86-38

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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,

Ann

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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and

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Submitted to:

Division of Natural Heritage
Illinois Department of Conservation
524 South Second Street
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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.

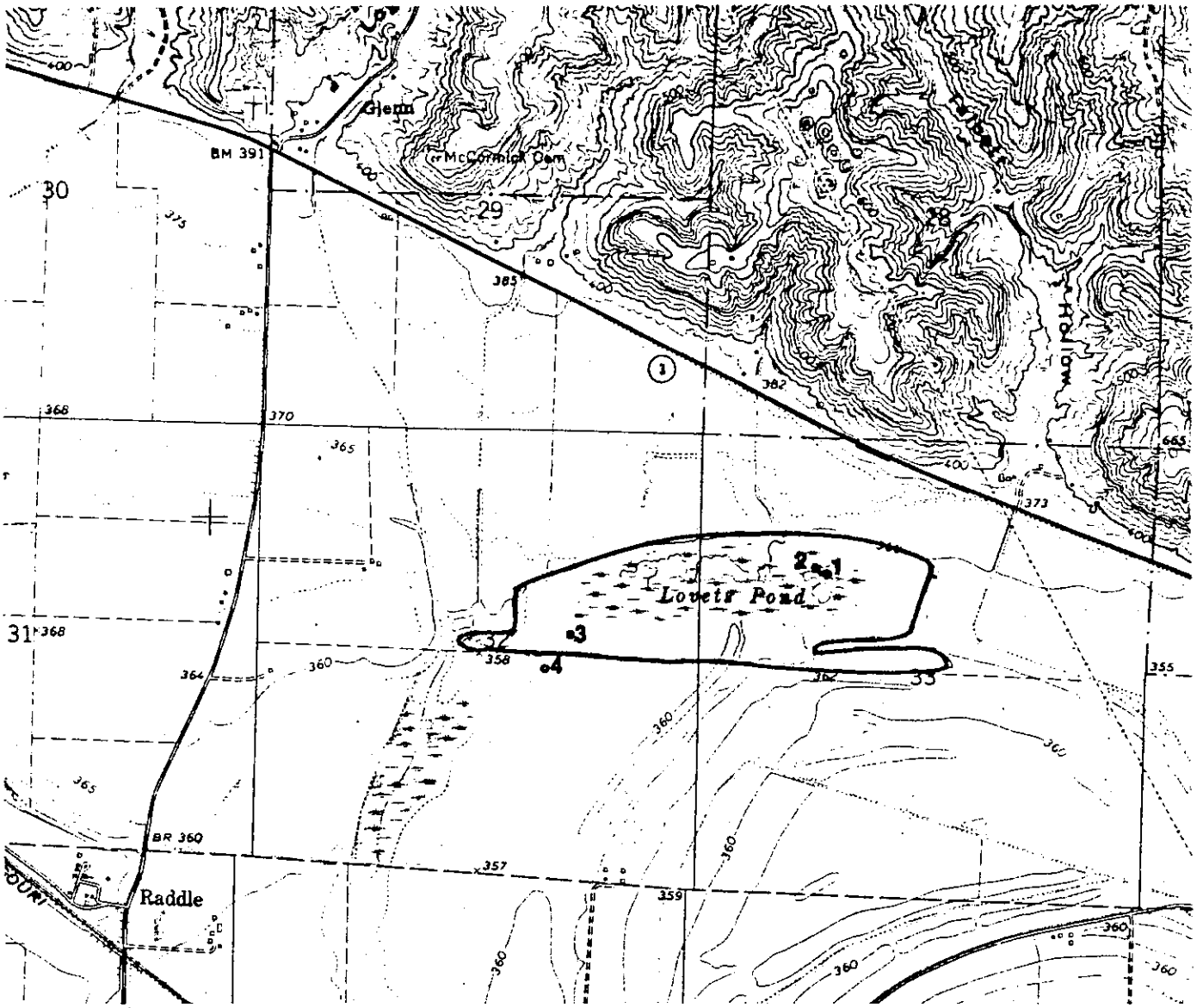

Figure 1. Portion of U.S.G.S. Raddle, ILL 7.5 Minute quadrangle map showing the location of the study sites at Lovets Pond in Jackson County, Illinois. Site 1 = pond, Site 2 = shrub-swamp, Site 3 = true swamp, and Site 4 = marsh. The area outlined in black appears as a lowland forest from Illinois Route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

