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September 17, 1986

Mr. Don McFall
Division of Natural Heritage
Department of Conservation
524 South Second Street
Springfield, IL 62706

Dear Don:

Enclosed please find our report. "A Preliminary Investigation of the Aquatic Macroinvertebrate Community of Lovets Pond in Jackson County, Illinois." We have found Lovets Pond to be a high quality wetland with a diverse aquatic community which indicates the ecosystem is in a healthy state even though agricultural endeavors immediately border the area. The narrow buffer of forest in the relatively flat floodplain has provided an adequate impediment to siltation.

We strongly urge the Division, based on these data herein enclosed, to pursue this wetland for designation and purchase as a natural area.

Sincerely,

A handwritten signature in cursive script, appearing to read "Ann", is written in black ink.

Ann Phillippi, Ph.D.
Assistant Professor

dd
Enclosure

A PRELIMINARY INVESTIGATION OF THE AQUATIC MACROINVERTEBRATE COMMUNITIES
OF LOVETS POND IN JACKSON COUNTY, ILLINOIS

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Submitted to:

Division of Natural Heritage
Illinois Department of Conservation
524 South Second Street
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31 August 1986

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INTRODUCTION

Lovets Pond is a natural pond with associated biological communities located in the Mississippi River bottoms about 24 km west of Murphysboro, Jackson County, Illinois (Figure 1). The pond proper is approximately 16 ha in size; the surrounding lowland woods increase the ecosystem to approximately 65 ha. The surrounding woods provide an adequate buffer such that siltation from surrounding agricultural activity is minimal. Maps compiled by Max D. Hutchison (provided in personal communication) from the 1807-1810 Public Land Survey indicate that Lovets Pond was part of a much more extensive pond, arching from the west-central edge of section 34, west through sections 33 and 32, and south into the northwest corner of section 5 (see Figure 1). Since then drainage efforts for agricultural purposes have drastically decreased the pond's size as well as eliminated other nearby wetlands referred to in the Public Land Survey. This study was undertaken because Lovets Pond is a rare remnant of the Mississippi River bottom wetlands of southern Illinois. It is an established fact that knowledge of a wetland's aquatic macroinvertebrate community composition and structure can help elucidate the biological character of that system. The data obtained from this survey establishes that Lovets Pond is a stable and unique wetland system which is remarkably intact especially in light of the almost complete elimination of most other wetlands in the area. We agree with Hutchison's assessment of the area; Lovets Pond is a fragile, significant natural area worthy of preservation.

METHODS

In order to obtain the most comprehensive assessment of the aquatic macroinvertebrate community of Lovets Pond, a field reconnaissance effort was conducted and revealed that four major and distinct aquatic community types were present in the study area: a pond community, a shrub-swamp community, a true swamp community, and a marsh community. Detailed descriptions of each community are provided in the Site Description section of this report.

A specific sampling site was established within each of the four communities (designated as sites 1, 2, 3, and 4). Each site was sampled for macroinvertebrates at 4-5 week intervals from January through June. Sampling methodology followed general wetland survey technique for macroinvertebrates. Two dip net samples were taken at each site on each sampling date (total number of samples = 48). The samples were fixed in 10% formalin and taken to the laboratory where the organisms were sorted from the debris. The organisms were counted and identified to the lowest possible taxonomic level using a variety of references. All specimens are stored in 70% ethyl alcohol and are deposited in the Department of Zoology at Southern Illinois University at Carbondale. To aid in the analysis of macroinvertebrate community diversity, the Shannon diversity base 10 (H') and the Simpson dominance (1) indices were used. For an explanation of the utility of each index see "Field and Laboratory Methods for General Ecology" (Brower and Zar 1984). During each visit air and water temperature and water depth were measured and a general habitat description compiled for each dip net sampling site.

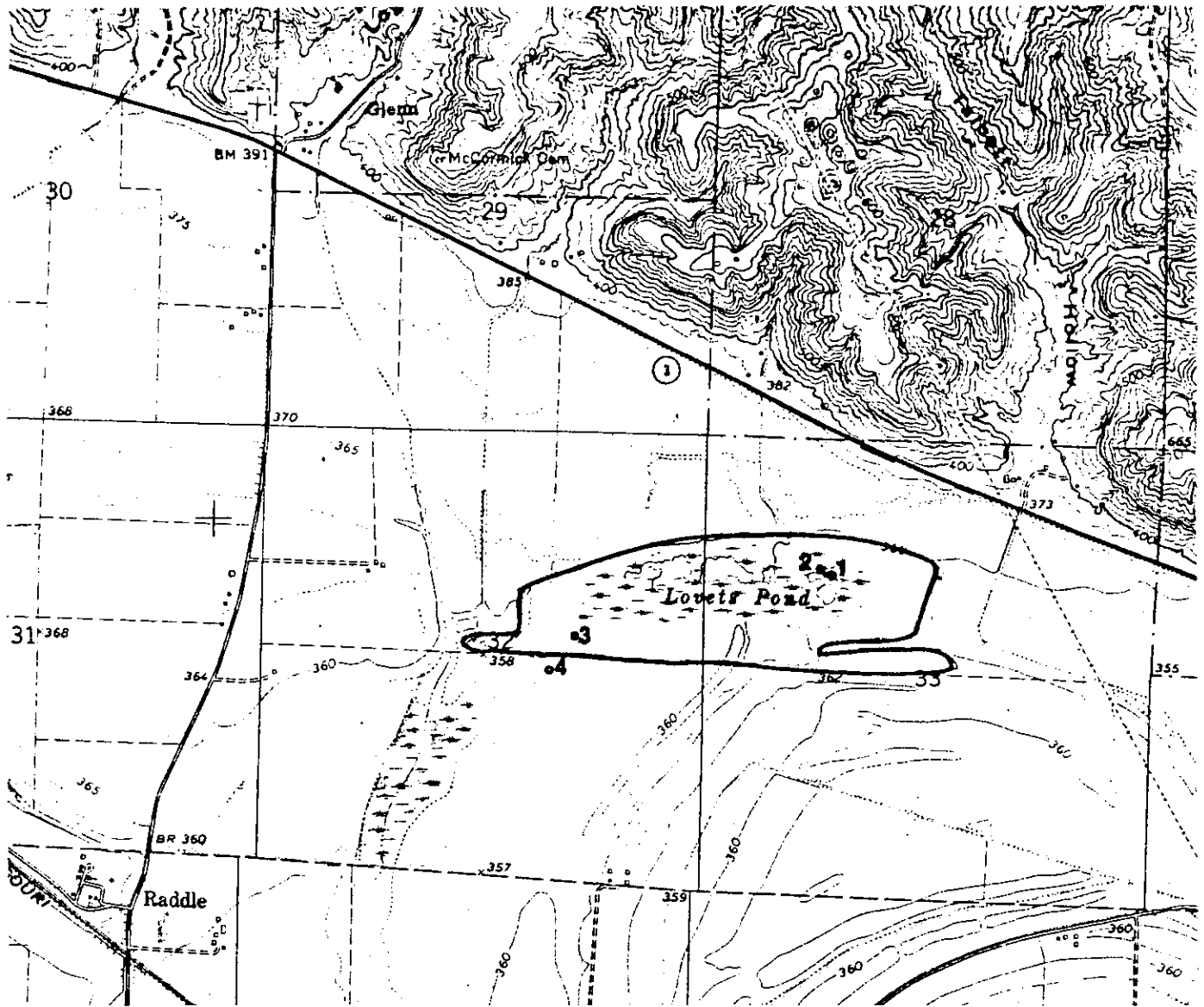


Figure 1. Portion of U.S.G.S. Raddle, ILL 7.5 Minute quadrangle map showing the location of the study sites at Lovets Pond in Jackson County, Illinois. Site 1 = pond, Site 2 = shrub-swamp, Site 3 = true swamp, and Site 4 = marsh. The area outlined in black appears as a lowland forest from Illinois Route 3.

SITE DESCRIPTIONS

At each site, the substrate was firm and free of silt, and the water was clear. The continuous, peripheral lowland forest has undoubtedly functioned to impede silt from entering the wetland from the surrounding plowed fields. The pond's close proximity to the forested Kinkaid Hills and the presence of better drained soils to the north also helps to prevent a heavy silt-load from entering the pond via the intermittent streams. Water temperature at all sites fluctuated in a similar seasonal manner (Figure 2) except for January when a brief warming trend caused a temperature increase within the less shaded sites (1, 3, and 4). At sites 1, 2, and 3, the samples were taken at similar depths throughout the sampling period (Figure 3). The marsh community (site 4) offered a greater and more accessible variety of depths from which to sample. Open water areas of Lovets Pond as well as the marsh shrank in size as the sampling period progressed in response to decreased rainfall and a lowered water table.

Many snow geese, Canada geese, various species of ducks (especially mallards), wading birds (e.g., herons), beavers, and muskrat dens were observed or heard on several field visits. These observations suggest that the area provides an important wintering ground for many game birds. The presence of duck blinds and well-used canoe and boat paths reveal that the wetland is frequently used by hunters.

The following descriptions are provided for each of the aquatic community types. Community descriptions were modeled after those provided by the 1978 Illinois Natural Areas Inventory Technical Report (INAI).

Pond community (site 1)

A pond community is classified as "a small, still body of water usually shallow enough to allow windswept rooted aquatic plants across most of it" (INAI). The pond community of Lovets Pond is approximately 16 ha in size and is classified here as Lovets Pond proper. The site is devoid of trees, and broad areas are covered with yellow pond lily (Nuphar luteum). Dense mats of smartweed (Polygonum sp.) are distributed sporadically. Covering much of the available water surface are duckweeds (Spirodela spp. and Lemna spp.), and water meal (Wolffia sp.). Sponge plant (Limnobium spongia) is reported to be abundant in late summer. A dense layer of coontail (Ceratophyllum demersum) exists just below the surface throughout most of the pond. In areas where coontail is not prevalent a pondweed (Potamogeton sp.) occurs sporadically below the water surface.

The sampling site in the pond community, located 30-60 m from the shoreline, was consistently the deepest of all the communities, averaging approximately 50 cm in depth. During January and February the site was completely free of emergent vegetation. By March 21, yellow pond lily (Nuphar luteum) was just beginning to protrude above the water's surface and by April 18, it was approximately 0.5 m above the water's surface. At the May and June sample dates the lily was so thick that the substrate was almost entirely covered with the roots and stems of this plant. The site was bordered primarily by buttonbush (Cephalanthus occidentalis). By our last sampling date (June 12), coontail, mosquito fern (Azolla mexicana), and various duckweeds were abundant.

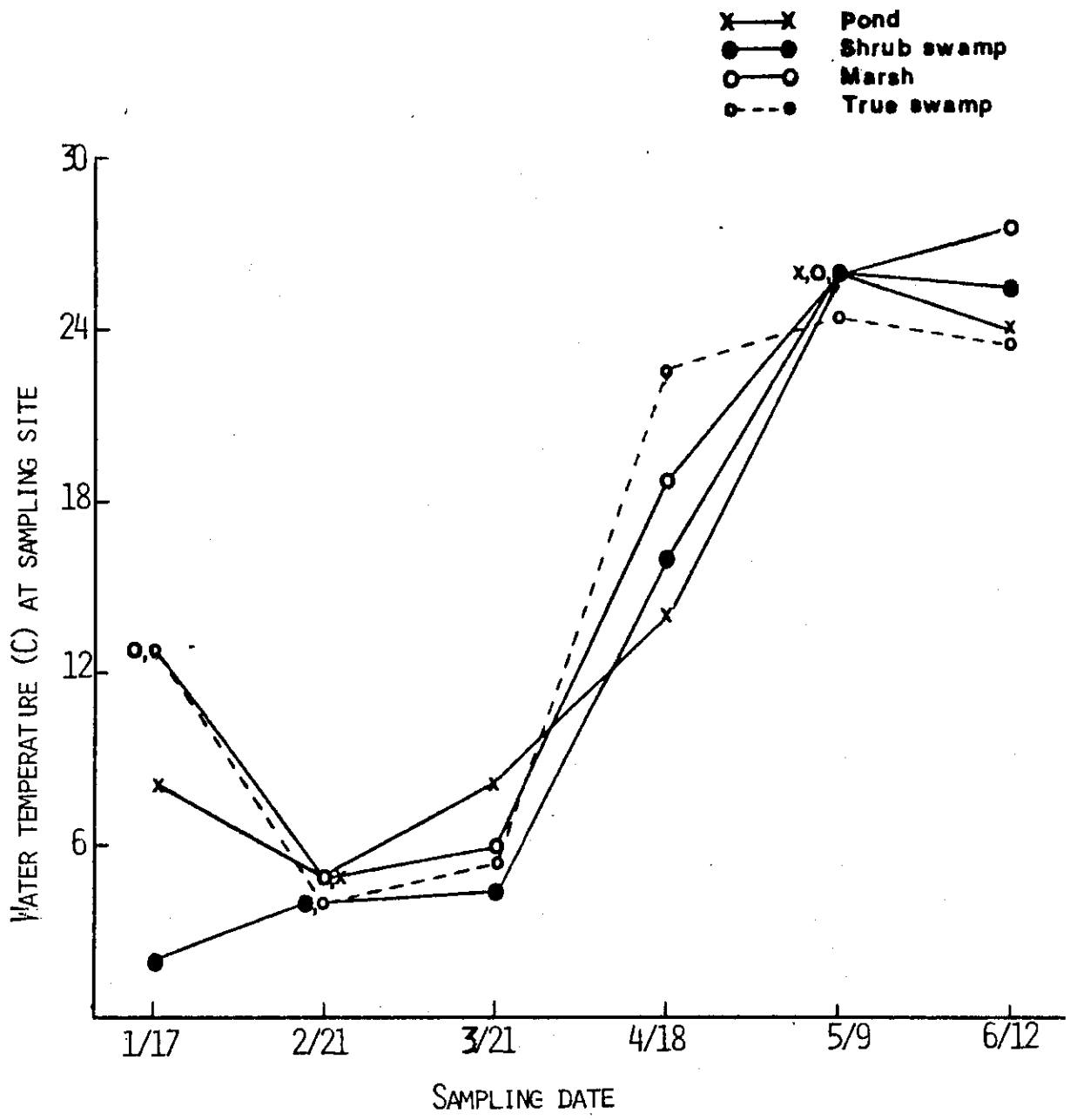


Figure 2. Water temperature of the four study sites in Lovets Pond at each sample date, January through June 1986.

