS 1	DS 1	DS 1	DS 1	DS 2	DS 2	DS 2	DS 2	DO T	DO T	CO T	CO T	CO T	WW 1	WW 1	WW 1	WW 1	WW 2	WW 2	WW 2	WW 2	WW 3	WW 3	WW 3	WW 3	AS H M	AS H M	AS H M	AS H M	NI L L	NI L L	NI L L	NI L L	CA S S	CA S S	CA S S	CA S S	CO D U	TO D U	TO D U	TO D U	BO D U	BR N W	BR N W	BR N W	LR N W	LA N A	LA N A
		Year	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89
		Season	au	su	sp	au	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	su	sp	sp	sp	su	sp	sp	sp	su	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su
		Replicate	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2
		Total Species	26	23	46	37	22	26	46	16	17	8	29	38	33	33	33	28	28	28	20	33	33	32	35	29	29	24	37	29	29	27	42	36	48	49	52	38	42	42	34	24	20	22	38	39	40	37	43	9	6	10	2	20	14	16	26	32	33
		GASTROPODA (continued)																																																															
		Armiger crista	-	-	+	+	+	+	+	-	-	-	-	+	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Hippeutis complanatus	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
		Planorbarius corneus	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Ancylidae & Acroloxidae																																																													
		Ancylus fluviatilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Acroloxus lacustris	+	+	+	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		HIRUDINEA																																																												
		Piscicolidae																																																											
		Piscicola geometra	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Glossiphoniidae																																																											
		Theromyzon tessulatum	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-	+	+	-	-	-	-	-	+	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
Local		Hemiclepsis marginata	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-
		Glossiphonia complanata	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	+	+	-	+	+	+	+	+	-	+	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
Local		Glossiphonia heteroclita	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	+	-	+	+	-	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Helobdella stagnalis	+	+	+	-	-	-	-	+	+	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
		Erpobdellidae																																																											
		Erpobdella octoculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	-	+	+	-	+	+	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local		Erpobdella testacea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
		ARANEAE																																																											
		Argyroneta aquatica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		DECAPODA																																																										
		Astacidae																																																											
Schedule		Austropotamobius pallipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		ISOPODA																																																										
		Asellidae																																																											
		Asellus aquaticus	+	+	+	+	+	+	+	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-
		Asellus meridianus	-	-	-	-	-	-	+	-	+	-	-	+	+	+	+	-	-	-	-	+	-	+	-	-	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	+	+	
		AMPHIPODA																																																											
		Gammaridae & Crangonyctidae																																																										
		Crangonyx pseudogracilis	+	+	+	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	-	-
		Gammarus pulex	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	+	-	+	+	+	+	+	+	+	+	+	-	+	-	+	+	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	+	+	
		EPHEMEROPTERA																																																										
		Baetidae																																																											
		Cloeon dipterum	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	+	+
Local		Cloeon simile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Ephemeridae																																																											
		Ephemera danica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

Status		Site	MPLB	MPLB	MPLB	NEWE	NEWE	NEWE	NEWE	SRCH	SRCH	SRCH	SRCH	DS1.	DS1.	DS1.	DS1.	DS2.	DS2.	DS2.	DS2.	COTH	COTH	COTH	COTH	WW1.	WW1.	WW1.	WW1.	WW2.	WW2.	WW2.	WW2.	WW3.	WW3.	WW3.	WW3.	WWWS	AS HM	AS HM	AS HM	AS HM	NI LL	NI LL	NI LL	NI LL	CA SS	CA SS	CA SS	CA SS	TO DU	TO DU	TO DU	TO DU	BR NW	BR NW	BR NW	BR NW	LA LA	LA LA
		Year	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89
		Season	au	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	sp	sp	sp	su	sp	sp	sp	su	sp	sp	sp	su	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su
		Replicate	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2
		Total Species	26	23	46	37	22	26	46	16	17	8	29	38	33	33	33	28	28	28	20	33	33	32	35	29	29	24	37	29	29	27	42	36	48	49	52	38	42	42	34	24	20	22	38	39	40	37	43	9	6	10	2	20	14	16	26	32	33
	EPHEMEROPTERA (continued)																																																																	
	Ephemera vulgata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Caenidae																																																													
	Caenis horaria		+	+	+	+	-	-	+	-	-	-	-	+	+	+	+	-	-	-	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Caenis luctuosa		-	-	-	+	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	+	+	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Local	Caenis robusta		-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PLECOPTERA																																																												
	Nemouridae																																																												
	Nemurella picteti		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Nemoura cinerea		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	+
Local	Nemoura erratica		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ODONATA																																																											
	Coenagrlidae																																																												
	Pyrrhosoma nymphula		-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	-	+	+	+	+	-	-	-	-	+	-	-	-	-	-	-	+	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
	Ischnura elegans		+	+	+	+	+	+	-	-	-	-	-	+	+	+	+	+	+	+	-	+	-	+	-	+	+	+	+	+	+	-	-	+	+	+	+	+	-	-	-	-	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-
	Enallagma cyathigerum		-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	-	+	+	+	+	+	-	-	-	-	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-
	Coenagrion puella		+	-	+	+	+	+	+	+	+	-	-	-	+	+	-	-	-	-	+	+	+	+	-	-	-	-	-	-	+	+	+	-	+	+	-	+	+	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	+	+	-	+	+
Local	Erythromma najas		+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aeshnidae																																																												
	Aeshna cyanea		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	+	+
	Aeshna grandis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-
	Libellulidae																																																												
	Libellula depressa		-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Libellula quadrimaculata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sympetrum striolatum		-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HEMIPTERA																																																											
	Mesoveliidae																																																												
Local	Mesovelia furcata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydrometridae																																																											
	Hydrometra stagnorum		-	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Veliidae																																																											
	Velia caprai		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
	Microvelia reticulata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-
	Gerridae																																																											
Local	Gerris argentatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gerris lacustris		-	-	+	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	+	-	+	-	+	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-
	Gerris odontogaster		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gerris thoracicus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

	Site	M	M	M	N	N	N	N	S	S	S	S	D	D	D	D	D	D	D	D	C	C	C	C	W	W	W	W	W	W	W	W	W	W	W	W	A	A	A	A	N	N	N	N	C	C	C	C	T	T	T	T	B	B	B	B	L	L
		P	P	P	E	E	E	E	R	R	R	R	S	S	S	S	S	S	S	S	O	O	O	O	W	W	W	W	W	W	W	W	W	W	W	W	S	S	S	S	I	I	I	I	A	A	A	A	O	O	O	O	R	R	R	R	A	A
		L	L	L	W	W	W	W	C	C	C	C	1	1	1	1	2	2	2	2	T	T	T	T	1	1	1	1	2	2	2	2	3	3	3	3	H	H	H	H	L	L	L	L	S	S	S	S	D	D	D	D	N	N	N	N	L	L
		B	B	B	E	E	E	E	H	H	H	H	.	.	.	.	.	.	.	.	H	H	H	H	.	.	.	.	.	.	.	.	.	.	.	.	M	M	M	M	L	L	L	L	S	S	S	S	U	U	U	U	W	W	W	W	A	A
	Year	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89
	Season	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	su	sp	sp	sp	su	sp	sp	sp	su	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su
	Replicate	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2
Status	Total Species	26	23	46	37	22	26	46	16	17	8	29	38	33	33	33	28	28	28	20	33	33	32	35	29	29	24	37	29	29	27	42	36	48	49	52	38	42	42	34	24	20	22	38	39	40	37	43	9	6	10	2	20	14	16	26	32	33
	HEMIPTERA (continued)																																																									
	Nepidae																																																									
	Nepa cinerea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Local	Ranatra linearis	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
	Naucoridae																																																									
	Ilyocoris cimicoides	.	.	+	+	+	+	+	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
	Notonectidae																																																									
	Notonecta glauca	.	+	+	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	+	+	+	+	.	.	.	+	.	.	.	.	+	.
	Notonecta maculata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Notonecta marmorea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	.
	Pleidae																																																									
	Plea leachi	.	+	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.
	Corixidae																																																									
Local	Micronecta scholtzi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Local	Cymatia bonsdorffi	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Local	Cymatia coleoptrata	.	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.
	Callicorixa praeusta	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.
Local	Corixa dentipes	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
Local	Corixa panzeri	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Corixa punctata	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	.	.	.	+	.	+	+	+	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	+	.
	Hesperocorixa linnei	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Hesperocorixa sahlbergi	.	.	.	.	.	.	.	.	.	.	+	+	+	+	+	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	+	.	.	.	.	.	+	.	.	+	+	+	.	.	.	.	.	+	+
	Arctocorisa germari	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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	Sigara distincta	.	.	+	.	+	.	+	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	+	+	+	+	+	+	+	+	+	.	.	.	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.
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	Sigara nigrolineata	.	.	.	.	.	.	.	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	+	+
Local	Sigara concinna	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.
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	COLEOPTERA																																																									
	Haliplidae																																																									
	Brychius elevatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
NN b	Peltodytes caesus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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	Haliplus flavicollis	.	.	.	+	+	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	.	+	+	+	+	+	.	.	.	.	.	.	.	.	.	.
	Haliplus fluviatilis	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Table A3.7 (cont.)

Status		Site	MPLB	MPLB	MPLB	NEWE	NEWE	NEWE	NEWE	SRCH	SRCH	SRCH	SRCH	DSS1	DSS1	DSS1	DSS1	DSS2	DSS2	DSS2	DSS2	CTOH	COOH	COOH	COOH	WWW1	WWW1	WWW1	WWW1	WWW2	WWW2	WWW2	WWW2	WWW3	WWW3	WWW3	WWW3	WWS3	AHM1	AHM2	AHM3	AHM4	NIL1	NIL1	NIL2	NIL2	NIL3	NIL3	CAS1	CAS2	CAS3	CAS3	TOU1	TOU2	TOU3	TOU3	BRW1	BRW1	BRW2	BRW3	LAS1	LAS2
		Year	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89
		Season	au	au	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	su	sp	sp	sp	su	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su
		Replicate	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2
		Total Species	26	23	46	37	22	26	46	16	17	8	29	38	33	33	33	28	28	28	20	33	33	32	35	29	29	24	37	29	29	27	42	36	48	49	52	38	42	42	34	24	20	22	38	39	40	37	43	9	6	10	2	20	14	16	26	32	33
		COLEOPTERA (continued)																																																																			
NN b		Haliplus heydeni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Haliplus immaculatus	-	-	-	+	+	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b		Haliplus laminatus	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Haliplus lineatocollis	-	-	-	+	-	+	+	-	-	-	-	+	-	+	+	+	+	+	+	-	+	+	-	+	+	+	+	-	-	-	+	-	+	-	+	-	+	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
		Haliplus lineolatus	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local		Haliplus obliquus	-	-	-	+	+	+	+	-	-	-	+	+	+	+	-	+	+	+	-	-	-	-	-	+	+	+	+	-	-	-	+	-	-	+	+	-	+	+	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
		Haliplus ruficollis	-	-	-	+	-	+	+	-	-	-	+	-	-	+	+	-	-	-	+	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Haliplus wehnckei	-	-	-	+	-	+	+	-	-	-	-	+	+	-	+	-	-	-	+	+	+	-	+	+	+	+	+	-	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Hygrobiidae																																																																
		Hygrobia hermanni	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Dytiscidae & Noteridae																																																															
		Noterus clavicornis	-	-	+	-	-	-	-	+	+	-	+	+	+	+	+	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
		Laccophilus hyalinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Laccophilus minutus	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Hyphydrus ovatus	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	+	-	-	-	-	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b		Hydroglyphus pusillus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Hygrotus inaequalis	+	-	-	+	+	-	+	-	-	-	+	-	+	+	+	+	+	+	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	+	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Local		Hygrotus versicolor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Coelambus confluens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Coelambus impressopunctatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Hydroporus angustatus	-	-	-	+	-	-	+	-	-	-	+	-	+	-	-	+	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-
		Hydroporus discretus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
		Hydroporus erythrocephalus	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
Local		Hydroporus memnonius	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
		Hydroporus nigrita	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
		Hydroporus palustris	-	-	-	+	-	+	-	+	-	-	+	-	-	-	-	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-	+	+	-	+	+	+	+	+	+	-	-	-	+	-	+	+	+	+	+	+	-	-	+	-	+	+	-	-	-	-
		Hydroporus planus	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	+	-	-	-	-	+	-	-	-	+	+	+	-	-	-	-	-	-
		Hydroporus pubescens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
		Hydroporus tessellatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Graptodytes pictus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local		Porhydrus lineatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Potamonectes depressus	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Stictotarsus duodecimpustulatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local		Copelatus haemorrhoidalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
		Platambus maculatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Agabus bipustulatus	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	+	+	-	-	-	-	+	+	+	+	+	-	-	-	-
NN b		Agabus chalconatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

Status		Site	MPLB	MPLB	MPLB	NEWE	NEWE	NEWE	NEWE	SERH	SCCH	SCCH	SCCH	DS1.	DS1.	DS1.	DS1.	DS2.	DS2.	DS2.	DS2.	DO1H	CO1H	CO1H	CO1H	CO1H	WO1H	WW1.	WW1.	WW1.	WW1.	WW2.	WW2.	WW2.	WW2.	WW3.	WW3.	WW3.	WW3.	WW3.	WS1.	AS1M	AS1M	AS1M	AS1M	AI1L	AI1L	AI1L	AI1L	AA1S	AA1S	AA1S	AA1S	AO1D	AO1D	AO1D	AO1D	AR1N	AR1N	AR1N	AR1N	AL1W	AA1A
		Year	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89
		Season	au	au	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	su	sp	sp	sp	su	sp	sp	sp	su	sp	sp	sp	su	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su
		Replicate	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2
		Total Species	26	23	46	37	22	26	46	16	17	8	29	38	33	33	33	28	28	28	20	33	33	32	35	29	29	24	37	29	29	27	42	36	48	49	52	38	42	42	34	24	20	22	38	39	40	37	43	9	6	10	2	20	14	16	26	32	33						
		COLEOPTERA (continued)																																																																								
		Agabus didymus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	+							
		Agabus guttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-							
		Agabus melanocornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
		Agabus nebulosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-							
		Agabus paludosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
		Agabus sturmii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	+							
		Ilybius ater	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-							
NN b		Ilybius fenestratus	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
		Ilybius fuliginosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	+	+	-	+	-	-	+	-	-	+	+	-	+	+	+	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-							
		Ilybius quadriguttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-							
		Rhantus exsoletus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-							
		Colymbetes fuscus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-							
		Acilius sulcatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
		Dytiscus marginalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+							
		Dytiscus semisulcatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
		Suphrodytes dorsalis	-	-	-	+	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
		Gyrinidae																																																																					
		Gyrinus marinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
		Gyrinus substriatus	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+							
RDB3		Gyrinus suffriani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
		Hydrophilidae & Hydraenidae																																																																			
		Helophorus aequalis	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-							
		Helophorus grandis	-	-	+	-	+	+	+	-	-	-	+	-	+	+	-	+	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	+	-	+	+	-	-	+	+	-							
		Helophorus brevipalpis	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+							
NN b		Helophorus dorsalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-							
Local		Helophorus granularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-							
NN b		Helophorus griseus	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-							
		Helophorus minutus	-	-	+	-	-	-	-	+	+	-	+	-	-	-	+	-	-	-	+	+	+	-	-	+	-	-	-	-	-	-	+	+	-	-	+	+	+	+	+	+	-	-	+	-	-	+	-	-	+	-	-	-	-	-							
NN b		Helophorus nanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
		Helophorus obscurus	-	-	+	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-							
		Hydrobius fuscipes	-	-	+	-	-	-	+	-	+	-	+	+	+	-	-	+	+	+	-	-	+	-	+	-	-	-	+	-	+	+	-	+	+	+	+	-	-	+	+	+	+	-	+	-	-	-	-	+	-	-	+	-	+							
NN b		Anacaena bipustulata	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-							
		Anacaena globulus	+	-	+	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	+	-	+	+	-	-	+	-	+	-	+	+	-	-	-	-	+	+	-	+	-	-	-	-	+	+	-	+							
		Anacaena limbata	-	-	+	-	+	-	-	-	-	-	-	-	-	+	-	+	+	+	+	-	-	+	+	-	+	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+							
		Anacaena lutescens	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Local		Laccobius biguttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
		Laccobius minutus	+	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	-	-	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+							

Table A3.7 (cont.)

Status		Site	MP LB	MP LB	MP LB	NE WE	NE WE	NE WE	NE WE	SR HC	SR CH	SR CH	SR CH	DS 1.	DS 1.	DS 1.	DS 1.	DS 2.	DS 2.	DS 2.	DS 2.	CO TH	CO TH	CO TH	CO TH	WW 1.	WW 1.	WW 1.	WW 1.	WW 2.	WW 2.	WW 2.	WW 2.	WW 3.	WW 3.	WW 3.	WW 3.	WA HM	AS HM	AS HM	AS HM	NI LM	NI LL	NI LL	NI LL	NC AS	CA SS	CA SS	CA SS	CT OD	TO UU	TO UU	TO UU	BO NW	BR WW	BR WW	BR WA	LA LA
		Year	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89
		Season	au	su	sp	au	su	au	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	su	sp	sp	sp	su	sp	sp	sp	su	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	su	su
		Replicate	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2
Status		Total Species	26	23	46	37	22	26	46	16	17	8	29	38	33	33	33	28	28	28	20	33	33	32	35	29	29	24	37	29	29	27	42	36	48	49	52	38	42	42	34	24	20	22	38	39	40	37	43	9	6	10	2	20	14	16	26	32	33
	COLEOPTERA (continued)																																																																
	Laccobius bipunctatus		+	-	+	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	+	+	+	+	+	-	-	-	-	+	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	-	+	+
	Laccobius striatulus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Helochares lividus		-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Enochrus coarctatus		-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RDB3	Enochrus isotae		-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Enochrus melanocephalus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Enochrus ochropterus		-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Enochrus testaceus		-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-
Local	Cymbiodyta marginella		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Chaetarthria seminulum		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Berosus signaticollis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Cercyon convexiusculus		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cercyon marinus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Cercyon sternalis		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Cercyon tristis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Cercyon ustulatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Ochthebius bicolon		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ochthebius dilatatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ochthebius minimus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Hydraena riparia		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-
NN b	Hydraena testacea		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Limnebius nitidus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Limnebius papposus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	+	+	-
	Limnebius truncatellus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
	Elmidae																																																											
	Elmis aenea		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	+	+	+	-	-	+	+	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	Oulimnius tuberculatus		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	-	-	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Riolus cupreus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MEGALOPTERA																																																											
	Sialidae																																																											
	Sialis lutaria		+	+	-	-	-	-	-	+	+	-	+	+	+	+	+	+	+	+	-	+	-	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	-	+	-	+	-	+	+	+	-	-	-	-	-	+	-	-	+	+
	TRICHOPTERA																																																											
	Hydroptilidae		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Agraylea sexmaculata		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Psychomyiidae & Ecnomidae																																																											
	Lype reducta		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tinodes waeneri		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

Status		Site	MPLB	MPLB	MPLB	NEWE	NEWE	NEWE	NEWE	SRCH	SRCH	SRCH	SRCH	DSHH	DSHH	DSHH	DSHH	DSHH	DSHH	DSHH	DSHH	COTH	COTH	COTH	COTH	CWWH	WWWH	WWWH	WWWH	WWWH	WWWH	WWWH	WWWH	WWWH	WWWH	WWWH	WWWH	AWSH	AASM	AASM	AASM	AASM	NILL	NILL	NILL	NILL	CASS	CASS	CASS	CASS	CASS	TODU	TODU	TODU	TODU	BRWW	BRWW	BRWW	BRWW	LAWA	LAWA
		Year	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89
		Season	au	au	sp	au	au	au	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	su	su
		Replicate	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2
Status		Total Species	26	23	46	37	22	26	46	16	17	8	29	38	33	33	33	28	28	28	20	33	33	32	35	29	29	24	37	29	29	27	42	36	48	49	52	38	42	42	34	24	20	22	38	39	40	37	43	9	6	10	2	20	14	16	26	32	33
	TRICHOPTERA (continued)																																																																
Local	Ecnomus tenellus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Polycentropodidae																																																												
	Cyrnus flavidus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyrnus trimaculatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Holocentropus dubius		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Holocentropus picicornis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-
	Plectrocnemia conspersa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Plectrocnemia geniculata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phryganeidae																																																											
	Agrypnia varia		-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phryganea bipunctata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-
	Lepidostomatidae																																																											
	Crunoecia irrorata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilidae																																																										
	Halesus radiatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Micropterna lateralis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anabolia nervosa		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	+	-	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	Glyphotaelius pellucidus		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Limnephilus affinis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus auricula		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Limnephilus decipiens		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus extricatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Limnephilus flavicornis		-	-	+	-	-	-	+	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus lunatus		-	-	-	-	-	-	+	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	+	+	+	-	+	+	+	-	-	-	-	-	-	-	-	-	+	+	-	-
	Limnephilus marmoratus		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Limnephilus vittatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Beraeidae																																																										
	Beraea pullata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-
Local	Beraeodes minutus		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Molannidae																																																										
	Molanna angustata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Leptoceridae																																																										
	Athripsodes aterrimus		+	-	+	+	-	+	+	-	-	-	-	+	+	+	+	-	-	-	-	+	+	+	+	+	+	+	-	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Leptocerus tineiformis		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mystacides longicornis		+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	+	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
	Triaenodes bicolor		-	-	-	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	+	+	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
	Oecetis lacustris		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

