KEEYASK PROJECT

Generating Station

February 2008

Report # 03-16

Aquatic Macrophyte and Associated Epiphytic Invertebrate Data Collected from the Keeyask Study Area, Manitoba, Late Summer 2003

Draft

ENVIRONMENTAL STUDIES PROGRAM

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AQUATIC MACROPHYTE AND ASSOCIATED EPIPHYTIC INVERTEBRATE DATA COLLECTED FROM THE KEEYASK STUDY AREA, MANITOBA, LATE SUMMER 2003

Draft Report Prepared for Manitoba Hydro

by
L. T. Dolce and M.J. Burt
February 2008

North/South Consultants Inc.
Aquatic Environment Specialists

83 Scurfield Blvd.
Winnipeg, Manitoba, R3Y 1G4
Website: www.nscons.ca

Tel.: (204) 284-3366
Fax: (204) 477-4173
E-mail: nscons@nscons.ca

OVERVIEW

Manitoba Hydro and its potential partners (Tataskweyak Cree Nation, War Lake First Nation, Fox Lake Cree Nation, and York Factory First Nation) are currently looking into building a hydroelectric generating station at Gull Rapids on the Nelson River. Studies are being done to support predictions of possible effects of this generating station on the environment. This information is required to prepare an Environmental Impact Statement (EIS), a document required by government for its consideration when deciding about licensing the generating station. The aquatic part of these studies is looking at the water, algae (microscopic plants in the water), weeds, bugs, and fish. The area being studied includes Split, Stephens, Clark, Gull, and Assean lakes and adjoining parts of the rivers (Burntwood, Nelson, Aiken, and Assean) and the streams that flow into them. Separate reports are being issued on each topic and for each different area.

This report presents the results of the third year of aquatic macrophytes and epiphytic invertebrate sampling conducted in the Keeyask Study Area. Aquatic macrophytes and epiphytic invertebrates were collected from Gull Lake, Clark Lake, and portions of the Nelson River between Birthday and Gull rapids during the 2003 open-water season. Aquatic macrophyte and epiphytic invertebrate sampling was also conducted in Gull Lake and the Nelson River between Birthday and Gull rapids in 2001 and 2002 (Dolce and Sotiropoulos 2004a and b, respectively). An additional year of sampling was conducted in 2004 and is the subject of another report.

TECHNICAL SUMMARY

Manitoba Hydro and its potential partners (Tataskweyak Cree Nation, War Lake First Nation, Fox Lake Cree Nation, and York Factory First Nation) are currently investigating the feasibility of developing a **hydroelectric generating station*** at Gull Rapids located at the upstream end of Stephens Lake on the Nelson River (Figure 1). An Environmental Studies Program has been developed to provide the data and information required for an **environmental impact assessment** of the above-mentioned hydroelectric **Project**, should a decision be made to proceed with a licensing submission to **regulatory authorities**. Manitoba Hydro and the potential partners have established a cooperative approach to assessing the potential effects of future development on the **environment** and for producing the information required for regulatory review and impact **monitoring**.

The Keeyask **aquatic monitoring** and impact assessment program was designed to investigate and document interrelated components of the Burntwood, Nelson, Aiken, and Assean rivers as well as the associated lake (Split, Stephens, Clark, Gull, and Assean) aquatic **ecosystems**. Investigations of physical **habitat**, **water quality**, **detritus**, **algae**, aquatic **macrophytes**, **aquatic invertebrates**, and fish were to be undertaken. Individual reports are being prepared and issued on each topic and for specific waterbodies.

The following report presents information collected from aquatic macrophyte and **epiphytic invertebrate** sampling conducted in the Keeyask Study Area during the 2003 open-water season. Specific objectives of this program were the following:

- to gain an understanding of the distribution of macrophyte beds located in the Keeyask Study Area;
- to provide a description of the aquatic macrophyte and associated epiphytic invetebrate community in terms of abundance, composition, and distribution within the Keeyask Study Area; and
- to compare the abundance and diversity of epiphytic invertebrates collected in a 400 versus a 500 μm mesh.

Sampling was attempted at 60 sites within eight areas in Gull Lake, Clark Lake, and portions of the Nelson River between Birthday and Gull rapids during late summer 2003. Nine of these sites could not be sampled due to low water levels, while four sites could not be

* *Definitions for words appearing in bold are provided in the glossary (see Section 5.0).*

sampled due to high water levels. Sixty-four percent of the sites sampled contained macrophytes. In five of the eight areas sampled, *Stuckenia vaginatus* was the dominant macrophyte species. *Potamogeton richardsonii* was dominant in two of the eight areas sampled. Area 2: John Garson Bay had the highest mean total macrophyte dry weight (31.31 g/m²), while Area 3: Kahpowinik Bay had the lowest mean total macrophyte dry weight (3.02 g/m²).

Epiphytic invertebrates were collected in conjunction with aquatic macrophyte sampling. The highest number of epiphytic invertebrate taxa was collected in Area 4: Tub Bay (19 taxa), while Area 2: John Garson Bay had the lowest number of epiphytic invertebrate taxa collected (12). In six out of the eight areas sampled, Insecta (primarily Chironomidae) were the dominant epiphytic invertebrate group. Mollusca (primarily Gastropoda) were the dominant epiphytic invertebrate group in two of the eight areas sampled. The mean total epiphytic invertebrate abundance in the 500 µm mesh ranged from 64 to 271 individuals/m² in Area 2: John Garson Bay and Area 5: Caribou Island, respectively. The additional epiphytic invertebrates collected in the 400 µm mesh had a mean total abundance that ranged from 21 to 50 individuals/m² in Area 4: Tub Bay and Area 2: John Garson Bay, respectively. The 500 µm mesh retained between 56.1 and 87.1% of epiphytic invertebrates. Chironomidae and Oligochaeta accounted for almost all of the invertebrates that passed through the 500 µm mesh and were retained by the 400 µm mesh.

ACKNOWLEDGEMENTS

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NORTH/SOUTH CONSULTANTS INC. STUDY TEAM

Data Collection

Leanne Dolce

Data Analysis, Report Preparation, and Report Review

Leanne Dolce

Melanie Burt

Laurel Neufeld

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1.0 INTRODUCTION

Manitoba Hydro and its potential partners (Tataskweyak Cree Nation [TCN], War Lake First Nation [WLFN], Fox Lake Cree Nation [FLCN], and York Factory First Nation [YFFN]) are currently investigating the feasibility of developing a **hydroelectric generating station*** at Gull Rapids located at the upstream end of Stephens Lake on the Nelson River (Figure 1). An Environmental Studies Program has been developed to provide the data and information required for an **environmental impact assessment** of the above-mentioned hydroelectric **Project** (hereafter referred to as the Project), should a decision be made to proceed with a licensing submission to **regulatory authorities**. Manitoba Hydro and the potential partners have established a cooperative approach to assessing the potential effects of the Project on the **environment** and for producing the information required for regulatory review and impact **monitoring**.

The broad objectives of the Environmental Studies Program are the following:

- to describe the **existing environment** of the Study Area using an **ecosystem**-based approach;
- to provide data and information to assist in the planning of the Project;
- to provide data and information to enable assessment of the potential adverse effects that may result from the Project; and
- to provide the basis for monitoring environmental change resulting from development, should the Project proceed.