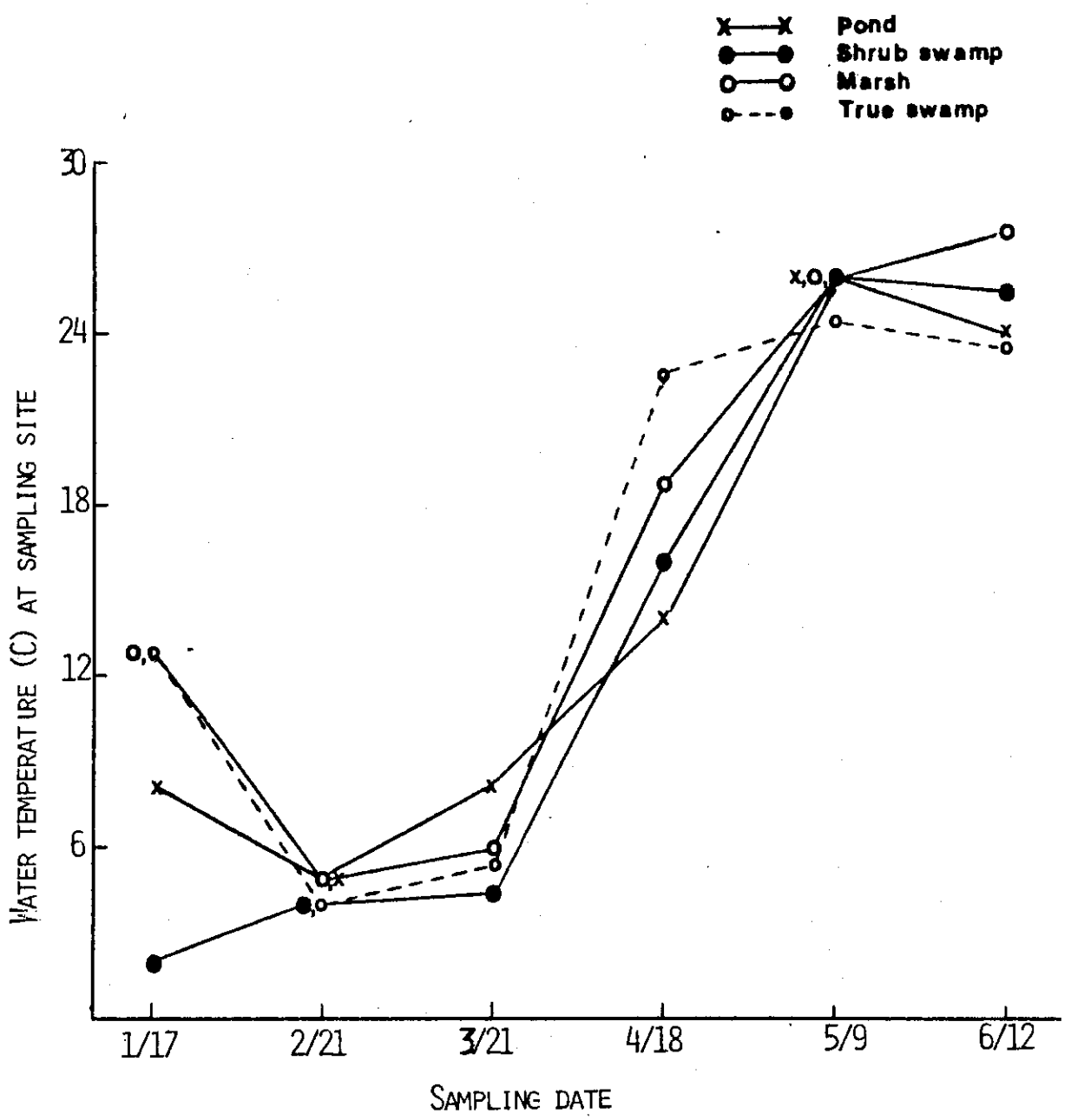

Figure 2. Water temperature of the four study sites in Lovets Pond at each sample date, January through June 1986.