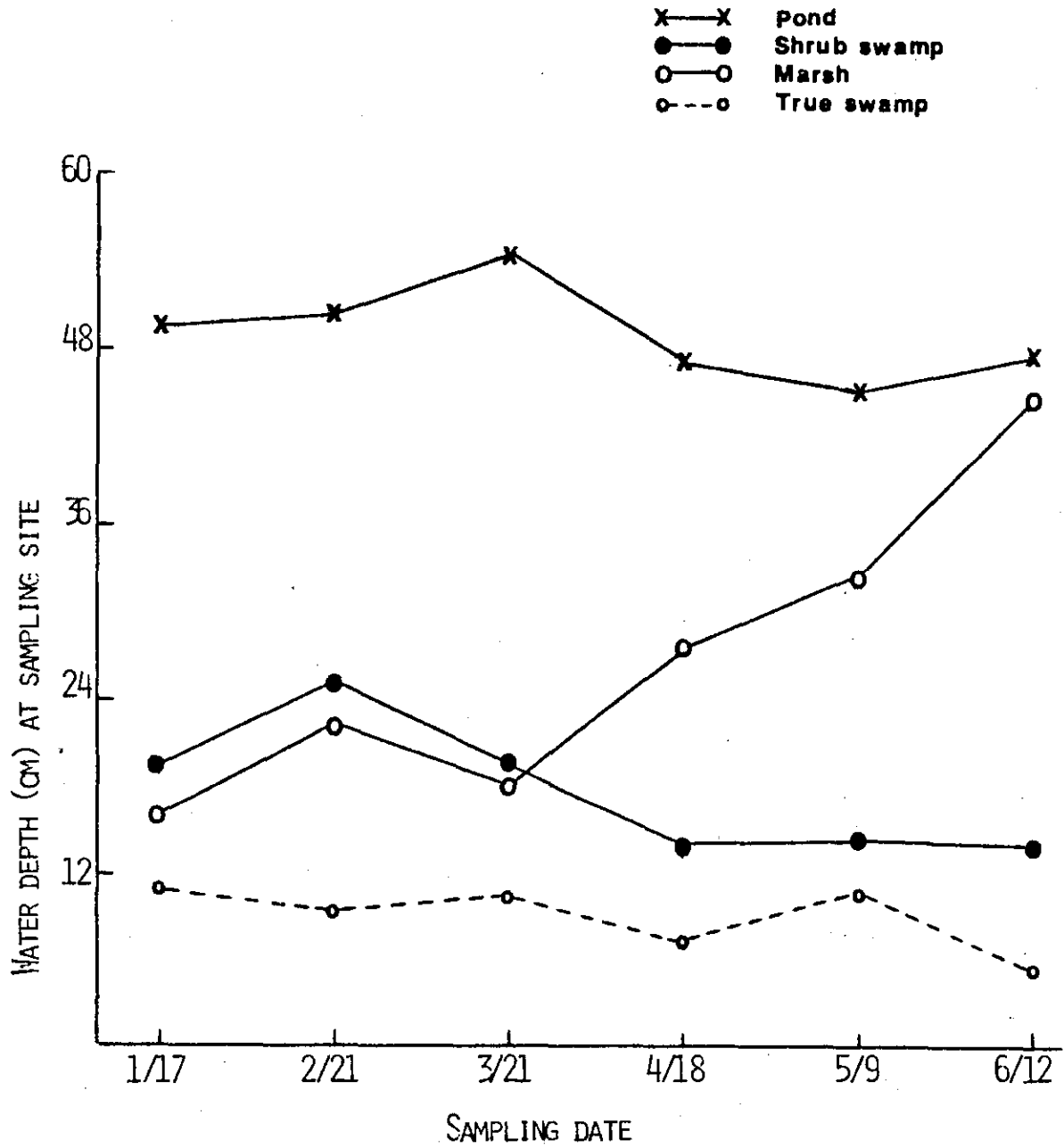


Figure 3. Water depth of the four study sites in Lovets Pond at each sample date, January through June 1986.

Shrub-swamp community (site 2)

A shrub-swamp community is classified as "having at least 50% coverage by shrubs... and less than 20% coverage by trees" (INAI). The shrub-swamp community of Lovets Pond is dominated by buttonbush (Cephalanthus occidentalis). Buttonbush forms an almost impenetrable border around the entire pond. A tree species commonly interspersed among the buttonbush is black willow (Salix nigra). Growing in scattered openings in the buttonbush are nonwoody emergent plants such as arrow arum (Peltandra virginica), swamp dock (Rumex verticillatus), arrowhead (Sagittaria latifolia), water plantain (Alisma plantago-aquatica), and in the most shallow areas, lizard's-tail (Saururus cernuus). The various floating and submergent plants that occur in the pond community occur in the shrub-swamp community as well.

Air temperature at the sampling site in the shrub-swamp community was cooler at most dates than the other sites due to the shade provided by the buttonbush thicket. Concomitantly, the water temperature was usually slightly less as well (Figure 2). During January through March, ice covering the water was thicker here compared to the other sites. Dip net samples were taken in water 14-25 cm deep directly beneath the buttonbush thicket and 6-11 m from the shoreline, which was indistinguishable due to the very gradual decrease in depth towards the muddy shore. Buttonbush was, by far, the primary vascular plant at this site. Between the buttonbush thicket and the shore was a spotty line of lizard's-tail and swamp dock. The June sample date had been preceded by an apparently natural fish-kill. At least 50 fish carcasses, mostly large carp (Cyprinus carpio) and a few sunfish (Lepomis sp.), were scattered in and among the bases of the buttonbush and along the shore. Natural oxygen depletion in this somewhat isolated, extensive, shallow, well-shaded community is a likely explanation.

True swamp community (site 3)

A true swamp community is "a forested, permanent, or semi-permanent body of water" (INAI). The true swamp community of Lovets Pond is dominated by a number of tree species, including pumpkin ash (Fraxinus profunda), swamp cottonwood (Populus heterophylla), black willow (Salix nigra), red maple (Acer rubrum), and water locust (Gleditsia aquatica). Arrow arum is the dominant nonwoody plant in the understory; swamp dock, lizard's-tail, and swamp loosestrife (Decodon verticillatus) were noted as occasional. A layer of duckweed covers the water surface in many areas.

The sampling site in the true swamp community was dominated by the tree species mentioned above. On our earliest sample date in January, decaying arrow arum plants covered the swamp floor. By our March 21 sample, sprouts of arrow arum were present and by our last sample date, June 12, plants were 1.5-2 m tall and occurred in extremely dense stands. Beneath the arrow arum was a layer of lizard's-tail. The water depth at this site was the shallowest of all sites examined. The dip nets were taken at depths ranging from 5-11 cm. By our April sampling date, the drying conditions had reduced the immediate site to a large puddle with only a few areas deep enough to sample. Through our June sample date there continued to be scattered patches of standing water from which to sample. However, standing water in the area undoubtedly disappears by summers' end during most years.

Marsh community (site 4)

A marsh is a community in which "graminoid plants dominate... and which has water near or above the surface for most of the year" (INAI). Two marsh communities are found along the southern edge of the Lovets Pond area. We chose to sample the western-most one because it was more accessible. The entire community was approximately 1 ha in size with water occupying about half the area. This marsh was connected to the true swamp community of site 3 by a narrow channel through a thick growth of arrow arum. Surrounding the standing water zone was primarily bur reed (Sparganium eurycarpum). Arrow arum, giant bulrush (Scirpus tabernaemontanii), water plantain (Alisma plantago-aquatica), common cat-tail (Typha latifolia), arrowleaf (Sagittaria sp.), smartweed (Polygonum spp.), and sedges (Carex spp.) were interspersed throughout. Covering the water surface along the inner edge of the standing water in spring and/or early summer were duckweeds, water meal, sponge plant, and creeping primrose willow (Ludwigia peploides). These species eventually covered the water surface as summer progressed. Coontail, pondweed, and various algae were thick beneath the surface.

Prior to our first field visit in January, the entire southern edge of the marsh had been burned. Approximately five muskrat dens were seen at that time, but by the February sample date, 21 dens had been built. The dead vegetation that was beneath the water's surface during January had been degraded a great deal by February and new growth had appeared. Water snakes (Nerodia sp.) were abundant beginning at the May sample date.

DISCUSSION AND COMPARISON OF THE AQUATIC MACROINVERTEBRATE COMMUNITIES

A total of 12,078 macroinvertebrates were collected and identified into 104 taxa (see Tables 1-4). This, however, is a conservative estimate of the total number of taxa due to the fact that several abundant groups of organisms (i.e., Oligochaeta, Chironomidae, Planorbidae) were not identified to lower taxonomic levels because of the large number of individuals therein.

The true swamp and marsh communities had the highest numbers of taxa, 58 and 60, respectively (Table 5). The highest number of individuals (4807) was found in the true swamp while the marsh yielded an intermediate number (2193). The lowest number of taxa (37) was found in the pond community. That site also yielded the lowest number of individuals (1043). Sampling of the shrub-swamp community yielded 51 taxa and 4035 individuals.

Species diversity (H') was generally highest in each community during the latter portion of the sampling period (April, May, and June). Diversity values ranged from 0.284 to 1.118; however, no one community consistently exhibited the highest or lowest values. Species dominance values (d) ranged from 0.128 to 0.706. For dip net samples yielding a dominance value greater than 0.355, aquatic earthworms (Oligochaeta), midges (Chironomidae), aquatic sowbugs (Asellidae), and/or fingernail clams (Sphaerium sp.) were found in abundance.

Many other noteworthy differences in macroinvertebrate community composition were found among the four communities. The shrub-swamp (site 2) and true swamp (site 3) communities were found to have 2-4 times more aquatic earthworms (Oligochaeta) than either the pond (site 1) or marsh community (site 4). In general, oligochaetes were most abundant during February and March with decreasing numbers from April through June. In each community, the oligochaetes were the most abundant group. Leeches (Hirudinea) were most abundant and diverse in the marsh where five taxa were found. As with the oligochaetes, the isopod, Asellus forbesi, was most numerous (greater than 350 individuals) in the shrub-swamp and true swamp communities compared to the pond and marsh sites (13 and 6 individuals, respectively). Sampling of the true swamp community also yielded a high number (370) of amphipods (Crangonyx sp.), while that taxon was either not collected or collected in low numbers from the other communities. Dip net sampling of crayfishes (Decapoda) did not yield large adults due to their ability to escape; however, two species of dwarf crayfishes were captured, (Procambarus acutus and Cambarellus shufeldtii). The collection of C. shufeldtii at Lovets Pond is a northwestern extension of its known range for Illinois (see "Crayfishes and Shrimp of Illinois", by L. M. Page, 1985, Illinois Natural History Survey).

Distinct differences were also found in the aquatic insect community composition of the four sampling sites. Mayflies were collected primarily from the marsh; none were collected from either the pond or true swamp. Odonates (dragonflies and damselflies) were more abundant in the shrub-swamp and the marsh communities than in the pond or true swamp. In each community, the true bugs (Hemiptera) were collected primarily during the April, May, and June sample dates. Water boatmen (Corixidae) were the most numerous and speciose of the true bug families. Water boatmen were especially abundant in the marsh. The caddisfly, Ptilostomis sp., was infrequently collected from each community with the exception of the pond. Two other caddisfly species

were collected from the shrub-swamp (see Table 2). The shrub-swamp and true swamp communities yielded the highest numbers of beetle (Coleoptera) taxa (11 and 17, respectively). The lowest number of beetle species (4) and individuals (13) was found in the pond community. Midges (Chironomidae) were collected in almost every dip net sample and were most numerous in the shrub-swamp and true swamp (951 and 760 individuals, respectively). The pond and shrub-swamp communities revealed a similar dipteran fauna (6 taxa) as did the true swamp and marsh (13 and 12 taxa, respectively).

Snails (Gastropoda) and clams (Pelecypoda) were found in each community. Each community yielded a large number of snails (greater than 400) with the exception of the pond which yielded fewer (less than 60). The true swamp yielded the highest number (600) of fingernail clams (Sphaerium sp.) of any site.

Table 1. The number of individuals collected in each aquatic macroinvertebrate taxon during January through June 1986 from the pond community (site 1) of Lovets Pond, Jackson County, Illinois. Shannon diversity and Simpson dominance values are provided for each sample date.