1.1 AQUATIC ECOSYSTEMS MONITORING AND ASSESSMENT

The collection of **baseline** information on the **aquatic environment** was initiated at the Project site in 1999. Manitoba Hydro expanded the program in 2001, and again in 2002, in response to concerns raised by the Cree Nations to include a broader geographic area to better characterize all aspects of the environment that may be affected by development at Gull Rapids. This included the **reach** of the Nelson River between, and including, Split Lake to Stephens Lake, the Burntwood, Aiken, and Assean rivers, as well as the associated lake (Split, Clark, Gull, and Assean) aquatic ecosystems. Biological investigations included measurements of physical **habitat**, **water quality**, **detritus**, **algae**, aquatic **macrophytes**, **aquatic invertebrates**, and fish.

* *Definitions for words appearing in bold are provided in the glossary (see Section 5.0).*

Individual reports are being prepared and issued on each of these topics and for specific waterbodies. These reports will describe the existing environment, provide information to assist in Project planning, and provide the basis for predicting and assessing the significance of potential adverse effects that may result from construction and operation of the Project.

The following report is one of a series of reports produced from the Keeyask Environmental Studies Program. This report presents results of the aquatic macrophyte and associated epiphytic invertebrate sampling program conducted in Gull Lake, Clark Lake, and portions of the Nelson River between Birthday and Gull rapids, during the 2003 open-water season. Specific objectives are as follows:

- to gain an understanding of the distribution of macrophyte beds located in the Keeyask Study Area;
- to provide a description of the aquatic macrophyte and associated epiphytic invertebrate community in terms of abundance, composition, and distribution within the Keeyask Study Area; and
- to compare the abundance and diversity of epiphytic invertebrates collected in a 400 versus a 500 μm mesh.

2.0 THE KEEYASK STUDY SETTING

2.1 STUDY AREA

The Keeyask Study Area includes the reach of the Nelson River from Kelsey Generating Station (GS) to Kettle GS, including Split, Clark, Gull, and Stephens lakes; the Burntwood River downstream of First Rapids; the Grass River downstream of Witchai Lake Falls; the Assean River **watershed**, including Assean Lake; and all other tributaries to the above stated reach of the Nelson River (Figure 1).

The entire Study Area lies within the High **Boreal** Land Region characterized by a mean annual temperature of –3.4ºC and an annual precipitation range of 415 to 560 mm. **Topography** is bedrock controlled overlain with fine-grained **glacio-lacustrine deposits** of clays and gravels. Depressional areas have **peat** plateaus and patterned **fens** with **permafrost** present. Black spruce/moss/sedge associations are the dominant vegetation (Canada-Manitoba Soil Survey 1976).

Split Lake, which is immediately downstream of the Kelsey GS at the **confluence** of the Burntwood and Nelson rivers, is the second largest waterbody in the Study Area. Due to the large inflows from the Nelson and Burntwood rivers, the lake has detectable current in several locations. Split Lake has maximum and mean depths of 28.0 m and 3.9 m, respectively, at a water surface elevation of 167.0 m **ASL** (Lawrence et al. 1999). The surface area of Split Lake is 26,100 ha (excluding islands), with a total shoreline length, including islands, of 940.0 km (Lawrence et al. 1999). The numerous islands in Split Lake represent 411.6 km of the total shoreline.

The reach of the Nelson River between Split Lake and Stephens Lake is characterized by: i) narrow sections with swiftly flowing water (including Birthday and Gull rapids); and ii) wider more **lacustrine** sections, including Clark and Gull lakes. Mean winter flow in the reach is 3,006 m^3/s and mean summer flow is 2,812 m^3/s (Manitoba Hydro 1996a).

The Assean River system is north of Split Lake and drains into Clark Lake (Figure 1). Except for the mouth of the Assean River, the hydrology of the watershed has not been affected by hydroelectric development.

Stephens Lake, the largest lake in the Study Area, is located downstream of Gull Rapids and was created through the development of the Kettle GS. Stephens Lake has a surface area of 29,930 ha (excluding islands) and a total shoreline length, including islands, of 740.8 km. The numerous islands encompass an area of 3,340 ha and 336.2 km of shoreline. There is no

detectable current throughout most of this large lake, except for the old Nelson River channel.

Communities in the Study Area include the First Nations communities of Split Lake (TCN) and York Landing (YFFN), both located on Split Lake (Figure 1). Members of WLFN reside in Ilford, south of the Nelson River, while some members of FLCN reside in Gillam, on the south shore of Stephens Lake. Gillam, the largest community in the Study Area, is the regional headquarters for Manitoba Hydro's northern operations.

The names assigned to some of the features described in Section 2.3 and illustrated in Figure 1 may be inconsistent with local names, topographic maps, and/or the Gazetteer of Canada. When field programs were initiated in spring, 2001, names of several features within the Study Area were unknown to North/South Consultants Inc. (NSC) biologists and First Nation assistants. Therefore, some features for which no name was known were assigned names by field personnel. Chief and council of TCN, YFFN, WLFN, and FLCN or the Canadian Permanent Committee on Geographical Names have not approved names of features described within this document.

2.2 PREVIOUS HYDROELECTRIC DEVELOPMENT

The Study Area is bounded by two Manitoba Hydro hydroelectric generating stations on the Nelson River: the Kelsey GS just upstream of Split Lake and Kettle GS downstream of Stephens Lake. The Kelsey GS came into service in 1961 and is operated as a **run-of-river plant** with very little storage or re-regulation of flows (Manitoba Hydro 1996a).

The Kettle GS was completed in 1974, which raised the water level at the structure by 30.0 m and created a backwater effect upstream to Gull Rapids. Approximately 22,055 ha of land were flooded in creating Stephens Lake (Manitoba Hydro 1996a). Kettle GS is operated as a **peaking-type plant**, cycling its **forebay** on a daily, weekly, and seasonal basis. The forebay is operated within an annual water level range of 141.1 m to 139.5 m ASL (Manitoba Hydro 1996a).

Since 1976, two water management projects, the Churchill River Diversion (CRD) and Lake Winnipeg Regulation (LWR), have influenced water levels and flows within the Study Area. These two projects augment and alter flows to generating stations on the lower Nelson River by diverting additional water into the drainage from the Churchill River (CRD) (Manitoba Hydro 1996b) and managing outflow from Lake Winnipeg (LWR). The CRD and LWR projects reversed the Nelson River pre-Project seasonal water level and flow patterns in the Keeyask Study Area by increasing water levels and flow during periods of ice cover and

reducing flows during the open-water period. Overall, there has been a net increase of 246 m^3/s in average annual flow at Gull Rapids since CRD and LWR (Manitoba Hydro 1996a). The historic and current flow regimes are described in "History and First Order Effects, Split Lake Cree Post-Project Environmental Review", Volume Two (Manitoba Hydro 1996a).

2.3 REPORT SPECIFIC STUDY AREA

Most of the land adjacent to Clark Lake and the Nelson River downstream to Gull Rapids is well drained and dominated by black spruce forest, with **sporadic** stands of trembling aspen. Immediately upstream of Gull Lake, the land adjacent to the south shore of the Nelson River is poorly drained and dominated by **organic soils**, black spruce **bogs**, peatlands, and fens. Mineral soils are predominant in the area with sporadic permafrost (Agriculture and Agri-Food Canada 2003).

Clark Lake is located immediately downstream of Split Lake, and approximately 42 km upstream of Gull Rapids on the Nelson River (Figure 1). Current is restricted to the main section of the lake, with off-current bays outside the main channel. Lake **substrates** are composed of fine mineral **sediments** and areas of bedrock. The shoreline is stable and largely bedrock with areas of mineral and organic sediments. **Riparian** vegetation includes willow, alder, and black spruce. Aquatic vegetation is restricted to and abundant in shallow, off-current bays. The Assean River is the only major tributary to Clark Lake, flowing into the north side of the lake. Two small **ephemeral** creeks also flow into the north shore of Clark Lake (Agriculture and Agri-Food Canada 2003).