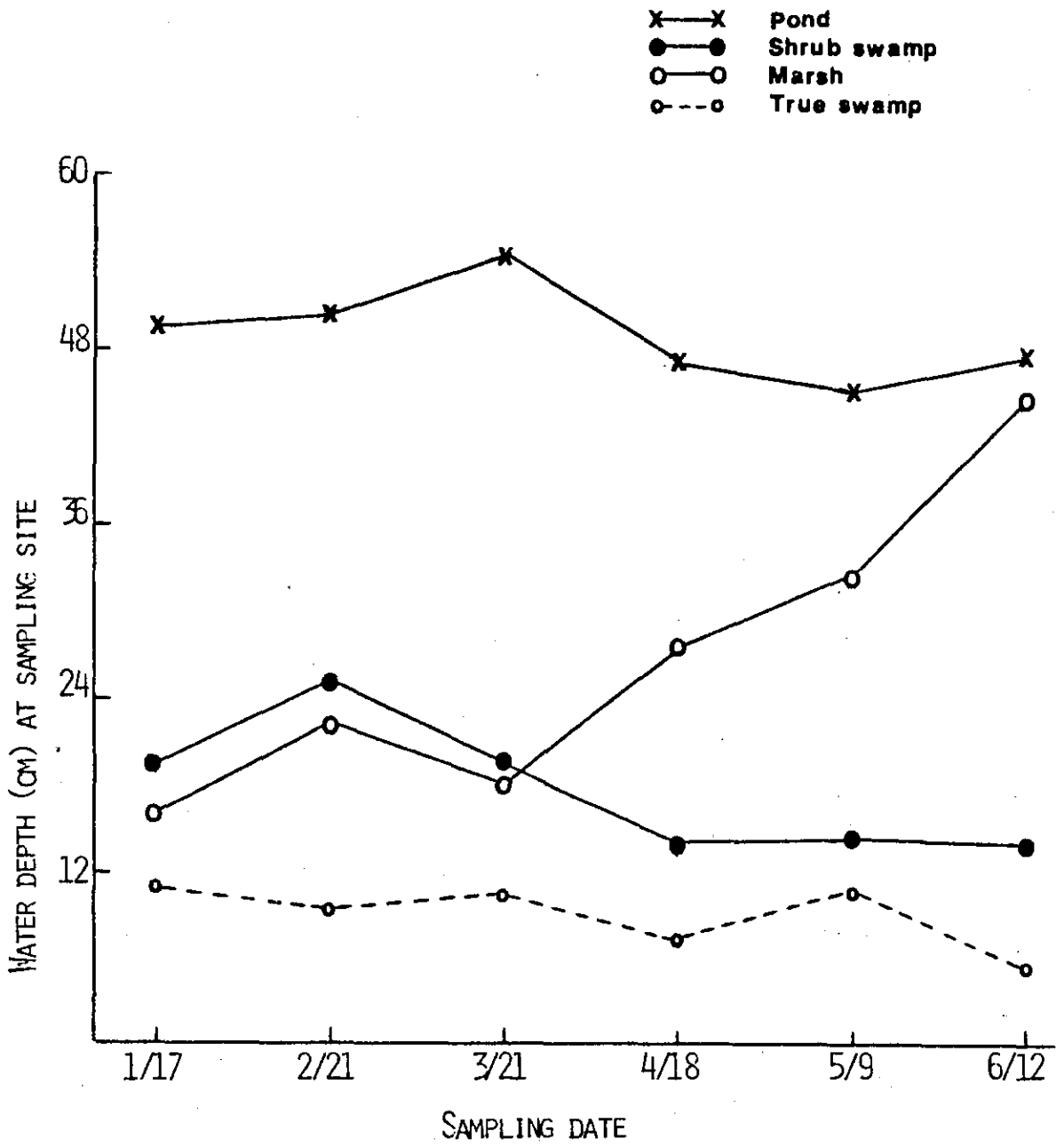

Figure 3. Water depth of the four study sites in Lovets Pond at each sample date, January through June 1986.

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 preceeded 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 interpersed 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 (1) 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 abilty 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												
	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	TOTAL
Phylum Annelida													
Class Oligochaeta	9	7	74	86	53	5	44	35	27	30	37	4	411
Class Hirudinea													
Order Rhynchobdellida													
Family Glossiphoniidae													
Helobdella triserialis	–	–	–	–	–	–	–	–	–	–	1	2	3
Order Gnathobdellida													
Family Hirudinidae													
Haemopsis plumbea	1	–	–	–	–	–	–	1	–	–	–	–	2
Haemopsis sp. 1	–	2	–	–	–	–	–	–	–	–	–	–	2
Phylum Arthropoda													
Class Crustacea													
Order Isopoda													
Family Asellidae													
Asellus forbesi ?	2	2	–	–	–	–	1	8	–	–	–	–	13
Order Decapoda													
Family Cambaridae													
Cambarellus shufeldtii	–	–	–	–	–	–	–	–	–	–	2	–	2
Class Insecta													
Order Odonata													
Family Libellulidae													
Erythemis sp.	–	1	–	–	–	–	–	–	–	–	–	–	1
Erythrodiplax sp.	–	2	–	–	–	–	–	–	–	–	–	–	2
Pachydiplax longipennis	5	8	–	–	–	–	–	1	–	–	–	–	14
Family Lestidae													
Lestes sp.	–	–		–	–	3	–	–	–	–	–	–	3
Family Coenagrionidae													
Ischnura sp.	1	–	–	–	–	–	–	2	–	–	–	–	3