TAXON	NUMBER OF INDIVIDUALS COLLECTED IN EACH DIP NET AT EACH SAMPLE DATE												TOTAL
	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	
Phylum Annelida													
Class Oligochaeta	9	7	74	86	53	5	44	35	27	30	37	4	411
Class Hirudinea													
Order Rhynchobdellida													
Family Glossiphoniidae													
<u>Helobdella triserialis</u>	-	-	-	-	-	-	-	-	-	-	1	2	3
Order Gnathobdellida													
Family Hirudinidae													
<u>Haemopsis plumbea</u>	1	-	-	-	-	-	-	1	-	-	-	-	2
<u>Haemopsis sp. 1</u>	-	2	-	-	-	-	-	-	-	-	-	-	2
Phylum Arthropoda													
Class Crustacea													
Order Isopoda													
Family Asellidae													
<u>Asellus forbesi</u> ?	2	2	-	-	-	-	1	8	-	-	-	-	13
Order Decapoda													
Family Cambaridae													
<u>Cambarellus shufeldtii</u>	-	-	-	-	-	-	-	-	-	-	2	-	2
Class Insecta													
Order Odonata													
Family Libellulidae													
<u>Erythemis sp.</u>	-	1	-	-	-	-	-	-	-	-	-	-	1
<u>Erythrodiplax sp.</u>	-	2	-	-	-	-	-	-	-	-	-	-	2
<u>Pachydiplax longipennis</u>	5	8	-	-	-	-	-	1	-	-	-	-	14
Family Lestidae													
<u>Lestes sp.</u>	-	-	-	-	-	3	-	-	-	-	-	-	3
Family Coenagrionidae													
<u>Ischnura sp.</u>	1	-	-	-	-	-	-	2	-	-	-	-	3

Table 1 continued

TAXON	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		TOTAL
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	
Family Chaoboridae													
<u>Chaoborus</u> sp.	5	5	-	-	-	5	1	16	-	8	14	6	60
Family Ceratopogonidae													
<u>Palpomyia/Sphaeromyia</u> sp.	2	4	6	10	5	-	7	3	1	-	-	-	38
Family Chironomidae	48	94	25	26	24	12	9	9	6	10	2	2	267
Family Sciomyzidae													
<u>Sepedon</u> sp.	-	-	-	-	-	-	-	-	1	-	-	-	1
Family Ephydriidae	-	-	1	-	-	-	-	-	-	-	-	-	1
Phylum Mollusca													
Class Gastropoda													
Order Basommatophora													
Family Lymnaeidae													
<u>Lymnaea</u> sp. 1	1	-	1	-	-	-	-	-	-	-	-	-	2 [†]
<u>Lymnaea</u> sp. 2	-	1	-	-	-	-	-	-	-	-	1	-	2
Family Physidae													
<u>Physa</u> sp.	2	4	3	2	2	-	-	6	3	7	6	3	38
Family Planorbidae													
<u>Helisoma</u> and <u>Gyraulus</u> spp.	1	1	1	-	2	-	-	1	2	2	1	2	13
Class Pelecypoda													
Family Sphaeriidae													
<u>Sphaerium</u> sp. ?	-	7	3	3	3	1	1	-	1	2	-	1	22
TOTAL NUMBER OF INDIVIDUALS:	220		241		116		235		118		113		1043
TOTAL NUMBER OF TAXA:	20		8		9		17		12		15		37
SHANNON DIVERSITY BASE 10 (H')	0.663		0.444		0.596		0.868		0.732		0.916		
SIMPSON DOMINANCE (1):	0.431		0.491		0.353		0.192		0.282		0.186		

Table 2. The number of individuals collected in each aquatic macroinvertebrate taxon during January through June 1986 for the buttonbush (Cephalanthes occidentalis) shrub-swamp community (site 2) of Lovets Pond, Jackson County, Illinois. Shannon diversity and Simpson dominance values are provided for each sample date.

TAXON	NUMBER OF INDIVIDUALS COLLECTED IN EACH DIP NET AT EACH SAMPLE DATE												TOTAL
	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	
Phylum Annelida													
Class Oligochaeta	56	40	189	393	84	135	94	418	26	27	9	24	1495
Class Hirudinea													
Order Rhynchobdellida													
Family Glossiphoniidae													
<u>Helobdella triserialis</u>	-	-	1	-	-	-	-	-	-	-	-	1	2
Phylum Arthropoda													
Class Crustacea													
Order Isopoda													
Family Asellidae													
<u>Asellus forbesi</u> ?	36	112	17	-	5	3	159	18	3	1	-	-	354
Order Amphipoda													
Family Gammaridae													
<u>Crangonyx</u> sp.	-	4	12	4	1	-	10	-	10	-	-	-	41
Order Decapoda													
Family Cambaridae													
<u>Procambarus acutus</u>	-	1	2	-	-	-	5	1	-	18	-	-	27
<u>Procambarus acutus</u> ? (immature)	-	-	-	1	-	2	-	-	36	-	3	1	43
Class Insecta													
Order Ephemeroptera													
Family Caenidae													
<u>Caenis</u> sp.	-	-	-	-	-	1	-	2	-	-	-	-	3
Order Odonata													
Family Libellulidae													
<u>Erythemis</u> sp.	-	-	2	-	-	-	-	-	4	7	-	-	13
<u>Pachydiplax longipennis</u>	6	-	-	2	-	3	3	-	6	11	-	-	31

Table 2 continued

TAXON	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		TOTAL
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	
Family Corduliidae													
<u>Somatochlora</u> sp.	-	-	-	-	-	-	-	-	3	-	-	-	3
Family Lestidae													
<u>Lestes</u> sp.	-	-	-	-	-	-	1	-	1	1	-	-	3
Family Coenagrionidae													
<u>Ischnura</u> sp.	-	2	2	-	-	-	2	3	5	6	-	2	22
Order Hemiptera													
Family Notonectidae													
<u>Buenoa</u> sp. (immature)	-	-	-	-	-	-	-	-	-	-	1	-	1
<u>Notonecta</u> sp.	-	-	-	-	-	-	-	-	1	-	-	1	2
<u>Notonecta</u> sp. (immature)	-	-	-	-	-	-	-	-	-	-	1	-	1
<u>Notonecta</u> <u>raleighi</u>	-	-	1	-	-	-	-	-	-	-	-	-	1
Family Pleidae													
<u>Neoplea</u> <u>striola</u>	-	-	-	-	1	2	1	-	-	-	-	2	6
Family Naucoridae													
<u>Pelocoris</u> <u>femoratus</u>	1	-	-	-	-	-	-	-	-	-	-	-	1
Family Belostomatidae													
<u>Belostoma</u> <u>lutarium</u>	1	-	-	-	-	-	-	-	-	-	-	2	3
Family Corixidae													
nymphs	-	-	-	-	-	-	5	10	6	5	-	-	26
<u>Sigara</u> sp.	-	-	-	-	-	-	-	-	4	4	-	-	8
<u>Trichocorixa</u> <u>calva</u>	-	-	-	-	-	6	-	5	3	11	-	-	25
<u>Trichocorixa</u> <u>kanza</u>	-	-	2	-	2	5	3	1	3	20	-	1	37
Order Megaloptera													
Family Corydalidae													
<u>Chauliodes</u> <u>rasticornis</u>	-	-	-	-	-	-	-	-	-	-	-	4	4
Order Trichoptera													
Family Hydroptilidae													
<u>Orthotrichia</u> sp.	-	-	-	-	-	-	-	-	-	-	1	-	1
Family Leptoceridae													
<u>Triaenodes</u> <u>abus</u>	-	-	-	-	-	-	2	-	-	-	-	-	2

Table 2 continued

TAXON	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		TOTAL
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	
Family Phryganeidae													
<u>Ptilostomis</u> sp.	-	1	-	-	-	-	-	-	-	-	-	-	1
Order Lepidoptera													
Family Pyralidae													
<u>Schoenobius</u> sp.	-	-	-	-	-	-	-	1	-	-	-	-	1
Order Coleoptera													
Family Haliplidae													
<u>Peltodytes</u> sp. (larvae)	-	-	-	-	-	-	-	-	8	6	-	-	14
<u>Peltodytes dietrichi</u> (adults)	-	-	-	-	-	-	1	-	-	-	-	-	1
Family Dytiscidae													
<u>Laccophilus</u> sp. (larvae)	-	-	-	-	-	-	-	-	4	4	1	-	9
<u>Hydrovatus</u> sp. (adults)	-	-	-	-	-	-	-	-	-	1	-	-	1
<u>Hydroporus</u> sp. (larvae)	-	-	-	-	-	-	2	4	3	-	-	-	9
<u>Hydroporus</u> sp.1 (adult)	5	1	7	-	-	-	1	-	-	-	-	-	14 ⁺
<u>Hygrotus</u> sp. (adult)	5	4	1	-	1	1	4	-	7	1	-	-	24 ^c
<u>Coptotomus interrogatus</u> (ad.)	-	-	1	-	-	-	-	-	-	-	-	-	1
<u>Cybister</u> sp. (larvae)	-	-	-	-	-	-	-	-	-	1	-	-	1
Family Hydrochidae													
<u>Hydrochus</u> sp. (larvae)	-	-	-	-	-	-	-	-	1	-	-	-	1
Family Hydrophilidae													
<u>Tropisternus</u> sp. (larvae)	-	-	-	-	-	-	-	-	1	-	-	-	1
Order Diptera													
Family Chaoboridae													
<u>Chaoborus</u> sp.	4	1	-	4	-	-	-	-	-	-	-	-	9
Family Ceratopogonidae													
<u>Palpomyia/Sphaeromias</u> sp.	-	-	-	-	-	-	-	14	-	-	2	2	18
Family Chironomidae	87	63	94	136	155	136	25	29	40	28	118	40	951
Family Sciomyzidae													
<u>Sepedon</u> sp.	-	-	-	-	-	-	-	-	-	1	-	1	2
Family Calliphoridae	-	-	-	-	-	-	-	-	-	-	-	1	1
Family Muscidae	-	-	-	-	-	-	-	2	-	-	-	-	2

Table 2 continued

TAXON	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		TOTAL
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	
Phylum Mollusca													
Class Gastropoda													
Order Basommatophora													
Family Lymnaeidae													
<u>Lymnaea</u> sp. 1	1	-	-	-	-	-	-	-	-	2	1	-	4
<u>Lymnaea</u> sp. 2	-	-	-	-	-	-	-	2	-	-	-	1	3
Family Physidae													
<u>Physa</u> sp.	4	17	12	42	1	9	1	51	80	78	82	164	541
Family Planorbidae													
<u>Helisoma</u> and <u>Gyraulus</u> spp.	4	8	12	7	1	6	4	12	10	11	11	10	96
Order Mesogastropoda													
Family Viviparidae													
<u>Viviparus</u> sp.	-	-	-	-	-	-	-	-	1	-	-	-	1
Class Pelecypoda													
Family Sphaeriidae													
<u>Sphaerium</u> sp. ?	35	27	26	12	14	4	2	21	13	12	3	5	174
<hr/>													
TOTAL NUMBER OF INDIVIDUALS:	526		982		578		919		535		495		4035
TOTAL NUMBER OF TAXA:	17		19		14		25		30		22		51
SHANNON DIVERSITY BASE 10 (H')	0.793		0.567		0.530		0.692		1.118		0.614		
SIMPSON DOMINANCE (1):	0.211		0.412		0.399		0.356		0.128		0.356		

Table 3. The number of individuals collected in each aquatic macroinvertebrate taxon during January through June 1986 for the true swamp community (site 3). Shannon diversity and Simpson dominance values are provided for each sample date.