Status		Site	LAL1	LAL2	COA1	COA2	COA3	COA4	WRT1	WRT2	WRT3	WRT4	WRB1	WRB2	WRB3	WRB4	GIZ1	GIZ2	GIZ3	GIZ4	KEN1	KEN2	KEN3	KEN4
		Year	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90
		Season	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	su	sp	sp	sp	su
		Replicate	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1
		Total Species	27	37	28	18	25	25	39	29	26	31	42	36	37	46	24	21	9	27	45	37	37	60
	TRICLADIDA																							
	Planariidae & Dugesiidae																							
	Polycelis felina		-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	+	-	-	-	-
	Polycelis nigra		-	+	-	+	+	+	-	-	-	-	-	-	+	+	-	-	-	+	-	+	-	+
	Polycelis tenuis		-	-	+	+	+	+	-	-	-	+	-	-	+	-	+	-	-	+	+	+	-	+
Local	Dugesia lugubris		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dugesia polychroa		-	-	-	-	-	-	+	-	-	-	+	-	+	-	-	-	-	-	+	-	-	-
	Dugesia tigrina		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dendrocoelidae																							
	Dendrocoelum lacteum		-	-	+	-	-	-	+	-	-	-	-	+	+	+	+	-	-	-	-	-	+	-
	GASTROPODA																							
	Viviparidae																							
	Viviparus viviparus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Valvatidae																							
	Valvata cristata		-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Valvata piscinalis		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-
	Hydrobiidae & Bithyniidae																							
	Potamopyrgus jenkinsi		-	+	+	-	-	-	-	+	-	+	-	-	-	-	+	+	-	+	+	+	+	+
	Bithynia leachi		-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	+
	Bithynia tentaculata		-	-	-	-	-	-	+	+	+	-	+	+	+	+	-	-	-	-	+	+	+	+
	Physidae																							
Local	Aplexa hypnorum		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Physa acuta		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Physa fontinalis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+
	Lymnaeidae																							
	Lymnaea auricularia		-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	+	-	-	+
	Lymnaea palustris		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Lymnaea peregra		+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-	+	-	-	-	+
	Lymnaea stagnalis		-	-	-	-	-	-	+	+	+	-	+	+	+	+	+	+	-	+	+	+	+	+
	Lymnaea truncatula		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RDB1	Myxas glutinosa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Planorbidae																							
	Planorbis carinatus		-	-	+	+	+	-	-	-	-	-	+	+	+	+	-	-	-	-	+	+	+	+
	Planorbis planorbis		-	-	-	-	-	+	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-
	Anisus leucostoma		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anisus vortex		-	-	-	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	+	+	+	+
	Bathyomphalus contortus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	+
	Gyraulus albus		-	-	+	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	+	+	+	+

Table A3.7 (cont.)

Status		Site	LA	LL	CA	CO	CO	CO	WR	WR	WR	WR	WR	WR	WR	WR	GI	GI	GI	GI	KE	KE	KE	KE
			LA	LL	LL	LL	LL	LL	TO	TO	TO	TO	BO	BO	BO	BO	ZO	ZO	ZO	ZO	NN	NN	NN	NN
		Year	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90
		Season	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	su	sp	sp	sp	su
		Replicate	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1
		Total Species	27	37	28	18	25	25	39	29	26	31	42	36	37	46	24	21	9	27	45	37	37	60
	GASTROPODA (continued)																							
	Armiger crista		-	-	+	-	+	+	-	-	-	-	+	+	-	+	-	-	-	+	-	+	-	+
	Hippeutis complanatus		-	-	-	-	-	-	-	-	-	+	+	+	-	+	-	-	-	-	-	-	+	+
	Planorbarius corneus		-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	+	+
	Ancylidae & Acroloxidae																							
	Ancylus fluviatilis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acroloxus lacustris		-	-	-	-	-	-	+	-	-	+	+	+	+	+	-	-	-	-	+	+	+	+
	HIRUDINEA																							
	Piscicolidae																							
	Piscicola geometra		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+
	Glossiphonilidae																							
	Theromyzon tessulatum		-	-	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-
Local	Hemiclepsis marginata		-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	+	-	+	+
	Glossiphonia complanata		-	+	-	+	-	+	-	-	+	+	+	-	-	-	+	+	-	+	-	-	-	+
Local	Glossiphonia heteroclita		-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	+	-	+	+
	Helobdella stagnalis		-	-	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+
	Erpobdellidae																							
	Erpobdella octoculata		-	-	+	+	+	+	+	-	+	+	+	+	+	+	+	+	-	+	+	+	-	+
Local	Erpobdella testacea		-	-	-	+	-	-	-	+	+	-	+	-	-	-	-	-	-	-	+	-	-	-
	ARANEAE																							
	Argyroneta aquatica		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	DECAPODA																							
	Astacidae																							
Schedule	Austropotamobius pallipes		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	ISOPODA																							
	Asellidae																							
	Asellus aquaticus		-	-	+	+	+	+	-	-	-	-	-	-	-	-	+	+	-	+	+	+	+	+
	Asellus meridianus		+	+	-	-	+	-	+	+	+	+	+	+	+	+	+	+	-	+	-	-	-	-
	AMPHIPODA																							
	Gammaridae & Crangonyctidae																							
	Crangonyx pseudogracilis		-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	-	+	+	+	+	+
	Gammarus pulex		+	+	+	-	+	+	+	+	+	+	+	+	-	+	+	+	+	+	-	-	-	-
	EPHEMEROPTERA																							
	Baetidae																							
	Cloeon dipterum		+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	-	+	+	+	+
Local	Cloeon simile		-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ephemeridae																							
	Ephemera danica		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

Status		Site	LA	LA	CO	CO	CO	CO	WR	WR	WR	WR	WR	WR	WR	WR	GI	GI	GI	GI	KE	KE	KE	KE
			LA	LA	LL	LL	LL	LL	TO	TO	TO	TO	BO	BO	BO	BO	ZO	ZO	ZO	ZO	NO	NO	NO	NO
		Year	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90
		Season	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	su	sp	sp	sp	su
		Replicate	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1
		Total Species	27	37	28	18	25	25	39	29	26	31	42	36	37	46	24	21	9	27	45	37	37	60
	EPHEMEROPTERA (continued)																							
	Ephemera vulgata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Caenidae																							
	Caenis horaria		-	-	-	-	-	-	+	-	+	+	+	+	+	+	-	-	-	-	+	+	+	-
	Caenis luctuosa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+
Local	Caenis robusta		-	-	-	-	-	-	+	+	+	-	+	+	+	+	-	-	-	-	-	+	-	-
	PLECOPTERA																							
	Nemouridae																							
	Nemurella picteti		+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nemoura cinerea		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Nemoura erratica		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ODONATA																							
	Coenagriidae																							
	Pyrrhosoma nymphula		+	+	-	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
	Ischnura elegans		-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	+	-	-	+
	Enallagma cyathigerum		-	-	+	-	-	+	-	-	-	+	-	-	-	+	-	-	-	-	-	-	+	+
	Coenagrion puella		+	+	-	-	+	+	+	-	-	+	+	-	+	+	-	-	-	-	+	+	+	-
Local	Erythromma najas		-	-	-	-	-	-	+	-	-	+	+	+	+	+	-	-	-	-	+	+	+	+
	Aeshnidae																							
	Aeshna cyanea		+	+	-	-	-	-	-	+	-	-	+	+	+	-	-	-	-	-	-	-	-	+
	Aeshna grandis		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	+	+
	Libellulidae																							
	Libellula depressa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Libellula quadrimaculata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sympetrum striolatum		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	HEMIPTERA																							
	Mesoveliidae																							
Local	Mesovelia furcata		-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-
	Hydrometridae																							
	Hydrometra stagnorum		-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Veliidae																							
	Velia caprai		-	-	-	-	-	-	-	+	+	-	-	-	-	+	-	-	-	-	-	-	-	-
	Microvelia reticulata		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gerridae																							
Local	Gerris argentatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Gerris lacustris		-	+	+	-	+	-	-	-	-	-	-	+	-	+	-	+	-	-	+	-	-	-
	Gerris odontogaster		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gerris thoracicus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

Status		Site	LAL1	LAL2	COA1	COL1	COL2	COL3	WRT1	WRT2	WRT3	WRT4	WRB1	WRB2	WRB3	WRO1	GIZ1	GIZ2	GIZ3	GIZ4	KEN1	KEN2	KEN3	KEN4
		Year	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90
		Season	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	su	sp	sp	sp	su
		Replicate	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1
		Total Species	27	37	28	18	25	25	39	29	26	31	42	36	37	46	24	21	9	27	45	37	37	60
	HEMIPTERA (continued)																							
	Nepidae																							
	Nepa cinerea		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Ranatra linearis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Naucoridae																							
	Ilyocoris cimicoides		-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	-	-	+	-	-	+
	Notonectidae																							
	Notonecta glauca		+	+	-	-	+	-	-	+	-	+	-	-	-	-	-	-	-	-	+	-	+	+
	Notonecta maculata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Notonecta marmorea		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pleidae																							
	Plea leachi		-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Corixidae																							
Local	Micronecta scholtzi		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cymatia bonsdorffi		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cymatia coleoptrata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Callicorixa praeusta		-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Corixa dentipes		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Corixa panzeri		-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Corixa punctata		-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hesperocorixa linnei		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hesperocorixa sahlbergi		+	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-
	Arctocorisa germari		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sigara dorsalis		-	+	+	+	+	+	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	+
	Sigara distincta		-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Sigara falleni		-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+
	Sigara fossarum		-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sigara lateralis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sigara nigrolineata		+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Sigara concinna		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sigara limitata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	COLEOPTERA																							
	Haliplidae																							
	Brychius elevatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Peltodytes caesus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus confinis		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus flavicollis		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus fluviatilis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

Status		Site	LA	LL	CO	CO	CO	WR	WR	WR	WR	WR	WR	WR	GI	GI	GI	GI	KE	KE	KE	KE
			LA	LL	LL	LL	LL	TO	TO	TO	TO	BO	BO	BO	ZZ	ZZ	ZZ	ZZ	NN	NN	NN	NN
		Year	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90
		Season	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	su	sp	sp	sp	su
		Replicate	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1
		Total Species	27	37	28	18	25	25	39	29	26	31	42	36	37	46	24	21	9	27	45	37	37	60
	COLEOPTERA (continued)																							
NN b	Haliplus heydeni		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus immaculatus		-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	+	+	+	+
NN b	Haliplus luminatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus lineatocollis		-	+	+	+	-	+	-	-	-	+	-	-	-	-	+	+	+	-	-	-	-	-
	Haliplus lineolatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
Local	Haliplus obliquus		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus ruficollis		-	-	-	-	-	-	+	-	+	-	+	+	-	+	-	+	-	-	-	-	+	-
	Haliplus wehncki		-	-	+	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
	Hygrobiidae																							
	Hygrobia hermanni		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dytiscidae & Noteridae																							
	Noterus clavicornis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+
	Laccophilus hyalinus		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-
	Laccophilus minutus		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hyphydrus ovatus		-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	+	-	+
NN b	Hydroglyphus pusillus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hygrotus inaequalis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Hygrotus versicolor		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coelambus confluens		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coelambus impressopunctatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus angustatus		-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus discretus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Hydroporus erythrocephalus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Hydroporus memnonius		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus nigrita		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus palustris		+	+	-	-	+	+	-	-	-	+	-	-	-	-	+	-	-	+	-	-	-	-
	Hydroporus planus		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Hydroporus pubescens		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus tessellatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Graptodytes pictus		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
Local	Porhydrus lineatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Potamonectes depressus		-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Stictotarsus duodecimpustulatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Copelatus haemorrhoidalis		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Platambus maculatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus bipustulatus		+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
NN b	Agabus chalconatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

Status		Site	L A L A	L A L A	C O L A	C O L A	C O L A	C O L A	W R T O	W R T O	W R T O	W R T O	W R B O	W R B O	W R B O	W R B O	G I Z Z	G I Z Z	G I Z Z	G I Z Z	K E N N	K E N N	K E N N	K E N N
		Year	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90
		Season	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	su	sp	sp	sp	su
		Replicate	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1
		Total Species	27	37	28	18	25	25	39	29	26	31	42	36	37	46	24	21	9	27	45	37	37	60
	COLEOPTERA (continued)																							
	Agabus didymus		+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	Agabus guttatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus melanocornis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus nebulosus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus paludosus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus sturmii		-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Ilybius ater		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Ilybius fenestratus		-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	+	-	-	+
	Ilybius fuliginosus		+	-	-	-	-	-	+	+	-	+	-	-	+	+	-	-	-	-	+	-	-	-
	Ilybius quadriguttatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Rhantus exsoletus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Colymbetes fuscus		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acilius sulcatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dytiscus marginalis		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dytiscus semisulcatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Suphrodytes dorsalis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gyrinidae																							
	Gyrinus marinus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	
	Gyrinus substriatus		-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RDB3	Gyrinus suffriani		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydrophilidae & Hydraenidae																							
	Helophorus aequalis		-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-
	Helophorus grandis		-	+	-	-	-	+	-	+	-	-	-	-	-	-	+	+	+	+	-	-	-	-
	Helophorus brevipalpis		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	-	+	+	+
NN b	Helophorus dorsalis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Helophorus granularis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Helophorus griseus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Helophorus minutus		-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-
NN b	Helophorus nanus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Helophorus obscurus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Hydrobius fuscipes		-	-	-	-	-	-	-	-	-	-	+	+	+	-	+	+	+	-	-	+	-	-
NN b	Anacaena bipustulata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anacaena globulus		-	+	+	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Anacaena limbata		+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	+	+	+	+
	Anacaena lutescens		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
Local	Laccobius biguttatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Laccobius minutus		+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

Status		Site	LAL	LAL	CLL	CLL	CLL	CLA	WRT	WRT	WRT	WRT	WRB	WRB	WRB	WRB	GIZ	GIZ	GIZ	GIZ	KEN	KEN	KEN	KEN
		Year	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	89	90
		Season	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	su	sp	sp	sp	su
		Replicate	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1
		Total Species	27	37	28	18	25	25	39	29	26	31	42	36	37	46	24	21	9	27	45	37	37	60
	COLEOPTERA (continued)																							
	Laccobius bipunctatus		+	+	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
	Laccobius striatulus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Helochares lividus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Enochrus coarctatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RDB3	Enochrus isotae		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Enochrus melanocephalus		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
NN b	Enochrus ochropterus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Enochrus testaceus		-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	+
Local	Cymbiodyta marginella		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Chaetarthria seminulum		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Berosus signaticollis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Cercyon convexiusculus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cercyon marinus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Cercyon sternalis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Cercyon tristis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Cercyon ustulatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
NN b	Ochthebius bicolon		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ochthebius dilatatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ochthebius minimus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydraena riparia		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+
NN b	Hydraena testacea		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Limnebius nitidus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Limnebius papposus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*	Limnebius truncatellus		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Elmidae																							
	Elmis aenea		-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-
	Oulimnius tuberculatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NN b	Riolus cupreus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MEGALOPTERA																							
	Sialidae																							
	Sialis lutaria		+	+	+	-	+	-	+	+	+	+	-	+	+	+	-	-	-	+	+	+	-	+
	TRICHOPTERA																							
	Hydroptilidae																							
Local	Agraylea sexmaculata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Psychomyiidae & Ecnomidae																							
	Lype reducta		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tinodes waeneri		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.7 (cont.)

Status		Site	L A L A	L A L A	C O L A	C O L A	C O L A	C O L A	W R T O	W R T O	W R T O	W R T O	W R B O	W R B O	W R B O	W R B O	G I Z Z	G I Z Z	G I Z Z	K E N N	K E N N	K E N N	K E N N
		Year	89	90	89	89	89	90	89	89	89	90	89	89	89	90	89	89	90	89	89	89	90
		Season	su	sp	su	su	su	sp	su	su	su	sp	su	su	su	sp	sp	sp	sp	su	sp	sp	sp	su
		Replicate	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1	1	2	3	1
		Total Species	27	37	28	18	25	25	39	29	26	31	42	36	37	46	24	21	9	27	45	37	37	60
	TRICHOPTERA (continued)																							
Local	Ecnomus tenellus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Polycentropodidae																							
	Cyrnus flavidus		-	-	-	-	-	-	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
	Cyrnus trimaculatus		-	-	-	-	-	-	-	+	-	-	-	+	+	+	-	-	-	-	-	-	-	-
	Holocentropus dubius		-	-	-	-	-	-	+	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
	Holocentropus picicornis		-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Plectrocnemia conspersa		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Plectrocnemia geniculata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
	Phryganeidae																							
	Agrypnia varia		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phryganea bipunctata		-	-	-	-	-	-	+	+	-	-	+	+	+	-	-	-	-	+	-	-	-	-
	Lepidostomatidae																							
	Crunoecia irrorata		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilidae																							
	Halesus radiatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Micropterna lateralis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-
	Anabolia nervosa		-	-	-	-	-	-	+	-	-	+	-	+	-	-	-	-	-	-	-	-	+	-
	Glyphotaelius pellucidus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus affinis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus auricula		-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Limnephilus decipiens		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+
	Limnephilus extricatus		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
	Limnephilus flavicornis		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	+	+
	Limnephilus lunatus		+	+	-	-	-	-	+	+	+	+	-	-	-	+	+	+	+	+	+	+	+	+
	Limnephilus marmoratus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+
	Limnephilus vittatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Beraeidae																							
	Beraea pullata		+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Beraeodes minutus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Molannidae																							
	Molanna angustata		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	Leptoceridae																							
	Athripsodes aterrimus		-	-	-	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	+	+	-	-
	Leptocerus tineiformis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mystacides longicornis		-	-	+	-	+	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	Triaenodes bicolor		-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	+	+
	Oecetis lacustris		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-

Table A3.8 Macroinvertebrate Lists by Site for 1988/89/90

Status		Total Species	12	21	79	10	73	45	26	87	58	62	14	34	18	14	23	31	14	45	68	42	34	46	22	23	66	71	68	70	13	23	22	9	27	41	20	20	40	88	68	27	21	14	16	21	16	46	22	68	66	16	12	13	36
	TRICLADIDA																																																							
	Planariidae & Dugesiidae																																																								
	Polycelis felina		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-
	Polycelis nigra		-	-	+	-	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-
	Polycelis tenuis		-	-	-	-	+	-	-	+	+	+	-	-	-	-	-	+	-	-	+	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-
Local	Dugesia lugubris		-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
	Dugesia polychroa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dugesia tigrina		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Dendrocoelidae																																																						
	Dendrocoelum lacteum		-	-	-	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GASTROPODA																																																						
	Viviparidae																																																						
Local	Viviparus contectus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Viviparus viviparus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Valvatidae																																																						
	Valvata cristata		-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
	Valvata piscinalis		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
	Hydrobiidae & Bithyniidae																																																						
	Potamopyrgus jenkinsi		-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	+	+	-	-	-	-	-	-	+	+	+	+	-	-	-	-	+	+	-	-	-	-	-
	Bithynia leachi		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bithynia tentaculata		-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	+	-	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Physidae																																																						
Local	Aplexa hypnorum		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Physa acuta		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Physa fontinalis		-	-	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Lymnaeidae																																																						
	Lymnaea auricularia		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	+	+	-	-	+	-	-	-	-	-	+	-	+	+	+	+	-	-	-
	Lymnaea palustris		-	+	+	-	-	+	-	+	+	+	-	+	-	+	-	-	-	+	+	+	+	+	-	-	+	+	+	+	-	+	-	+	+	+	+	+	+	+	-	-	+	+	-	-	-	+	+	+	+	+	-	+	-	-
	Lymnaea peregra		+	+	+	-	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	-	+	-	-	+	+	+	+	-	+	+	+	-	+	-	+	+	+	-	+	+	-	-	-	+	+	+	+	-	-	-	-	-
	Lymnaea stagnalis		-	-	+	-	+	+	-	-	+	+	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	+	+	+	-	-	+	+	-	+	-	+	+	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-
	Lymnaea truncatula		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
RDB 1	Myxas glutinosa		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Planorbidae																																																						
	Planorbis carinatus		-	-	+	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	+	+	-	+	-	-	-	-
	Planorbis planorbis		-	-	+	+	+	+	+	+	+	+	-	-	-	-	-	-	+	+	+	+	+	-	+	-	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Anisus leucostoma		-	-	+	-	-	-	+	+	-	-	-	-	+	+	-	-	+	+	+	+	-	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
	Anisus vortex		+	-	+	+	+	+	-	+	+	+	-	+	-	-	+	+	-	+	-	+	-	+	-	+	-	+	+	+	+	+	-	-	-	+	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
	Bathyomphalus contortus		-	-	+	+	+	+	-	+	+	+	-	-	-	-	+	+	-	+	-	+	-	+	-	-	+	+	+	+	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	+	+	-	+	-	+	-	-
	Gyraulus albus		-	-	-	-	-	-	-	-	+	+	-	-	-	-	+	+	-	-	-	-	-	+	-	-	+	+	-	+	+	+	-	-	-	-	-	-	+	+	+	+	+	-	-	-	-	+	+	-	-	-	-	-	-
Notable B	Gyraulus laevis		-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	+	+	+	-	-	-	-	-	-	+	+	-	-	-	-	-	-
	Armiger crista		-	+	+	+	+	+	-	+	-	+	+	+	-	+	+	+	-	+	+	+	-	-	+	+	+	+	+	-	-	+	-	-	+	-	-	-	+	+	+	-	-	-	-	-	-	+	+	-	+	-	-	-	-

Table A3.8 (cont.)