Downstream from the outlet of Clark Lake, the Nelson River narrows and water **velocity** increases significantly for a 3 km stretch, with numerous rapids that are largely confined within bedrock shorelines. The substrate and shoreline features of this section of the river are largely bedrock and boulder/cobble. For the next 7 km, the river widens, velocity decreases, and fine sediments become predominant. Five small ephemeral creeks drain into the Nelson River between Clark Lake and Birthday Rapids (Agriculture and Agri-Food Canada 2003).

Birthday Rapids is located approximately 10 km downstream of Clark Lake and 30 km upstream of Gull Rapids on the Nelson River (Figure 1). The drop in elevation from the upstream to downstream side of Birthday Rapids is approximately 5 m. The 14 km reach of the Nelson River between Birthday Rapids and Gull Lake is characterized as a large, somewhat uniform channel with medium to high water velocity. A series of exposed shoals and boulders are located within the first 7 km downstream of Birthday Rapids, after which **run** habitat dominates the river. There are a few large bays with reduced water velocity and a number of small tributaries that drain into the Nelson River between Birthday Rapids and

Gull Lake. River substrates are typically bedrock, boulder, cobble, and sand, with some fine sediment in areas with reduced current. The shoreline in this section of the river contains large sections of bedrock and some areas of fine sediments. Riparian vegetation includes willow, alder, black spruce, tamarack, and trembling aspen. Aquatic vegetation is restricted to bays that are removed from the major river current (Agriculture and Agri-Food Canada 2003).

Gull Lake is a section of the Nelson River where the river widens, is lacustrine in nature, with moderate to low water velocity, and features numerous bays. Gull Lake is herein defined as the reach of the Nelson River beginning approximately 17 km upstream of Gull Rapids and 14 km downstream of Birthday Rapids, where the river widens to the north into a bay around a large point of land (Figure 1), and extending downstream to the downstream end of Caribou Island, approximately 3 km upstream of Gull Rapids. Gull Lake has three distinct **basins**, the first extending from the upstream end of the lake downstream approximately 6 km to a large island; the second extending from the large island to Morris Point (a constriction in the river immediately upstream of Caribou Island); and the third extending from Morris Point to the downstream end of Caribou Island. Water velocity in the third basin is somewhat faster than in the first two, particularly under low flows, as the river channel flows around Caribou Island. Gull Lake has numerous small tributaries, with the majority being ephemeral. Lake substrates are predominantly **silt** and sand with some cobble and boulder in the first two basins where current is slow, and predominantly cobble, boulder, and bedrock in the third basin, with soft substrates in off-current areas. Riparian vegetation includes willow, alder, black spruce, tamarack, and trembling aspen. Aquatic vegetation is restricted to bays that are removed from the major river channel (Agriculture and Agri-Food Canada 2003).

The 3 km reach of the Nelson River between Gull Lake and Gull Rapids is characterized by a steep gradient with high water velocity. The river channel is separated into two by a large island at the upstream end of Gull Rapids (Figure 1). The substrate is bedrock, boulder, and cobble with small amounts of clay and silt in off-current bays. Aquatic vegetation is restricted to a bay on the south shore (Agriculture and Agri-Food Canada 2003).

3.0 METHODS

3.1 MACROPHYTE AND EPIPHYTIC INVERTEBRATE SAMPLING

3.1.1 Sampling Locations

Aquatic macrophyte and associated epiphytic invertebrate sampling was conducted in the Nelson River from Birthday to Gull rapids, Gull Lake and Clark Lake from August 19 to 23, 2003 (Table 1 and figures 2 and 3).

Macrophyte beds in the Keeyask Study Area were identified and stratified (shallow: 1.0 – 1.5 m; moderate: 1.5 – 2.0 m; and, deep: 2.0 – 2.5 m) using **bathymetric survey** data collected in 2001 and aerial photos from July 8, 2003. For ease of sampling, the study area was divided into eight areas and each area was then further divided into zones as follows:

- Area 1: Pahwaypanik Bay (Zones 1 to 4);
- Area 2: John Garson Bay (Zones 1 to 4);
- Area 3: Kahpowinik Bay (Zones 1 to 4);
- Area 4: Tub Bay (Zones 1 to 4);
- Area 5: Caribou Isand (Zones East and West);
- Area 6: John Kitch Bay (Zones East and West);
- Area 7: Bay East of Rabbit Creek (Zones 1 to 4); and
- Area 8: Clark Lake (Zones 1 to 4).

A set of random sampling sites were generated for each zone using the Random Point Generator utility in ArcGIS® 8.3. Three sites per zone were generated for the areas in Gull Lake (for a total of 12 sampling sites) and two sites per zone were generated for all other areas (for a total of 48 sites). These randomly generated sites were then mapped on a 1:15,000 scale digital ortho-imagery. Field crews used a handheld Garmin Global Positioning System (GPS) unit to locate and sample the randomly selected sites.

3.1.2 Sample Collection

All sampling locations were accessed by boat. Two subsamples were collected at each site: one off the port side of the boat (Sample A) and a second off the starboard side (Sample B). Water depth was measured at the port and starboard side of the boat with a weighted rope graduated to the nearest 10 cm; an average depth was later calculated for each site (Table 1).

If aquatic macrophytes were found to be absent from a randomly pre-selected site, field crews measured water depth and noted the absence of plants.

Aquatic macrophytes and associated epiphytic invertebrates were collected with a custom designed sampler constructed of industrial ABS grade material. The frame measured 0.6 x 0.7 m in depth, 1.4 m in height, with a surface area of 0.42 m^2, and an attached 1.5 m, 400 µm mesh cod-end. The sampler is functional to water depths of less than 2.5 m. As a result, deeper sites were not sampled. To disturb the aquatic vegetation as little as possible, the sampler was lowered into the water with the cutter blade retracted until it reached the sediment. The cutter blade was then pulled across the bottom of the sampler, severing the rooted macrophytes above the sediment surface. All plants and associated invertebrates were retained within the sampler.

Once the sampler was pulled to the surface, macrophytes were removed by hand, placed in a ziplock bag and a whole wet weight was taken (to the nearest gram) with a Kilotech PC 2000A digital scale. The macrophytes were then placed in a 500 µm mesh-bottom bucket with a 400 µm mesh-bottom bucket directly below it and rinsed thoroughly to remove epiphytic invertebrates. After rinsing, macrophyte samples were placed in a salad spinner and spun to remove excess moisture, placed in labelled ziplock bags and weighed again. Any water collected from the spinning process was added to the rinse buckets to retain all invertebrates. Subsamples A and B were processed separately. Macrophyte samples were transported to the field laboratory, frozen and then transported to the North/South Consultants Inc. laboratory in Winnipeg for further processing. Invertebrate samples from both the 500 and 400 µm mesh-bottom buckets were placed in separate labelled plastic jars, preserved with 10% formalin, and transported to the North/South Consultants Inc. laboratory in Winnipeg for further processing.

The double sieving method allowed for a comparison of catch efficiency between mesh sizes. The values presented in the tables, figures, and appendices for the 500 µm mesh are the total number of epiphytic invertebrates captured in the 500 µm mesh. The values presented for the 400 µm mesh are the additional invertebrates that were captured in this mesh after the initial use of the 500 µm mesh, not the total number of invertebrates that would be captured using just the 400 µm mesh.