TAXON	NUMBER OF INDIVIDUALS COLLECTED IN EACH DIP NET AT EACH SAMPLE DATE												TOTAL
	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	
Phylum Annelida													
Class Oligochaeta	235	96	131	534	439	506	29	20	1	3	44	-	2038
Class Hirudinea													
Order Rhynchobdellida													
Family Glossiphoniidae													
<u>Helobdella triserialis</u>	-	-	-	-	-	-	3	-	2	-	-	2	7
<u>Helobdella fusca</u>	-	-	-	-	-	-	-	1	-	-	-	-	1
Phylum Arthropoda													
Class Crustacea													
Order Isopoda													
Family Asellidae													
<u>Asellus forbesi</u> ?	149	37	-	4	-	-	105	63	-	-	-	-	358
Order Amphipoda													
Family Gammaridae													
<u>Crangonyx</u> sp.	3	-	5	35	-	-	113	214	-	-	-	-	370
Order Decapoda													
Family Cambaridae													
<u>Cambarellus shufeldtii</u>	-	-	-	-	-	-	-	-	-	-	-	2	2
<u>Procambarus acutus</u>	-	-	1	-	-	-	-	3	-	2	-	-	6
<u>Procambarus acutus</u> ? (immature)	-	-	-	3	-	-	-	-	1	-	-	-	4
Class Insecta													
Order Odonata													
Family Libellulidae													
<u>Pachydiplax longipennis</u>	-	-	-	-	-	-	-	2	1	-	-	-	3
Family Lestidae													
<u>Lestes</u> sp.	-	-	-	-	-	-	2	9	-	-	-	-	11

Table 3 continued

TAXON	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		TOTAL
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	
Family Coenagrionidae													
<u>Ischnura</u> sp.	-	-	1	-	-	-	-	-	-	-	-	-	1
Order Hemiptera													
Family Gerridae													
<u>Gerris argenticollis</u>	-	-	-	-	-	-	-	-	1	-	-	-	1
<u>Gerris marginatus</u>	-	-	-	-	-	-	-	1	-	-	-	-	1
Family Notonectidae													
<u>Buenoa</u> sp. (immature)	-	-	-	-	-	-	-	10	-	-	-	-	10
<u>Notonecta</u> sp. (immature)	-	-	-	-	-	-	3	-	3	3	-	-	9
Family Naucoridae													
<u>Pelocoris femoratus</u>	1	-	-	-	-	-	-	-	-	-	-	-	1
Family Belostomatidae													
<u>Belostoma lutarium</u>	1	-	-	-	-	-	-	-	-	-	-	-	1
Family Corixidae													
nymphs	-	-	-	-	-	-	-	-	-	1	-	-	1
<u>Sigara</u> sp.	-	-	-	-	-	-	-	-	1	-	2	1	4
<u>Trichocorixa kanza</u>	-	-	-	-	-	-	-	-	1	-	-	1	2
Order Megaloptera													
Family Corydalidae													
<u>Chauliodes rasticornis</u>	1	-	-	-	-	-	-	-	-	-	5	2	8
Order Trichoptera													
Family Phryganeidae													
<u>Ptilostomis</u> sp.	2	1	-	-	-	-	-	-	-	-	-	-	3
Order Coleoptera													
Family Haliplidae													
<u>Peltodytes dietrichi</u> (adult)	1	-	-	-	-	-	-	-	-	-	-	-	1
<u>Peltodytes sexmaculatus</u> (ad.)	-	-	-	-	-	-	-	1	-	-	-	-	1

Table 3 continued

TAXON	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		TOTAL
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	
Family Dolichopodidae	-	-	7	-	6	12	-	-	-	-	-	-	25
Family Sciomyzidae													
<u>Sepedon</u> sp.	-	-	-	-	-	-	-	-	-	-	-	1	1
Family Ephydriidae	-	-	-	-	-	-	-	-	-	-	-	3	3
Family Muscidae	-	-	-	-	-	-	-	-	-	-	-	7	7
Phylum Mollusca													
Class Gastropoda													
Order Basommatophora													
Family Lymnaeidae													
<u>Lymnaea</u> sp. 1	-	-	-	-	-	-	-	-	-	-	1	-	1
<u>Lymnaea</u> sp. 2	9	2	9	8	-	1	16	21	-	-	3	5	74
Family Physidae													
<u>Physa</u> sp.	24	14	4	11	3	1	66	37	28	36	27	27	278 ⁿ
Family Planorbidae													
<u>Helisoma</u> and <u>Gyraulus</u> spp.	24	2	2	17	5	4	15	19	9	11	3	2	113
Order Mesogastropoda													
Family Viviparidae													
<u>Viviparus</u> sp.	8	2	3	11	5	-	2	5	-	-	-	2	38
Class Pelecypoda													
Family Sphaeriidae													
<u>Sphaerium</u> sp. ?	12	6	57	91	152	49	37	44	34	29	55	36	602
TOTAL NUMBER OF INDIVIDUALS:	640		943		1187		1259		521		257		4807
TOTAL NUMBER OF TAXA:	16		14		10		30		17		22		58
SHANNON DIVERSITY BASE 10 (H')	0.610		0.474		0.284		0.888		0.497		0.872		
SIMPSON DOMINANCE (1):	0.358		0.525		0.663		0.184		0.485		0.207		

Table 4. The number of individuals collected in each aquatic macroinvertebrate taxon during January through June 1986 from the marsh community (site 4) of Lovets Pond, Jackson County, Illinois. Shannon diversity and Simpson dominance values are provided for each sample date.

TAXON	NUMBER OF INDIVIDUALS COLLECTED IN EACH DIP NET AT EACH SAMPLE DATE													
	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		TOTAL	
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2		
Phylum Annelida														
Class Oligochaeta	148	87	302	76	46	37	15	6	-	-	3	1	721	
Class Hirudinea														
Order Rhynchobdellida														
Family Glossiphoniidae														
<u>Helobdella triserialis</u>	-	-	2	-	-	1	2	2	6	-	-	-	13	
<u>Helobdella elongata</u>	-	-	-	-	-	-	-	-	-	1	-	-	1	
Order Gnathobdellida														
Family Hirudinidae														
<u>Haemopsis plumbea</u>	-	-	-	-	-	-	1	-	-	-	-	-	1	
<u>Haemopsis grandis</u>	2	-	-	-	-	-	-	-	-	-	-	-	2	
<u>Haemopsis ? sp. 2</u>	1	-	-	-	-	-	-	-	-	-	-	-	1	
Phylum Arthropoda														
Class Crustacea														
Order Isopoda														
Family Asellidae														
<u>Asellus forbesi ?</u>	6	-	-	-	-	-	-	-	-	-	-	-	6	
Order Amphipoda														
Family Talitridae														
<u>Hyalella azteca</u>	-	-	-	-	-	-	-	-	1	1	-	-	2	
Family Gammaridae														
<u>Crangonyx sp.</u>	1	-	1	-	-	-	-	-	-	-	-	-	2	
Order Decapoda														
Family Cambaridae														
<u>Cambarellus shufeldtii</u>	-	-	-	-	-	-	1	-	-	-	-	-	1	
<u>Procambarus acutus</u>	-	-	1	-	1	-	10	-	3	-	-	-	15	

Table 4 continued

TAXON	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		TOTAL
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	
Class Insecta													
Order Ephemeroptera													
Family Baetidae													
<u>Callibaetis ferugineus</u>	-	-	-	-	-	-	-	-	2	2	-	-	4
Family Ephemerellidae													
<u>Ephemerella dorothea</u>	-	-	-	-	-	-	-	-	1	-	-	-	1
Family Caenidae													
<u>Caenis sp.</u>	1	-	-	-	-	-	15	5	6	1	-	-	28
Order Odonata													
Family Libellulidae													
<u>Erythemis sp.</u>	5	-	-	-	-	-	2	-	-	-	-	-	7
<u>Pachydiplax longipennis</u>	6	-	2	-	-	-	20	3	2	-	-	-	33
Family Aeshnidae													
<u>Anax junius</u>	-	-	-	-	-	-	-	-	-	-	-	1	1
<u>Anax verticalis ?</u>	-	-	-	-	-	-	-	-	1	-	-	-	1
Family Coenagrionidae													
<u>Ischnura sp.</u>	7	2	-	-	-	-	4	-	3	-	-	-	16
Order Hemiptera													
Family Notonectidae													
<u>Buenoa sp.</u>	-	-	-	-	-	-	-	-	-	-	-	1	1
<u>Notonecta sp.</u>	-	-	-	-	-	-	-	-	-	2	-	-	2
<u>Notonecta raleighi</u>	-	-	-	-	-	-	-	-	-	-	-	1	1
Family Pleidae													
<u>Neoplea striola</u>	-	-	-	-	-	-	-	-	-	11	-	-	11
Family Belostomatidae													
<u>Belostoma lutarium</u>	-	-	-	-	-	-	-	-	1	-	-	-	1

Table 4 continued

TAXON	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		TOTAL
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	
Family Corixidae													
nymphs	-	-	-	-	-	-	-	3	44	82	-	1	130
<u>Hesperocorixa</u> sp. 1	-	-	-	-	-	-	-	-	-	-	18	27	45
<u>Hesperocorixa</u> sp. 2	-	-	-	-	-	-	-	-	-	-	1	2	3
<u>Ramphocorixa</u> <u>acuminata</u>	-	-	-	-	-	-	-	-	-	-	-	1	1
<u>Sigara</u> sp.	-	-	-	-	1	-	-	-	33	26	-	1	61
<u>Trichocorixa</u> <u>calva</u>	-	-	-	-	-	-	-	-	-	-	-	4	4
<u>Trichocorixa</u> <u>kanza</u>	-	-	-	-	-	-	-	-	8	3	1	10	22
Order Megaloptera													
Family Corydalidae													
<u>Chauliodes</u> <u>rasticornis</u>	-	-	-	-	-	-	-	-	-	-	-	1	1
Order Trichoptera													
Family Phryganeidae													
<u>Ptilostomis</u> sp.	-	-	1	-	-	-	-	-	-	-	-	-	1
Order Coleoptera													
Family Haliplidae													
<u>Peltodytes</u> sp. (adult)	1	-	-	-	-	-	-	-	-	-	-	-	1
<u>Peltodytes</u> <u>muticus</u> (adult)	-	-	-	-	-	-	-	-	-	-	-	1	1
Family Noteridae													
<u>Hydrocanthus</u> sp. (adults)	2	-	-	-	-	-	-	-	-	-	-	3	5
Family Dytiscidae													
<u>Laccophilus</u> <u>proximus</u> (adults)	-	-	-	-	-	-	-	-	-	-	-	2	2
<u>Hydroporus</u> sp.1 (adult)	-	1	-	-	-	-	1	-	-	-	-	-	2
<u>Hygrotus</u> sp. (adults)	5	2	-	-	-	-	-	-	1	-	-	-	8
Family Hydrophilidae													
<u>Tropisternus</u> sp. (larva)	-	1	-	-	-	-	-	-	-	-	-	-	1
<u>Berosus</u> sp. (larva and adult)	-	-	-	-	-	-	-	2	-	-	-	-	2
Family Chrysomelidae													
<u>Donacia</u> sp. (larvae)	-	-	-	-	-	1	2	-	-	-	-	-	3

Table 4 continued

TAXON	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		TOTAL
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	
Order Diptera													
Family Tipulidae													
<u>Hexatoma</u> sp.	-	-	-	-	-	1	-	-	-	-	-	-	1
<u>Pilaria</u> sp.	-	1	-	-	-	-	-	-	-	-	-	-	1
Family Chaoboridae													
<u>Chaoborus</u> sp.	-	-	-	-	-	-	-	-	1	-	-	-	1
Family Ceratopogonidae													
<u>Palpomyia/Sphaeromyias</u> sp.	-	-	-	-	-	-	-	-	3	-	-	-	3
Family Chironomidae													
	3	2	13	-	11	1	38	54	134	50	1	3	310
Family Stratiomyidae													
<u>Hedreiodiscus/Odontomyia</u> sp.	-	-	-	-	-	-	-	-	-	-	-	1	1 ₄
Family Tabanidae													
<u>Chrysops</u> sp.	-	1	-	-	-	-	-	-	1	-	-	-	2
<u>Tabanus</u> sp.	1	-	-	-	-	-	-	-	-	-	-	-	1
Family Dolichopodidae													
	-	-	-	-	-	-	-	-	-	-	1	-	1
Family Syrphidae													
<u>Eristalis</u> sp.	-	1	-	-	-	-	-	-	-	-	-	-	1
Family Ephydriidae													
	-	-	-	-	-	-	-	-	-	-	-	1	1
Family Muscidae													
	-	-	-	-	-	-	-	-	-	-	1	-	1
Phylum Mollusca													
Class Gastropoda													
Order Basommatophora													
Family Lymnaeidae													
<u>Lymnaea</u> sp. 1	-	-	-	-	-	-	-	-	-	-	-	2	2
<u>Lymnaea</u> sp. 2	6	1	4	2	3	1	1	-	2	-	-	1	21
Family Physidae													
<u>Physa</u> sp.	15	-	4	1	2	1	3	5	177	146	8	7	369

Table 4 continued

TAXON	17 Jan 1986		21 Feb 1986		21 Mar 1986		18 Apr 1986		9 May 1986		12 June 1986		TOTAL
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	
Family Planorbidae													
<u>Helisoma</u> and <u>Gyraulus</u> spp.	5	2	8	1	6	2	9	7	8	3	1	3	55
Order Mesogastropoda													
Family Viviparidae													
<u>Viviparus</u> sp.	-	-	-	-	-	-	1	2	1	-	-	-	4
Class Pelecypoda													
Family Sphaeriidae													
<u>Sphaerium</u> sp. ?	6	184	2	32	13	8	-	3	2	-	1	2	253
TOTAL NUMBER OF INDIVIDUALS:	506		452		136		217		769		113		2193
TOTAL NUMBER OF TAXA:	23		11		11		19		26		25		60
SHANNON DIVERSITY BASED (H')	0.626		0.313		0.582		0.893		0.739		1.003		
SIMPSON DIVERSITY (1):	0.359		0.707		0.409		0.216		0.266		0.187		

Table 5. Aquatic macroinvertebrate taxa collected from four aquatic community types at Lovets Pond, Jackson County, Illinois, January through June, 1986.