Status	Taxon	WIDU	WIFI	PILL	HICO	BECK	ORRA	WILL	CENT	SHO4	UFFI	MAYH	BOUR	EACH	WCHA	BLE1	BLE2	PARS	WENB	NRRA	HONO	KIMA	KIDI	KITY	KIRO	LRUD	FCMO	FCLA	FCSM	LOMA	LICO	GRTY	BRIM	LAWA	LAWB	LSCA	LSCB	WHMT	LWIU	LWIL	LWMA	LWCH	NESE	NEP2	NEP3	NESH	WOLA	WOLB	MPLA	MPLB	MIPD	BAMO	BACO	BAP4
	GASTROPODA (continued)																																																					
	Hippeutis complanatus	-	-	+	-	+	+	-	+	+	-	-	-	-	-	+	+	-	-	+	-	-	+	-	-	+	+	-	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
	Planorbarius corneus	-	+	+	-	-	+	-	+	-	+	-	-	-	-	-	-	-	-	+	-	-	+	-	-	+	+	-	+	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-
	Ancylidae & Acroloxidae																																																				
	Ancylus fluviatilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acroloxus lacustris	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	HIRUDINEA																																																				
	Piscicolidae																																																				
	Piscicola geometra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-
	Glossiphoniidae																																																				
	Theromyzon tessulatum	-	-	+	-	+	-	-	+	+	-	-	+	-	-	-	-	+	-	+	-	-	+	-	-	-	+	+	-	-	+	-	-	+	-	-	+	+	+	+	-	-	-	-	-	-	+	-	+	-	-	-	-	-
Local	Hemiclepsis marginata	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
	Glossiphonia complanata	-	-	+	-	+	+	-	+	+	+	-	+	-	-	-	+	+	-	+	-	-	+	-	-	+	+	+	+	-	+	+	-	+	+	-	+	+	-	+	-	-	+	-	-	-	+	-	+	+	-	+	-	+
Local	Glossiphonia heteroclita	-	-	+	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	-	-	-	+	-	-	-	+	-	-	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Helobdella stagnalis	+	+	+	-	+	+	-	+	+	+	-	+	+	+	-	+	-	-	+	-	-	+	-	-	+	+	+	-	-	+	+	+	-	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	-	+	+	+
	Hirudinidae																																																				
	Haemopis sanguisuga	-	-	-	-	-	+	-	+	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
	Erpobdellidae																																																				
	Erpobdella octoculata	-	-	+	-	+	+	-	+	+	+	-	-	-	-	+	+	+	+	+	-	-	-	-	-	+	+	-	-	+	-	-	+	+	+	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
Local	Erpobdella testacea	-	+	+	-	+	+	+	+	+	+	-	+	-	-	-	+	-	+	+	+	-	+	-	-	+	-	+	+	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-	-	-	-	-	-
	ARANEAE																																																				
	Argyroneta aquatica	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
	DECAPODA																																																				
	Astacidae																																																				
Schedule 5	Austropotamobius pallipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ISOPODA																																																				
	Asellidae																																																				
	Asellus aquaticus	-	-	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	-	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	-	-	+
	Asellus meridianus	-	-	+	-	-	-	-	-	+	+	-	-	-	+	-	+	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	+	-	-
	AMPHIPODA																																																				
	Gammaridae & Crangonyctidae																																																				
	Crangonyx pseudogracilis	-	-	+	-	+	+	+	+	+	+	+	-	-	-	+	-	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	-	-	+	+	+	+	+	+	+	+	-	-	+	-	+	+	+	+	+	-	-	-
	Gammarus pulex	-	-	+	-	+	-	-	+	+	+	+	+	+	-	-	+	+	+	+	-	-	+	-	+	+	+	-	-	-	-	-	-	+	+	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-
	Niphargidae																																																				
Local	Niphargus aquilex	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	EPHEMEROPTERA																																																				
	Baetidae																																																				
	Cloeon dipterum	-	+	+	+	+	+	-	+	+	+	-	+	+	-	-	-	-	+	+	+	-	+	-	-	+	+	+	+	-	-	+	-	-	+	-	-	-	+	+	+	-	-	-	-	-	+	-	+	+	+	-	-	-
Local	Cloeon simile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ephemeridae																																																				
	Ephemera danica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ephemera vulgata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Caenidae																																																				
	Caenis horaria	-	-	+	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	+	-	-	-	-	+	-	-	-	+	+	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-

Table A3.8 (cont.)

Status		WIDU	WIFI	PILL	HICO	BECK	ORRA	WILL	CENT	SHO4	UFFI	MAYH	BOUR	EACH	WCHA	BLE1	BLE2	PARS	WENB	NRRA	HONO	KIMA	KIDI	KITY	KIRO	LRUD	FCMO	PCLA	FCSM	LOMA	LICO	GRTY	BRIM	LAWA	LAWB	LSCA	LSCB	WHMT	LWIU	LWIL	LWMA	LWCH	NESE	NEP2	NEP3	NESH	WOLA	WOLB	MPLA	MPLB	MIPD	BAMO	BACO	BAP4
	EPHEMEROPTERA (continued)																																																					
	Caenis luctuosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Local	Caenis robusta	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	+	+	+	.	+	.	.	.	.	.	+	+	.	.	.	.
	PLECOPTERA																																																					
	Nemouridae																																																					
	Nemurella picteti	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Nemoura cinerea	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Local	Nemoura erratica	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	ODONATA																																																					
	Coenagriidae																																																					
	Pyrrhosoma nymphula	.	.	+	.	+	.	.	.	+	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
	Ischnura elegans	.	.	.	.	+	.	.	.	.	+	+	+	.	.	.	.	.	.	.	.	.	+	.	.	+	+	+	+	.	.	.	.	+	+	.	.	+	+	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.
	Enallagma cyathigerum	.	.	.	.	+	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.	.	.	+	.	.	.	+	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.
	Coenagrion puella	.	+	+	.	+	+	.	+	+	+	+	+	.	.	.	.	.	+	+	+	+	+	.	.	+	.	+	+	.	.	+	.	+	+	.	.	+	+	+	.	.	.	.	.	.	.	.	+	+	.	.	.	.
Local	Erythromma najas	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.
	Aeshnidae																																																					
	Aeshna cyanea	+	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	+	.	+	.	.	.	.	.	+	+	.	.	.	+	.	.	.	+	.	+	.	.	.	.	+	.	.	.	.
	Aeshna grandis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.
	Libellulidae																																																					
	Libellula depressa	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Libellula quadrimaculata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Notable B	Sympetrum sanguineum	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Sympetrum striolatum	.	.	+	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.	.	+	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
	HEMIPTERA																																																					
	Mesoveliidae																																																					
Local	Mesovelia furcata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Hydrometridae																																																					
	Hydrometra stagnorum	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.
	Veliidae																																																					
	Velia caprai	.	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
	Microvelia reticulata	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Gerridae																																																					
Local	Gerris argentatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Gerris lacustris	.	.	.	.	+	.	.	+	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	+	+	+	.	.	.
	Gerris odontogaster	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Gerris thoracicus	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Nepidae																																																					
	Nepa cinerea	.	.	.	.	+	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	+	+	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.
Local	Ranatra linearis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.
	Naucoridae																																																					
	Ilyocoris cimicoides	.	.	+	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.	+	.	.	.	+	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.
	Notonectidae																																																					
	Notonecta glauca	.	+	+	.	+	+	+	+	.	+	+	+	.	.	.	.	.	.	+	.	+	+	.	.	.	+	.	.	.	.	+	.	.	.	.	.	.	+	+	.	.	.	.	.	.	+	.	+	+	+	.	.	.
	Notonecta maculata	.	.	.	.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Table A3.8 (cont.)

Status	Species	WIDU	WIPI	PILL	HICO	BECK	ORRA	WILL	CENT	SHO4	UFFI	MAYH	BOUR	ECHH	WCHA	BLE1	BLE2	PARS	WENB	NRRA	HONO	KINA	KIDI	KITY	KIRO	LRUD	FCMO	FCLA	FCSM	LOMA	LICO	GRTY	BRIM	LAWA	LAWB	LSCA	LSCB	WHMT	LWIU	LWIL	LWMA	LWCH	NESE	NEP2	NEP3	NESH	WOLA	WOLB	MPLA	MPLB	MIPD	BAMO	BACO	BAP4
	HEMIPTERA (continued)																																																					
	Notonecta marmorea	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pleidae																																																					
	Plea leachi	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
	Corixidae																																																					
Local	Micronecta scholtzi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cymatia bonsdorffi	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cymatia coleoptrata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-
	Callicorixa praeusta	-	-	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-
Local	Corixa dentipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Corixa panzeri	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-
-	Corixa punctata	+	-	+	-	+	-	-	+	-	+	+	+	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	+
	Hesperocorixa linnei	-	-	+	-	+	+	+	+	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-
	Hesperocorixa moesta	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hesperocorixa sahlbergi	-	-	+	-	+	+	+	+	+	+	+	-	+	-	+	-	-	-	-	+	+	+	+	+	+	+	-	-	-	-	-	-	-	+	+	-	-	-	-	+	+	+	+	-	+	+	+	-	-	-	+	+	+
	Arctocorisa germari	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sigara dorsalis	-	-	+	-	+	+	-	+	+	+	+	+	-	-	-	+	-	+	+	-	+	+	-	-	+	+	+	+	-	+	-	-	+	-	-	-	+	+	+	-	-	-	-	-	-	+	-	+	+	-	-	-	-
	Sigara distincta	-	-	+	-	+	+	-	+	-	-	-	+	-	-	-	-	-	-	+	-	-	+	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	-	+	+	+	-	-	-
	Sigara falleni	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+	+	-	-	-
	Sigara fossarum	-	-	-	-	+	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	-	+	-	-	-	-	-
	Sigara scotti	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sigara lateralis	+	+	+	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Sigara nigrolineata	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
Local	Sigara concinna	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sigara limitata	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	COLEOPTERA																																																					
	Haliplidae																																																					
	Brychius elevatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Peltodytes caesus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus confinis	-	-	+	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus flavicollis	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	+	+	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Haliplus fluviatilis	-	-	-	-	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Haliplus fulvus	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Haliplus heydeni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-
	Haliplus immaculatus	-	-	+	-	-	+	-	+	-	+	-	+	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+	-	+	+	-	-	+	-	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
Notable B	Haliplus laminatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus lineatocollis	-	+	+	-	+	-	+	+	-	+	+	+	-	+	+	+	+	+	+	-	-	+	-	+	+	+	+	+	+	+	+	-	+	-	-	-	-	+	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-
	Haliplus lineolatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
Local	Haliplus obliquus	+	-	-	-	+	-	-	+	-	+	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	+	+	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus ruficollis	-	-	+	-	+	+	+	+	-	+	+	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	+	+	-	-	-	+	+	-	-	-	+	-	+	+	-	+	-	-	+	+	-	-	-	-	-	-	-
	Haliplus wehnckei	-	-	-	-	+	-	-	+	+	-	+	-	-	-	-	-	+	-	+	-	-	-	-	-	-	+	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Hygrobiidae																																																					
	Hygrobia hermanni	-	-	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-
	Dytiscidae & Noteridae																																																					

Table A3.8 (cont.)

Status	COLEOPTERA (continued)	WIDU	WIFI	PILL	HICO	BECK	ORAA	WILL	CEHT	SHO4	UFFI	MAYH	BOUR	ECHA	WCHA	BLEE	BLER	PAER	WERN	NROB	HOIA	KIMI	KIDY	KITO	KIRO	LRUD	FCML	PCLO	PCSM	LOIA	LRTO	GBRY	BRAM	LAAB	LAWA	LSWC	LHCA	WLBT	LWWI	LWIU	LWMA	LNWH	NEES	NEPE	NEP2	NEP3	NEES	NWOS	WOLH	MPLA	MPLB	MPLB	BIPD	BAMO	BAAC	BAP4
	Noterus clavicornis	-	-	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	-	-	+	+	-	-	+	-	-	-	-	-	-	+	+	-	-	-	-	-
	Laccophilus hyalinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
	Laccophilus minutus	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-
	Hyphydrus ovatus	-	+	+	+	+	+	-	+	+	+	-	-	-	-	-	-	-	+	+	-	-	+	+	+	+	-	+	-	-	+	+	-	+	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
Notable B	Hydroglyphus pusillus	-	-	+	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Hygrotus inaequalis	-	+	+	-	+	+	-	+	-	+	-	-	-	-	-	-	-	+	+	+	+	+	-	+	-	-	+	+	-	-	+	-	+	-	-	-	-	-	-	+	+	+	-	-	-	+	-	-
Local	Hygrotus versicolor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Coelambus confluens	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coelambus impressopunctatus	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-
	Hydroporus angustatus	-	-	+	-	-	-	+	+	-	-	-	-	+	-	+	-	-	+	+	-	-	-	+	+	+	-	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	+	-	+	-	-	-	-	-	+
	Hydroporus discretus	-	+	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus erythrocephalus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-
Notable B	Hydroporus marginatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Hydroporus memnonius	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus nigrita	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
	Hydroporus palustris	+	+	+	+	+	+	+	+	+	+	-	-	+	+	-	+	-	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	+	+	+	+	+	+	+	-	-	-	+	+	+	+	-	-	-
	Hydroporus planus	+	-	+	-	+	+	+	+	+	+	-	-	+	+	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+	+	+	-	-	-	-	-	-	+	-	-	-
	Hydroporus pubescens	-	-	+	-	+	-	+	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Hydroporus tessellatus	-	-	-	-	+	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Graptodytes pictus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Local	Porhydrus lineatus	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Potamonectes depressus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Stictotarsus duodecimpustulatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Scarodytes halensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Copelatus haemorrhoidalis	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
	Platambus maculatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus bipustulatus	-	+	-	-	+	-	+	+	-	+	-	-	-	+	-	-	-	+	+	+	+	-	+	+	-	+	+	+	+	-	+	+	-	-	+	+	+	+	+	+	+	+	-	+	-	+	-	-	+	+
Notable B	Agabus chalconatus	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	+	+	+	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Agabus didymus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus guttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Agabus labiatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus melanocornis	-	-	+	-	+	-	-	+	-	-	-	-	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
	Agabus nebulosus	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	+	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus paludosus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus sturmii	-	-	-	-	+	+	-	-	+	+	-	-	-	-	+	-	+	+	+	+	+	+	-	+	+	+	-	-	-	-	-	-	+	+	+	+	+	+	+	+	-	-	+	-	-	-	-	-	-
Notable B	Agabus uliginosus	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ilybius ater	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	+	+	+	-	+	-	-	+	-	-	-	-	-	+	-	-	-	+	+	-	+	-	-	+	-	-	-	-	-	+	-	+
Notable B	Ilybius fenestratus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-
	Ilybius fuliginosus	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	+	-	+	+	+	+	+	-	+	+	+	+	-	-	-	+	+	+	-	-	-	-	-	+	+	+	-	+
	Ilybius quadriguttatus	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	+	+	+	-	+	-	+	+	-	+	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	+	-	-	+
Notable B	Ilybius subaeneus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-
	Rhantus exsoletus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Colymbetes fuscus	-	-	+	-	+	-	-	+	+	+	-	-	-	+	-	-	-	+	+	+	+	+	-	+	-	-	+	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-	-	-	+	-

Table A3.8 (cont.)

Status	COLEOPTERA (continued)	WIDU	WIFI	PILL	HICO	BECK	ORRA	WILL	CENT	SHO4	UFFI	MAYH	BOUR	EACH	WCHA	BLE1	BLE2	PARS	WENB	NRRA	HONO	KIMA	KIDI	KITY	KIRO	LRUD	FCMO	FCLA	FCSM	LOMA	LICO	GRTY	BRIM	LAWA	LAWB	LSCA	LSCB	WHMT	LWIU	LWIL	LWMA	LWCH	NESE	NEP2	NEP3	NESH	WOLA	WOLB	MPLA	MPLB	MIPD	BAMO	BACO	BAP4
	Acilius sulcatus	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dytiscus marginalis	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	+	-	+	+	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dytiscus semisulcatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Suphrodytes dorsalis	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-
	Gyrinidae																																																					
Notable A	Gyrinus bicolor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gyrinus marinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gyrinus substriatus	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
RDB 3	Gyrinus suffriani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydrophilidae & Hydraenidae																																																				
	Helophorus aequalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Helophorus grandis	-	+	+	+	+	+	+	+	-	+	-	+	+	-	-	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	+	-	+	+	-	-	-	-	+	-	+	-	-	-	-	+	-	+	+	-	+	-	-
	Helophorus brevipalpis	-	-	+	-	+	-	+	+	-	+	-	+	-	-	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	-	-	+	+
Notable B	Helophorus dorsalis	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Helophorus granularis	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Helophorus griseus	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Helophorus minutus	-	-	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-
Notable B	Helophorus nanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Helophorus obscurus	-	-	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-
	Coelostoma orbiculare	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydrobius fuscipes	-	-	+	+	+	+	+	+	+	+	-	+	-	-	-	-	-	+	+	-	+	+	+	-	+	+	-	+	-	+	-	-	-	+	+	-	-	-	+	+	+	-	-	-	-	-	+	+	+	-	+	-	-
Notable B	Anacaena bipustulata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
	Anacaena globulus	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	+	+	+	-	-	-
	Anacaena limbata	+	+	+	-	+	-	+	+	+	+	-	-	+	-	-	-	-	+	+	+	+	+	+	-	+	-	-	+	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	+	+	+	+	-	+	-
	Anacaena lutescens	-	-	+	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-
Local	Laccobius biguttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Laccobius minutus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	-
	Laccobius bipunctatus	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	+	+	-	-	+
Notable B	Laccobius sinuatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Laccobius striatulus	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Helochares lividus	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Enochrus coarctatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RDB 3	Enochrus isotae	-	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Enochrus melanocephalus	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Enochrus ochropterus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Enochrus testaceus	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cymbiodyta marginella	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Chaetarthria seminulum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
Notable B	Berosus signaticollis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Cercyon convexiusculus	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cercyon marinus	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
Notable B	Cercyon sternalis	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
Notable B	Cercyon tristis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.8 (cont.)

Status		WIDU	WIFI	PILL	HICO	BECK	ORRA	WILL	CENT	SHO4	UFFI	MAYH	BOUR	EACH	WCHA	BLE1	BLE2	PARS	WENB	NRRA	HONO	KIMA	KIDI	KITY	KIRO	LRUD	FCMO	FCLA	FCSM	LOMA	LICO	GRTY	BRIM	LAWA	LAWB	LSCA	LSCB	WHMT	LWIU	LWIL	LWMA	LWCH	NESE	NEP2	NEP3	NESH	WOLA	WOLB	MPLA	MPLB	MIPD	BAMO	BACO	BAP4
	COLEOPTERA (continued)																																																					
Notable B	Cercyon ustulatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Ochthebius bicolon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ochthebius dilatatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ochthebius minimus	-	-	+	-	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
Local	Hydraena britteni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydraena riparia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-
Notable B	Hydraena testacea	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Limnebius nitidus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
Notable B	Limnebius papposus	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
	Limnebius truncatellus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Elmidae																																																					
	Elmis aenea	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Oulimnius tuberculatus	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Riolus cupreus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Riolus subviolaceus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MEGALOPTERA																																																					
	Sialidae																																																					
	Sialis lutaria	-	-	+	-	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	TRICHOPTERA																																																					
	Hydroptilidae																																																					
Local	Agraylea sexmaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Psychomyiidae & Ecnomidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lype reducta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tinodes waeneri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Ecnomus tenellus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Polycentropodidae																																																					
	Cyrnus flavidus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
	Cyrnus trimaculatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Holocentropus dubius	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Holocentropus picicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Plectrocnemia conspersa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Plectrocnemia geniculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydropsychidae																																																					
	Hydropsyche angustipennis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phryganeidae																																																					
	Agrypnia varia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phryganea bipunctata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
Local	Phryganea grandis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lepidostomatidae																																																					
	Crunoecia irrorata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilidae																																																					
	Halesus radiatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-

Table A3.8 (cont.)