Due to low water levels in 2003, some sites were located in areas no longer wetted, or only partially wetted. Although these sites were dry or in very little water, some still contained **aquatic plants**. These plants were collected by placing the sampler over the plants and hand

grabbing all vegetation contained within the area of the sampler. There were no duplicate samples taken at these hand-grabbed sites.

3.1.3 Laboratory and Data Analyses

Macrophytes were thawed in cold water and rinsed again using the 500 and 400 µm mesh-bottom buckets to collect any epiphytic invertebrates missed during field processing. Macrophytes were sorted under a 3x magnifying lamp and identified to the lowest **taxonomic** group possible (usually **genus** or **species**). Macrophyte identification was based on Fassett (1957), Flora of North America Editorial Committee (2000), Johnson et al. (1995), Lahring (2003), Scoggan (1978-1979), and personal communications with Jackie Krindle (Calyx Consulting). Scientific names were updated according to the Integrated Taxonomic Information System (ITIS 2006).

Species level identification of certain aquatic macrophytes (genus *Potamogeton*) was difficult due to the late sampling period and the loss of flowering parts that aid in identification. Consequently, these macrophytes were sorted into groups of similar appearances and are referred to as *Potamogeton* spp. Any macrophyte material that could not be identified was grouped as unidentified.

The wet weight (g) of each macrophyte group was determined by weighing plant material in pre-weighed aluminum pans with a Mettler PM480 Delta Range digital scale to the nearest 0.001 of a gram. Samples were subsequently dried in a Fisher Scientific Isotemp drying oven for approximately 24 hours at a temperature of 106 °C and a dry-weight (g) was determined for each macrophyte group. Dried samples were discarded once processed. Aquatic macrophyte biomass (g/m^2) was determined by dividing the dry weight of the macrophyte group per sample (g) by the surface area of the sampler (0.42 m²).

Epiphytic invertebrate samples were sorted under a 3x magnifying lamp and invertebrates were transferred to 70% ethanol. Any remaining invertebrates found on macrophytes in the laboratory that were not initially rinsed and placed into bottles in the field were included in the analysis. Invertebrates were identified under an 80-100x stereomicroscope to major group and enumerated with reference texts by Clifford (1991), McCafferty (1998), and Merritt and Cummins (1996). Quality Assurance/Quality Control (QA/QC) procedures were followed for sample processing and invertebrate identification (Appendix 1).

Epiphytic invertebrate abundance (individuals/m^2) was calculated by dividing the number of invertebrates per sample by the surface area of the sampler (0.42 m^2). To determine total

number of taxa, epiphytic invertebrate groups were identified to the lowest practical taxonomic level as presented in the following table:

Phylum, Subphylum or Class	Major Group	Taxonomic Level of Identification
Annelida	Oligochaeta; Hirudinea	Subclass
Crustacea	Ostracoda	Class
	- all other Crustacea	Order
Arachnida	Acarina	Subclass
Mollusca	Bivalvia	Family
	Gastropoda	Class
Hydrozoa	-	Class
Insecta	Odonata; Coleoptera; Hemiptera; Ephemeroptera; Trichoptera; Diptera	Family

If aquatic macrophytes were absent from randomly pre-selected sites, values of zero were assigned to those sites when calculating overall dry weights and epiphytic invertebrate abundance. Subsamples (A and B) were averaged for each site and this value was used to calculate the overall mean, **standard deviation**, and percent composition of aquatic macrophyte and epiphytic invertebrates for each area.

3.2 ADDITIONAL DATA COLLECTED

3.2.1 Macrophyte Mapping

Additional aquatic macrophyte mapping was conducted while field crews were in the Keeyask Study Area. Fifteen macrophyte beds were mapped in the Nelson River between Birthday and Gull rapids (including Gull Lake) on August 16 to 25, 2003 (Appendix 2; Table A2-1 and figures A2-1 and A2-2).

Aquatic macrophyte beds were mapped based on the abundance of macrophytes within a bed; individual plants or small groupings of plants were not mapped. A Trimble ProXR with a TSC1 datalogger for submetre accuracy was used to record data. Because 2003 was a low water year, the perimeters of macrophyte beds were walked and depths were taken manually (with a meter stick) and recorded in meters. The data collected in the field was then downloaded into Trimble Pathfinder Office v2.90.

Trimble Pathfinder point files were exported as ArcView Shape files and imported into ArcGIS v9.0. Polygons were digitized and presented as maps displaying the location of the macrophyte beds (Appendix 2; figures A2-1 and A2-2).

4.0 RESULTS

4.1 MACROPHYTE AND EPIPHYTIC INVERTEBRATE SAMPLING

Sampling was attempted at 60 sites within eight areas in Gull Lake, Clark Lake, and portions of the Nelson River between Birthday and Gull rapids during late summer 2003 (Table 1; figures 2 and 3). Nine of these sites could not be sampled due to low water levels, while four sites could not be sampled due to high water levels. Only 64% of the sites sampled contained macrophytes (Table 1).

Note that invertebrate abundance results for the 500 µm mesh are the total number of invertebrates collected in this mesh size, while the results for the 400 µm mesh are the additional invertebrates collected that passed through the 500 µm mesh.

4.1.1 Area 1: Pahwaypanik Bay

4.1.1.1 Macrophytes

Collection of aquatic macrophytes was not possible at five of the eight sites in Pahwaypanik Bay during the 2003 sampling period (Table 1 and Appendix 3). These five sites were not accessible by boat due to low water levels. One site had no macrophytes. Hand grabs were collected at two shallow sites where macrophytes were present. The depths at these hand grab sites were 0.03 m and 0.06 m, respectively (Table 1).

Four species of **vascular** aquatic macrophytes and one **nonvascular** taxon were identified in samples from Pahwaypanik Bay in 2003 (Table 2 and Appendix 3). The mean dry weight of macrophyte samples from this area was 10.62 g/m^2 and the species composition was primarily *Stuckenia vaginatus* (70.40%) and *Sagittaria cuneata* (17.88%; Table 2 and Figure 4).

4.1.1.2 Epiphytic Invertebrates

Fifteen epiphytic invertebrate taxa were collected in aquatic macrophyte samples from Pahwaypanik Bay in 2003 (Table 3 and Appendix 4). Insecta, primarily Chironomidae, was the most common invertebrate group with mean abundances of 56 and 21 individuals/m^2 collected in the 500 and 400 µm mesh, respectively (Table 3). Annelida, primarily Oligochaeta, were also captured with mean abundances of 24 and 13 individuals/m^2 collected in the 500 and 400 µm mesh, respectively (Table 3). For both mesh sizes, the overall percent composition of Insecta accounted for 45.8% of invertebrates collected from this area, followed by Annelida with 22.0% (Table 3).

The 500 µm mesh retained 73.4% of the total invertebrates captured in samples from Pahwaypanik Bay, while 26.6% passed through and were retained by the 400 µm mesh (Figure 5). The 500 µm mesh retained 96.7% of captured molluscs, 72.4% of captured insects, 65.7% of captured crustaceans, and 63.8% of captured annelids (Figure 5). Chironomidae and Oligochaeta accounted for almost all of the invertebrates that passed through the 500 µm mesh and were retained by the 400 µm mesh (Table 3 and Appendix 4).

4.1.2 Area 2: John Garson Bay

4.1.2.1 Macrophytes

Aquatic macrophytes were not present at two out of eight sites in John Garson Bay during the 2003 sampling period (Table 1 and Appendix 3). Hand grabs were collected at two dry sites where macrophytes were present. The average depth at the sampled sites ranged from 0.00 to 2.32 m (Table 1).