Table 1 continued

TAXON	17 Jan 1986 Dip 1	17 Jan 1986 Dip 2	21 Feb 1986 Dip 1	21 Feb 1986 Dip 2	21 Mar 1986 Dip 1	21 Mar 1986 Dip 2	18 Apr 1986 Dip 1	18 Apr 1986 Dip 2	9 May 1986 Dip 1	9 May 1986 Dip 2	12 June 1986 Dip 1	12 June 1986 Dip 2	TOTAL
Order Hemiptera													
Family Mesoveliidae													
Mesovelia mulsanti	-	-	-	-	-	-	-	-	-	1	-	-	1
Family Gerridae													
Gerris marginatus	-	-	-	-	-	-	-	-	-	1	-	-	1
Family Notonectidae													
Buenoa sp.	-	-	-	-	-	-	-	-	-	-	1	7	8
Notonecta undulata	-	-	-	-	-	1	-	-	-	-	-	-	1
Family Pleidae													
Neoplea striola	-	-	-	-	-	-	-	49	-	-	-	-	49
Family Belostomatidae													
Belostoma lutarium	-	-	-	-	-	-	-	1	-	-	-	-	1
Family Corixidae													
Nymphs	-	-	-	-	-	-	1	32	-	15	-	-	48
Hesperocorixa sp. 1	2	-	-	-	-	-	-	-	-	-	4	2	8
Hesperocorixa sp. 2	-	-	-	-	-	-	-	-	-	-	2	-	2
Order Homoptera													
Family Delphacidae ?	-	-	-	-	-	-	-	2	-	-	-	7	9
Order Megaloptera													
Family Corydalidae													
Chauliodes rasticornis ?	1	-	-	-	-	-	-	-	-	-	-	-	1
Order Coleoptera													
Family Noteridae													
Hydrocanthus sp. (adults)	-	-	-	-	-	-	-	4	-	-	2	3	9
Family Dytiscidae													
Hygrotus sp. (adult)	-	-	-	-	-	-	-	1	-	-	-	-	1
Agabus sp. (larvae and adults)	1	-	-	-	-	-	-	-	-	-	-	-	1
Cybister sp. (larvae)	-	-	-	-	-	-	-	-	-	1	-	1	2
Order Diptera													
Unknown larva	-	1	-	-	-	-	-	-	-	-	-	-	1

Table 1 continued

TAXON	17 Jan 1986 Dip 1	17 Jan 1986 Dip 2	21 Feb 1986 Dip 1	21 Feb 1986 Dip 2	21 Mar 1986 Dip 1	21 Mar 1986 Dip 2	18 Apr 1986 Dip 1	18 Apr 1986 Dip 2	9 May 1986 Dip 1	9 May 1986 Dip 2	12 June 1986 Dip 1	12 June 1986 Dip 2	TOTAL
Family Chaoboridae													
Chaoborus sp.	5	5	–	–	–	5	1	16	–	8	14	6	60
Familiy Ceratopogonidae													
Palpomyia/Sphaeromias 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													
Sepedon sp.	–	–	–	–	–	–	–	–	1	–	–	–	1
Family Ephydridae	–	–	1	–	–	–	–	–	–	–	–	–	1
Phylum Mollusca													
Class Gastropoda													
Order Basommatophora													
Family Lymnaeidae													
Lymnaea sp. 1	1	–	1	–	–	–	–	–	–	–	–	–	2
Lymnaea sp. 2	–	1	–	–	–	–	–	–	–	–	1	–	2
Family Physidae													
Physa sp.	2	4	3	2	2	–	–	6	3	7	6	3	38
Family Planorbidae													
Helisoma and *Gyraulus* spp.	1	1	1	–	2	–	–	1	2	2	1	2	13
Class Pelecypoda													
Family Sphaeriidae													
Sphaerium 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												
	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	TOTAL
Phylum Annelida													
Class Oligochaeta	56	40	189	393	84	135	94	418	26	27	9	24	1495
Class Hirudinea													
Order Rhynchobdellida													
Family Glossiphoniidae													
Helobdella triserialis	–	–	1	–	–	–	–	–	–	–	–	1	2
Phylum Arthropoda													
Class Crustacea													
Order Isopoda													
Family Asellidae													
Asellus forbesi ?	36	112	17	–	5	3	159	18	3	1	–	–	354
Order Amphipoda													
Family Gammaridae													
Crangonyx sp.	–	4	12	4	1	–	10	–	10	–	–	–	41
Order Decapoda													
Family Cambaridae													
Procambarus acutus	–	1	2	–	–	–	5	1	–	18	–	–	27
Procambarus acutus ? (immature)	–	–	–	1	–	2	–	–	36	–	3	1	43
Class Insecta													
Order Ephemeroptera													
Family Caenidae													
Caenis sp.	–	–	–	–	–	1	–	2	–	–	–	–	3
Order Odonata													
Family Libellulidae													
Erythemis sp.	–	–	2	–	–	–	–	–	4	7	–	–	13
Pachydiplax longipennis	6	–	–	2	–	3	3	–	6	11	–	–	31