		WIDU	WIFI	PILL	HICO	BECK	ORRA	WILL	CENT	SHO4	UFFI	MAYH	BOUR	EACH	WCHA	BLE1	BLE2	PARS	WENB	NRNA	HONO	KIMA	KIDI	KITY	KIRO	LRUD	FCMO	FCLA	FCSM	LOMA	LICO	GRTY	BRIM	LAWA	LAWB	LSCA	LSCB	WHMT	LWIU	LWIL	LWMA	LWCH	NESE	NEP2	NEP3	NESH	WOLA	WOLB	MPLA	MPLB	MIPD	BAMO	BACO	BAP4
Status	**TRICHOPTERA (continued)**																																																					
	Micropterna lateralis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anabolia nervosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
	Glyphotaelius pellucidus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus affinis	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus auricula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus centralis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Limnephilus decipiens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Limnephilus extricatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus flavicornis	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Limnephilus lunatus	-	-	-	-	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Limnephilus marmoratus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus vittatus	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Beraeidae																																																					
	Beraea pullata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Beraeodes minutus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Molannidae																																																					
	Molanna angustata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Leptoceridae																																																					
	Athripsodes aterrimus	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
	Leptocerus tineiformis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mystacides longicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
	Triaenodes bicolor	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Oecetis lacustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.8 (cont.)

		ODDI	MOTW	WASP	ASMU	ASFI	NEWE	PAMO	PAPO	GRFP	GAZE	SRLI	SRCH	SRTE	YOUL	FOHA	FODR	CLAR	WEAV	AIRP	DS1.	DS2.	DS3.	COTH	WW1.	WW2.	WW3.	WW4.	BERN	ASHM	WHIX	MASC	MAMU	HSLA	HSLE	COMR	COPI	BUTT	NILL	MA03	MA04	MA07	MA11	MA22	CASS	CANU	TODU	TOGA	BTRI	BPAT	BRAM	ARQU	BRNW	LALA	MAAR
Status	Total Species	17	31	35	5	14	68	23	20	22	36	18	43	4	20	30	39	28	11	34	77	55	21	65	73	75	99	28	40	75	35	28	15	24	16	34	26	12	66	49	42	60	45	72	78	38	16	18	12	11	29	25	50	61	23
	TRICLADIDA																																																						
	Planariidae & Dugesiidae																																																						
	Polycelis felina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Polycelis nigra	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	+	-
	Polycelis tenuis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+
Local	Dugesia lugubris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-
	Dugesia polychroa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	-	+	-	-
	Dugesia tigrina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Dendrocoelidae																																																						
	Dendrocoelum lacteum	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	GASTROPODA																																																						
	Viviparidae																																																						
Local	Viviparus contectus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Viviparus viviparus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Valvatidae																																																						
	Valvata cristata	-	-	-	-	+	+	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Valvata piscinalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Hydrobiidae & Bithyniidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Potamopyrgus jenkinsi	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	+	-	-	-	+	+	+	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-
	Bithynia leachi	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bithynia tentaculata	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	+	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Physidae																																																						
Local	Aplexa hypnorum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Physa acuta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Physa fontinalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lymnaeidae																																																						
	Lymnaea auricularia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-
	Lymnaea palustris	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	+	+	+	-
	Lymnaea peregra	+	+	+	-	-	+	+	+	+	+	+	-	-	-	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	+	+	-	+	-	-	+	+	+	+	+	+	+	+	-	-	-	+	+	+	+	+	+
	Lymnaea stagnalis	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	+	-	+
	Lymnaea truncatula	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
RDB 1	Myxas glutinosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Planorbidae																																																						
	Planorbis carinatus	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Planorbis planorbis	-	+	+	-	-	+	+	-	+	-	-	-	+	-	+	-	+	-	+	+	-	-	+	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	+	-	-	-	-	+
	Anisus leucostoma	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	+
	Anisus vortex	+	+	+	-	+	+	-	-	-	-	+	+	-	-	+	+	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	+	-	-	+	-	-	-	-	-	+	-	-	-
	Bathyomphalus contortus	-	+	+	-	-	+	+	+	-	+	-	-	-	-	+	+	+	-	+	+	-	-	+	+	-	+	-	+	-	-	-	-	-	+	-	-	+	+	+	+	-	-	-	-	-	-	-	+	+	-	-	-	-	-
	Gyraulus albus	-	-	-	-	-	-	-	+	+	+	-	-	-	-	+	+	-	-	-	-	-	-	+	+	+	+	+	-	-	+	-	-	-	+	-	-	-	+	-	+	-	-	+	+	+	-	-	+	-	-	-	-	-	+
Notable B	Gyraulus laevis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Armiger crista	+	+	+	-	-	+	+	+	-	+	-	-	-	-	+	+	-	-	-	+	+	-	-	+	+	-	+	+	+	-	-	-	+	-	-	-	+	+	+	+	+	-	+	-	+	-	+	+	-	+	-	-	-	+

Table A3.8 (cont.)

		O	M	W	A	A	N	P	P	G	G	S	S	S	Y	P	F	C	W	A	D	D	D	C	W	W	W	W	B	A	W	M	M	H	H	C	C	B	N	M	M	M	M	M	C	C	T	T	B	B	B	A	B	L	M
		D	O	A	S	S	E	A	A	R	A	R	R	R	O	O	O	L	E	I	S	S	S	O	W	W	W	W	E	S	H	A	A	S	S	O	O	U	I	A	A	A	A	A	A	A	O	O	T	P	R	R	R	A	A
		D	T	S	M	F	W	M	P	F	Z	L	C	T	U	H	D	A	A	R	1	2	3	T	1	2	3	4	R	H	I	S	M	L	L	M	P	T	L	0	0	0	1	2	S	N	D	G	R	A	A	Q	N	L	A
		I	W	P	U	I	E	O	O	P	E	I	H	E	L	A	R	R	V	P	.	.	.	H	.	.	.	.	N	M	X	C	U	A	E	R	I	T	L	3	4	7	1	2	S	U	U	A	I	T	M	U	W	A	R
Status	**GASTROPODA (continued)**																																																						
	Hippeutis complanatus	-	-	-	-	+	-	-	+	-	-	-	-	-	+	+	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	+	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-
	Planorbarius corneus	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ancylidae & Acroloxidae																																																						
	Ancylus fluviatilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acroloxus lacustris	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-
	HIRUDINEA																																																						
	Piscicolidae																																																						
	Piscicola geometra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Glossiphoniidae																																																						
	Theromyzon tessulatum	-	+	+	-	-	+	+	-	+	+	+	-	-	+	-	+	+	-	+	-	-	-	-	+	+	+	+	-	-	-	+	-	+	-	+	+	-	+	+	-	-	+	+	+	+	-	-	-	-	-	-	+	+	-
Local	Hemiclepsis marginata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-
	Glossiphonia complanata	-	+	+	-	+	+	+	+	-	-	+	-	-	-	+	+	-	-	+	+	+	-	+	+	+	+	+	+	+	-	+	-	-	+	+	+	+	+	+	+	+	+	-	+	+	-	+	-	+	+	-	-	+	-
Local	Glossiphonia heteroclita	-	-	+	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	+	+	-	-	+	-	+	-	+	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	Helobdella stagnalis	-	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	-	-	+	+	-	-	-	+	+	+	+	-	+	+	-	+	-	+	-	+	+	+	+	+	+	+	+	+	+	+	+	-	+	-	+	+	+
	Hirudinidae																																																						
	Haemopis sanguisuga	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Erpobdellidae																																																						
	Erpobdella octoculata	-	+	+	-	-	-	+	+	+	+	-	-	-	+	+	+	-	-	+	-	-	-	+	+	+	+	-	-	-	-	-	-	+	-	+	-	-	+	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-
Local	Erpobdella testacea	-	-	-	-	+	-	-	-	-	+	-	-	-	+	-	-	-	-	+	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-
	ARANEAE																																																						
	Argyroneta aquatica	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DECAPODA																																																						
	Astacidae																																																						
Schedule 5	Austropotamobius pallipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ISOPODA																																																						
	Asellidae																																																						
	Asellus aquaticus	+	-	+	+	+	+	-	-	+	+	-	+	-	+	+	+	+	+	-	-	-	-	+	+	-	-	-	+	+	+	+	-	+	+	-	-	+	+	+	-	+	+	+	+	+	+	+	-	-	-	-	+	-	+
	Asellus meridianus	-	+	-	-	-	+	-	+	-	-	+	+	-	-	-	-	-	-	+	+	-	-	+	+	+	+	+	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
	AMPHIPODA																																																						
	Gammaridae & Crangonyctidae																																																						
	Crangonyx pseudogracilis	+	+	+	-	-	-	+	+	+	+	-	-	+	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	+
	Gammarus pulex	-	+	-	+	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	+	-	-	+	+	+	+	+	-	-	+	+	-	-	+	+	-	+	+	-	-	+	-	-	-	+	-	-	+	+	-	-	+	+	+
	Niphargidae																																																						
Local	Niphargus aquilex	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	EPHEMEROPTERA																																																						
	Baetidae																																																						
	Cloeon dipterum	-	+	+	-	-	+	-	-	-	+	-	+	-	+	-	+	-	-	-	+	+	-	+	+	+	+	+	-	+	+	+	-	+	-	-	+	-	+	+	-	-	-	+	+	+	+	+	-	-	+	-	-	+	+
Local	Cloeon simile	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ephemeridae																																																						
	Ephemera danica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ephemera vulgata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Caenidae																																																						
	Caenis horaria	-	-	-	-	-	+	+	-	-	-	-	-	-	+	+	-	-	-	-	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-

Table A3.8 (cont.)

		ODDI	MOTW	WASP	ASMU	ASFI	NEWE	PAMO	PAPO	GRFP	GAZE	SRLI	SRCH	SRTE	YOUL	FOHA	FODR	CLAR	WEAV	AIRP	DS1.	DS2.	DS3.	COTH	WW1.	WW2.	WW3.	WW4.	BERN	ASHM	WHIX	MASC	MAMU	HSLA	HSLE	COMR	COPI	BUTT	NILL	MA03	MA04	MA07	MA11	MA22	CASS	CANU	TODU	TOGA	BTRI	BPAT	BRAM	ARQU	BRNW	LALA	MAAR
Status	**EPEMEROPTERA (continued)**																																																						
	Caenis luctuosa	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Local	Caenis robusta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PLECOPTERA																																																						
	Nemouridae																																																						
	Nemurella picteti	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Nemoura cinerea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-
Local	Nemoura erratica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ODONATA																																																						
	Coenagriidae																																																						
	Pyrrhosoma nymphula	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	+	+	-	+	-	+	+	-	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Ischnura elegans	-	-	+	-	-	+	-	+	-	-	+	-	-	-	+	+	-	-	+	+	+	-	+	+	+	+	-	-	+	-	+	-	-	-	-	-	-	+	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	+
	Enallagma cyathigerum	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Coenagrion puella	-	+	-	-	-	+	-	-	-	-	+	+	-	+	+	+	-	-	-	+	+	-	+	+	+	+	+	-	+	+	+	+	+	-	-	-	-	+	+	-	+	+	+	+	+	-	-	-	-	+	-	-	+	+
Local	Erythromma najas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aeshnidae																																																						
	Aeshna cyanea	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	+	-	-	-	+	+	-	-	-	-	-	-	+	+	+	-	-	-	+	-	-	-	-	-	-	+	-	-	+	+	-	-	-	-	+	-	+	+	+
	Aeshna grandis	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
	Libellulidae																																																						
	Libellula depressa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-
	Libellula quadrimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Sympetrum sanguineum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sympetrum striolatum	-	+	+	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	+	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	HEMIPTERA																																																						
	Mesoveliidae																																																						
Local	Mesovelia furcata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydrometridae																																																						
	Hydrometra stagnorum	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Veliidae																																																						
	Velia caprai	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
	Microvelia reticulata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
	Gerridae																																																						
Local	Gerris argentatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gerris lacustris	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	+	+	+	-	-	+	-	-	-	+	-	+	+	-	+	-	-	-	-	-	+	+	-	-	-	-	-	+	+	+	-
	Gerris odontogaster	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gerris thoracicus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nepidae																																																						
	Nepa cinerea	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-
Local	Ranatra linearis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Naucoridae																																																						
	Ilyocoris cimicoides	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
	Notonectidae																																																						
	Notonecta glauca	-	-	-	-	-	+	-	-	+	-	+	+	-	-	-	-	+	-	-	+	+	-	+	-	-	-	-	+	+	+	+	-	+	+	-	+	-	+	+	+	-	+	+	+	+	+	+	+	-	+	-	-	+	+
	Notonecta maculata	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+	+

Table A3.8 (cont.)

Status		ODDI	MOTW	WASP	ASMU	ASFI	NEWE	PAMO	PAPO	GRFP	GAZE	SRLI	SRCH	SRTE	YOUL	FOHA	FODR	CLAR	WEAV	AIRP	DS1.	DS2.	DS3.	COTH	WW1.	WW2.	WW3.	WW4.	BERN	ASHM	WHIX	MASC	MAMU	HSLA	HSLE	COMR	COPI	BUTT	NILL	MA03	MA04	MA07	MA11	MA22	CASS	CANU	TODU	TOGA	BTRI	BPAT	BRAM	ARQU	BRNW	LALA	MAAR
	HEMIPTERA (continued)																																																						
	Notonecta marmorea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-
	Pleidae																																																						
	Plea leachi	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Corixidae																																																						
Local	Micronecta scholtzi	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cymatia bonsdorffi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cymatia coleoptrata	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
	Callicorixa praeusta	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	+	+	-	-	-	-	-	+	-	-	-	+	+	-	-	-	-	-	+	-	-	-	-
Local	Corixa dentipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Local	Corixa panzeri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	Corixa punctata	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	+	+	+	+	+	+	+	-	-	+	-	-	+	-	-	+	+	+	+	+	+	+	-	+	+	-	+	-	-	+	-
	Hesperocorixa linnei	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	+	-	-	+	-	-	+	-	+	-	-	-	+	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	+	-
	Hesperocorixa moesta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	Hesperocorixa sahlbergi	+	-	-	-	-	-	+	-	-	-	-	+	-	-	-	+	+	+	+	+	+	+	+	-	-	-	-	+	+	+	-	-	-	-	-	+	-	-	+	+	+	+	+	+	-	+	+	+	-	+	+	+	+	+
	Arctocorisa germari	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sigara dorsalis	-	+	+	-	-	+	+	+	+	+	-	+	-	-	-	+	+	-	+	+	+	-	+	+	+	+	+	-	+	-	+	-	-	-	+	-	+	+	+	-	-	+	+	+	+	-	-	+	-	+	-	-	+	-
	Sigara distincta	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	+	-	+	-	-	-	-	-	-	+	+	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-
	Sigara falleni	-	-	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	+	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	-	-	+	+	+	-	-	-	+	+	+	-	-	+	-	+	-	-	-	-
	Sigara fossarum	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
	Sigara scotti	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Sigara lateralis	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-
	Sigara nigrolineata	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	+	-	+	+	+
Local	Sigara concinna	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Sigara limitata	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-
	COLEOPTERA																																																						
	Haliplidae																																																						
	Brychius elevatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Peltodytes caesus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	Haliplus confinis	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	-
	Haliplus flavicollis	-	-	-	-	-	+	+	-	+	-	-	-	-	+	-	-	-	-	-	+	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Haliplus fluviatilis	-	-	+	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	+	-	+	+	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	Haliplus fulvus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Haliplus heydeni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus immaculatus	+	-	+	-	-	+	-	-	+	+	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	+	-	+	-	+	+	-	-	-	+	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-
Notable B	Haliplus laminatus	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus lineatocollis	-	+	-	-	+	+	+	-	-	+	-	-	-	-	-	-	+	-	+	+	+	-	+	+	+	+	+	+	+	+	-	-	+	-	+	+	-	+	-	+	+	-	+	-	-	-	-	-	-	+	-	-	+	-
	Haliplus lineolatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
Local	Haliplus obliquus	-	-	-	-	-	+	+	-	+	-	-	+	-	+	+	-	-	-	-	+	+	-	-	+	+	+	+	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	-
	Haliplus ruficollis	+	+	+	-	-	+	+	+	-	+	+	+	-	+	+	+	+	-	+	+	+	-	+	-	-	-	-	+	+	+	+	-	-	-	-	-	-	+	+	+	+	-	+	-	-	-	-	-	-	+	-	-	-	-
	Haliplus wehnckei	-	+	+	-	-	+	+	+	-	+	-	-	-	-	-	+	-	-	+	+	-	-	+	+	+	+	+	+	-	+	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hygrobiidae																																																						
	Hygrobia hermanni	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	+	-	-	-	-
	Dytiscidae & Noteridae																																																						

Table A3.8 (cont.)

		ODDI	MOTW	WASP	ASMU	ASFI	NEWE	PAMO	PAPO	GRFP	GAZE	SRLI	SRCH	SRTE	YOUL	FOHA	FODR	CLAR	WEAV	AIRP	DS1.	DS2.	DS3.	COTH	WW1.	WW2.	WW3.	WW4.	BERN	ASHM	WHIX	MASC	MAMU	HSLA	HSLE	COMR	COPI	BUTT	NILL	MA03	MA04	MA07	MA11	MA22	CASS	CANU	TODU	TOGA	BTRI	BPAT	BRAM	ARQU	BRNW	LALA	MAAR
Status	COLEOPTERA (continued)																																																						
	Noterus clavicornis	-	-	+	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	+	-	-	+	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-
	Laccophilus hyalinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	Laccophilus minutus	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	+	-	-	+	-	-	+	-
	Hyphydrus ovatus	-	+	-	-	-	-	+	+	-	-	-	+	-	+	+	-	+	-	-	-	+	-	-	+	-	+	-	-	+	+	-	-	+	-	-	+	-	+	-	+	+	-	-	+	-	-	+	-	-	+	+	-	-	-
Notable B	Hydroglyphus pusillus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hygrotus inaequalis	-	+	-	-	-	+	+	-	-	+	-	-	-	-	-	+	+	-	+	+	+	-	-	+	-	+	-	+	+	+	+	-	-	-	-	+	-	+	+	+	+	+	+	+	+	+	+	-	-	+	+	-	-	-
Local	Hygrotus versicolor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Coelambus confluens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coelambus impressopunctatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus angustatus	-	-	-	-	-	+	-	-	-	+	-	+	-	-	-	+	-	+	-	+	+	+	+	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-
	Hydroporus discretus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-
	Hydroporus erythrocephalus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
Notable B	Hydroporus marginatus	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Hydroporus memnonius	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
	Hydroporus nigrita	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
	Hydroporus palustris	+	+	-	-	+	+	-	-	-	+	-	+	-	-	-	+	-	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	-	-	+	+	-	+	+	+	+	+	-	+	+	+	+	-	-	+	-	+	+	-
	Hydroporus planus	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	+	-	+	-	-	-	-	+	+	-	-	+	-	-	-	+	-	+	-	+	+	+	-	-	-	+	-	-	-	+	+	+	+	-
	Hydroporus pubescens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
	Hydroporus tessellatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Graptodytes pictus	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Porhydrus lineatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Potamonectes depressus	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Stictotarsus duodecimpustulatus	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Scarodytes halensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
Local	Copelatus haemorrhoidalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-
	Platambus maculatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus bipustulatus	+	-	+	-	-	-	+	-	-	+	-	+	-	-	+	+	+	+	+	-	+	+	-	-	-	-	-	+	+	+	-	-	-	-	+	+	+	+	+	-	+	+	+	+	-	+	+	-	+	+	-	+	+	-
Notable B	Agabus chalconatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus didymus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-
	Agabus guttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-
Notable B	Agabus labiatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus melanocornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Agabus nebulosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
	Agabus paludosus	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-
	Agabus sturmii	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	+	+	+	-	-	-	+	+	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+	+	+
Notable B	Agabus uliginosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ilybius ater	+	-	+	-	+	-	-	-	-	+	+	-	+	-	-	-	-	-	+	-	+	-	+	-	-	-	-	+	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Notable B	Ilybius fenestratus	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ilybius fuliginosus	-	-	+	-	-	+	-	+	-	-	-	-	-	-	+	+	-	-	-	+	+	-	+	+	+	+	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+	+	-
	Ilybius quadriguttatus	-	-	+	-	+	-	-	+	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Notable B	Ilybius subaeneus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rhantus exsoletus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Colymbetes fuscus	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	+	-	+	-	+	-	-	+	-	-	+	+	-	-	-	+	+	-	-	-	-	-	-	+	+	+	-	+	-	-	-	-	-	-	+	-

Table A3.8 (cont.)