Six species of vascular aquatic macrophytes and one nonvascular species were identified in samples from John Garson Bay in 2003 (Table 2 and Appendix 3). The mean dry weight of macrophyte samples from this area was 31.31 g/m^2 and the species composition was primarily *Potamogeton richardsonii* (45.90%) and *Polygonum amphibium* (38.96%; Table 2 and Figure 4).

4.1.2.2 Epiphytic Invertebrates

Twelve epiphytic invertebrate taxa were collected in aquatic macrophyte samples from John Garson Bay in 2003 (Table 3 and Appendix 4). Insecta, primarily Chironomidae, was the most common invertebrate group with mean abundances of 32 and 26 individuals/m² collected in the 500 and 400 µm mesh, respectively (Table 3). Annelida, primarily Oligochaeta, were also captured with mean abundances of 22 and 16 individuals/m^2 collected in the 500 and 400 µm mesh, respectively (Table 3). For both mesh sizes, the overall percent composition of Insecta accounted for 50.7% of invertebrates collected from this area, followed by Annelida with 33.9% (Table 3).

The 500 µm mesh retained 56.1% of invertebrates captured in samples from John Garson Bay while 43.9% passed through and were retained by the 400 µm mesh (Figure 6). The 500 µm mesh retained 95.7% of captured molluscs and 55.6% of captured insects (Figure 6). More than half of the annelids captured (57.7%) passed through to the 400 µm mesh (Figure 6). Chironomidae and Oligochaeta accounted for almost all of the invertebrates that passed through the 500 µm mesh and were retained by the 400 µm mesh (Table 4 and Appendix 4).

4.1.3 Area 3: Kahpowinik Bay

4.1.3.1 Macrophytes

Collection of aquatic macrophytes was not possible at four of the eight sites in Kahpowinik Bay during the 2003 sampling period (Table 1 and Appendix 3). These four sites could not be accessed by boat due to low water levels. No macrophytes were present at three sites. The average depths of the sampled sites ranged from 0.40 to 1.00 m (Table 1).

Two species of vascular aquatic macrophytes and two nonvascular species were identified in samples from Kahpowinik Bay in 2003 (Table 2 and Appendix 3). The mean dry weight of macrophyte samples from this area was 2.67 g/m^2 and the species composition was primarily *Stuckenia pectinatus* (53.45%), *Potamogeton gramineus* (21.66%), and aquatic moss (8.27%; Table 2 and Figure 4).

4.1.3.2 Epiphytic Invertebrates

Fourteen taxa were collected in aquatic macrophyte samples from Kahpowinik Bay in 2003 (Table 3 and Appendix 4). Mollusca, primarily Gastropoda, was the most common invertebrate group collected in the 500 µm mesh with a mean abundance of 105 individuals/m^2 (Table 3). Annelida (primarily Oligochaeta) and Insecta (primarily Chironomidae) were also common with mean abundances of 52 and 51 individuals/m^2 collected in the 500 µm mesh, respectively (Table 3). For both mesh sizes, the overall percent composition of Mollusca accounted for 42.3% of invertebrates collected from this area, followed by Insecta (27.5%), and Annelida (25%; Table 3).

The 500 µm mesh retained 87.1% of invertebrates captured in samples from Kahpowinik Bay while 12.9% passed through and were retained by the 400 µm mesh (Figure 7). The 500 µm mesh retained 99.7% of captured molluscs, 82.5% of captured annelids, and 74.0% of captured insects (Figure 7). Chironomidae and Oligochaeta accounted for almost all of the invertebrates that passed through the 500 µm mesh and were retained by the 400 µm mesh (Table 3 and Appendix 4).

4.1.4 Area 4 : Tub Bay

4.1.4.1 Macrophytes

Collection of aquatic macrophytes was not possible at two of the eight sites in Tub Bay during the 2003 sampling period (Table 1 and Appendix 3). These two sites were too deep

for the sampler. No macrophytes were present at three sites. The average depths of the sampled sites ranged from 0.27 to 2.14 m (Table 1).

Five species of vascular aquatic macrophytes and one nonvascular species were identified in samples from Tub Bay in 2003 (Table 2 and Appendix 3). The mean dry weight of macrophyte samples from this area was 5.57 g/m^2 and the species composition was primarily *Stuckenia vaginatus* (59.74%), followed by *Potamogeton gramineus* (12.81%), and filamentous algae (11.49%; Table 2 and Figure 4).

4.1.4.2 Epiphytic Invertebrates

Nineteen epiphytic invertebrate taxa were collected in aquatic macrophyte samples from Tub Bay in 2003 (Table 3 and Appendix 4). Insecta, primarily Chironomidae, was the most common invertebrate group with a mean abundance of 56 individuals/m^2 collected in the 500 µm mesh (Table 3). Mollusca, primarily Gastropoda, were also captured with a mean abundance of 34 individuals/m^2 collected in the 500 µm mesh (Table 3). For both mesh sizes, the overall percent composition of Insecta accounted for 56.1% of invertebrates collected from this area, followed by Mollusca with 28.1% (Table 3).

The 500 µm mesh retained 83.5% of invertebrates captured in samples from Tub Bay while 16.5% passed through and were retained by the 400 µm mesh (Figure 8). The 500 µm mesh retained 96.0% of captured molluscs, 84.3% of captured crustaceans, and 79.9% of captured insects (Figure 8). Chironomidae and Oligochaeta accounted for almost all of the invertebrates that passed through the 500 µm mesh and were retained by the 400 µm mesh (Table 3 and Appendix 4).

4.1.5 Area 5: Caribou Island

4.1.5.1 Macrophytes

Aquatic macrophytes were not present at one of the six sites in Gull Lake at Caribou Island during the 2003 sampling period (Table 1 and Appendix 3). Due to low water levels, a hand grab was collected at one site. Most of the sites sampled in this area were shallow with average depths ranging from 0.00 to 0.39 m (Table 1).

Five species of vascular aquatic macrophytes and one nonvascular taxon were identified in samples from Gull Lake at Caribou Island in 2003 (Table 2 and Appendix 3). The mean dry weight of macrophyte samples from this area was 13.51 g/m^2 and the species composition was primarily *Stuckenia vaginatus* (55.14%) and aquatic moss (22.40%; Table 2 and Figure 4).

4.1.5.2 Epiphytic Invertebrates

Fifteen epiphytic invertebrate taxa were collected in aquatic macrophyte samples from Gull Lake at Caribou Island in 2003 (Table 3 and Appendix 4). Mollusca, primarily Gastropoda, was the most common invertebrate group with a mean abundance of 151 individuals/m^2 collected in the 500 µm mesh (Table 3). Insecta, primarily Chironomidae, were also common with mean abundances of 74 and 30 individuals/m^2 collected in the 500 and 400 µm mesh, respectively (Table 3). For both mesh sizes, the overall percent composition of Mollusca accounted for 48.6% of invertebrates collected from this area, followed by Insecta with 32.7% (Table 3).

The 500 µm mesh retained 85.3% of invertebrates captured in samples from Gull Lake at Caribou Island while 14.7% passed through and were retained by the 400 µm mesh (Figure 9). The 500 µm mesh retained 97.7% of captured molluscs, 88.8% of captured crustaceans, and 70.8% of captured insects (Figure 9). Chironomidae and Oligochaeta accounted for most of the invertebrates that passed through the 500 µm mesh and were retained by the 400 µm mesh (Table 3 and Appendix 4).