Table 2 continued

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

Table 2 continued

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

Table 2 continued

TAXON	17 Jan 1986 Dip 1	17 Jan 1986 Dip 2	21 Feb 1986 Dip 1	21 Feb 1986 Dip 2	21 Mar 1986 Dip 1	21 Mar 1986 Dip 2	18 Apr 1986 Dip 1	18 Apr 1986 Dip 2	9 May 1986 Dip 1	9 May 1986 Dip 2	12 June 1986 Dip 1	12 June 1986 Dip 2	TOTAL
Phylum Mollusca													
Class Gastropoda													
Order Basommatophora													
Family Lymnaeidae													
Lymnaea sp. 1	1	–	–	–	–	–	–	–	–	2	1	–	4
Lymnaea sp. 2	–	–	–	–	–	–	–	2	–	–	–	1	3
Family Physidae													
Physa sp.	4	17	12	42	1	9	1	51	80	78	82	164	541
Family Planorbidae													
Helisoma and *Gyraulus* spp.	4	8	12	7	1	6	4	12	10	11	11	10	96
Order Mesogastropoda													
Family Viviparidae													
Viviparus sp.	–	–	–	–	–	–	–	–	1	–	–	–	1
Class Pelecypoda													
Family Sphaeriidae													
Sphaerium sp. ?	35	27	26	12	14	4	2	21	13	12	3	5	174
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												
	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	235	96	131	534	439	506	29	20	1	3	44	–	2038
Class Hirudinea													
Order Rhynchobdellida													
Family Glossiphoniidae													
Helobdella triserialis	–	–	–	–	–	–	3	–	2	–	–	2	7
Helobdella fusca	–	–	–	–	–	–	–	1	–	–	–	–	1
Phylum Arthropoda													
Class Crustacea													
Order Isopoda													
Family Asellidae													
Asellus forbesi ?	149	37	–	4	–	–	105	63	–	–	–	–	358
Order Amphipoda													
Family Gammaridae													
Crangonyx sp.	3	–	5	35	–	–	113	214	–	–	–	–	370
Order Decapoda													
Family Cambaridae													
Cambarellus shufeldtii	–	–	–	–	–	–	–	–	–	–	–	2	2
Procambarus acutus	–	–	1	–	–	–	–	3	–	2	–	–	6
Procambarus acutus ? (immature)	–	–	–	3	–	–	–	–	1	–	–	–	4
Class Insecta													
Order Odonata													
Family Libellulidae													
Pachydiplax longipennis	–	–	–	–	–	–	–	2	1	–	–	–	3
Family Lestidae													
Lestes sp.	–	–	–	–	–	–	2	9	–	–	–	–	11