		ODDI	MOTW	WASP	ASMU	ASFI	NEWE	PAMO	PAPO	GRFP	GAZE	SRLI	SRCH	SRTE	YOUL	FOHA	FODR	CLAR	WEAV	AIRP	DS1.	DS2.	DS3.	COTH	WW1.	WW2.	WW3.	WW4.	BERN	ASHM	WHIX	MASC	MAMU	HSLA	HSLE	COMR	COPI	BUTT	NILL	MA03	MA04	MA07	MA11	MA22	CASS	CONU	TODU	TTGA	BPRI	BRAT	BRAM	ARQU	BNW	LALA	MAAR
Status	**COLEOPTERA (continued)**																																																						
	Acilius sulcatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
	Dytiscus marginalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+
	Dytiscus semisulcatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Suphrodytes dorsalis	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
	Gyrinidae																																																						
Notable A	Gyrinus bicolor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Gyrinus marinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
	Gyrinus substriatus	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-
RDB 3	Gyrinus suffriani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydrophilidae & Hydraenidae																																																						
	Helophorus aequalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
	Helophorus grandis	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	+	+	-	-	+	+	-	+	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+	-	-	-	+	+	+	-
	Helophorus brevipalpis	+	+	+	-	-	+	-	-	-	+	+	+	+	-	+	+	+	-	-	+	+	-	+	+	+	+	-	+	+	-	-	-	-	-	+	+	-	+	+	+	+	+	+	+	-	+	+	-	-	-	+	+	+	-
Notable B	Helophorus dorsalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
Local	Helophorus granularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
Notable B	Helophorus griseus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-
	Helophorus minutus	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	+	+	-	+	+	-	+	-	-	+	-	-	-	-	-	-	+	-	+	+	-	-	+	+	+	-	+	-	-	-	-	+	+	+	-
Notable B	Helophorus nanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Helophorus obscurus	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	+	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-
	Coelostoma orbiculare	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydrobius fuscipes	+	-	+	-	+	+	-	-	-	-	-	+	-	-	+	+	+	-	+	+	+	+	+	+	+	+	-	+	+	+	+	+	-	+	+	-	-	+	-	+	+	+	+	-	-	+	-	-	-	-	+	+	+	-
Notable B	Anacaena bipustulata	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Anacaena globulus	-	-	+	-	-	+	-	-	-	+	-	+	-	-	-	+	+	-	-	-	-	-	-	+	+	+	-	-	+	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-
	Anacaena limbata	-	+	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	+	+	-	+	+	-	+	-	+	+	-	-	+	-	-	-	-	-	+	-	-	-	-	+	+	-	-	+	-	-	-	+	+	+	-
	Anacaena lutescens	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	+	-	+	-	-	-	-	-	+	-	-	-	+	-	+	-	-	-	-	-	-	-	-	+	-
Local	Laccobius biguttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Laccobius minutus	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	+	-	-	-	+	+	-	-	-	-	+	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	+
	Laccobius bipunctatus	-	-	+	-	+	+	+	-	+	-	-	-	-	-	+	-	-	-	-	+	-	-	+	+	-	+	-	+	-	-	+	+	-	-	+	+	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	+	+	-
Notable B	Laccobius sinuatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-
	Laccobius striatulus	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Helochares lividus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	+	-	-	-	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-
	Enochrus coarctatus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RDB 3	Enochrus isotae	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Enochrus melanocephalus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Enochrus ochropterus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Enochrus testaceus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Local	Cymbiodyta marginella	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Notable B	Chaetarthria seminulum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Berosus signaticollis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
Notable B	Cercyon convexiusculus	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cercyon marinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Cercyon sternalis	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Cercyon tristis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.8 (cont.)

Status		ODDI	MOTW	WASP	ASMU	ASFI	NEWE	PAMO	PAPO	GRFP	GAZE	SRLI	SRCH	SRTE	YOUL	FOHA	FODR	CLAR	WEAV	AIRP	DS1.	DS2.	DS3.	COTH	WW1.	WW2.	WW3.	WW4.	BERN	ASHM	WHIX	MASC	MAMU	HSLA	HSLE	COMR	COPI	BUTT	NILL	MA03	MA04	MA07	MA11	MA22	CASS	CANU	TODU	TOGA	BTRI	BPAT	BRAM	ARQU	BRNW	LALA	MAAR
	COLEOPTERA (continued)																																																						
Notable B	Cercyon ustulatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Ochthebius bicolon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ochthebius dilatatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ochthebius minimus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Local	Hydraena britteni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydraena riparia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-
Notable B	Hydraena testacea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Limnebius nitidus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Limnebius papposus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-
	Limnebius truncatellus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-
	Elmidae																																																						
	Elmis aenea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Oulimnius tuberculatus	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Riolus cupreus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Riolus subviolaceus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MEGALOPTERA																																																						
	Sialidae																																																						
	Sialis lutaria	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-
	TRICHOPTERA																																																						
	Hydroptilidae																																																						
Local	Agraylea sexmaculata	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Psychomyiidae & Ecnomidae																																																						
	Lype reducta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tinodes waeneri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Ecnomus tenellus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Polycentropodidae																																																						
	Cyrnus flavidus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyrnus trimaculatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Holocentropus dubius	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Holocentropus picicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Plectrocnemia conspersa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Plectrocnemia geniculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydropsychidae																																																						
	Hydropsyche angustipennis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phryganeidae																																																						
	Agrypnia varia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phryganea bipunctata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Local	Phryganea grandis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lepidostomatidae																																																						
	Crunoecia irrorata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilidae																																																						
	Halesus radiatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.8 (cont.)

Status		O D D I	M O T W	W A S P	A S M U	A S F I	N E W E	P A M O	P A P O	G A R P	G A R E	S A R L	S R C H	S R T E	Y O U L	F O H A	F O D R	C O L A	W E I R	A I S V	D S 1 P	D S 2 .	D S 3 .	C O T H	W W 1 .	W W 2 .	W W 3 .	W W 4 .	B E R N	A S H M	W H I X	M A S C	M A S U	H A S A	H S L E	H S L R	C O M I	C O P T	B U T L	N I L 3	M A A 4	M A A 7	M A 0 1	M A 1 2	M A 2 S	C A S U	C A N U	T A D U	T O G A	B O T I	B P R T	B R A M	A R A Q	B R N U	L A L W	M A A R
	TRICHOPTERA (continued)																																																					
	Micropterna lateralis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
	Anabolia nervosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Glyphotaelius pellucidus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-
	Limnephilus affinis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus auricula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-
	Limnephilus centralis	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Limnephilus decipiens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus extricatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Limnephilus flavicornis	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Limnephilus lunatus	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	+	+	+	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-
	Limnephilus marmoratus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Limnephilus vittatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Beraeidae																																																				
	Beraea pullata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
Local	Beraeodes minutus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Molannidae																																																				
	Molanna angustata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Leptoceridae																																																				
	Athripsodes aterrimus	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Leptocerus tineiformis	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mystacides longicornis	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Triaenodes bicolor	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Oecetis lacustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.8 (cont.)

Status		C O R U	C O R M	C O L A	C O R S	S O G O	S W R A	W I L A	W I F O	W I R R	A S S O	A D N U	A S S E	S W W U	S H D I	S D V O	S W R A	W R T O	W R B O	W R D I	W T V I	L E M B	L E M O	L E C A	G I Z R	K E N Z	R A S C
	Total Species	23	23	49	16	13	13	43	15	11	26	9	58	4	8	13	5	63	77	20	8	23	18	11	12	47	82	42
	TRICLADIDA																											
	Planariidae & Dugesiidae																											
	Polycelis felina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	+	-	-
	Polycelis nigra	+	+	+	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	+	+	-
	Polycelis tenuis	+	+	+	-	-	-	+	+	+	-	-	-	-	-	-	-	+	+	-	-	-	+	-	-	+	+	+
Local	Dugesia lugubris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dugesia polychroa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+	-
	Dugesia tigrina	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Dendrocoelidae																											
	Dendrocoelum lacteum	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	+	+	+	+
	GASTROPODA																											
	Viviparidae																											
Local	Viviparus contectus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Viviparus viviparus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Valvatidae																											
	Valvata cristata	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	+	-
	Valvata piscinalis	-	-	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-
	Hydrobiidae & Bithyniidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Potamopyrgus jenkinsi	-	-	-	-	+	-	+	+	+	+	-	+	-	-	-	-	+	-	-	+	-	+	+	-	+	+	+
	Bithynia leachi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	+	-
	Bithynia tentaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	+	-
	Physidae																											
Local	Aplexa hypnorum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Physa acuta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Physa fontinalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Lymnaeidae																											
	Lymnaea auricularia	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-
	Lymnaea palustris	-	-	-	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	+	+	+	-	+	-	+
	Lymnaea peregra	+	+	+	-	-	-	+	+	+	-	+	+	-	-	-	-	+	+	-	-	+	+	+	+	+	+	+
	Lymnaea stagnalis	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	+	+
	Lymnaea truncatula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
RDB 1	Myxas glutinosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Planorbidae																											
	Planorbis carinatus	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	+
	Planorbis planorbis	-	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	+	-	-	-	+
	Anisus leucostoma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-
	Anisus vortex	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	+	+	+	-	-	-	+	+	+	+	+
	Bathyomphalus contortus	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	+	+	+	+
	Gyraulus albus	-	+	+	+	-	-	+	-	-	+	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	+	+
Notable B	Gyraulus laevis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Armiger crista	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	+	+	+

Table A3.8 (cont.)

Status	Taxon	CORU	CORM	COLA	CORS	SWGO	SWRA	WILA	WIFO	WIIR	ASRO	ASDU	ASNE	SWDU	SWHI	SWDO	SWVA	WRTO	WRBO	WRDI	WRVI	TWAB	LEMO	LEMA	LECR	GIZZ	KENN	RASC
Status	**GASTROPODA (continued)**																											
	Hippeutis complanatus	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	+	+
	Planorbarius corneus	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+
	Ancylidae & Acroloxidae																											
	Ancylus fluviatilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Acroloxus lacustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	+	-
	HIRUDINEA																											
	Piscicolidae																											
	Piscicola geometra	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	+	-
	Glossiphoniidae																											
	Theromyzon tessulatum	+	+	+	-	+	+	+	+	-	+	+	+	-	-	-	-	+	+	-	-	-	-	-	-	-	+	-
Local	Hemiclepsis marginata	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-
	Glossiphonia complanata	+	+	+	+	+	-	+	-	-	+	-	-	-	-	-	-	+	+	-	-	-	-	-	+	+	+	-
Local	Glossiphonia heteroclita	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+	+
	Helobdella stagnalis	-	+	+	-	-	+	+	+	+	+	+	-	-	+	-	-	+	-	-	-	-	-	-	-	+	+	+
	Hirudinidae																											
	Haemopis sanguisuga	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Erpobdellidae																											
	Erpobdella octoculata	+	+	+	-	-	+	+	-	-	-	-	-	-	-	-	-	+	+	+	-	-	+	-	-	+	+	+
Local	Erpobdella testacea	+	+	+	-	-	+	+	-	-	-	-	-	-	-	-	-	+	+	-	+	-	-	-	-	-	+	+
	ARANEAE																											
	Argyroneta aquatica	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	DECAPODA																											
	Astacidae																											
Schedule 5	Austropotamobius pallipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-
	ISOPODA																											
	Asellidae																											
	Asellus aquaticus	+	+	+	+	+	-	+	-	+	+	+	+	-	+	-	-	-	-	-	-	+	+	+	+	+	+	+
	Asellus meridianus	-	-	+	-	+	+	+	-	-	-	-	+	-	-	-	-	+	+	+	-	-	-	-	-	+	-	-
	AMPHIPODA																											
	Gammaridae & Crangonyctidae																											
	Crangonyx pseudogracilis	-	-	+	-	-	-	+	-	-	+	-	-	-	-	-	-	-	+	+	+	+	+	-	+	+	+	+
	Gammarus pulex	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	+	+	+	+	+	-	+	-	+	+	-	-
	Niphargidae																											
Local	Niphargus aquilex	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	EPHEMEROPTERA																											
	Baetidae																											
	Cloeon dipterum	+	+	+	-	-	-	+	+	-	+	-	+	-	-	+	-	+	+	-	-	+	-	-	-	+	+	+
Local	Cloeon simile	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ephemeridae																											
	Ephemera danica	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ephemera vulgata	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
	Caenidae																											
	Caenis horaria	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	+	+	-	-	-	-	-	-	-	+	-

Table A3.8 (cont.)

Status		CORU	COMM	COLA	CORS	SOGO	SWRA	SWLA	WIFA	WIAO	WIRR	AASO	AARD	AANU	SWDE	SWHU	SWDI	SWVO	SWTA	WRBO	WRDI	WRVI	WRAB	TWEO	LEAA	LEMR	LECA	GIZR	KENZ	RASC
	EPEMEROPTERA (continued)																													
	Caenis luctuosa	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-
Local	Caenis robusta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	-
	PLECOPTERA																													
	Nemouridae																													
	Nemurella picteti	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nemoura cinerea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Nemoura erratica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ODONATA																													
	Coenagriidae																													
	Pyrrhosoma nymphula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	+
	Ischnura elegans	-	-	-	-	-	-	+	-	-	+	-	+	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	+	+
	Enallagma cyathigerum	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	+	-
	Coenagrion puella	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	-	-	-	-	+	+	+
Local	Erythromma najas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	-
	Aeshnidae																													
	Aeshna cyanea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	+	+
	Aeshna grandis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-
	Libellulidae																													
	Libellula depressa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Libellula quadrimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Sympetrum sanguineum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sympetrum striolatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	HEMIPTERA																													
	Mesoveliidae																													
Local	Mesovelia furcata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Hydrometridae																													
	Hydrometra stagnorum	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Veliidae																													
	Velia caprai	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
	Microvelia reticulata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
	Gerridae																													
Local	Gerris argentatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Gerris lacustris	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-
	Gerris odontogaster	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gerris thoracicus	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nepidae																													
	Nepa cinerea	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	+
Local	Ranatra linearis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Naucoridae																													
	Ilyocoris cimicoides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-
	Notonectidae																													
	Notonecta glauca	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	-	+	+	-	-	-	-	-	+	+
	Notonecta maculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.8 (cont.)

Status	Species	CORU	CORM	COLA	CORS	SWGO	SWRA	WILA	WIFO	WIIR	ASRO	ASDU	ASNE	SWDU	SWHI	SWDO	SWVA	WRTO	WRBO	WRDI	WRVI	TWAB	LEMO	LEMA	LECR	GIZZ	KENN	RASC
	HEMIPTERA (continued)																											
	Notonecta marmorea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pleidae																											
	Plea leachi	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
	Corixidae																											
Local	Micronecta scholtzi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cymatia bonsdorffi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cymatia coleoptrata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Callicorixa praeusta	+	-	+	-	-	-	+	-	-	+	-	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Local	Corixa dentipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Corixa panzeri	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
	Corixa punctata	-	-	-	-	+	+	+	-	-	+	-	+	+	+	+	+	+	-	-	-	-	-	-	-	+	-	-
	Hesperocorixa linnei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hesperocorixa moesta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hesperocorixa sahlbergi	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	+	+	+	+	-	+
	Arctocorisa germari	-	-	-	-	+	+	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	Sigara dorsalis	+	+	+	-	+	+	+	-	-	+	+	+	-	+	-	-	+	+	-	+	+	-	-	-	-	+	-
	Sigara distincta	+	-	+	-	-	-	-	-	-	+	-	+	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-
	Sigara falleni	-	-	-	-	-	-	-	-	-	+	-	+	-	-	+	-	+	+	-	-	+	-	-	-	-	+	-
	Sigara fossarum	+	+	+	-	-	-	+	-	-	+	-	+	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-
	Sigara scotti	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sigara lateralis	-	-	-	-	+	+	-	-	-	+	-	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-
	Sigara nigrolineata	-	-	-	+	+	+	+	+	-	+	-	+	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-
Local	Sigara concinna	-	-	-	-	-	+	-	-	-	+	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	Sigara limitata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	COLEOPTERA																											
	Haliplidae																											
	Brychius elevatus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Peltodytes caesus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus confinis	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
	Haliplus flavicollis	-	-	+	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
	Haliplus fluviatilis	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus fulvus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Haliplus heydeni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus immaculatus	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	+	+	+
Notable B	Haliplus laminatus	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Haliplus lineatocollis	+	+	+	+	-	-	+	+	-	+	+	+	-	-	-	-	+	-	-	-	+	+	-	-	+	+	+
	Haliplus lineolatus	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
Local	Haliplus obliquus	+	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Haliplus ruficollis	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	+	+
	Haliplus wehnckei	+	-	+	+	-	-	+	-	-	+	-	+	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-
	Hygrobiidae																											
	Hygrobia hermanni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dytiscidae & Noteridae																											

Table A3.8 (cont.)

Status	COLEOPTERA (continued)	C O R U	C O R M	C O L A	C O R S	S W G O	S W R A	W I L A	W I F O	W I R	A S R O	A S D U	A S D E	S W D N	S W H D	S W D I	S W V O	W R T A	W R B O	W R D I	W R V I	T W A B	L E M O	L E M A	L E C R	G I Z Z	K E N N	R A S C
	Noterus clavicornis	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Laccophilus hyalinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-
	Laccophilus minutus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+
	Hyphydrus ovatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	+	-
Notable B	Hydroglyphus pusillus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hygrotus inaequalis	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+
Local	Hygrotus versicolor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coelambus confluens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Coelambus impressopunctatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus angustatus	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus discretus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-
	Hydroporus erythrocephalus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Hydroporus marginatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Hydroporus memnonius	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus nigrita	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus palustris	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-
	Hydroporus planus	-	-	-	+	-	-	-	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	+
	Hydroporus pubescens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydroporus tessellatus	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Graptodytes pictus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
Local	Porhydrus lineatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Potamonectes depressus	-	-	+	-	+	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Stictotarsus duodecimpustulatus	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Scarodytes halensis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Copelatus haemorrhoidalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Platambus maculatus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus bipustulatus	-	-	-	+	-	-	-	+	-	-	-	+	-	-	-	-	-	-	+	-	-	-	+	-	-	+	-
Notable B	Agabus chalconatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus didymus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Agabus guttatus	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Agabus labiatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus melanocornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Agabus nebulosus	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-
	Agabus paludosus	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
	Agabus sturmii	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+
Notable B	Agabus uliginosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ilybius ater	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Ilybius fenestratus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-
	Ilybius fuliginosus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	+	-	-
	Ilybius quadriguttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
Notable B	Ilybius subaeneus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rhantus exsoletus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Colymbetes fuscus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.8 (cont.)

Status	COLEOPTERA (continued)	CORU	CORM	COLA	CORS	SWGO	SWRA	WILA	WIFO	WIIR	ASRO	ASDU	ASNE	SWDU	SWHI	SWDO	SWVA	WRTO	WRBO	WRDI	WRVI	TWAB	LEMO	LEMA	LECR	GIZZ	KENN	RASC
	Acilius sulcatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dytiscus marginalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Dytiscus semisulcatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Suphrodytes dorsalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gyrinidae																											
Notable A	Gyrinus bicolor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Gyrinus marinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Gyrinus substriatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-
RDB 3	Gyrinus suffriani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydrophilidae & Hydraenidae																											
	Helophorus aequalis	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-
	Helophorus grandis	-	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-
	Helophorus brevipalpis	+	+	+	+	-	-	-	-	-	-	-	+	-	-	-	-	+	+	-	-	-	+	+	-	+	+	+
Notable B	Helophorus dorsalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Helophorus granularis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Helophorus griseus	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Helophorus minutus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
Notable B	Helophorus nanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Helophorus obscurus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
	Coelostoma orbiculare	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydrobius fuscipes	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	+	+	+
Notable B	Anacaena bipustulata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Anacaena globulus	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
	Anacaena limbata	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	+	+	+
	Anacaena lutescens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
Local	Laccobius biguttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Laccobius minutus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Laccobius bipunctatus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+
Notable B	Laccobius sinuatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Laccobius striatulus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Helochares lividus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
	Enochrus coarctatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RDB 3	Enochrus isotae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Enochrus melanocephalus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
Notable B	Enochrus ochropterus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Enochrus testaceus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-
Local	Cymbiodyta marginella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Chaetarthria seminulum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Berosus signaticollis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Cercyon convexiusculus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Cercyon marinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Cercyon sternalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Cercyon tristis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.8 (cont.)