COMMUNITY TYPE AND SITE NUMBER

TAXON	Pond (Site 1)	Shrub-swamp (Site 2)	True Swamp (Site 3)	Marsh (Site 4)
Phylum Annelida				
Class Oligochaeta	X	X	X	X
Class Hirudinea				
Order Rhynchobdellida				
Family Glossiphoniidae				
<u>Helobdella triserialis</u>	X	X	X	X
<u>Helobdella fusca</u>	-	-	X	-
<u>Helobdella elongata</u>	-	-	-	X
Order Gnathobdellida				
Family Hirudinea				
<u>Haemopsis plumbea</u>	X	-	-	X
<u>Haemopsis grandis</u>	-	-	-	X
<u>Haemopsis</u> sp. 1	X	-	-	-
<u>Haemopsis</u> ? sp. 2	-	-	-	X
Phylum Arthropoda				
Class Crustacea				
Order Isopoda				
Family Asellidae				
<u>Asellus forbesi</u> ?	X	X	X	X
Order Amphipoda				
Family Talitridae				
<u>Hyaella azteca</u>	-	-	-	X
Family Gammaridae				
<u>Crangonyx</u> sp.	-	X	X	X

Table 5 continued

TAXON	Pond (Site 1)	Shrub-swamp (Site 2)	True Swamp (Site 3)	Marsh (Site 4)
Order Decapoda				
Family Cambaridae				
<u>Cambarellus shufeldtii</u>	X	-	X	X
<u>Procambarus acutus</u>	-	X	X	X
<u>Procambarus acutus</u> ? (immature)	-	X	X	-
Class Insecta				
Order Ephemeroptera				
Family Baetidae				
<u>Callibaetis ferugineus</u>	-	-	-	X
Family Ephemerellidae				
<u>Ephemerella dorothea</u>	-	-	-	X
Family Caenidae				
<u>Caenis</u> sp.	-	X	-	X
Order Odonata				
Family Libellulidae				
<u>Erythemis</u> sp.	X	X	-	X
<u>Erythrodiplax</u> sp.	X	-	-	-
<u>Pachydiplax longipennis</u>	X	X	X	X
Family Corduliidae				
<u>Somatochlora</u> sp.	-	X	-	-
Family Aeshnidae				
<u>Anax junius</u>	-	-	-	X
<u>Anax verticalis</u> ?	-	-	-	X
Family Lestidae				
<u>Lestes</u> sp.	X	X	X	-
Family Coenagrionidae				
<u>Ischnura</u> sp.	X	X	X	X
Order Hemiptera				
Family Mesoveliidae				
<u>Mesovelia mulsanti</u>	X	-	-	-

Table 5 continued

TAXON	Pond (Site 1)	Shrub-swamp (Site 2)	True Swamp (Site 3)	Marsh (Site 4)
Family Gerridae				
<u>Gerris argenticollis</u>	-	-	X	-
<u>Gerris marginatus</u>	X	-	X	-
Family Notonectidae				
<u>Buenoa</u> sp.	X	-	-	X
<u>Buenoa</u> sp. (immature)	-	X	X	-
<u>Notonecta</u> sp.	-	X	-	X
<u>Notonecta</u> sp. (immature)	-	X	X	-
<u>Notonecta raleighi</u>	-	X	-	X
<u>Notonecta undulata</u>	X	-	-	-
Family Pleidae				
<u>Neoplea striola</u>	X	X	-	X
Family Naucoridae				
<u>Pelocoris femoratus</u>	-	X	X	-
Family Belostomatidae				
<u>Belostoma lutarium</u>	X	X	X	X
Family Corixidae				
nymphs	X	X	X	X
<u>Hesperocorixa</u> sp. 1	X	-	-	X
<u>Hesperocorixa</u> sp. 2	X	-	-	X
<u>Ramphocorixa acuminata</u>	-	-	-	X
<u>Sigara</u> sp.	-	X	X	X
<u>Trichocorixa calva</u>	-	X	-	X
<u>Trichocorixa kanza</u>	-	X	X	X
Order Homoptera				
Family Delphacidae ?	X	-	-	-

Table 5 continued

TAXON	Pond (Site 1)	Shrub-swamp (Site 2)	True Swamp (Site 3)	Marsh (Site 4)
Order Megaloptera				
Family Corydalidae				
<u>Chauliodes rasticornis</u>	X	X	X	X
Order Trichoptera				
Family Hydroptilidae				
<u>Orthotrichia</u> sp.	-	X	-	-
Family Leptoceridae				
<u>Triaenodes abus</u>	-	X	-	-
Family Phryganeidae				
<u>Ptilostomis</u> sp.	-	X	X	X
Order Lepidoptera				
Family Pyralidae				
<u>Schoenobius</u> sp.	-	X	-	-
Order Coleoptera				
Family Haliplidae				
<u>Peltodytes</u> sp. (larvae)	-	X	-	-
<u>Peltodytes</u> sp. (adults)	-	-	-	X
<u>Peltodytes dietrichi</u> (ad.)	-	X	X	-
<u>Peltodytes muticus</u> (adults)	-	-	-	X
<u>Peltodytes sexmaculatus</u> (ad.)	-	-	X	-
Family Noteridae				
<u>Hydrocanthus</u> sp. (adults)	X	-	-	X
Family Dytiscidae				
<u>Laccophilus</u> sp. (larvae)	-	X	-	-
<u>Laccophilus proximus</u> (ad.)	-	-	-	X
<u>Hydrovatus</u> sp. (adults)	-	X	-	-
<u>Celina</u> sp. (adult)	-	-	X	-
<u>Hydroporus</u> sp. (larvae)	-	X	-	-
<u>Hydroporus</u> sp.1 (adults)	-	X	X	X
<u>Hydroporus</u> sp.2 (adults)	-	-	X	-

Table 5 continued

TAXON	Pond (Site 1)	Shrub-swamp (Site 2)	True Swamp (Site 3)	Marsh (Site 4)
<u>Hygrotus</u> sp. (adults)	X	X	X	X
<u>Agabus</u> sp. (larvae and adults)	X	-	X	-
<u>Agabetes</u> sp. (adult)	-	-	X	-
<u>Coptotomus interrogatus</u> (ad.)	-	X	-	-
<u>Dytiscus</u> sp. (larvae)	-	-	X	-
<u>Acilius</u> sp. (larvae)	-	-	X	-
<u>Cybister</u> sp. (larvae)	X	X	-	-
Family Hydrochidae				
<u>Hydrochus</u> sp. (larvae)	-	X	-	-
Family Hydrophilidae				
<u>Hydrochara</u> sp. (larvae)	-	-	X	-
<u>Tropisternus</u> sp. (larvae)	-	X	X	X
<u>Tropisternus</u> sp.1 (adult)	-	-	X	-
<u>Tropisternus</u> sp.2 (adult)	-	-	X	-
<u>Berosus</u> sp. (larvae and adults)	-	-	X	X
<u>Enochrus</u> sp.1 (adult)	-	-	X	-
<u>Enochrus</u> sp.2 (adult)	-	-	X	-
Family Chrysomelidae				
<u>Donacia</u> sp. (larvae)	-	-	-	X
Order Diptera				
Unknown larva	X	-	X	-
Family Tipulidae				
<u>Hexatoma</u> sp.	-	-	-	X
<u>Pilaria</u> sp.	-	-	-	X
<u>Tipula</u> sp.	-	-	X	-
Family Chaoboridae				
<u>Chaoborus</u> sp.	X	X	-	X
Family Culicidae				
<u>Anopheles</u> sp.	-	-	X	-
<u>Culiseta</u> sp. 1	-	-	X	-
<u>Culiseta</u> sp. 2	-	-	X	-

Table 5 continued

TAXON	Pond (Site 1)	Shrub-swamp (Site 2)	True Swamp (Site 3)	Marsh (Site 4)
Family Ceratopogonidae <u>Palpomyia/Sphaeromyias</u> sp.	X	X	X	X
Family Chironomidae	X	X	X	X
Family Tabanidae <u>Chrysops</u> sp.	-	-	X	X
<u>Tabanus</u> sp.	-	-	X	X
Family Dolichopodidae	-	-	X	X
Family Stratiomyidae <u>Hedreiodiscus/Odontomyia</u> sp.	-	-	-	X
Family Syrphidae <u>Eristalis</u> sp.	-	-	-	X
Family Sciomyzidae <u>Sepedon</u> sp.	X	X	X	-
Family Ephydriidae	X	-	X	X
Family Calliphoridae	-	X	-	-
Family Muscidae	-	X	X	X
Phylum Mollusca				
Class Gastropoda				
Order Basommatophora				
Family Lymnaeidae <u>Lymnaea</u> sp. 1	X	X	X	X
<u>Lymnaea</u> sp. 2	X	X	X	X
Family Physidae <u>Physa</u> sp.	X	X	X	X

Table 5 continued

TAXON	Pond (Site 1)	Shrub-swamp (Site 2)	True Swamp (Site 3)	Marsh (Site 4)
Family Planorbidae				
<u>Helisoma</u> and <u>Gyraulus</u> spp.	X	X	X	X
Order Mesogastropoda				
Family Viviparidae				
<u>Viviparus</u> sp.	-	X	X	X
Class Pelecypoda				
Family Sphaeriidae				
<u>Sphaerium</u> sp. ?	X	X	X	X
TOTAL NUMBER OF TAXA:	37	51	58	60
TOTAL NUMBER OF INDIVIDUALS:	1043	4035	4807	2193

SUMMARY AND CONCLUSIONS

A distinct aquatic macroinvertebrate community was found to be associated with each of the four aquatic plant communities that were sampled in Lovets Pond. Each macroinvertebrate community was diverse even though the numbers of individuals varied greatly. Community assemblages were those typically found in stable, unpolluted wetland ecosystems. Further qualitative sampling of the abundant and diverse microhabitats observed at Lovets Pond would undoubtedly yield many more taxa.

Based on the data presented herein Lovets Pond is a stable, diverse wetland ecosystem that can be considered representative of the once common Mississippi River bottom wetlands. Lovets Pond should be maintained in the present condition by either state, federal, or local agencies. Justifications for such acquisition are that it represents the once common wetland ecosystems of southern Illinois, its relatively small size provides a manageable resource as a natural area, and its boundaries are well-defined. Furthermore, there is evidence that Lovets Pond is providing a significant year-round habitat as well as wintering ground for many game and non-game species, especially waterfowl. Lovets Pond, if maintained in its current state, could provide an excellent educational environment for public schools, colleges, and universities.

Appendix 1. Computer listings of the calculated values for various diversity indices used in the analysis of macroinvertebrate community diversity for each of the four study sites in Lovets Pond at each sample date.

WIND: SWS, 10-20 KTS, SURFACE

TEMP: 28.5, SURFACE

28.5

28.5

28.5

28.5

28.5

28.5

28.5

28.5

WIND: SWS, 10-20 KTS

TEMP: 28.5, SURFACE

WIND: SWS, 10-20 KTS

TEMP: 28.5, SURFACE

WIND: SWS, 10-20 KTS

TEMP: 28.5, SURFACE

WIND: SWS, 10-20 KTS

TEMP: 28.5, SURFACE

WIND: SWS, 10-20 KTS

TEMP: 28.5, SURFACE

WIND: SWS, 10-20 KTS

TEMP: 28.5, SURFACE

WIND: SWS, 10-20 KTS

TEMP: 28.5, SURFACE

WIND: SWS, 10-20 KTS

TEMP: 28.5, SURFACE

WIND: SWS, 10-20 KTS

EXPLANATIONS

FOR CLARIFICATION

WIND: SWS, 10-20 KTS

0.500

TEMP: 28.5, SURFACE

0.500

WIND: SWS, 10-20 KTS

0.500 (BASE 10)

TEMP: 28.5, SURFACE

0.500 (BASE 10)

WIND: SWS, 10-20 KTS

0.500

Site 1 April

1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1

1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1

	EFFORT	% DIVERSITY
1	0.858	0.945
2	0.781	10.260
3	0.705	1.273 (BASE E)
4	0.650	2.514 (BASE E)
5	0.434	
6	0.399	

Site 1 May

1. Name of the person or organization: [Illegible]
 2. Address: [Illegible]
 3. City: [Illegible]
 4. State: [Illegible]
 5. Zip: [Illegible]
 6. Date: [Illegible]
 7. Name of the person: [Illegible]
 8. Title: [Illegible]
 9. Organization: [Illegible]

10. Name of the person: [Illegible]
 11. Title: [Illegible]

12. Name of the person: [Illegible] 0.000
 13. Name of the person: [Illegible] 0.125
 14. Name of the person: [Illegible] 0.250
 15. Name of the person: [Illegible] 0.375
 16. Name of the person: [Illegible] 0.500
 17. Name of the person: [Illegible] 0.625
 18. Name of the person: [Illegible] 0.750
 19. Name of the person: [Illegible] 0.875
 20. Name of the person: [Illegible] 1.000
 21. Name of the person: [Illegible] 1.125
 22. Name of the person: [Illegible] 1.250
 23. Name of the person: [Illegible] 1.375
 24. Name of the person: [Illegible] 1.500
 25. Name of the person: [Illegible] 1.625
 26. Name of the person: [Illegible] 1.750
 27. Name of the person: [Illegible] 1.875
 28. Name of the person: [Illegible] 2.000

STAFFING

1.2. RESPONSIBILITY

1. Name of the person: [Illegible] 0.000
 2. Name of the person: [Illegible] 0.125
 3. Name of the person: [Illegible] 0.250
 4. Name of the person: [Illegible] 0.375
 5. Name of the person: [Illegible] 0.500
 6. Name of the person: [Illegible] 0.625
 7. Name of the person: [Illegible] 0.750
 8. Name of the person: [Illegible] 0.875
 9. Name of the person: [Illegible] 1.000

0.000
 0.125
 0.250
 0.375
 0.500
 0.625
 0.750
 0.875
 1.000

TABLE 1. VALUE OF THE FRACTIONS

TABLE 1. VALUE OF THE FRACTIONS

1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20

Site 1 June

1	1	15
2	2	17
3	3	19
4	4	21
5	5	23
6	6	25
7	7	27
8	8	29
9	9	31
10	10	33
11	11	35
12	12	37
13	13	39
14	14	41
15	15	43
16	16	45
17	17	47
18	18	49
19	19	51
20	20	53