Table 3 continued

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

Table 3 continued

TAXON	17 Jan 1986 Dip 1	17 Jan 1986 Dip 2	21 Feb 1986 Dip 1	21 Feb 1986 Dip 2	21 Mar 1986 Dip 1	21 Mar 1986 Dip 2	18 Apr 1986 Dip 1	18 Apr 1986 Dip 2	9 May 1986 Dip 1	9 May 1986 Dip 2	12 June 1986 Dip 1	12 June 1986 Dip 2	TOTAL
Family Dytiscidae													
Celina sp. (adult)	–	–	–	–	–	–	–	–	–	1	–	–	1
Hydroporus sp.1 (adult)	–	1	–	–	–	–	–	–	–	–	–	–	1
Hydroporus sp.2 (adult)	–	–	–	–	–	–	1	1	–	–	–	–	2
Hygrotus sp. (adult)	5	–	–	–	–	–	1	–	–	–	–	–	6
Agabus sp. (larvae and adults)	–	–	–	–	–	–	2	14	–	–	–	–	16
Agabetes sp. (adult)	–	–	–	–	–	–	–	–	1	–	–	–	1
Dytiscus sp. (larvae)	–	–	–	–	–	–	–	1	–	–	–	–	1
Acilius sp. (larvae)	–	–	–	–	–	–	–	–	–	1	–	–	1
Family Hydrophilidae													
Hydrochara sp. (larvae)	–	–	–	–	–	–	1	1	–	–	–	–	2
Tropisternus sp. (larvae)	–	–	–	–	–	–	4	–	–	–	–	–	4
Tropisternus sp.1 (adult)	–	–	–	–	–	–	2	4	–	–	–	–	6
Tropisternus sp.2 (adult)	–	–	–	–	–	–	1	2	–	–	–	–	3
Berosus sp. (larva and adult)	–	–	–	–	–	–	–	1	–	–	1	–	2
Enochrus sp.1 (adult)	–	–	–	–	–	–	–	1	–	–	–	–	1
Enochrus sp.2 (adult)	–	–	–	–	–	–	–	–	–	–	1	–	1
Order Diptera													
Unknown larva	–	–	–	–	–	–	–	1	–	–	–	–	1
Family Tipulidae													
Tipula sp.	–	–	–	–	–	–	–	–	–	–	1	–	1
Family Culicidae													
Anopheles sp.	–	–	–	–	–	–	–	–	–	–	–	1	1
Culiseta sp. 1	–	–	–	–	–	–	–	–	–	–	1	1	2
Culiseta sp. 2	–	–	–	–	–	–	–	–	–	–	2	–	2
Familiy Ceratopogonidae													
Palpomyia/Sphaeromias sp.	–	–	–	–	–	–	2	1	–	–	–	–	3
Family Chironomidae	1	3	6	2	–	2	254	123	241	110	10	8	760
Family Tabanidae													
Chrysops sp.	–	–	1	–	–	1	–	–	–	–	–	–	2
Tabanus sp.	–	–	–	–	1	–	–	–	–	–	–	–	1

Table 3 continued

TAXON	17 Jan 1986 Dip 1	17 Jan 1986 Dip 2	21 Feb 1986 Dip 1	21 Feb 1986 Dip 2	21 Mar 1986 Dip 1	21 Mar 1986 Dip 2	18 Apr 1986 Dip 1	18 Apr 1986 Dip 2	9 May 1986 Dip 1	9 May 1986 Dip 2	12 June 1986 Dip 1	12 June 1986 Dip 2	TOTAL
Family Dolichopodidae	–	–	7	–	6	12	–	–	–	–	–	–	25
Family Sciomyzidae													
Sepedon sp.	–	–	–	–	–	–	–	–	–	–	–	1	1
Family Ephydridae	–	–	–	–	–	–	–	–	–	–	–	3	3
Family Muscidae	–	–	–	–	–	–	–	–	–	–	–	7	7
Phylum Mollusca													
Class Gastropoda													
Order Basommatophora													
Family Lymnaeidae													
Lymnaea sp. 1	–	–	–	–	–	–	–	–	–	–	1	–	1
Lymnaea sp. 2	9	2	9	8	–	1	16	21	–	–	3	5	74
Family Physidae													
Physa sp.	24	14	4	11	3	1	66	37	28	36	27	27	278
Family Planorbidae													
Helisoma and *Gyraulus* spp.	24	2	2	17	5	4	15	19	9	11	3	2	113
Order Mesogastropoda													
Family Viviparidae													
Viviparus sp.	8	2	3	11	5	–	2	5	–	–	–	2	38
Class Pelecypoda													
Family Sphaeriidae													
Sphaerium 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		
	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	Dip 1	Dip 2	TOTAL
Phylum Annelida													
Class Oligochaeta	148	87	302	76	46	37	15	6	–	–	3	1	721
Class Hirudinea													
Order Rhynchobdellida													
Family Glossiphoniidae													
Helobdella triserialis	–	–	2	–	–	1	2	2	6	–	–	–	13
Helobdella elongata	–	–	–	–	–	–	–	–	–	1	–	–	1
Order Gnathobdellida													
Family Hirudinidae													
Haemopsis plumbea	–	–	–	–	–	–	1	–	–	–	–	–	1
Haemopsis grandis	2	–	–	–	–	–	–	–	–	–	–	–	2
Haemopsis ? sp. 2	1	–	–	–	–	–	–	–	–	–	–	–	1
Phylum Arthropoda													
Class Crustacea													
Order Isopoda													
Family Asellidae													
Asellus forbesi ?	6	–	–	–	–	–	–	–	–	–	–	–	6
Order Amphipoda													
Family Talitridae													
Hyalella azteca	–	–	–	–	–	–	–	–	1	1	–	–	2
Family Gammaridae													
Crangonyx sp.	1	–	1	–	–	–	–	–	–	–	–	–	2
Order Decapoda													
Family Cambaridae													
Cambarellus shufeldtii	–	–	–	–	–	–	1	–	–	–	–	–	1
Procambarus acutus	–	–	1	–	1	–	10	–	3	–	–	–	15