Status		C O R U	C O R M	C O L A	C O R S	S W G O	S W R A	W I L A	W I F O	W I I R	A S R O	A S D U	A S N E	S W D U	S W H I	S W D O	S W V A	W R T O	W R B O	W R D I	W R V I	W T A B	L E M O	L E M A	L E C R	G I Z Z	K E N N	R A S C
Status	**COLEOPTERA (continued)**																											
Notable B	Cercyon ustulatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
Notable B	Ochthebius bicolon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ochthebius dilatatus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Ochthebius minimus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Hydraena britteni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hydraena riparia	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
Notable B	Hydraena testacea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Limnebius nitidus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Limnebius papposus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnebius truncatellus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Elmidae																											
	Elmis aenea	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-
	Oulimnius tuberculatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Riolus cupreus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Notable B	Riolus subviolaceus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MEGALOPTERA																											
	Sialidae																											
	Sialis lutaria	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	+	+	-
	TRICHOPTERA																											
	Hydroptilidae																											
Local	Agraylea sexmaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Psychomylidae & Ecnomidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lype reducta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tinodes waeneri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Local	Ecnomus tenellus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Polycentropodidae																											
	Cyrnus flavidus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
	Cyrnus trimaculatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
	Holocentropus dubius	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-
	Holocentropus picicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Plectrocnemia conspersa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
	Plectrocnemia geniculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
	Hydropsychidae																											
	Hydropsyche angustipennis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
	Phryganeidae																											
	Agrypnia varia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phryganea bipunctata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	+	-
Local	Phryganea grandis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+
	Lepidostomatidae																											
	Crunoecia irrorata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilidae																											
	Halesus radiatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A3.8 (cont.)

Status	TRICHOPTERA (continued)	CORU	COOM	CORL	COOA	SOWR	SWOA	WIRA	WIFO	WIRR	AROU	ASSD	ASNE	SWWD	SWHU	SWDI	SWVO	WRTA	WRBO	WRDI	WRVI	TWAB	LEMO	LEMA	LECR	GIZZ	KENN	RASC
	Micropterna lateralis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
	Anabolia nervosa	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	-	+	-
	Glyphotaelius pellucidus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus affinis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus auricula	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Limnephilus centralis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Limnephilus decipiens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Limnephilus extricatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
	Limnephilus flavicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-
	Limnephilus lunatus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	+	+	-
	Limnephilus marmoratus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
	Limnephilus vittatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Beraeidae																											
	Beraea pullata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local	Beraeodes minutus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Molannidae																											
	Molanna angustata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
	Leptoceridae																											
	Athripsodes aterrimus	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	-	+	-
	Leptocerus tineiformis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Mystacides longicornis	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
	Triaenodes bicolor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-
	Oecetis lacustris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-

APPENDIX 4

CHEMISTRY

A4.1 Analytical methods for the assay of chemical determinands in Oxfordshire ponds

Table A4.1 Summary of Analytical Methods

Determinand	Collection	Analysis
Alkaline phosphatase	Bottle	Spectrophotometric following incubation
Alkalinity	Bottle	Colourimetric titration / gran titration
Calcium	Filtered syringe	Inductively coupled plasma atomic emission spectroscopy (ICPAES)
Chloride	Filtered syringe	Spectrophotometric flow injection analysis (FIA)
Conductivity	Bottle	Electrometric
Magnesium	Filtered syringe	ICPAES
Nitrate	Filtered syringe	Spectrophotometric FIA following pre-reduction
Nitrite	Filtered syringe	Spectrophotometric FIA
pH	Bottle	Electrometric
Potassium	Filtered syringe	ICPAES
Sodium	Filtered syringe	ICPAES
Sulphate	Filtered syringe	Turbidimetric

A4.1.1 General procedures

Equipment for most analyses was washed thoroughly in Decon90 (Decon Laboratories Ltd, Hove, England), rinsed in distilled water, soaked in 2% Hydrochloric acid (Analar grade: BDH Ltd, Poole, England) and then rinsed ten times in distilled, de-ionised water. Equipment for element analyses was scoured with aqua regia before rinsing ten times in distilled de-onised water. Bottles used for water collection were rinsed several times with pond water before samples were collected.

A4.1.2 Sample collection

Time of collection

Water samples were collected from 133 Oxfordshire ponds in early Spring 1988 between 1:00 a.m and 6:00 a.m. The time of collection was suggested by a 24-hour study of the Henry Stephens/C.S. Lewis nature reserve pond (SP 560066) in which the pH of the water was monitored hourly at eight different locations (see Figure A4.1). The least variation in pH was seen between the hours of 2:00a.m and 6:00a.m.

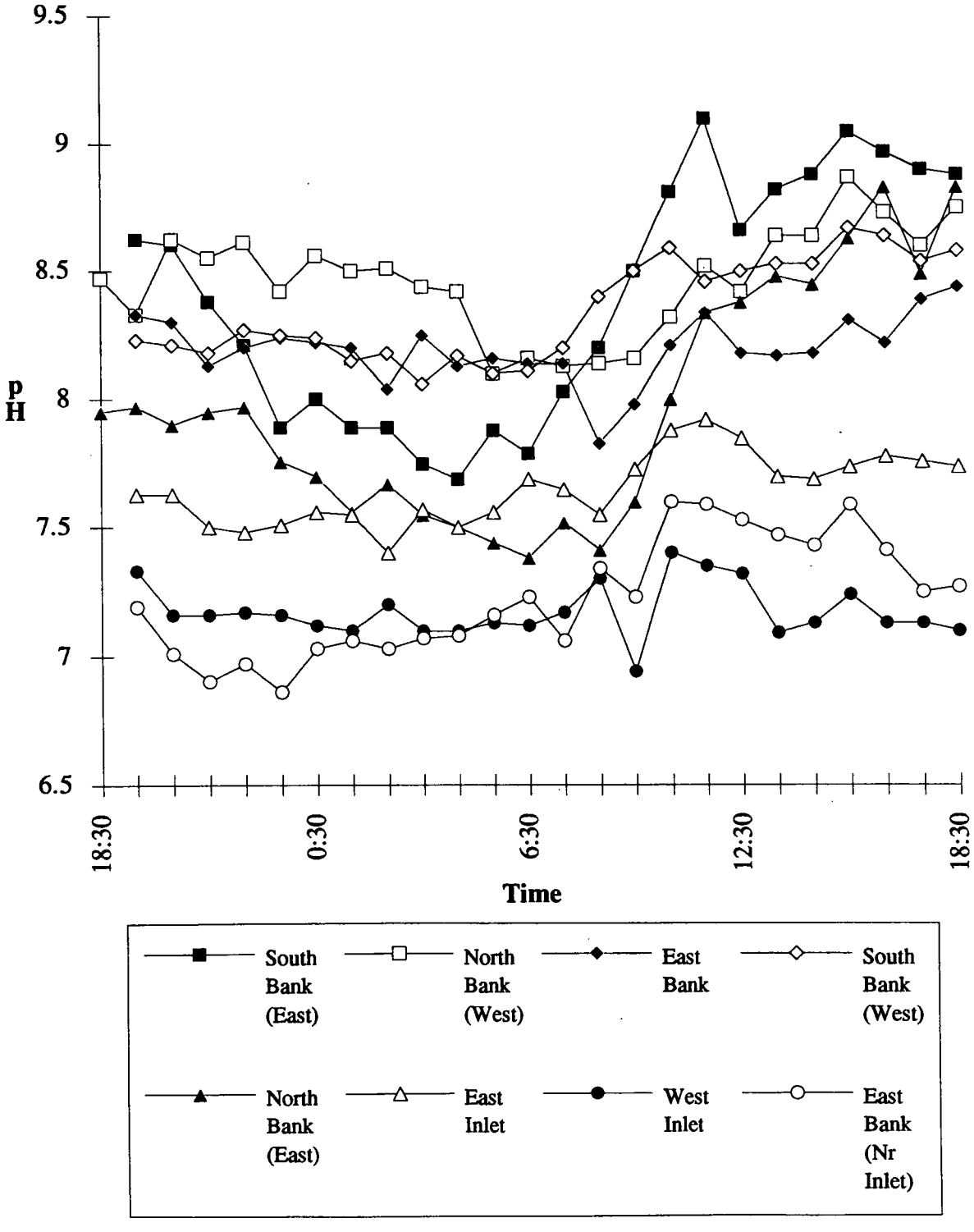
Place of collection

Samples were collected from as near to the centre of the pond as was possible without disturbing the sediment. Care was taken to avoid taking samples close to inlets or outlets or in unrepresentatively dense growths of aquatic plants.

Collection by bottle

Water samples for several determinands (see Table A4.1) were collected by immersion of an inverted 60ml polyethylene bottle (Azlon, U.K.) to 15 cm below the water surface. The bottle was then righted until all air was excluded and sealed (screw cap) under water. In ponds where the depth was below 30cm the bottle was filled at mid-column depth. The bottles were kept cool and in the dark until analysis later the same day.

Figure A4.1 Diurnal Variation of pH in an Oxfordshire Pond



Collection by filtered syringe

For several analyses water was collected first by bottle (250ml polyethylene: Azlon) at15cm or mid-column depth and then filtered on site through 47mm Whatman GF/C filters (Whatman Paper Ltd, England) via a Whatman on-line filter holder either directly into a second 250 ml bottle or via a 60ml syringe when slight negative pressure was needed to filter the water. The second bottle was filled in order to exclude as much air as possibe.

A4.1.3 Processing of collected water

Samples for most determinands were analysed as collected, with the exception of the water from two sites (Wilcote Duck Pond and Towersey Village Pond) where on-site filtration had proved impossible due to the amount of suspended green algae in the water. These samples were centrifuged in a Mistral 6L centrifuge (MSE, England) at 3000g before filtration as normal. Samples for element analysis were further filtered under negative pressure through a Whatman membrane filter (0.45µm, 47mm) before acidification with concentrated Nitric acid (ARISTAR grade, BDH Ltd) to 100mM.

A4.1.4 Alkaline phosphatase

Duplicate assays were conducted in 20ml pyrex boiling tubes. Analysis followed that of Berman, T. (1970). 1.3 ml of pond water (unflitered), 0.7ml of 1M Tris buffer (AnalaR Biochemical grade, BDH Ltd) at pH 8.6, 1ml of freshly prepared 1mM p-Nitrophenyl Phosphate (Sigma Chemical Company Ltd, Poole, Dorset) and 0.05 ml Toluene (AnalaR, BDH Ltd) were incubated in a sealed (Parafilm, American Can Company, Greenwich, England) boiling tube. Sample blanks were prepared as above but with 1ml distilled, de-ionised water replacing the p-NPP solution. The assay proceeded for 120 hours at 25°C in the dark before the assay was stopped and the colour developed with 2ml of 2M Sodium Hydroxide (AnalaR, BDH Ltd).

The resulting colour was read against the sample blank at 410nm in a 1cm path length cell in a spectrophotometer (Cecil Instruments, England, CE373 linear readout grating spectrophotometer). The average optical density of the duplicates was used to calculate enzyme activity in nano katals per litre.

A4.1.5 Alkalinity

Alkalinity was measured within six hours of collection.

Alkalinity was measured by titration of 10ml of unfiltered pond water against 0.5M Hydrochoric acid (ConvoL, BDH Ltd, prepared with distilled, de-ionised water) with a mixed indicator to judge the end point of the titration. The colour of the true end point was conveniently judged by addition of the mixed indicator to a sample pre-titrated to pH 4.5 as judged by a pH meter (Jenway Model 3070). This standard was checked periodically. Mixed indicator was prepared by dissolving 0.02g of methyl red (BDH Ltd) and 0.08g bromocresol green (BDH Ltd) in 100ml 95% v/v ethanol (BDH Ltd). The alkalinity was calculated (milliequivalents/litre) from the amount of titrant added.

In order to check the results from the simple colourimetric titration a Gran titration was performed on 10% (13) of the samples. Gran titrations were performed by titration with 0.5M hydrochloric acid via a 1ml double bore burette into a sealed bottle containing ca. 65ml of pond water. Entry was gained via a 0.3mm teflon tube and pH was read from a probe sealed through the lid of the bottle. Six pH measurements were taken between pH 4.5 and pH 3.9 with the volume of titrant recorded concomitantly. Alkalinity was assessed by use of an antilog plot as described by Mackereth *et al.* (1978) after measurement of the amount of pondwater in the bottle.

The results of the Gran titrations agreed with those of the simpler titrations to within 2%.

A4.1.6 Calcium, magnesium, potassium and sodium

The membrane filtered and acidified pond water was passed into an inductively coupled plasma atomic emission spectrophotometer (ARL model 3510) using a peristaltic pump (Beckman, Minipulse). The emissions due to the presence of the elements was read three times at four appropriate wavelengths: 422.673nm for calcium, 279.08nm

for magnesium, 766.491 for potassium and 589.592 for sodium. Periodic re-calibrations of the instrument were made to correct for drift. The instrument was calibrated with a range of solutions of each element prepared in 100ml nitric acid (ARISTAR, BDH Ltd) from the chloride of each of the four elements (AnalaR, BDH Ltd). Blanks prepared by processing distilled de-ionised water in the same manner as the samples (double filtration and acidification) showed no detectable levels of any of the four elements. Previous tests using high concentrations of each of these elements individually had shown no sign of intra-element interference. Concentrations of the elements were calculated automatically in mg/l.

A4.1.7 Chloride

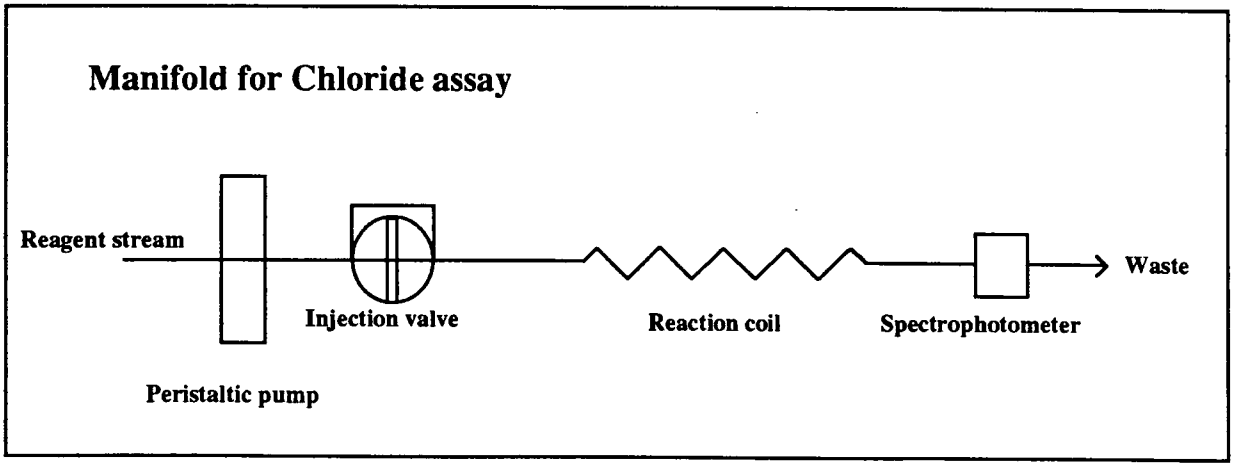
Assays for chloride used a simple flow injection apparatus. A reagent stream was propelled through 0.3mm Teflon tubing by a peristaltic pump (Watson-Marlow 501). Where necessary the stream was switched between reagent and reagent blank solution using a simple two way switch (Omnifit, England). Sample was injected into the stream by a simple injection valve (Omnifit, England) with a sample loop volumeof 35µl. The mixing sample and reagent then passed through a reaction coil of 0.3mm Teflon tubing wound round a 1cm diameter former. The mixed, reacted sample and reagent then passed through a microvolume cell in a spectrophotometer (Cecil Instruments, England, CE373 linear readout grating spectrophotometer) where the optical density was measured. Output from the spectrophotometer was printed on a chart recorder. The appartus was conveniently stabilised in a manifold built from small building blocks (Lego, Bilund, Denmark). See diagram.

For the chloride assay the reagent was mercuric thiocyanate (2mM), iron(III) nitrate (75mM), nitric acid 50mM in 15% v/v methanol (all AnalaR BDH Ltd except methanol, GPR, BDH Ltd). Reagent blanks solution was as reagent with mercuric thiocyanate omitted. Flow rate was 2ml per minute and the reaction coil 50cm in length. Chloride standards were prepared in distilled de-onised water from sodium chloride (AnalaR, BDH Ltd). Optical density was measured at 480nm.

The assay was linear up to 100mg/l chloride. Dilutions of samples were performed where necessary. Standard solutions were measured after every 10 sample assays in order to correct for any drift. Samples were normally assayed in duplicate, first with a reagent stream and then with a reagent blank stream. Where chloride concentration was low this procedure was repeated and blanks and low concentration standard solutions re-assayed at the same time. Accuracy was within 2% and the detection limit (2mg/l) was not approached by any of the pond samples.

A4.1.8 Conductivity

Conductivity was measured with a temperature compensated conductivity meter (Kent EIL, England, model PTI-58). The meter was calibrated against a standard potassium chloride solution. The meter responded linearly over the range of conductivities found in the pond water. Pond water samples were raised to approximately 25°C in a stirring water bath before analysis to avoid any problems with automatic calibration.



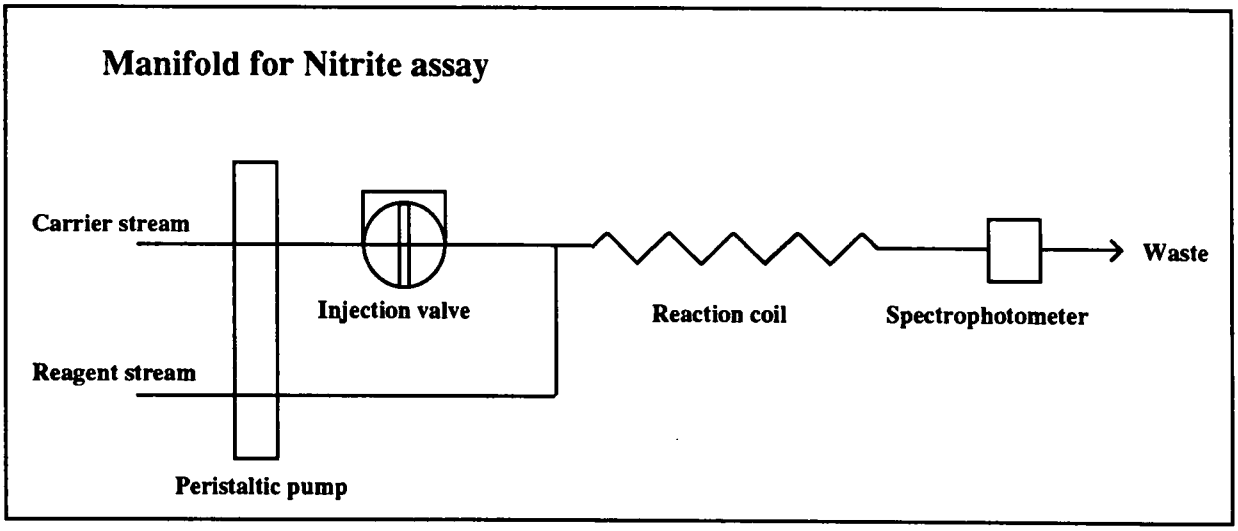
A4.1.9 Nitrate and nitrite

Nitrate was assayed as nitrite following a reduction of the nitrate to nitrite by cadmium. Nitrate concentration was then calculated by subtracting the nitrite concemtration which was measured separately. Samples for nitrite and nitrate determinations were filtered on site.

Cadmium (0.3 to 1.5mm mesh, BDH Ltd) was pre-washed with 10% v/v HCl and then rinsed with distilled de-ionised water and stored in 1% w/v ammonium chloride (AnalaR, BDH Ltd). Approximately 0.3g of cadmium was added to 1.5ml Eppendorf (type) vials (Sarstedt, W.Germany) by means of a small spatula. To these vials were added 1ml of pond water or standard solutions and 0.5 ml of 10%w/v ammonium chloride solution. Vials were then sealed and shaken vigorously using a flask shaker (Griffin Flask Shaker, Des. No. 896331, Griffin and George, England) for two hours. Vials were then centifuged for two minutes in a microcentrifuge (Eppendorf, Hamburg, W.Germany). The reduction was effective for nitrate concentrations of up to 200mg nitrate nitrogen per ml which was higher than the highest concentration (34mg/l) seen during the study.