1	1	15	17
2	2	19	21
3	3	23	25
4	4	27	29
5	5	31	33
6	6	35	37
7	7	39	41
8	8	43	45
9	9	47	49
10	10	51	53
11	11	55	59
12	12	59	63
13	13	63	67
14	14	67	71
15	15	71	75
16	16	75	79
17	17	79	83
18	18	83	87
19	19	87	91
20	20	91	95

Site 2 January

Species	Count	Abundance
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11	1	1
12	1	1
13	1	1
14	1	1
15	1	1
16	1	1
17	1	1
18	1	1
19	1	1
20	1	1
21	1	1
22	1	1
23	1	1
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25	1	1
26	1	1
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66	1	1
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69	1	1
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87	1	1
88	1	1
89	1	1
90	1	1
91	1	1
92	1	1
93	1	1
94	1	1
95	1	1
96	1	1
97	1	1
98	1	1
99	1	1
100	1	1

TOI = 100 * (S^2 / (S^2 - 1)) = 17
 H' = 100 * (S^2 / (S^2 - 1)) = 926

NO. SPECIES: 0.000
 SPECIES DIVERSITY: 0.741
 SPECIES RICHNESS: 0.009
 SPECIES EVENNESS: 0.791
 SPECIES DIVERSITY (BASE 10): 1.784
 SPECIES RICHNESS (BASE 10): 0.211
 SPECIES EVENNESS (BASE 10): 0.739
 SPECIES DIVERSITY (BASE 2): 2.793
 SPECIES RICHNESS (BASE 2): 1.928
 SPECIES EVENNESS (BASE 2): 2.684
 SPECIES DIVERSITY (BASE 10): 0.734
 SPECIES RICHNESS (BASE 10): 1.771
 SPECIES EVENNESS (BASE 10): 2.551

	EVENNESS	NO. DIVERSITY
SPECIES DIVERSITY	0.839	0.940
SPECIES RICHNESS (BASE 10)	0.270	2.129
SPECIES EVENNESS (BASE 10)	0.444	2.837 (BASE 10)
SPECIES DIVERSITY (BASE 2)	0.839	2.854 (BASE 2)
SPECIES RICHNESS (BASE 2)	0.325	

Site 2 February

SP	FR	ST	AN	EPOR	AXDN
1					307
2					1
3					17
4					13
5					2
6					1
7					2
8					1
9					2
10					2
11					1
12					1
13					2
14					1
15					1
16					1
17					1
18					1
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95					1
96					1
97					1
98					1
99					1
100					1

85 40000 1000 17
 101 40000 1000 902

MEAN SPECIES RICHNESS	5.210
MEAN SPECIES RICHNESS	0.604
MEAN SPECIES RICHNESS	0.412
MEAN SPECIES RICHNESS	0.359
MEAN SPECIES RICHNESS	2.433
MEAN SPECIES RICHNESS	1.112
MEAN SPECIES RICHNESS	0.588
MEAN SPECIES RICHNESS	2.433
MEAN SPECIES RICHNESS (BASE 10)	0.517
MEAN SPECIES RICHNESS (BASE 2)	1.705
MEAN SPECIES RICHNESS (BASE 3)	1.593
MEAN SPECIES RICHNESS (BASE 10)	0.533
MEAN SPECIES RICHNESS (BASE 2)	1.272
MEAN SPECIES RICHNESS (BASE 3)	1.537

	EVENSNESS	AXIAL DIVERSITY
MEAN SPECIES RICHNESS	0.621	0.945
MEAN SPECIES RICHNESS	0.126	17.551
MEAN SPECIES RICHNESS	0.443	2.744 (BASE 2)
MEAN SPECIES RICHNESS	0.433	2.742 (BASE 2)
MEAN SPECIES RICHNESS (BASE 2)	0.194	
MEAN SPECIES RICHNESS (BASE 3)	0.149	

POPULATION DENSITY (INDIVIDUALS PER HECTARE)

POPULATION DENSITY IN EACH YEAR

1971	1	210
1972	2	2
1973	3	1
1974	4	2
1975	5	1
1976	6	1
1977	7	2
1978	8	1
1979	9	7
1980	10	1
1981	11	2
1982	12	1
1983	13	1
1984	14	1

Site 2 March

1971 1984 14
1984 1971 14

1971	4.707
1972	0.502
1973	0.578
1974	0.637
1975	0.582
POPULATION DENSITY, YEARLY MEAN	
1971-1984	0.399
1971-1984	0.502
1971-1984	2.506
POPULATION DENSITY (BASE 10)	
1971-1984	0.530
1971-1984	1.221
1971-1984	1.781
POPULATION DENSITY (BASE 10)	
1971-1984	0.513
1971-1984	1.161
1971-1984	1.704

EVENNESS

MAX. DIVERSITY

1971	0.647	0.950
1972	0.175	1.131
1973	0.483	2.635 (BASE 10)
1974	0.484	2.808 (BASE 5)
1975	0.242	
1976	2.184	

Site 2 April

Code	Value	Count
100	100	1
101	101	1
102	102	1
103	103	1
104	104	1
105	105	1
106	106	1
107	107	1
108	108	1
109	109	1
110	110	1
111	111	1
112	112	1
113	113	1
114	114	1
115	115	1
116	116	1
117	117	1
118	118	1
119	119	1
120	120	1
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189	189	1
190	190	1
191	191	1
192	192	1
193	193	1
194	194	1
195	195	1
196	196	1
197	197	1
198	198	1
199	199	1
200	200	1

Site 2 April

INDIVIDUALS: 919

Category	Value
REVENUE	8.071
DEVIANCE	0.825
DIFFERENCE	0.302
REVENUE	0.843
REVENUE	2.815
REVENUE	0.302
REVENUE	0.644
REVENUE	2.010
REVENUE (BASE 10)	0.680
REVENUE (BASE 2)	1.304
REVENUE (BASE 3)	2.100
REVENUE (BASE 10)	0.870
REVENUE (BASE 2)	1.898
REVENUE (BASE 3)	2.133

REVENUE

REVENUE

Category	Value
REVENUE	0.671
REVENUE	0.110
REVENUE	0.495
REVENUE	0.401
REVENUE (BASE 2)	0.197
REVENUE (BASE 3)	0.163

20.671
0.209 (BASE 2)
0.211 (BASE 3)

Site 2 May

Code	Value	Count
01	1	1
02	1	1
03	1	1
04	1	1
05	1	1
06	1	1
07	1	1
08	1	1
09	1	1
10	1	1
11	1	1
12	1	1
13	1	1
14	1	1
15	1	1
16	1	1
17	1	1
18	1	1
19	1	1
20	1	1
21	1	1
22	1	1
23	1	1
24	1	1
25	1	1
26	1	1
27	1	1
28	1	1
29	1	1
30	1	1
31	1	1
32	1	1
33	1	1
34	1	1
35	1	1
36	1	1
37	1	1
38	1	1
39	1	1
40	1	1
41	1	1
42	1	1
43	1	1
44	1	1
45	1	1
46	1	1
47	1	1
48	1	1
49	1	1
50	1	1
51	1	1
52	1	1
53	1	1
54	1	1
55	1	1
56	1	1
57	1	1
58	1	1
59	1	1
60	1	1
61	1	1
62	1	1
63	1	1
64	1	1
65	1	1
66	1	1
67	1	1
68	1	1
69	1	1
70	1	1
71	1	1
72	1	1
73	1	1
74	1	1
75	1	1
76	1	1
77	1	1
78	1	1
79	1	1
80	1	1
81	1	1
82	1	1
83	1	1
84	1	1
85	1	1
86	1	1
87	1	1
88	1	1
89	1	1
90	1	1
91	1	1
92	1	1
93	1	1
94	1	1
95	1	1
96	1	1
97	1	1
98	1	1
99	1	1
100	1	1

TOTAL NUMBER OF SPECIES: 50
 TOTAL NUMBER OF INDIVIDUALS: 533

SHANNON DIVERSITY:	10.629
SHANNON DIVERSITY:	1.277
SIMPSON DOMINANCE:	0.125
SIMPSON DIVERSITY:	0.872
INVERSE SIMPSON DOMINANCE:	7.838
FOR SPECIES RICHNESS, VALLER ARE:	
SIMPSON DOMINANCE:	0.129
SIMPSON DIVERSITY:	0.971
INVERSE SIMPSON DOMINANCE:	7.734
SHANNON DIVERSITY (BASE 10):	1.118
(BASE E):	2.571
(BASE 2):	3.714
SHANNON DIVERSITY (BASE 10):	1.075
(BASE E):	2.475
(BASE 2):	3.670

EVANRICH

SHANNON DIVERSITY

SHANNON DIVERSITY:	0.901	0.928
SHANNON DIVERSITY:	0.107	0.173
SHANNON DIVERSITY:	0.757	3.441 (BASE E)
SHANNON DIVERSITY:	0.722	3.407 (BASE E)
SHANNON DIVERSITY (BASE 10):	0.437	
SHANNON DIVERSITY (BASE 10):	0.418	

Site 2 June

Code	Value	Count
1	1	1
2	2	1
3	3	1
4	4	1
5	5	1
6	6	1
7	7	1
8	8	1
9	9	1
10	10	1
11	11	1
12	12	1
13	13	1
14	14	1
15	15	1
16	16	1
17	17	1
18	18	1
19	19	1
20	20	1
21	21	1
22	22	1
23	23	1
24	24	1
25	25	1
26	26	1
27	27	1
28	28	1
29	29	1
30	30	1
31	31	1
32	32	1
33	33	1
34	34	1
35	35	1
36	36	1
37	37	1
38	38	1
39	39	1
40	40	1
41	41	1
42	42	1
43	43	1
44	44	1
45	45	1
46	46	1
47	47	1
48	48	1
49	49	1
50	50	1
51	51	1
52	52	1
53	53	1
54	54	1
55	55	1
56	56	1
57	57	1
58	58	1
59	59	1
60	60	1
61	61	1
62	62	1
63	63	1
64	64	1
65	65	1
66	66	1
67	67	1
68	68	1
69	69	1
70	70	1
71	71	1
72	72	1
73	73	1
74	74	1
75	75	1
76	76	1
77	77	1
78	78	1
79	79	1
80	80	1
81	81	1
82	82	1
83	83	1
84	84	1
85	85	1
86	86	1
87	87	1
88	88	1
89	89	1
90	90	1
91	91	1
92	92	1
93	93	1
94	94	1
95	95	1
96	96	1
97	97	1
98	98	1
99	99	1
100	100	1

Site 2 June

TOTAL NUMBER OF TAXA: 22
 TOTAL NUMBER OF INDIVIDUALS: 495

SHANNON DIVERSITY:	2.793
SIMPSON DIVERSITY:	0.989
SIMPSON DIVERSITY (BASE 10):	0.314
PILOT DIVERSITY:	0.806
PILOT DIVERSITY (BASE 10):	0.227
SHANNON DIVERSITY (BASE 2):	0.354
PILOT DIVERSITY (BASE 2):	0.344
SHANNON DIVERSITY (BASE 10):	3.812
SHANNON DIVERSITY (BASE 2):	0.319
SHANNON DIVERSITY (BASE 10):	1.412
SHANNON DIVERSITY (BASE 2):	2.041
SHANNON DIVERSITY (BASE 10):	0.038
SHANNON DIVERSITY (BASE 2):	1.354
SHANNON DIVERSITY (BASE 10):	1.954

EVENNESS MAX. DIVERSITY

SIMPSON DIVERSITY:	0.675	0.752
SHANNON DIVERSITY (BASE 10):	0.123	22.977
SHANNON DIVERSITY (BASE 2):	0.458	3.071 (BASE 2)
SHANNON DIVERSITY (BASE 10):	0.443	3.015 (BASE 10)
SHANNON DIVERSITY (BASE 2):	0.187	
SHANNON DIVERSITY (BASE 10):	0.148	

DATA AND DIVERSITY VALUES FOR levels3.1

NOS. OF INDIVIDUALS IN EACH TAXON

Site 3 January

TAXON 1: 331
 TAXON 2: 186
 TAXON 3: 3
 TAXON 4: 1
 TAXON 5: 1
 TAXON 6: 1
 TAXON 7: 3
 TAXON 8: 4
 TAXON 9: 1
 TAXON 10: 11
 TAXON 11: 35
 TAXON 12: 26
 TAXON 13: 10
 TAXON 14: 18
 TAXON 15: 5
 TAXON 16: 1

TOT. NUMBER OF TAXA: 16
 TOT. NUMBER OF INDIVIDUALS: 640

MARGALEF DIVERSITY: 5.345
 MENHINICK DIVERSITY: 0.632
 SIMPSON DOMINANCE: 0.358
 SIMPSON DIVERSITY: 0.642
 INVERSE SIMPSON DOMINANCE: 2.796

FOR NONRANDOM SAMPLE, VALUES ARE:

SIMPSON DOMINANCE: 0.359
 SIMPSON DIVERSITY: 0.641
 INVERSE SIMPSON DOMINANCE: 2.789
 SHANNON DIVERSITY (BASE 10): 0.610
 (BASE E): 1.404
 (BASE 2): 2.025
 BRILLOUIN DIVERSITY (BASE 10): 0.592
 (BASE E): 1.362
 (BASE 2): 1.965

EVENNESS

MAX. DIVERSITY

SIMPSON DIVERSITY: 0.684 0.939
 INVERSE SIMPSON DOMINANCE: 0.171 16.385
 SHANNON DIVERSITY: 0.506 2.773 (BASE E)
 BRILLOUIN DIVERSITY: 0.503 2.710 (BASE E)
 SHELDON EVENNESS (BASE E): 0.254
 HEIF EVENNESS (BASE E): 0.205