Table 4 continued

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

Table 4 continued

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

Table 4 continued

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

Table 4 continued

TAXON	17 Jan 1986 Dip 1	17 Jan 1986 Dip 2	21 Feb 1986 Dip 1	21 Feb 1986 Dip 2	21 Mar 1986 Dip 1	21 Mar 1986 Dip 2	18 Apr 1986 Dip 1	18 Apr 1986 Dip 2	9 May 1986 Dip 1	9 May 1986 Dip 2	12 June 1986 Dip 1	12 June 1986 Dip 2	TOTAL
Family Planorbidae													
Helisoma and Gyraulus spp.	5	2	8	1	6	2	9	7	8	3	1	3	55
Order Mesogastropoda													
Family Viviparidae													
Viviparus sp.	–	–	–	–	–	–	1	2	1	–	–	–	4
Class Pelecypoda													
Family Sphaeriidae													
Sphaerium 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.

TAXON	COMMUNITY TYPE AND SITE NUMBER			
	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				
Helobdella triserialis	X	X	X	X
Helobdella fusca	-	-	X	-
Helobdella elongata	-	-	-	X
Order Gnathobdellida				
Family Hirudinea				
Haemopsis plumbea	X	-	-	X
Haemopsis grandis	-	-	-	X
Haemopsis sp. 1	X	-	-	-
Haemopsis ? sp. 2	-	-	-	X
Phylum Arthropoda				
Class Crustacea				
Order Isopoda				
Family Asellidae				
Asellus forbesi ?	X	X	X	X
Order Amphipoda				
Family Talitridae				
Hyalella azteca	-	-	-	X
Family Gammaridae				
Crangonyx 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				
Cambarellus shufeldtii	X	-	X	X
Procambarus acutus	-	X	X	X
Procambarus acutus ? (immature)	-	X	X	-
Class Insecta				
Order Ephemeroptera				
Family Baetidae				
Callibaetis ferugineus	-	-	-	X
Family Ephemerellidae				
Ephemerella dorothea	-	-	-	X
Family Caenidae				
Caenis sp.	-	X	-	X
Order Odonata				
Family Libellulidae				
Erythemis sp.	X	X	-	X
Erythrodiplax sp.	X	-	-	-
Pachydiplax longipennis	X	X	X	X
Family Corduliidae				
Somatochlora sp.	-	X	-	-
Family Aeshnidae				
Anax junius	-	-	-	X
Anax verticalis ?	-	-	-	X
Family Lestidae				
Lestes sp.	X	X	X	-
Family Coenagrionidae				
Ischnura sp.	X	X	X	X
Order Hemiptera				
Family Mesoveliidae				
Mesovelia mulsanti	X	-	-	-