Assay of the nitrite already present in the samples, and nitrite produced during the nitrate reduction, was measured using a flow injection apparatus. This was similar to that for the chloride assay except that the sample was first injected into a carrier stream of the ammonium chloride solution (1ml/min) and this then mixed with the reagent or reagent blank solution (2ml/min) (see diagram). The reagent was 0.025% w/v *N*-1-napthylethylenediamine dihydrochloride (BDH Ltd), 1.25% sulphanilamide (BDH Ltd) and 10% v/v orthophosphoric acid (freshly prepared). The reagent blank was 10%v/v orthophosphoric acid. Reaction coil length was 50cm. The optical density was read at 540nm.

Most samples were analysed in duplicate against reagent and reagent blank. Samples with low nitrite levels were analysed up to 10 times in order to increase the accuracy of the results. In these cases sample blanks and low concentration standards were analysed at the same time to compensate for any small amounts of drift which may have occurred. The detection limit as judged by the variability of reagent blanks with sample and with sample blanks was 0.005 mg/l. Analyses were carried out within 12 hours of collection.



A4.1.10 pH

pH was measured with a pH meter (Jenway, Model 3070). The meter was calibrated against a pH 7.0 buffer and the slope adjusted against a pH 9.2 buffer. The measured pH of a pH 4.0 buffer measured after this dual calibration was never in error by more than 0.01 units. Results were quoted to 0.1 pH units.

A4.1.11 Sulphate

Samples for sulphate determination were filtered on site. Analysis took place in 20ml Pyrex boiling tubes. To 5ml of sample were added 5ml reagent or 5ml reagent blank. The reagent was 0.05%w/v polyvinyl alcohol (BDH Ltd), 5% w/v barium chloride dihydrate (AnalaR, BDH Ltd) in 10mM hydrochloric acid (AnalaR, BDH Ltd). The reagent blank was as the reagent but with 5% w/v sodium chloride substituted for the barium chloride dihydrate.

Tubes were then gently shaken by hand for 45 minutes before the optical density being read in 1cm path length cells at 420nm in a spectrophotometer (Cecil Instruments, England, CE373). Standard curves were constructed in a similar manner using a solution prepared from ammonium sulphate (AnalaR, BDH Ltd) and sulphate concentrations of the samples assessed in reference to these. The accuracy of the determinations was aproximately 5%.

Table A4.2 Values of Chemical Determinands Recorded During the Oxfordshire Pond Survey

Pond	Ca	Mg	K	Na	SO4	NO3	NO2	Cl	Alk.	Cond.	pH	A. Pase
WIDU	43.80	1.58	18.40	6.04	10.80	0.735	0.000	12.6	2.77	345	9.37	456.17
WIFI	44.50	3.43	7.76	13.24	12.30	0.035	0.050	39.5	1.49	373	7.40	494.81
PILL	35.91	2.48	0.00	10.39	10.40	0.015	0.010	21.2	1.29	294	6.67	197.25
HICO	110.50	4.55	5.07	10.04	60.10	13.640	0.200	69.5	1.00	768	9.33	754.99
BECK	-	-	-	-	31.00	3.410	0.020	24.2	4.00	608	8.14	115.2
ORRA	97.79	6.04	2.18	14.82	19.90	4.230	0.100	26.5	3.00	587	7.75	197.95
WILL	81.72	2.21	0.00	6.51	14.70	1.040	0.000	37.0	3.50	500	8.04	248.67
CENT	82.25	5.01	2.71	14.37	19.50	3.930	0.035	26.3	3.00	508	7.35	161.84
SHO4	-	-	-	-	13.00	0.287	0.000	25.5	2.50	424	7.20	97.78
UFFI	101.70	4.58	1.81	9.61	16.00	1.550	0.020	19.4	3.50	550	8.26	324.81
MAYH	135.80	13.36	48.47	51.32	57.00	0.151	0.005	92.4	6.00	1101	8.66	263.14
BOUR	156.80	5.62	4.05	17.97	17.10	0.005	0.000	20.7	6.50	800	7.88	253.16
EACH	151.80	3.70	1.55	12.08	18.50	2.210	0.020	14.6	7.00	768	7.84	293.06
CHA	171.00	9.19	12.74	22.50	21.60	3.040	0.040	43.5	8.00	977	7.88	397.45
BLE1	105.40	1.76	2.15	5.47	12.60	7.480	0.005	19.1	3.50	532	7.96	282.53
LE2	132.30	2.13	0.72	5.21	17.30	5.270	0.010	27.3	4.00	645	7.70	410.93
PARS	104.50	2.18	1.83	6.12	8.30	7.220	0.005	21.3	4.00	560	7.53	154.12
WENB	-	-	-	-	-	-	-	-	-	-	-	-
NRRA	101.20	6.28	3.41	15.88	8.60	4.980	0.035	26.2	3.50	593	7.62	87.94
HONO	73.20	5.00	10.13	13.07	13.70	0.000	0.000	34.9	2.50	466	7.54	150.89
KIMA	82.95	9.61	1.87	20.36	16.10	0.045	0.005	40.7	5.00	950	8.09	100.73
KIDI	76.30	5.61	5.74	21.15	27.40	12.000	0.010	45.5	4.50	695	7.88	715.38
KITY	47.50	3.68	19.70	6.27	16.70	13.200	0.055	31.9	3.50	659	7.87	305.43
KIRO	126.40	10.07	11.38	32.44	30.40	18.600	0.060	100.1	4.00	1112	8.20	152.15
LRUD	120.60	6.90	5.23	30.80	16.40	2.860	0.005	34.4	5.00	716	7.50	209.89
FCMO	141.90	3.93	1.54	14.72	21.60	8.600	0.040	38.2	4.50	715	8.39	259.77
CLA	85.70	1.83	0.74	13.50	9.10	0.000	0.000	34.7	3.00	479	8.21	230.97
FCSM	91.00	2.16	0.00	13.18	25.70	0.000	0.000	27.9	2.50	502	8.09	64.48
LOMA	99.46	11.02	4.03	12.89	12.30	0.050	0.000	13.2	1.54	267	7.53	403.35
LICO	138.50	10.65	6.77	11.50	15.10	19.250	0.030	29.6	3.75	772	8.04	113.09
GRTY	100.70	8.80	8.28	14.59	16.80	16.950	0.020	47.5	2.11	646	7.97	86.12
BRIM	112.90	15.53	31.38	36.53	-	-	-	-	-	-	-	-
LAWA	79.00	17.89	5.61	33.70	10.30	0.020	0.005	29.5	5.00	651	7.84	112.39
LAWB	51.70	13.21	6.17	27.90	12.00	0.002	0.005	26.5	3.52	537	7.61	165.5
LSCA	115.00	2.25	2.04	8.74	13.00	0.105	0.015	16.4	6.00	670	7.92	78.67
LSCB	100.30	2.58	3.11	9.83	13.00	0.065	0.010	14.5	4.00	516	8.10	173.93
WHMT	59.10	7.03	6.74	13.11	33.20	0.065	0.010	29.4	3.00	508	8.13	54.51
WIU	78.50	3.92	3.32	18.10	8.50	0.015	0.000	21.0	3.50	446	8.36	490.59
LWIL	69.80	3.26	3.51	14.50	9.80	0.015	0.010	23.3	3.50	458	8.27	36.1
LWMA	105.50	7.26	45.20	22.10	10.60	1.540	0.000	38.6	6.00	785	8.21	89.21
LWCH	119.60	6.11	9.53	22.10	5.90	0.640	0.005	31.6	7.50	841	8.22	83.73
NESE	6.50	2.80	4.14	5.57	2.75	0.025	0.005	16.5	1.00	160	7.87	137.82
NEP2	4.69	2.05	6.63	5.32	1.20	0.045	0.000	14.6	0.50	109	6.66	227.03
NEP3	18.67	2.12	8.59	4.59	1.95	0.010	0.010	17.0	0.52	123	6.92	196.69
NESH	23.06	6.00	23.85	9.40	2.11	0.035	0.005	11.9	1.00	153	7.10	419.36
WOLA	31.77	3.85	0.85	19.26	25.30	0.030	0.005	62.8	3.50	597	8.30	96.93
WOLB	122.80	0.00	9.56	37.50	33.60	0.085	0.005	41.5	6.50	771	7.62	129.11
MPLA	58.70	4.88	2.49	12.48	9.35	0.025	0.000	31.4	2.50	399	8.11	181.37
MPLB	50.80	3.75	9.00	13.60	4.55	0.000	0.005	34.2	2.50	350	8.69	110.57
MIPD	55.20	8.22	1.95	8.96	5.55	0.005	0.010	18.1	3.00	312	8.28	111.83
BAMO	71.14	4.98	0.00	6.73	8.50	6.800	0.030	24.7	3.00	502	8.08	52.96
BAP4	18.80	2.21	0.00	4.06	11.00	0.115	0.005	3.1	1.00	736	6.52	669.29
ODDI	83.94	9.61	65.50	22.57	34.50	0.000	0.000	40.1	3.00	660	8.60	140.49
MOTW	148.00	2.69	1.59	12.82	6.25	8.650	0.010	32.6	5.00	770	7.74	62.79
WASP	113.70	7.44	8.45	19.47	30.00	0.135	0.000	29.4	5.14	692	8.50	107.33
ASMU	33.26	2.00	4.21	9.47	12.50	2.620	0.005	24.3	1.50	251	7.04	254.44
ASFI	156.50	3.97	0.00	16.83	16.20	9.440	0.050	54.7	4.00	823	7.43	28.51
NEWE	121.60	4.87	0.00	13.91	25.40	3.880	0.080	39.5	4.00	671	7.88	213.54
PAMO	72.70	5.10	3.40	16.86	26.20	0.005	0.000	37.8	2.50	470	8.85	116.04
PAPO	105.00	4.26	6.55	14.12	11.10	0.010	0.000	33.5	4.50	602	7.95	209.19
GRFP	68.70	3.61	16.42	15.68	26.10	0.015	0.000	33.4	2.00	495	8.19	303.04
GAZE	92.36	3.89	25.91	19.38	1.35	0.010	0.000	36.6	3.50	624	8.08	458.7
SRLI	4.59	0.84	4.43	5.41	1.35	0.020	0.005	15.8	0.50	92	6.90	394.64
SRCH	5.17	0.82	3.51	2.18	4.00	0.030	0.000	4.2	0.50	71	6.46	832.12
SRTE	30.23	2.94	4.54	5.42	8.70	0.000	0.000	20.1	1.50	276	7.94	66.17
YOUL	31.56	5.23	2.32	12.14	13.00	0.016	0.000	26.4	0.50	278	7.67	228.16
FOHA	38.21	6.35	0.00	19.88	16.90	1.860	0.005	48.4	1.00	376	7.53	116.47

(cont.)

Table A4.2 (cont.)

Pond	Ca	Mg	K	Na	SO4	NO3	NO2	Cl	Alk.	Cond.	pH	A. Pase
FODR	39.06	6.55	0.00	20.86	15.40	2.230	0.010	51.0	0.50	373	7.51	286.04
CLAR	287.20	17.04	12.66	29.87	35.00	0.029	0.060	30.1	3.50	636	8.02	243.61
WEAV	109.00	5.05	1.19	12.08	50.10	1.850	0.075	36.4	4.00	749	7.86	233.78
AIRP	75.62	5.18	19.80	14.10	16.20	2.200	0.015	29.9	5.50	716	7.57	131.78
DS1.	110.20	2.36	1.91	21.50	7.30	4.490	0.005	29.1	5.00	639	8.35	220.01
DS2.	94.60	2.39	1.11	17.00	7.30	0.015	0.005	28.7	4.50	582	7.96	498.6
DS3.	185.90	3.01	1.53	15.80	15.50	0.015	0.000	61.2	6.00	868	7.54	115.48
COTH	130.60	2.94	2.72	16.40	18.00	3.390	0.000	34.6	4.50	700	8.15	245.72
WW1.	77.00	2.55	0.00	6.76	-	-	-	-	-	-	-	-
WW2.	70.14	2.02	0.00	5.79	-	-	-	-	-	-	-	-
WW3.	86.60	2.53	0.00	6.55	-	-	-	-	-	-	-	-
WW4.	-	-	-	-	-	-	-	-	-	-	-	-
BERN	-	-	-	-	13.60	0.450	0.015	34.8	2.00	402	7.70	180.81
ASHM	43.80	5.46	8.57	16.40	2.50	0.015	0.000	20.8	2.50	332	8.73	273.67
WHIX	38.30	3.64	2.37	14.92	15.20	0.045	0.005	36.4	0.50	331	6.81	242.49
MASC	47.40	3.53	14.66	13.11	10.20	0.000	0.000	22.6	3.00	445	9.06	43.41
MAMU	99.90	6.19	46.10	28.20	14.30	0.180	0.015	23.7	3.50	520	8.38	701.89
HSLA	-	-	-	-	19.00	0.000	0.005	32.9	2.50	544	8.73	48.89
HSLE	106.30	3.85	0.00	11.80	18.00	0.600	0.020	40.2	2.50	536	8.05	78.25
COMR	-	-	-	-	14.00	7.490	0.025	39.4	5.00	733	7.89	151.31
COPI	13.10	3.62	1.79	284.70	78.10	0.035	0.000	63.5	5.00	1406	8.74	239.82
BUTT	61.39	6.18	12.84	9.28	15.50	0.077	0.005	1.8	2.00	227	6.91	365.13
NILL	92.22	3.15	3.46	6.87	7.20	5.150	0.030	20.9	2.00	449	7.70	54.79
MA03	-	-	-	-	9.30	0.097	0.015	29.3	3.50	500	7.99	202.59
MA04	-	-	-	-	9.00	0.370	0.005	26.0	4.50	534	8.36	167.75
MA07	62.00	5.11	17.10	13.60	4.90	0.390	0.010	9.5	2.50	320	7.59	347.15
MA11	-	-	-	-	15.00	0.020	0.000	8.6	2.50	385	8.05	110.99
MA22	-	-	-	-	35.60	0.030	0.010	61.8	1.00	417	9.43	72.49
CASS	89.60	4.00	6.18	31.40	23.90	0.140	0.005	75.0	2.37	627	8.18	191.07
CANU	98.50	6.03	4.49	16.11	34.30	0.275	0.005	40.0	3.24	593	8.32	299.1
TODU	145.20	9.26	19.21	46.13	50.50	2.750	0.025	67.1	6.00	984	7.96	98.2
TOGA	122.00	8.21	13.07	38.47	7.65	0.175	0.010	81.3	5.50	818	7.54	123.77
BTRI	-	-	-	-	9.65	12.600	0.030	29.6	5.50	830	7.68	76.14
BPAT	-	-	-	-	8.70	0.025	0.005	6.7	4.50	517	7.96	232.51
BRAM	91.80	5.72	19.50	17.60	7.25	34.000	0.005	22.7	4.50	836	7.35	33.43
BRNW	102.90	4.25	1.83	18.40	14.60	0.140	0.000	38.0	4.00	591	7.28	26.27
LALA	-	-	-	-	7.65	1.660	0.000	25.6	5.50	678	7.86	94.97
MAAR	36.80	3.71	0.00	13.10	14.10	0.832	0.005	20.9	1.00	280	7.46	241.08
CORU	96.70	1.76	0.00	6.55	12.60	14.560	0.010	28.0	3.00	565	7.96	172.66
CORM	94.60	1.75	0.94	6.61	13.00	14.100	0.025	27.1	3.00	540	8.19	125.18
COLA	97.00	1.88	1.64	6.26	14.10	13.210	0.005	24.3	3.50	577	7.58	88.36
CORS	123.90	2.80	5.61	7.73	14.00	10.420	0.010	24.7	4.00	632	8.12	214.11
SWGO	12.30	2.03	0.00	5.69	12.40	20.800	0.015	22.0	3.54	618	8.22	519.25
SWRA	-	-	-	-	13.00	22.300	0.015	22.1	3.50	613	8.03	244.03
WILA	74.60	4.26	3.18	7.81	14.10	13.800	0.025	20.8	3.00	551	8.28	86.54
WIFO	133.00	2.49	1.64	5.53	11.70	17.100	0.010	21.3	3.50	605	7.59	163.81
WIIR	126.30	2.40	2.53	5.18	14.20	18.700	0.005	22.6	3.50	600	7.89	66.17
ASRO	131.25	2.72	3.70	8.20	11.70	6.950	0.015	22.4	4.00	594	8.23	133.47
ASDU	130.40	2.49	0.69	7.14	18.70	8.130	0.010	20.6	4.00	593	7.59	117.03
ASNE	68.60	5.33	2.38	9.67	15.20	7.280	0.010	21.3	4.00	579	8.35	174.35
SWDU	158.20	3.86	4.95	11.67	16.80	16.530	0.025	17.6	4.00	690	7.86	138.66
SWHI	134.10	2.62	1.89	7.05	11.50	17.460	0.020	20.6	3.50	602	7.84	130.52
SWDO	71.10	5.17	5.31	16.76	11.50	0.492	0.000	16.2	3.50	379	7.53	327.06
SWVA	142.20	2.42	0.00	9.11	15.60	22.530	0.005	21.1	3.50	616	8.15	76.0
WRTO	107.40	5.05	3.27	8.27	6.55	5.700	0.020	22.3	3.00	487	8.05	95.11
WRBO	93.60	4.77	1.39	9.06	6.95	3.000	0.025	23.1	3.00	433	8.14	45.65
WRDI	169.70	9.43	1.32	19.02	6.15	2.100	0.020	22.0	3.00	437	8.03	113.38
WRVI	-	-	-	-	20.40	12.700	0.020	57.3	3.00	703	7.95	75.58
TWAB	-	-	-	-	106.00	2.550	0.020	30.0	4.50	1135	7.97	119.84
LEMO	111.40	9.12	22.90	19.24	5.50	8.340	0.025	19.7	3.50	557	7.45	60.55
LEMA	168.00	1.85	0.00	6.88	5.75	12.420	0.010	22.9	4.00	620	7.73	22.47
LECR	-	-	-	-	3.95	6.510	0.000	56.3	3.50	616	7.51	24.3
GIZZ	142.00	10.08	35.10	37.01	19.30	13.810	0.005	64.2	4.50	946	7.35	28.66
KENN	109.20	6.68	5.50	23.80	10.60	2.950	0.020	54.2	2.50	563	8.90	113.18
RASC	188.40	11.97	27.40	80.54	31.90	0.561	0.045	100.6	5.00	986	7.80	320.04

APPENDIX 5

STATISTICAL TECHNIQUES

A5.1 Nonparametric statistical techniques

A5.1.1 Introduction

Standard parametric statistical techniques require that each series of data be normally distributed. Many of the series of data collected during the Oxfordshire Pond Survey either have distributions which are either skewed or have too few ranks to estimate whether or not their distribution is normal. For these reasons, all statistical analyses performed on data from the OPS were nonparametric. In nonparametric analysis, data are transformed into ranked series, ensuring that the data are distributed evenly. This allows comparison of series of data with different types of distribution, but does not allow estimates to be made of the amount of variation of one parameter which is explained by another. For example, it is possible to use nonparametric statistics to compare pond area with pH and see if the two are significantly correlated. It is not possible, however, to estimate how much of the variation in pH is explained by the variation of pond size, or to estimate how reliably the pH of a pond could be predicted from its size.

All nonparametric statistical tests were performed using the programme StatView®, running on Macintosh Classics (Apple Computer Inc.).

A5.1.2 Spearman's rank correlation

Spearman's rank correlations test the null hypothesis that one parameter is *not* correlated with another parameter. This test has been used extensively in the analysis of the OPS data. The test is best illustrated by an example.

The relationship between nitrate concentration and inflow volume was analysed by testing the following statement:

'The nitrate concentrations of ponds in the OPS data set are *not* related to the inflow volumes of those ponds.'

Spearman's rank correlation test shows that the chances of the statement being correct are less than one in two thousand: i.e., that there is less than a one in two thousand chance that nitrate and inflow volume are not correlated. We can, therefore, conclude that they are, highly significantly, correlated.

In the tables in this report, correlations are denoted by a series of pluses or minuses. In the above example, this significance would be denoted +++++ or $p<0.0005$ (less than one in two thousand). The + indicates a positive correlation: i.e., that high nitrate levels are associated with high inflow.

In a second example, the result of the test between nitrate and surface water input is denoted as —. In this case there is less than a one in two hundred ($p=<0.005$) chance of the nitrate and surface water not being associated. This time, however, the correlation is negative: i.e., low nitrate concentrations are associated with high surface water inputs.