Site 3 February

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1970	1	0	0	0	0	0	0	0	0	0	0	0
1971	1	1	1	1	1	1	1	1	1	1	1	1
1972	1	1	1	1	1	1	1	1	1	1	1	1
1973	1	1	1	1	1	1	1	1	1	1	1	1
1974	1	1	1	1	1	1	1	1	1	1	1	1
1975	1	1	1	1	1	1	1	1	1	1	1	1
1976	1	1	1	1	1	1	1	1	1	1	1	1
1977	1	1	1	1	1	1	1	1	1	1	1	1
1978	1	1	1	1	1	1	1	1	1	1	1	1
1979	1	1	1	1	1	1	1	1	1	1	1	1
1980	1	1	1	1	1	1	1	1	1	1	1	1
1981	1	1	1	1	1	1	1	1	1	1	1	1
1982	1	1	1	1	1	1	1	1	1	1	1	1
1983	1	1	1	1	1	1	1	1	1	1	1	1
1984	1	1	1	1	1	1	1	1	1	1	1	1
1985	1	1	1	1	1	1	1	1	1	1	1	1
1986	1	1	1	1	1	1	1	1	1	1	1	1
1987	1	1	1	1	1	1	1	1	1	1	1	1
1988	1	1	1	1	1	1	1	1	1	1	1	1
1989	1	1	1	1	1	1	1	1	1	1	1	1
1990	1	1	1	1	1	1	1	1	1	1	1	1
1991	1	1	1	1	1	1	1	1	1	1	1	1
1992	1	1	1	1	1	1	1	1	1	1	1	1
1993	1	1	1	1	1	1	1	1	1	1	1	1
1994	1	1	1	1	1	1	1	1	1	1	1	1
1995	1	1	1	1	1	1	1	1	1	1	1	1
1996	1	1	1	1	1	1	1	1	1	1	1	1
1997	1	1	1	1	1	1	1	1	1	1	1	1
1998	1	1	1	1	1	1	1	1	1	1	1	1
1999	1	1	1	1	1	1	1	1	1	1	1	1
2000	1	1	1	1	1	1	1	1	1	1	1	1
2001	1	1	1	1	1	1	1	1	1	1	1	1
2002	1	1	1	1	1	1	1	1	1	1	1	1
2003	1	1	1	1	1	1	1	1	1	1	1	1
2004	1	1	1	1	1	1	1	1	1	1	1	1
2005	1	1	1	1	1	1	1	1	1	1	1	1
2006	1	1	1	1	1	1	1	1	1	1	1	1
2007	1	1	1	1	1	1	1	1	1	1	1	1
2008	1	1	1	1	1	1	1	1	1	1	1	1
2009	1	1	1	1	1	1	1	1	1	1	1	1
2010	1	1	1	1	1	1	1	1	1	1	1	1
2011	1	1	1	1	1	1	1	1	1	1	1	1
2012	1	1	1	1	1	1	1	1	1	1	1	1
2013	1	1	1	1	1	1	1	1	1	1	1	1
2014	1	1	1	1	1	1	1	1	1	1	1	1
2015	1	1	1	1	1	1	1	1	1	1	1	1
2016	1	1	1	1	1	1	1	1	1	1	1	1
2017	1	1	1	1	1	1	1	1	1	1	1	1
2018	1	1	1	1	1	1	1	1	1	1	1	1
2019	1	1	1	1	1	1	1	1	1	1	1	1
2020	1	1	1	1	1	1	1	1	1	1	1	1
2021	1	1	1	1	1	1	1	1	1	1	1	1
2022	1	1	1	1	1	1	1	1	1	1	1	1
2023	1	1	1	1	1	1	1	1	1	1	1	1
2024	1	1	1	1	1	1	1	1	1	1	1	1
2025	1	1	1	1	1	1	1	1	1	1	1	1
2026	1	1	1	1	1	1	1	1	1	1	1	1
2027	1	1	1	1	1	1	1	1	1	1	1	1
2028	1	1	1	1	1	1	1	1	1	1	1	1
2029	1	1	1	1	1	1	1	1	1	1	1	1
2030	1	1	1	1	1	1	1	1	1	1	1	1

1970-1971: 14
 1972-1973: 9-0

WATER QUALITY INDEX:	4.170
WATER QUALITY INDEX:	0.405
WATER QUALITY INDEX:	0.525
WATER QUALITY INDEX:	0.475
WATER QUALITY INDEX:	1.904
WATER QUALITY INDEX:	0.474
WATER QUALITY INDEX:	1.091
WATER QUALITY INDEX:	1.575
WATER QUALITY INDEX:	0.452
WATER QUALITY INDEX:	1.064
WATER QUALITY INDEX:	1.575

EVIENCE

WATER QUALITY

WATER QUALITY INDEX:	0.511	0.700
WATER QUALITY INDEX:	0.154	1.177
WATER QUALITY INDEX:	0.413	3.234 (BASE 1)
WATER QUALITY INDEX:	0.405	2.620 (BASE 1)
WATER QUALITY INDEX:	0.213	
WATER QUALITY INDEX:	0.154	

1870	1871	1872
1873	1874	1875
1876	1877	1878
1879	1880	1881
1882	1883	1884
1885	1886	1887
1888	1889	1890
1891	1892	1893
1894	1895	1896
1897	1898	1899
1900	1901	1902

Site 3 March

STATE OF NEW YORK
 LAND OFFICE

1870	1871
1872	1873
1874	1875
1876	1877
1878	1879
1880	1881
1882	1883
1884	1885
1886	1887
1888	1889
1890	1891
1892	1893
1894	1895
1896	1897
1898	1899
1900	1901
1902	1903

VE VOUCH

STATE OF NEW YORK

1870	1871
1872	1873
1874	1875
1876	1877
1878	1879
1880	1881
1882	1883
1884	1885
1886	1887
1888	1889
1890	1891
1892	1893
1894	1895
1896	1897
1898	1899
1900	1901
1902	1903

1870	1871
1872	1873
1874	1875
1876	1877
1878	1879
1880	1881
1882	1883
1884	1885
1886	1887
1888	1889
1890	1891
1892	1893
1894	1895
1896	1897
1898	1899
1900	1901
1902	1903

WATER QUALITY ANALYSIS FOR CONTAMINANTS

Site 3 April

CONCENTRATION OF INDIVIDUALS IN EACH BIN

1000	1	0
1100	1	1
1200	1	1
1300	1	1
1400	1	1
1500	1	1
1600	1	1
1700	1	1
1800	1	1
1900	1	1
2000	1	1
2100	1	1
2200	1	1
2300	1	1
2400	1	1
2500	1	1
2600	1	1
2700	1	1
2800	1	1
2900	1	1
3000	1	1
3100	1	1
3200	1	1
3300	1	1
3400	1	1
3500	1	1
3600	1	1
3700	1	1
3800	1	1
3900	1	1
4000	1	1
4100	1	1
4200	1	1
4300	1	1
4400	1	1
4500	1	1
4600	1	1
4700	1	1
4800	1	1
4900	1	1
5000	1	1
5100	1	1
5200	1	1
5300	1	1
5400	1	1
5500	1	1
5600	1	1
5700	1	1
5800	1	1
5900	1	1
6000	1	1
6100	1	1
6200	1	1
6300	1	1
6400	1	1
6500	1	1
6600	1	1
6700	1	1
6800	1	1
6900	1	1
7000	1	1
7100	1	1
7200	1	1
7300	1	1
7400	1	1
7500	1	1
7600	1	1
7700	1	1
7800	1	1
7900	1	1
8000	1	1
8100	1	1
8200	1	1
8300	1	1
8400	1	1
8500	1	1
8600	1	1
8700	1	1
8800	1	1
8900	1	1
9000	1	1
9100	1	1
9200	1	1
9300	1	1
9400	1	1
9500	1	1
9600	1	1
9700	1	1
9800	1	1
9900	1	1
10000	1	1

BASE 10 LOG OF TOTAL = 30
 BASE 10 LOG OF INDIVIDUALS = 12.29

WATER QUALITY	9.322
WATER QUALITY	0.845
WATER QUALITY	0.109
WATER QUALITY	0.811
WATER QUALITY	0.301
WATER QUALITY	0.129
WATER QUALITY	0.811
WATER QUALITY	5.082
WATER QUALITY (BASE 10):	3.052
WATER QUALITY (BASE 2):	2.045
WATER QUALITY (BASE 2):	2.980
WATER QUALITY (BASE 10):	0.870
WATER QUALITY (BASE 2):	2.003
WATER QUALITY (BASE 2):	2.990

EVENNESS MAX. DIVERSITY

WATER QUALITY:	0.829	0.947
WATER QUALITY DEFICIENCY:	0.173	30.709
WATER QUALITY DIVERSITY:	0.301	31.401 (BASE 10)
WATER QUALITY DIVERSITY:	0.395	31.422 (BASE 2)
WATER QUALITY DEFICIENCY (BASE 10):	0.258	
WATER QUALITY DEFICIENCY (BASE 2):	0.232	

TABLE 1. TAXONOMIC VALUES FOR Level 3 E

TABLE 1. TAXONOMIC VALUES FOR Level 3 E

TAXON	1	2
1	4	
2	2	
3	2	
4	1	
5	1	
6	0	
7	1	
8	1	
9	1	
10	1	
11	1	
12	1	
13	1	
14	1	
15	1	
16	1	
17	64	
18	10	
19	60	

Site 3 May

100% = 17
 100% = 511

TAXONIC DIVERSITY	1.559
MAX. DIVERSITY	0.743
PILOTAGE DIVERSITY	0.484
PILOTAGE EVENNESS	0.516
PILOTAGE DIVERSITY (BASE 10)	2.065
PILOTAGE DIVERSITY (BASE 2)	0.485
PILOTAGE DIVERSITY (BASE 2)	0.515
PILOTAGE DIVERSITY (BASE 10)	2.061
PILOTAGE DIVERSITY (BASE 10)	0.497
PILOTAGE DIVERSITY (BASE 2)	1.244
PILOTAGE DIVERSITY (BASE 2)	1.650
PILOTAGE DIVERSITY (BASE 10)	0.477
PILOTAGE DIVERSITY (BASE 2)	1.049
PILOTAGE DIVERSITY (BASE 2)	1.566

EVENNESS

MAX. DIVERSITY

PILOTAGE DIVERSITY	0.547	0.945
PILOTAGE DIVERSITY (BASE 10)	0.118	17.540
PILOTAGE DIVERSITY (BASE 2)	0.404	2.033 (BASE 2)
PILOTAGE DIVERSITY (BASE 2)	0.389	2.028 (BASE 2)
PILOTAGE DIVERSITY (BASE 10)	0.115	
PILOTAGE DIVERSITY (BASE 2)	0.124	

Site 3 June

Parameter	Value	Unit
W	0.1	1/m
W ₁	0.1	1/m
W ₂	0.1	1/m
W ₃	0.1	1/m
W ₄	0.1	1/m
W ₅	0.1	1/m
W ₆	0.1	1/m
W ₇	0.1	1/m
W ₈	0.1	1/m
W ₉	0.1	1/m
W ₁₀	0.1	1/m
W ₁₁	0.1	1/m
W ₁₂	0.1	1/m
W ₁₃	0.1	1/m
W ₁₄	0.1	1/m
W ₁₅	0.1	1/m
W ₁₆	0.1	1/m
W ₁₇	0.1	1/m
W ₁₈	0.1	1/m
W ₁₉	0.1	1/m
W ₂₀	0.1	1/m
W ₂₁	0.1	1/m
W ₂₂	0.1	1/m
W ₂₃	0.1	1/m
W ₂₄	0.1	1/m
W ₂₅	0.1	1/m
W ₂₆	0.1	1/m
W ₂₇	0.1	1/m
W ₂₈	0.1	1/m
W ₂₉	0.1	1/m
W ₃₀	0.1	1/m
W ₃₁	0.1	1/m
W ₃₂	0.1	1/m
W ₃₃	0.1	1/m
W ₃₄	0.1	1/m
W ₃₅	0.1	1/m
W ₃₆	0.1	1/m
W ₃₇	0.1	1/m
W ₃₈	0.1	1/m
W ₃₉	0.1	1/m
W ₄₀	0.1	1/m
W ₄₁	0.1	1/m
W ₄₂	0.1	1/m
W ₄₃	0.1	1/m
W ₄₄	0.1	1/m
W ₄₅	0.1	1/m
W ₄₆	0.1	1/m
W ₄₇	0.1	1/m
W ₄₈	0.1	1/m
W ₄₉	0.1	1/m
W ₅₀	0.1	1/m
W ₅₁	0.1	1/m
W ₅₂	0.1	1/m
W ₅₃	0.1	1/m
W ₅₄	0.1	1/m
W ₅₅	0.1	1/m
W ₅₆	0.1	1/m
W ₅₇	0.1	1/m
W ₅₈	0.1	1/m
W ₅₉	0.1	1/m
W ₆₀	0.1	1/m
W ₆₁	0.1	1/m
W ₆₂	0.1	1/m
W ₆₃	0.1	1/m
W ₆₄	0.1	1/m
W ₆₅	0.1	1/m
W ₆₆	0.1	1/m
W ₆₇	0.1	1/m
W ₆₈	0.1	1/m
W ₆₉	0.1	1/m
W ₇₀	0.1	1/m
W ₇₁	0.1	1/m
W ₇₂	0.1	1/m
W ₇₃	0.1	1/m
W ₇₄	0.1	1/m
W ₇₅	0.1	1/m
W ₇₆	0.1	1/m
W ₇₇	0.1	1/m
W ₇₈	0.1	1/m
W ₇₉	0.1	1/m
W ₈₀	0.1	1/m
W ₈₁	0.1	1/m
W ₈₂	0.1	1/m
W ₈₃	0.1	1/m
W ₈₄	0.1	1/m
W ₈₅	0.1	1/m
W ₈₆	0.1	1/m
W ₈₇	0.1	1/m
W ₈₈	0.1	1/m
W ₈₉	0.1	1/m
W ₉₀	0.1	1/m
W ₉₁	0.1	1/m
W ₉₂	0.1	1/m
W ₉₃	0.1	1/m
W ₉₄	0.1	1/m
W ₉₅	0.1	1/m
W ₉₆	0.1	1/m
W ₉₇	0.1	1/m
W ₉₈	0.1	1/m
W ₉₉	0.1	1/m
W ₁₀₀	0.1	1/m