4.1.6 Area 6: John Kitch Bay

4.1.6.1 Macrophytes

Collection of aquatic macrophytes was not possible in one of the six sites in John Kitch Bay during the 2003 sampling period (Table 1 and Appendix 3). This one site was too deep for the sampler. Due to low water levels, a hand grab was collected at another site. The average depths of the sampled sites ranged from 0.03 to 0.78 m (Table 1).

Three species of vascular aquatic macrophytes and one nonvascular taxon were identified in samples from John Kitch Bay in 2003 (Table 2 and Appendix 3). The mean dry weight of macrophyte samples from this area was 10.17 g/m^2 and the species composition was primarily *Stuckenia vaginatus* (62.41%) followed by *Stuckenia pectinatus* (15.34%) and aquatic moss (14.85%; Table 2 and Figure 4).

4.1.6.2 Epiphytic Invertebrates

Fourteen epiphytic invertebrate taxa were collected in aquatic macrophyte samples from John Kitch Bay in 2003 (Table 3 and Appendix 4). Insecta, primarily Chironomidae, was the most common invertebrate group collected with mean abundances of 87 and 19 individuals/m^2 captured in the 500 and 400 µm mesh, respectively. Mollusca, primarily Gastropoda, were also captured with a mean abundance of 25 individuals/m^2 collected in the

500 µm mesh (Table 3). For both mesh sizes, the overall percent composition of Insecta accounted for 70.6% of invertebrates collected from this area, followed by Mollusca with 16.7% (Table 3).

The 500 µm mesh retained 81.1% of invertebrates captured in samples from John Kitch Bay while 18.9% passed through and were retained by the 400 µm mesh (Figure 10). The 500 µm mesh retained 99.0% of captured molluscs, 81.2% of captured insects, and 49.1% of captured annelids (Figure 10). Chironomidae and Oligochaeta accounted for almost all of the invertebrates that passed through the 500 µm mesh and were retained by the 400 µm mesh (Table 3 and Appendix 4).

4.1.7 Area 7: Bay East of Rabbit Creek

4.1.7.1 Macrophytes

Aquatic macrophytes were not present at three of the eight sites in the bay east of Rabbit Creek during the 2003 sampling period (Table 1 and Appendix 3). Hand grabs were collected at two dry/shallow sites where macrophytes were present. One site was too deep for the sampler. The average depths of the sampled sites ranged from 0.00 to 1.20 m (Table 1).

Four species of vascular aquatic macrophytes and one nonvascular taxon were identified in samples from the bay east of Rabbit Creek in 2003 (Table 2 and Appendix 3). The mean dry weight of macrophyte samples from this area was 13.54 g/m^2 and the species composition was primarily *Stuckenia vaginatus* (64.17%) followed by *Potamogeton gramineus* (12.83%) and *Potamogeton richardsonii* (12.06%; Table 2 and Figure 4).

4.1.7.2 Epiphytic Invertebrates

Seventeen epiphytic invertebrate taxa were collected in aquatic macrophyte samples from the bay east of Rabbit Creek in 2003 (Table 3 and Appendix 4). Insecta, primarily Chironomidae, was the most common invertebrate group collected with mean abundances of 84 and 26 individuals/m^2 captured in the 500 and 400 µm mesh, respectively (Table 3). Mollusca, primarily Gastropoda, followed with a mean abundance of 56 individuals/m^2 captured in the 500 mesh (Table 3). For both mesh sizes, the overall percent composition of Insecta accounted for 55.9% of invertebrates colleted from this area, followed by Mollusca with 28.6% (Table 3).

The 500 µm mesh retained 80.0% of invertebrates captured in samples from the bay east of Rabbit Creek, while 20.0% passed through and were retained by the 400 µm mesh (Figure

11). The 500 µm mesh retained 99.1% of captured molluscs and 76.1% of captured insects (Figure 11). More than half of the annelids captured (56.9%) passed through to the 400 µm mesh (Figure 11). Chironomidae and Oligochaeta accounted for almost all of the invertebrates that passed through the 500 µm mesh and were retained by the 400 µm mesh (Table 3 and Appendix 4).

4.1.8 Area 8: Clark Lake

4.1.8.1 Macrophytes

Aquatic macrophytes were not present at four of the eight sites in Clark Lake during the 2003 sampling period (Table 1 and Appendix 3). At sites where aquatic macrophytes were present, average depths ranged from 0.26 to 1.78 m (Table 1).

Four species of vascular macrophytes were identified in samples from Clark Lake in 2003 (Table 2 and Appendix 3). The mean dry weight of macrophyte samples from this area was 7.03 g/m^2 and the species composition was primarily *Potamogeton richardsonii* (55.34%) and *Callitriche palustris* (31.51%; Table 2 and Figure 4)

4.1.8.2 Epiphytic Invertebrates

Eighteen epiphytic invertebrate taxa were collected in aquatic macrophyte samples from Clark Lake in 2003 (Table 3 and Appendix 4). Insecta, primarily Chironomidae, was the most common invertebrate group collected with mean abundances of 57 and 16 individuals/m^2 captured in the 500 and 400 µm mesh, respectively (Table 3). Mollusca (primarily Gastropoda) and Annelida (primarily Oligochaeta) followed with mean abundances of 15 and 7 individuals/m^2 captured in the 500 µm mesh, respectively (Table 3). For both mesh sizes, the overall percent composition of Insecta accounted for 64.8% of invertebrates collected from this area, followed by Annelida (14.1%) and Mollusca (13.5%; Table 3).

The 500 µm mesh retained 77.1% of invertebrates captured in samples from Clark Lake while 22.9% passed through and were retained by the 400 µm mesh (Figure 12). The 500 µm mesh retained 98.1% of captured molluscs and 77.7% of captured insects (Figure 12). More than half of the annelids captured (56.1%) passed through to the 400 µm mesh (Figure 12). Chironomidae and Oligochaeta accounted for almost all of the invertebrates that passed through the 500 µm mesh and were retained by the 400 µm mesh (Table 3 and Appendix 4).

4.2 AQUATIC MACROPHYTE MAPPING

Seventeen aquatic macrophyte beds were identified and mapped at fifteen locations in the Nelson River between Birthday and Gull rapids (including Gull Lake) during late summer 2003 (Appendix 2; Table A2-1 and figures A2-1 and A2-2).The average depths of these macrophyte beds ranged from 0.26 to 1.36 m (Appendix 2; Table A2-1).

5.0 GLOSSARY

Algae (al) − a group of simple plant-like aquatic ***organisms*** possessing ***chlorophyll*** and capable of ***photosynthesis***; they may be attached to surfaces or free-floating. Most freshwater ***species*** are very small in size.

Aquatic – living or found in water.

Aquatic environment − areas that are permanently under water, or that are under water for a sufficient period to support ***organisms*** that remain for their entire lives, or a significant portion of their lives, totally immersed in water.

Aquatic invertebrate (s) − an animal lacking a backbone that lives, at least part of its life, in the water (e.g., aquatic insect, mayfly, clam, aquatic earthworm, crayfish).

Aquatic monitoring – the primary goal of long term ***monitoring*** of lakes and rivers is to understand how ***aquatic*** communities and ***habitats*** respond to natural processes and to be able to distinguish differences between human-induced disturbance effects to aquatic ***ecosystems*** and those caused by natural processes.

Aquatic plants – multi-celled plants living in the water.

ASL − Above Sea Level.

Baseline − information about an area, over a period of time, that is used as background for detecting and/or comparing potential future changes.