In most ecological analyses the lowest level of significance acceptable is normally $p=<0.05$ (a less than one in twenty chance of being wrong). It should be noted that with such a large number of series of data derived from the OPS that there is a high chance that some of the individual correlations will be due to chance. Uninterpretable correlations should, therefore, be treated with caution.

It should be noted that a correlation between two variables does not imply that one variable *causes* a change in another, merely that they are associated.

A5.1.3 Mann-Whitney U test

The Mann-Whitney U test, tests the statement that the distribution of data in one series is not significantly different from that in another series. Unlike the Spearman's rank correlation test, the data are *not* from the same sites. For example, when assessing whether a sandstone geology is significantly correlated with the macroinvertebrate TWINSPAN group 4 (see A5.2), we need to look at the amount of sandstone geology surrounding ponds in this group, compared to the amount surrounding ponds in all the other groups. In this case, the Mann-Whitney U test yields a significance of $p=<0.005$: i.e., that there is less than a one in two hundred chance of the level of sandstone geology

around ponds in Group 4 *not* being different from that in the other groups. In this case the notation (+++) indicates that the levels are higher in Group 4.

Note that this test treats all the other three groups as *one* group for this analysis. In order to discover whether or not sandstone geology differs significantly between *all* groups we need a further test.

A5.1.4 The Kruskal-Wallis test

This is a one-way analysis of variance by ranks. The Kruskal-Wallis test tests the hypothesis that there is no significant difference in the populations of a variable between several groups.

For example, when assessing whether a sandstone geology is significantly correlated with *all* macroinvertebrate TWINSPAN groups (see A5.2), we need to look at the amount of sandstone geology surrounding ponds in each individual group, compared to the amount surrounding ponds in all the other groups individually. In this example the Kruskal-Wallis test yields a significance of p=<0.05: i.e., that there is a one in twenty chance of being wrong in saying that the amount of sandstone surrounding the ponds, does *not* vary between the four groups.

The distribution of this variation is not assessed by this test. A significant result could be due to one group being widely different from all other groups, or it could be due all the groups varying slightly. Also, as no one group is being assessed against any other, there is no sign to the result; i.e., the test does not yield positive or negative results. For this reason significance levels are denoted with a • rather than a + or -.

In general, it would be expected that if the Kruskal-Wallis test were significant then at least on of the other groups would test to be significantly different from the other groups with the Mann-Whitney U test. The corollary, however, is not true. For example, ponds in macroinvertebrate Group 3 have significantly larger proportions of clay geology around them than those of other groups. However, the amount of clay around ponds is not significant when looking at the groups as a whole. This is because all other Groups (1,2 and 4) are rather similar in terms of clay geology.

A5.2 Multivariate statistical techniques

A5.2.1 Introduction

Different habitat conditions are attractive to different species of plants and animals. The presence of certain species may attract other species, and so on. Over the course of time, complex communities will develop in a habitat. The type of community which develops may not be uniquely predicted by the abiotic features of the habitat, but may be influenced from the outset by the initial species which colonise; a process which may be influenced by conditions prevailing far from the habitat itself. Nevertheless, it would be reasonable to suppose that, though the abiotic conditions will not uniquely predict the exact community which evolves, certain types of community should be recognisable and certain species associations be more likely than others. It is these broad types of community which classification and ordination aim to recognise and help to interpret.

Being able to recognise different types of community is important in both conservation value assessment and environmental impact prediction. Any strategic policy for conservation will need to use a classification, as it is important to preserve as many different types of community as possible, in order to maximise the variety of wildlife conserved.

Classification is also important when interpreting work on environmental impacts. Studies may have shown that a particular aquatic community responds in a particular way to a given impact. If we want to look at the effect of the same type of impact on another site, then, if the community of this site is similar to sites in which the impacts have a known effect, we can have a degree of confidence in predicting that the effects will be similar in the new site. If, however, the community types are not similar then we must be very cautious in predicting the effects of the impact.

A5.2.2 TWINSPAN and DECORANA

The most widely used method of classifying communities in recent years has been the FORTRAN programme TWINSPAN (Two-Way INdicator SPecies ANalysis) and this has been used on the OPS database. As an aid to interpreting the results from TWINSPAN, and as a means of elucidating the principal environmental parameters which shape communities, the FORTRAN programme DECORANA (DEtrended CORrespondence ANAlysis) is also used. This has been used her on the same data as TWINSPAN.

The following is a non-technical description of how the two programmes handle data.

Both TWINSPAN and DECORANA work by arranging samples in an order of similarity of community composition. The closer together two samples are, the more similar their community structure. TWINSPAN produces a dendrogram which shows the relationship between sites. It also produces indicator species which enable recognition of the type of any other site, given its community composition. TWINSPAN is the method of choice for grouping sites with similar invertebrate communities.

DECORANA analyses community composition in terms of major variations in community structure. The principal variation in community structure is shown by the first axis, the next major variation by the second axis, etc. DECORANA is used to investigate the principal environmental factors which are associated with the differences between pond communities.

The rearrangement of the data

A very simple example shows what the two techniques do - look at these two tables of data (Figure A5.1). Column A (raw data) shows the way the basic species lists are entered before analysis begins. They are then rearranged by TWINSPAN or DECORANA to give the situation shown in column B (rearranged data).

From the raw data, it is not immediately obvious which of the sites are most like each other and which least like each other. Rearranged, however, it is immediately obvious that C and A are different from B and E, with D rather in the middle. Whilst no computer is needed to work this out with only five sites and five species, it would be impossible to do this with, say, 30 sites and 200 species. This is what TWINSPAN and DECORANA do.

So, running raw data through TWINSPAN and DECORANA leads to it being reorganised, showing how similar sites are to each other in terms of the species they support. The analysis, essentially, reorganises large data sets in a way which allows them to be interpreted more easily.

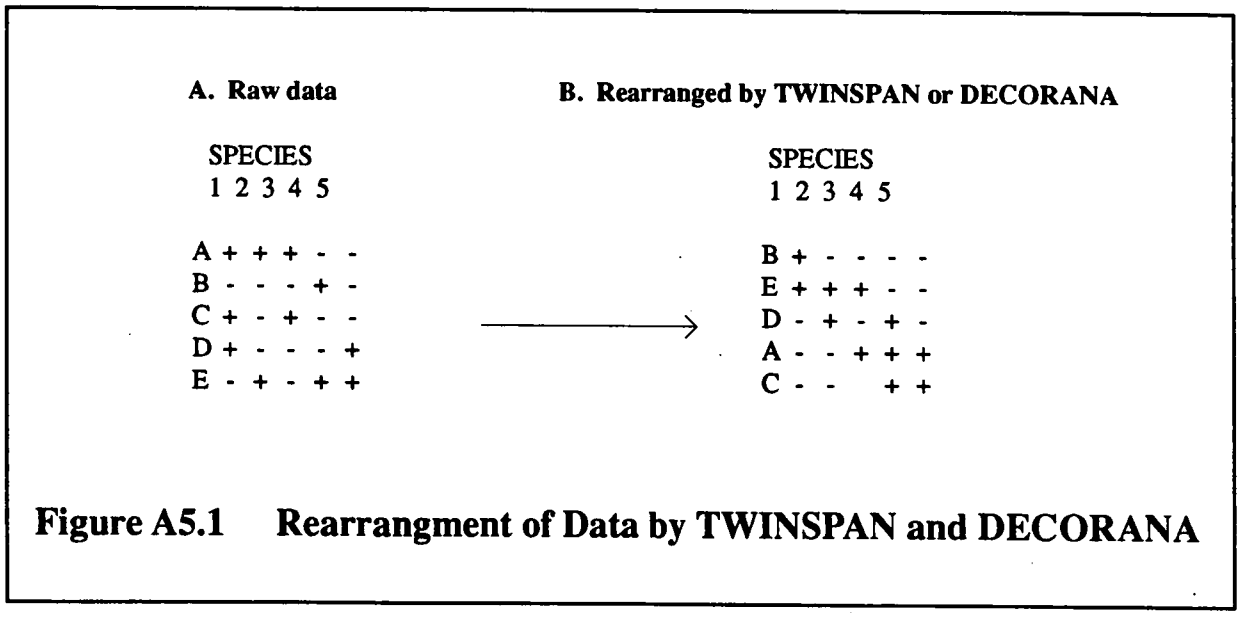


Figure A5.1 Rearrangment of Data by TWINSPAN and DECORANA

The first axis of DECORANA will be roughly equivalent to the order of sites as shown in the rearranged column. TWINSPAN also uses this order to make the first split of the dendrogram, splitting the samples at the point in the sample order at which the difference (statistically) between the two sets of sites is greatest, e.g., between D and A.

Even in the simple example above it can be seen that there is more variation in the species composition than is explained by the site order. If the site order explained all the variation, then we might expect the 'diagonal' of species to be straight. In a more complex data set the variation which is not explained by the first axis might be quite considerable. How the two techniques handle this extra variation forms the fundamental difference between them.

DECORANA, essentially, ignores the variation in species composition which has been explained by the first axis, and then orders the sites on the basis of the remaining variation. This order is then the basis of the *second* axis of DECORANA. Having done this, it can then ignore the variation explained by the first and second axes and produce a third axis, and so on.

TWINSPAN handles the data differently. Having made its first split, it then treats the two 'halves' (which may be unequal) of the data-set independently, and in exactly the same way as it handled the whole data set. This does *not* produce a series of splits following the same sequence as the original site order.

If we imagine a data set in which the principal *source of variation** is size, then we would expect that the first split of TWINSPAN would reflect this, and similarly that the first axis of DECORANA would be related to this. The second major source of variation in our data set might be pH, and the third might be longitude. It might be, however, that the pH of the water has little effect on large sites but a large effect on small sites, and the opposite might be true of longitude. In this case the second axis of DECORANA would be related to pH and the third to longitude. One of the splits of TWINSPAN (the split of the small sites group) could well be based on the pH of the sites, whereas the split of the large sites group could be based on longitude. Alternatively, the effect of size might still prevail and one or both of the second splits of TWINSPAN might be related to size, with the effects of pH and longitude becoming evident only at lower splits in the dendrogram.

Thus, TWINSPAN is in some ways more versatile than DECORANA, in that it can handle more types of variation in a data set (DECORANA does not generate more than four axes - largely because the lesser sources of variation will not affect the whole data set, but only a part of it). DECORANA, on the other hand, can generate sample/site orders which allow us to evaluate the principal factors affecting sites, which would be more difficult (though not impossible) to analyse with the information from TWINSPAN.

Indicator species

At each split, TWINSPAN produces a set of indicator species for each side of the split. These are the species which are most strongly associated with each branch of the dendrogram. They can also be used to make a dichotomous key for classifying new sites.

'Pseudospecies'

TWINSPAN uses numerical data by classing species into pseudospecies. In the case of the OPS the following cut levels for pseudospecies were used: 1-5; 6-25; 26-125; 126-625; >625. Thus, if there were, say, 50 *Cloeon dipterum* in a sample, then TWINSPAN would treat this as *Cloeon dipterum* pseudospecies 3 (CLOE DIPT.3), CLOE DIPT.2 and CLOE DIPT.1: i.e., as three different entities. By contrast, DECORANA uses data in a standard, linear way. For the OPS the species abundances were $\log_5$ transformed.

One thing which may seem confusing at first glance is that it is possible that a species may occur as a negative indicator for a split but then, later, as an indicator on the positive side of the split. This occurs because indicator species are species which are strongly associated with one side or other of a split, but not exclusively with that side of the split. If a species is an indicator at a split this doesn't prevent it from occurring at some sites on the other side of the split. It may even become an indicator at a later split.

(**Source of variation* is used here, rather than variation, as this is easier to conceptualise. There is the tacit assumption that a particular variation in community structure has a source, e.g., an environmental variable such as size.)

APPENDIX 6

CONSERVATION ASSESSMENT

A6.1 Species Rarity Indices (SRIs)

In order to gain an objective impression of the conservation value of plant and invertebrate communities, a Species Rarity Index (SRI) was developed.

A6.1.1 Use of Species Rarity Indices

Species rarity indices provide an objective method of comparing the conservation value of the animal and plant communities of different sites and have been used to good effect in other studies (e.g., Foster, G.N. *et al.* (1992), Ball, S.G. (1990; 1992)).

SRIs have several advantages over other systems of conservation assessment. These are listed in Table A6.1.

Table A6.1 Advantages of the Use of Species Rarity Indices

1.	Objectivity	The SRI method is one of a very small number of systems available for objectively comparing community value.
2.	Effort independence	Unlike many other similar typological studies, the OPS used a constant effort method of surveying. It is therefore possible to compare, directly, species-richness between sites. Nevertheless, random variation of sampling will affect species-richness results, whereas an SRI, because it represents average rarity, is able to be largely independent of the actual numbers of plants or animals recorded.
3.	Site type independence	Comparisons of species-richness between sites can give misleading information on community value, as certain types of community (e.g., those of oligotrophic waters) will tend to be naturally less diverse than other types (e.g., those of eutrophic waters).
4.	Analytical simplicity	The SRI of a community is a single datum which makes it ideal for use in subsequent statistical analysis.

The latter point regarding analytical simplicity is the main reason for the extensive use of SRIs in analysing the results of the OPS. When assessing the value of individual sites, however, conservation assessments should look at the data available more critically. Qualifications to the system of SRIs for assessing individual sites are listed in Table A6.2. Note that several of these qualifications can be applied to many other systems of conservation assessment.

A6.2 Calculation of the Species Rarity Index

The SRI is calculated in the following way (more detailed information about the derivation is given in Sections (a), (b) and (c)):

i) All species present are given a numerical value depending on their national distribution pattern (see section (a) below);
ii) The values of all the species present are added together to give a total rarity score (see section (b)below);
iii) The total rarity score is divided by the number of species present to give the SRI (see Section (c) below).

Table A6.2 Qualifications to the Use of Species Rarity Indices

1.	Tourist species	Some specimens present in a sample from a site might be 'tourists', i.e., individuals which have recently arrived at a site but which would not breed there. In some cases the site might provide a valuable 'stopover' for a species, and this habit might be quite normal for that species. If this were the case, then it would be correct to consider the site as, in some way, supporting that species, and the species should be considered when evaluating the site. However, some records will be of 'strays' which have been blown far from their natural habitat. For example, Pond Action, during the course of the National Pond Survey, recorded the endangered Lesser Silver Water Beetle (*Hydrochara caraboides*) from a site in Cheshire. This was almost certainly a specimen which had been blown from the Somerset Levels, which were drying out at the time (Biggs *et al.*, 1991). It would have been wrong to use this record as part of an SRI to estimate the conservation value of the macroinvertebrate community of that pond. Therefore, the inclusion of individual species, which have a large influence on the SRI, should be reviewed critically.
2.	Types of sampling	Though SRIs are largely independent of sampling effort, they are not independent of the type of sampling used. For example, a survey which was directed at recording water bugs would inevitably yield lower SRIs than would one directed at recording water beetles, the simple reason being that most water bugs are fairly widespread and hence do not score as highly as many of the water beetles.
3.	Species poor	SRIs compensate for differences in community type. However, the SRIs of species-poor communities will be affected considerably by single species, and due to sampling variability the SRI method is inherently prone to variation in these sites.
4	Viable populations	SRIs take no account of abundance data, and so give no indication of the viability of the species which are being used to derive the index.
5.	'Writing off' sites	A low SRI should not be used to 'write off' a site, as this would assume that a complete record of species at that site had been obtained, which would be unlikely to be the case.
6.	Distribution information	The SRI relies on having up accurate information on the national distribution of species. The groups surveyed during the OPS were chosen partly for this reason.
7.	Distribution	Species inhabiting small, fragmented habitats, (e.g., ponds) with a relatively wide distribution are apparently less rare than species inhabitating large, unfragmented, habitats which have a less widespread distribution (e.g., Lizard heath). The threats to the smaller, fragmented habitats, however, may well be greater than those to the larger, unfragmented, habitats. For the rarer plants and animals, this type of information may be taken into account when assessing status, but this is rarely the case for local and notable species.

(a) All species present are given a numerical value depending on their national distribution patterns

Common species are given the value of 1, local species the value of 2 and so on, culminating with the most endangered species (RDB1) which are given a value of 64 (see Table A6.3).

Statuses given to individual species are derived mainly from JNCC invertebrate species reviews and Red Data Books. Within this system, a level of discretion is required when interpreting the literature on species distribution. For example, The Atlantic Stream Crayfish (*Austropotamobius pallipes*) is, technically, a local species. However, the

species is currently under threat due to a number of factors (see notes on the species in A3.4) and is, therefore, upgraded (for the purposes of calculating SRI) to Nationally Notable B.

(b) The values of all the species present are totalled to give a total rarity score

Were the communities being compared of the same type (e.g., communities of large fishponds) and individual sites of the same size (and, therefore, expected to support similar numbers of species), then it would be valid to use the total rarity score to assess the relative conservation value of the sites.

However, different types of site often differ in the number of species they support: temporary ponds, acidic ponds and gravel-pit lakes are all likely to have different types of macroinvertebrate community and, therefore, likely to support different numbers of species. To make comparisons, therefore, an index must be used which corrects for differences in species numbers.

Table A6.3 Definition of Terms Used for Plant and Invertebrate Species in this Report, and Conservation Scores for Each Category

Description	Score	Plants	Invertebrates
Common	1	Recorded from >700 10x10km grid squares in Britain.	Generally regarded as common.
Local	2	Recorded from between 101 and 700 grid squares in Britain.	Generally regarded as local (see A3.4)
Nationally Scarce B	4	Nationally Scarce. Recorded from 31-100 grid squares in Britain.	Nationally Notable B. Recorded from 31-100 grid squares in Britain.
Nationally Scarce A	8	Nationally Scarce. Recorded from 16-30 grid squares in Britain.	Nationally Notable A. Recorded from 16-30 grid squares in Britain.
RDB3	16	Red Data Book: Category 3 (rare), Perring and Farrell (1977).	Red Data Book: Category 3 (rare). Shirt (1987), Bratton (1991).
RDB2	32	Red Data Book: Category 2 (vulnerable), Perring and Farrell (1977).	Red Data Book: Category 2 (vulnerable). Shirt (1987), Bratton (1991).
RDB1	64	Red Data Book: Category 1 (endangered), Perring and Farrell (1977).	Red Data Book: Category 1 (endangered). Shirt (1987, Bratton (1991).

Notes:

Distribution information is derived from the following sources:

Plants:
Aquatic plants: Croft, Preston and Forrest (1991).
Emergent wetland plants: Palmer and Newbold (1983), Perring and Farrell (1983), Perring and Walters (1990).

Aquatic macroinvertebrates:
Ball (1986), Elliott and Tullett (1982), Bratton, (1990, 1991), Wallace (1991), Hyman and Parsons (1992), Kirby (1992), Shirt (1987), Kerney (1976), Foster (1981,1985, 1987), Elliott (1977), Elliott *et al.* (1988), Friday (1988), Goddard and Hogger (1986), Hammond (1983), Reynoldson (1988), Savage (1989).

(c) **The total rarity score is divided by the number of species present to give the SRI**

The SRI gives a good comparison between sites of any type. It should also be relatively independent of sampling effort. The SRI is, in effect, a measure of the *average rarity* of the species recorded.

In sites with low numbers of species, the presence of one or two local or notable species can have a large effect on the SRI. For this reason, it is particularly important to be cautious in the interpretation of SRIs of small sites (particularly those with less than 16 species).

In this report, the statistical treatment is such that no categories need be applied to the data. However, for other purposes, SRIs may be grouped in the following bands (Table A6.4) to allow sites to be assessed on a national scale.

Table A6.4 National Rating of Species Rarity Index

Conservation value of macroinvertebrate community	Species Rarity Index
Very high	1.50
High	1.20-1.49
Moderate	1.01-1.19
Low	1.00

Table A6.5 gives a verbal description of the types of community qualifying for the above categorie:

Table A6.5 Provisional System for Assessing the Nature Conservation Value of Plant and Aquatic Macroinvertebrate Communities

CONSERVATION CATEGORY	DESCRIPTION OF TYPE OF COMMUNITY
VERY HIGH	Typically supporting a very rich community of plant and/or macro-invertebrate species, including local and rare (RDB) species (though note that some sites with rare species can be relatively species-poor). Sites in this category would normally have National Conservation Indices in excess of 1.5.
HIGH	Supporting a rich community of common plants and/or macroinvertebrate species. Generally an above average number of local species recorded . No RDB species. Sites in this category would normally have National Conservation Indices between 1.2 and 1.5.
MODERATE	Supporting a moderately rich or rich community of common plant and/or macroinvertebrate species, with at least one local species. Sites in this category would normally have National Conservation Indices between 1.01 and 1.19.
LOW	Supporting a species-poor community of common plants and macroinvertebrates. No rare or local species. Sites in this category will have National Conservation Indices of 1.00.