Table 5 continued

TAXON	Pond (Site 1)	Shrub-swamp (Site 2)	True Swamp (Site 3)	Marsh (Site 4)
Family Gerridae				
Gerris argenticollis	-	-	X	-
Gerris marginatus	X	-	X	-
Family Notonectidae				
Buenoa sp.	X	-	-	X
Buenoa sp. (immature)	-	X	X	-
Notonecta sp.	-	X	-	X
Notonecta sp. (immature)	-	X	X	-
Notonecta raleighi	-	X	-	X
Notonecta undulata	X	-	-	-
Family Pleidae				
Neoplea striola	X	X	-	X
Family Naucoridae				
Pelocoris femoratus	-	X	X	-
Family Belostomatidae				
Belostoma lutarium	X	X	X	X
Family Corixidae				
nymphs	X	X	X	X
Hesperocorixa sp. 1	X	-	-	X
Hesperocorixa sp. 2	X	-	-	X
Ramphocorixa acuminata	-	-	-	X
Sigara sp.	-	X	X	X
Trichocorixa calva	-	X	-	X
Trichocorixa kanza	-	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				
Chauliodes rasticornis	X	X	X	X
Order Trichoptera				
Family Hydroptilidae				
Orthotrichia sp.	-	X	-	-
Family Leptoceridae				
Triaenodes abus	-	X	-	-
Family Phryganeidae				
Ptilostomis sp.	-	X	X	X
Order Lepidoptera				
Family Pyralidae				
Schoenobius sp.	-	X	-	-
Order Coleoptera				
Family Haliplidae				
Peltodytes sp. (larvae)	-	X	-	-
Peltodytes sp. (adults)	-	-	-	X
Peltodytes dietrichi (ad.)	-	X	X	-
Peltodytes muticus (adults)	-	-	-	X
Peltodytes sexmaculatus (ad.)	-	-	X	-
Family Noteridae				
Hydrocanthus sp. (adults)	X	-	-	X
Family Dytiscidae				
Laccophilus sp. (larvae)	-	X	-	-
Laccophilus proximus (ad.)	-	-	-	X
Hydrovatus sp. (adults)	-	X	-	-
Celina sp. (adult)	-	-	X	-
Hydroporus sp. (larvae)	-	X	-	-
Hydroporus sp.1 (adults)	-	X	X	X
Hydroporus sp.2 (adults)	-	-	X	-

Table 5 continued

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

Table 5 continued

TAXON	Pond (Site 1)	Shrub-swamp (Site 2)	True Swamp (Site 3)	Marsh (Site 4)
Familiy Ceratopogonidae				
Palpomyia/Sphaeromias sp.	X	X	X	X
Family Chironomidae	X	X	X	X
Family Tabanidae				
Chrysops sp.	-	-	X	X
Tabanus sp.	-	-	X	X
Family Dolichopodidae	-	-	X	X
Family Stratiomyidae				
Hedreiodiscus/Odontomyia sp.	-	-	-	X
Family Syrphidae				
Eristalis sp.	-	-	-	X
Family Sciomyzidae				
Sepedon sp.	X	X	X	-
Family Ephydridae	X	-	X	X
Family Calliphoridae	-	X	-	-
Family Muscidae	-	X	X	X
Phylum Mollusca				
Class Gastropoda				
Order Basommatophora				
Family Lymnaeidae				
Lymnaea sp. 1	X	X	X	X
Lymnaea sp. 2	X	X	X	X
Family Physidae				
Physa 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				
Helisoma and *Gyraulus* spp.	X	X	X	X
Order Mesogastropoda				
Family Viviparidae				
Viviparus sp.	–	X	X	X
Class Pelecypoda				
Family Sphaeriidae				
Sphaerium 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.

Site 1 January

Site 1 February

Site 1 March

Site 1 April

Site 1 May

Site 1 June

Site 2 January

Site 2 February

Site 2 March

Site 2 April

Site 2 May

Site 2 June

DATA AND DIVERSITY VALUES FOR lovets3.1

Site 3 January

NOs. OF INDIVIDUALS IN EACH TAXON

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:	38
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		
HEIP EVENNESS (BASE E):	0.205		

Site 3 February

Site 3 March

Site 3 April

Site 3 May

Site 3 June

Site 4 January

Site 4 February

Site 4 March

Site 4 April

[illegible]	217
[illegible]	7.703
[illegible]	1.290
[illegible]	0.210
[illegible]	0.704
[illegible]	[illegible]

[illegible] SAMPLE, ABUNDANCE

[illegible]	0.319
[illegible]	0.761
[illegible]	4.559
[illegible] DIVERSITY (BASE 10)	0.893
(BASE E)	2.057
(BASE 2)	2.967
[illegible] DIVERSITY (BASE 10)	0.830
(BASE E)	1.922
(BASE 2)	2.775

	EVENNESS	MAX. DIVERSITY
[illegible]	0.826	0.952
[illegible]	0.224	20.737
[illegible]	0.699	1.744 (BASE E)
[illegible]	0.673	2.639 (BASE 2)
[illegible] (BASE E)	0.812	
[illegible] (BASE E)	0.379	

Site 4 May

Site 4 June