Basin (s) – a distinct section of a lake, separated from the remainder of the lake by a constriction.

Bathymetric survey – a survey to describe the area and water depth of a lake or river.

Bog (s) – wetland ***ecosystem*** characterized by an accumulation of ***peat***, acid conditions, and a plant community dominated by sphagnum moss.

Boreal − of, or relating to, the forest areas of the North Temperate Zone, dominated by coniferous trees such as spruce, fir, and pine.

Chlorophyll – a group of green pigments present in plant and ***algal*** cells that are necessary in the trapping of light energy during ***photosynthesis***.

Confluence – the meeting place of two streams or rivers.

Detritus − particulate and dissolved ***organic*** matter that is produced by the decomposition of plant and animal matter.

Ecosystem (s) − all living ***organisms*** in an area and the non-living parts of the environment upon which they depend, as well as all interactions, both among living and non-living components of the ecosystem.

Environment − 1) the total of all the surrounding natural conditions that affect the existence of living ***organisms*** on earth, including air, water, soil, minerals, climate, and the organisms themselves; and 2) the local complex of such conditions that affects a particular organism and ultimately determines its physiology and survival.

Environmental impact assessment − an evaluation of the likely adverse environmental effects of a project that will contribute to decisions about whether to proceed with a project.

Ephemeral − a stream that flows only in direct response to precipitation, and thus ceases flowing during dry seasons.

Epiphytic invertebrate – an ***invertebrate*** found on ***aquatic plants***, using the plant for food or shelter.

Existing environment − the present condition of a particular area; generally assessed prior to the construction of a proposed project.

Fen (s) – a peatland with the water table usually at or just above the surface; often stagnant and alkaline.

Forebay – the portion of a reservoir immediately upstream of a hydroelectric facility.

Genus – a division in the classification of plants and animals, consisting of a group of related ***species***; a ***taxonomic*** rank below family and above species.

Glacio-lacustrine deposits − ***soil*** that originates from lakes that were formed by melting glaciers.

Habitat − the place where a plant or animal lives; often related to a function such as spawning, feeding, etc.

Hydroelectric generating station − a generating station that converts the potential energy of elevated water or the kinetic energy of flowing water into electricity.

Invertebrate (s) – animals without a spinal column.

Lacustrine − referring to freshwater lakes; ***sediments*** generally consisting of stratified fine sand, ***silt***, and clay deposits on a lake bed.

Macrophyte (s) − multi-celled ***aquatic*** and ***terrestrial*** plants.

Monitoring − measurement or collection of data to determine whether change is occurring in something of interest.

Nonvascular − refers to lower plants which lack well developed conducting tissues (xylem and phloem): e.g., moss and ***algae***.

Organic – the compounds formed by living ***organisms***.

Organism (s) – an individual living thing.

Peaking-type plant – a hydroelectric generating station that is designed to supply power during high demand periods and is generally operated to serve that purpose.

Peat − material consisting of non-decomposed and only slightly decomposed ***organic*** matter found in extremely moist areas.

Permafrost − subsoil that remains below the freezing point throughout the year, as in an Arctic environment.

Photosynthesis – a process which occurs in plants and ***algae*** where, in the presence of light, carbon dioxide and water are turned into a useable form of energy (sugar) and oxygen.

Project − proposed ***hydroelectric generating station*** on the Nelson River, upstream of Stephens Lake.

Reach − any length of stream or river under study, often with similar features along its length.

Regulatory authorities − a decision-making body such as a government department.

Riparian – along the banks of rivers and streams.

Run – an area of a stream with uniform, swiftly flowing water without surface breaks.

Run-of-river plant − a hydroelectric generating station that has no upstream storage capacity and must pass all water flows as they come.

Sediment (s) – material, usually ***soil*** or ***organic detritus***, which is deposited in the bottom of a waterbody.

Silt – a very small rock fragment or mineral particle, smaller than a very fine grain of sand and larger than coarse clay; usually having a diameter of 0.002 to 0.06 mm; the smallest ***soil*** material that can be seen with the naked eye.

Soil (s) – 1) all loose, unconsolidated, weathered, or otherwise altered rock material above bedrock; and 2) a natural accumulation of ***organic*** matter and inorganic rock material that is capable of supporting the growth of vegetation.

Species – a group of ***organisms*** that can interbreed to produce fertile offspring.

Sporadic – the occurrence of isolated patches of ***permafrost*** or trembling aspen, 10-35% of a geographic region.

Standard deviation (SD) – the square root of the variance of a collection of numbers.

Substrate (s) – the material forming the streambed; also solid material upon which an ***organism*** lives or to which it is attached.

Taxon (a) – any valid taxonomic category (e.g., order, family, genus, species) defined according to hierarchical level.

Taxonomic – pertaining to the classification of plants and animals into groups.

Terrestrial – belonging to, or inhabiting the land or ground.

Topography − the general configuration of the land surface including relief and position of natural and man-made features.

Vascular – refers to higher plants which have well developed conducting tissues (xylem and phloem): e.g. flowering plants.

Velocity – a measurement of speed of flow.

Water quality − measures of substances in the water such as nitrogen, phosphorus, oxygen, and carbon.

Watershed − the area within which all water drains to collect in a common channel or lake.

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TABLES AND FIGURES

Table 1. Survey information for macrophytes and epiphytic invertebrates collected in Gull Lake, Clark Lake, and portions of the Nelson River between Birthday and Gull rapids, late summer, 2003.

Date	Area Number	Area Name	Zone	Site	Location (UTM/Datum NAD 83)			Average Water Depth (m)	Samples [1, 2, 3, 4, 5]	
					Zone	Easting	Northing		Macrophyte	Epiphytic Invertebrate
21-Aug-03	1	Pahwaypanik Bay	1	1	15	340096	6244933	-	n.s.	n.s.
21-Aug-03	1	Pahwaypanik Bay	1	2	15	340091	6244883	-	n.s.	n.s.
21-Aug-03	1	Pahwaypanik Bay	2	1	15	340458	6244496	-	n.s.	n.s.
21-Aug-03	1	Pahwaypanik Bay	2	2	15	340899	6244462	-	n.s.	n.s.
21-Aug-03	1	Pahwaypanik Bay	3	1	15	339324	6245440	0.03	h.g.	h.g.
21-Aug-03	1	Pahwaypanik Bay	3	2	15	339281	6245519	0.00	n.m.	
21-Aug-03	1	Pahwaypanik Bay	4	1	15	338836	6245234	0.06	h.g.	h.g.
21-Aug-03	1	Pahwaypanik Bay	4	2	15	339205	6245399	-	n.s.	n.s.
19-Aug-03	2	John Garson Bay	1	1	15	355520	6243480	0.00	h.g.	n.s.
19-Aug-03	2	John Garson Bay	1	2	15	355483	6243488	0.00	h.g.	n.s.
19-Aug-03	2	John Garson Bay	2	1	15	355617	6244222	0.74	√	√
19-Aug-03	2	John Garson Bay	2	2	15	355236	6243951	0.87	√	√
19-Aug-03	2	John Garson Bay	3	1	15	355623	6244159	0.83	n.m.	
19-Aug-03	2	John Garson Bay	3	2	15	355238	6244049	1.15	√ [4]	√ [4]
19-Aug-03	2	John Garson Bay	4	1	15	354946	6244413	2.32	n.m.	
19-Aug-03	2	John Garson Bay	4	2	15	354969	6244334	1.36	√	√
21-Aug-03	3	Kahpowinik Bay	1	1	15	343836	6245056	-	n.s.	n.s.
21-Aug-03	3	Kahpowinik Bay	1	2	15	344159	6245252	-	n.s.	n.s.
21-Aug-03	3	Kahpowinik Bay	2	1	15	344333	6245342	-	n.s.	n.s.
21-Aug-03	3	Kahpowinik Bay	2	2	15	345038	6245453	-	n.s.	n.s.
21-Aug-03	3	Kahpowinik Bay	3	1	15	345163	6245013	0.41	n.m.	
21-Aug-03	3	Kahpowinik Bay	3	2	15	345532	6245248	0.40	√	√
21-Aug-03	3	Kahpowinik Bay	4	1	15	345304	6245015	1.00	n.m.	
21-Aug-03	3	Kahpowinik Bay	4	2	15	345291	6245160	0.51	n.m.	