TOTAL NUMBER OF SPECIES: 22
 TOTAL NUMBER OF INDIVIDUALS: 257

SHANNON DIVERSITY	9.714
SHANNON DIVERSITY (BASE 2)	1.377
SHANNON DIVERSITY (BASE 10)	0.204
SHANNON DIVERSITY (BASE E)	0.796
SHANNON DIVERSITY (BASE 10) (BASE 10)	4.890
SHANNON DIVERSITY (BASE 10) (BASE 2)	0.207
SHANNON DIVERSITY (BASE 10) (BASE E)	0.793
SHANNON DIVERSITY (BASE 10) (BASE 10)	4.825
SHANNON DIVERSITY (BASE 10) (BASE 10) (BASE 10)	0.872
SHANNON DIVERSITY (BASE 10) (BASE 10) (BASE E)	2.009
SHANNON DIVERSITY (BASE 10) (BASE 10) (BASE 2)	2.898
SHANNON DIVERSITY (BASE 10) (BASE 10) (BASE 10) (BASE 10)	0.819
SHANNON DIVERSITY (BASE 10) (BASE 10) (BASE 10) (BASE 2)	1.805
SHANNON DIVERSITY (BASE 10) (BASE 10) (BASE 10) (BASE E)	2.720

SHANNON

SHANNON

SHANNON DIVERSITY	0.830	0.999
SHANNON DIVERSITY (BASE 2)	0.204	21.766
SHANNON DIVERSITY (BASE 10)	0.650	3.091 (BASE E)
SHANNON DIVERSITY (BASE E)	0.617	3.059 (BASE E)
SHANNON DIVERSITY (BASE 10) (BASE 10)	0.329	
SHANNON DIVERSITY (BASE 10) (BASE 2)	0.307	

Site 4 January

Group	Species	Count
AV	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	0
	[illegible]	1
	[illegible]	1
	[illegible]	1
A	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
AV	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
A	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
AV	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
A	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
AV	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
A	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1

Group	Species	Count
AV	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
A	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
AV	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1
A	[illegible]	1
	[illegible]	1
	[illegible]	1
	[illegible]	1

PERCENTAGE		PERCENT DIVERSITY
Species	Count	
AV	9.67%	0.98%
A	9.67%	24.04%
AV	0.46%	8.15% (BASE E)
A	0.45%	8.03% (BASE E)
AV	0.18%	
A	0.14%	

1000 1000 1000 1000 1000 1000 1000 1000 1000 1000

Species	Abundance	Relative Abundance
1	10	10
2	15	15
3	20	20
4	25	25
5	30	30
6	35	35
7	40	40
8	45	45
9	50	50
10	55	55
11	60	60
12	65	65
13	70	70
14	75	75
15	80	80
16	85	85
17	90	90
18	95	95
19	100	100

Site 4 February

Species	Abundance	Relative Abundance
19	100	100
20	105	105
21	110	110
22	115	115
23	120	120
24	125	125
25	130	130
26	135	135
27	140	140
28	145	145
29	150	150
30	155	155
31	160	160
32	165	165
33	170	170
34	175	175
35	180	180
36	185	185
37	190	190
38	195	195
39	200	200
40	205	205
41	210	210
42	215	215
43	220	220
44	225	225
45	230	230
46	235	235
47	240	240
48	245	245
49	250	250
50	255	255
51	260	260
52	265	265
53	270	270
54	275	275
55	280	280
56	285	285
57	290	290
58	295	295
59	300	300
60	305	305
61	310	310
62	315	315
63	320	320
64	325	325
65	330	330
66	335	335
67	340	340
68	345	345
69	350	350
70	355	355
71	360	360
72	365	365
73	370	370
74	375	375
75	380	380
76	385	385
77	390	390
78	395	395
79	400	400
80	405	405
81	410	410
82	415	415
83	420	420
84	425	425
85	430	430
86	435	435
87	440	440
88	445	445
89	450	450
90	455	455
91	460	460
92	465	465
93	470	470
94	475	475
95	480	480
96	485	485
97	490	490
98	495	495
99	500	500

Species	Abundance	Relative Abundance	Species	Abundance	Relative Abundance
99	505	505	101	510	510
100	510	510	102	515	515
101	515	515	103	520	520
102	520	520	104	525	525
103	525	525	105	530	530
104	530	530	106	535	535
105	535	535	107	540	540
106	540	540	108	545	545
107	545	545	109	550	550
108	550	550	110	555	555
109	555	555	111	560	560
110	560	560	112	565	565
111	565	565	113	570	570
112	570	570	114	575	575
113	575	575	115	580	580
114	580	580	116	585	585
115	585	585	117	590	590
116	590	590	118	595	595
117	595	595	119	600	600
118	600	600	120	605	605
119	605	605	121	610	610
120	610	610	122	615	615
121	615	615	123	620	620
122	620	620	124	625	625
123	625	625	125	630	630
124	630	630	126	635	635
125	635	635	127	640	640
126	640	640	128	645	645
127	645	645	129	650	650
128	650	650	130	655	655
129	655	655	131	660	660
130	660	660	132	665	665
131	665	665	133	670	670
132	670	670	134	675	675
133	675	675	135	680	680
134	680	680	136	685	685
135	685	685	137	690	690
136	690	690	138	695	695
137	695	695	139	700	700
138	700	700	140	705	705
139	705	705	141	710	710
140	710	710	142	715	715
141	715	715	143	720	720
142	720	720	144	725	725
143	725	725	145	730	730
144	730	730	146	735	735
145	735	735	147	740	740
146	740	740	148	745	745
147	745	745	149	750	750
148	750	750	150	755	755
149	755	755	151	760	760
150	760	760	152	765	765
151	765	765	153	770	770
152	770	770	154	775	775
153	775	775	155	780	780
154	780	780	156	785	785
155	785	785	157	790	790
156	790	790	158	795	795
157	795	795	159	800	800
158	800	800	160	805	805
159	805	805	161	810	810
160	810	810	162	815	815
161	815	815	163	820	820
162	820	820	164	825	825
163	825	825	165	830	830
164	830	830	166	835	835
165	835	835	167	840	840
166	840	840	168	845	845
167	845	845	169	850	850
168	850	850	170	855	855
169	855	855	171	860	860
170	860	860	172	865	865
171	865	865	173	870	870
172	870	870	174	875	875
173	875	875	175	880	880
174	880	880	176	885	885
175	885	885	177	890	890
176	890	890	178	895	895
177	895	895	179	900	900
178	900	900	180	905	905
179	905	905	181	910	910
180	910	910	182	915	915
181	915	915	183	920	920
182	920	920	184	925	925
183	925	925	185	930	930
184	930	930	186	935	935
185	935	935	187	940	940
186	940	940	188	945	945
187	945	945	189	950	950
188	950	950	190	955	955
189	955	955	191	960	960
190	960	960	192	965	965
191	965	965	193	970	970
192	970	970	194	975	975
193	975	975	195	980	980
194	980	980	196	985	985
195	985	985	197	990	990
196	990	990	198	995	995
197	995	995	199	1000	1000

Site 4 March

1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11	1	1
12	1	1
13	1	1
14	1	1
15	1	1
16	1	1
17	1	1
18	1	1
19	1	1
20	1	1
21	1	1
22	1	1
23	1	1
24	1	1
25	1	1
26	1	1
27	1	1
28	1	1
29	1	1
30	1	1
31	1	1

TOTAL NUMBER OF SPECIES: 11
 TOTAL NUMBER OF INDIVIDUALS: 136

1	1	6.697
2	1	0.943
3	1	0.408
4	1	0.598
5	1	2.073
TOTAL NUMBER OF FALLS, VALUES ARE:		
6	1	0.408
7	1	0.591
8	1	0.408
9	1	0.408
10	1	0.408
11	1	0.408
12	1	0.408
13	1	0.408
14	1	0.408
15	1	0.408
16	1	0.408
17	1	0.408
18	1	0.408
19	1	0.408
20	1	0.408
21	1	0.408
22	1	0.408
23	1	0.408
24	1	0.408
25	1	0.408
26	1	0.408
27	1	0.408
28	1	0.408
29	1	0.408
30	1	0.408
31	1	0.408

EVENNESS

SHANNON DIVERSITY

1	0.650
2	0.200
3	0.551
4	0.533
5	0.291
6	0.282

0.916
11.560
2.398 (BASE E)
2.121 (BASE E)

Site 4 April

Species	Count	Abundance
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11	1	1
12	1	1
13	1	1
14	1	1
15	1	1
16	1	1
17	1	1
18	1	1
19	1	1
20	1	1
21	1	1
22	1	1
23	1	1
24	1	1
25	1	1
26	1	1
27	1	1
28	1	1
29	1	1
30	1	1
31	1	1
32	1	1
33	1	1
34	1	1
35	1	1
36	1	1
37	1	1
38	1	1
39	1	1
40	1	1
41	1	1
42	1	1
43	1	1
44	1	1
45	1	1
46	1	1
47	1	1
48	1	1
49	1	1
50	1	1
51	1	1
52	1	1
53	1	1
54	1	1
55	1	1
56	1	1
57	1	1
58	1	1
59	1	1
60	1	1
61	1	1
62	1	1
63	1	1
64	1	1
65	1	1
66	1	1
67	1	1
68	1	1
69	1	1
70	1	1
71	1	1
72	1	1
73	1	1
74	1	1
75	1	1
76	1	1
77	1	1
78	1	1
79	1	1
80	1	1
81	1	1
82	1	1
83	1	1
84	1	1
85	1	1
86	1	1
87	1	1
88	1	1
89	1	1
90	1	1
91	1	1
92	1	1
93	1	1
94	1	1
95	1	1
96	1	1
97	1	1
98	1	1
99	1	1
100	1	1

TOTAL NUMBER OF INDIVIDUALS: 217

MEAN OF DOMINANCE	2.704
MEAN OF DIVERSITY	1.290
MEAN OF RICHNESS	0.216
MEAN OF EVENNESS	0.744
MEAN OF HOMOGENEITY	0.636
MEAN OF HETEROGENEITY	0.636
MEAN OF SPECIES RICHNESS	0.219
MEAN OF DIVERSITY	0.781
MEAN OF RICHNESS	4.519
MEAN OF DIVERSITY (BASE 10):	0.893
(BASE E):	2.057
(BASE 2):	2.767
MEAN OF DIVERSITY (BASE 10):	0.835
(BASE E):	1.922
(BASE 2):	2.775

EVENNESS

MAX. DIVERSITY

MEAN OF DIVERSITY	0.820	0.952
MEAN OF RICHNESS	0.224	20.727
MEAN OF DIVERSITY	0.699	11.744 (BASE E)
MEAN OF RICHNESS	0.573	2.689 (BASE E)
MEAN OF DIVERSITY (BASE E):	0.812	
MEAN OF RICHNESS (BASE E):	0.279	

Parameter	Value	Unit
Temp	14	°C
pH	7.5	
Dissolved Oxygen	7.2	mg/L
Total Dissolved Solids	120	mg/L
Total Suspended Solids	15	mg/L
Ammonia Nitrogen	0.5	mg/L
Nitrite Nitrogen	0.1	mg/L
Nitrate Nitrogen	1.2	mg/L
Orthophosphate	0.05	mg/L
Chlorophyll a	2.5	µg/L
Chlorophyll b	1.8	µg/L
Chlorophyll c	0.5	µg/L
Chlorophyll total	4.8	µg/L
Secchi Disk Depth	1.5	m
Water Transparency	1.5	m
Water Color	10	PCU
Specific Conductance	150	µmhos/cm
Total Hardness	120	mg/L
Calcium	80	mg/L
Magnesium	40	mg/L

Water Temperature: 25
 Water Transparency: 113

Water Temperature	11.540
Water Transparency	11.552
Water Color	0.107
Water Transparency	0.013
Water Transparency	5.340
Water Transparency	0.194
Water Transparency	0.803
Water Transparency	2.137
Water Transparency	1.007
Water Transparency	2.510
Water Transparency	2.733
Water Transparency	0.864
Water Transparency	2.940
Water Transparency	2.940

Parameter	Average	Max. Deviation
Water Transparency	0.604	0.907
Water Transparency	0.168	0.511
Water Transparency	0.718	0.217 (BASE 1)
Water Transparency	0.476	0.906 (BASE 1)
Water Transparency	0.403	
Water Transparency	0.178	