Table 1. Continued.

Date	Area Number	Area Name	Zone	Site	Location (UTM/Datum NAD 83)			Average Water Depth (m)	Samples [1, 2, 3, 4,, 5]	
					Zone	Easting	Northing		Macrophyte	Epiphytic Invertebrate
20-Aug-03	4	Tub Bay	1	1	15	360174	6245369	0.27	√	√
20-Aug-03	4	Tub Bay	1	2	15	360090	6245496	0.38	√	√
20-Aug-03	4	Tub Bay	2	1	15	360262	6245622	1.54	n.m.	
20-Aug-03	4	Tub Bay	2	2	15	360220	6245595	0.45	√	√
20-Aug-03	4	Tub Bay	3	1	15	360401	6245657	2.14	n.m.	
20-Aug-03	4	Tub Bay	3	2	15	360185	6245627	1.92	n.m.	
20-Aug-03	4	Tub Bay	4	1	15	360352	6245668	2.79	t.d.	
20-Aug-03	4	Tub Bay	4	2	15	360288	6245658	3.08	t.d.	
22-Aug-03	5	Caribou Island	East	1	15	356939	6247906	0.15	√	√
22-Aug-03	5	Caribou Island	East	2	15	357055	6247609	0.13	√	√
22-Aug-03	5	Caribou Island	East	3	15	357402	6247647	0.39	√	√
23-Aug-03	5	Caribou Island	West	1	15	356520	6247503	0.00	n.m.	
23-Aug-03	5	Caribou Island	West	2	15	357055	6247609	0.01	h.g.	h.g.
23-Aug-03	5	Caribou Island	West	3	15	357402	6247647	0.13	√	√
23-Aug-03	6	John Kitch Bay	East	1	15	355137	6246614	0.52	√	√
23-Aug-03	6	John Kitch Bay	East	2	15	355365	6246340	2.71	t.d.	
23-Aug-03	6	John Kitch Bay	East	3	15	355229	6245996	0.78	√ [4]	√ [4]
23-Aug-03	6	John Kitch Bay	West	1	15	354865	6246868	0.45	√ [4]	√ [4]
23-Aug-03	6	John Kitch Bay	West	2	15	354958	6246646	0.03	h.g.	h.g.
23-Aug-03	6	John Kitch Bay	West	3	15	355075	6246610	0.40	√	√
23-Aug-03	7	Bay East of Rabbit Creek	1	1	15	350844	6242873	0.28	√	√
23-Aug-03	7	Bay East of Rabbit Creek	1	2	15	351012	6242769	0.24	n.m.	
23-Aug-03	7	Bay East of Rabbit Creek	2	1	15	350977	6242951	0.00	h.g.	h.g.
23-Aug-03	7	Bay East of Rabbit Creek	2	2	15	351094	6242871	0.01	h.g.	h.g.
23-Aug-03	7	Bay East of Rabbit Creek	3	1	15	351172	6242947	0.29	√	√

Table 1. Continued.

Date	Area Number	Area Name	Zone	Site	Location (UTM/Datum NAD 83)			Average Water Depth (m)	Samples [1, 2, 3, 4, 5]	
					Zone	Easting	Northing		Macrophyte	Epiphytic Invertebrate
23-Aug-03	7	Bay East of Rabbit Creek	3	2	15	350943	6243167	0.54	n.m.	
23-Aug-03	7	Bay East of Rabbit Creek	4	1	15	351195	6243114	1.20	n.m.	
23-Aug-03	7	Bay East of Rabbit Creek	4	2	15	351241	6243124	2.69	t.d.	
22-Aug-03	8	Clark Lake	1	1	15	318007	6239505	0.00	n.m.	
22-Aug-03	8	Clark Lake	1	2	15	318085	6239437	0.00	n.m.	
22-Aug-03	8	Clark Lake	2	1	15	318254	6239667	0.27	√	√
22-Aug-03	8	Clark Lake	2	2	15	318345	6240094	0.29	√	√
22-Aug-03	8	Clark Lake	3	1	15	318442	6240030	0.86	√ [4]	√ [4]
22-Aug-03	8	Clark Lake	3	2	15	318597	6239813	0.53	n.m.	
22-Aug-03	8	Clark Lake	4	1	15	318898	6240269	1.78	√ [4]	√ [4]
22-Aug-03	8	Clark Lake	4	2	15	318583	6240079	1.52	n.m.	

[1] √ = sample taken; n.s. = no sample due to lack of water.
[2] n.m. = no macrophytes.
[3] t.d. = too deep to sample.
[4] no duplicate sample due to lack of macrophytes.
[5] h.g. = hand grabbed macrophytes at shallow site; no duplicate sample.

Table 2. Summary of mean dry weight (g/m^2) +/- one standard deviation (SD) and percent dry weight (%) of vascular and nonvascular macrophyte samples collected in Gull Lake, Clark Lake, and portions of the Nelson River between Birthday and Gull rapids, late summer, 2003. Individual abundances may not add up to totals due to rounding.

Area	1: Pahwaypanik Bay			2: John Garson Bay			3: Kahpowinik Bay		
	Mean	**SD**	**%**	**Mean**	**SD**	**%**	**Mean**	**SD**	**%**
Vascular Macrophytes									
Callitriche palustris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hippuris vulgaris	0.00	0.00	0.00	2.62	7.42	8.38	0.00	0.00	0.00
Lemna trisulca	0.40	0.68	3.72	0.33	0.63	1.06	0.00	0.00	0.00
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Polygonum amphibium	0.00	0.00	0.00	12.20	34.42	38.96	0.00	0.00	0.00
Potamogeton gramineus	0.00	0.00	0.00	0.78	2.22	2.50	0.65	1.31	21.66
Potamogeton richardsonii	0.78	0.68	7.37	14.37	30.87	45.90	0.00	0.00	0.00
Potamogeton spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.18	2.91
Sagittaria cuneata	1.90	3.29	17.88	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia pectinatus	0.00	0.00	0.00	0.00	0.00	0.00	1.62	3.23	53.45
Stuckenia vaginatus	7.48	12.95	70.40	0.80	1.98	2.55	0.00	0.00	0.00
Nonvascular Macrophytes									
Aquatic moss	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.50	8.27
Chara spp.	0.07	0.10	0.64	0.00	0.00	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.13	2.15
Filamentous algae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified	0.00	0.00	0.00	0.14	0.39	0.44	0.00	0.00	0.00
TOTAL MACROPHYTES	**10.62**	**12.05**	**100.00**	**31.25**	**39.54**	**100.00**	**2.67**	**5.35**	**100.00**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

Table 2. Continued.

Area	4: Tub Bay			5: Caribou Island			6: John Kitch Bay		
	Mean	**SD**	**%**	**Mean**	**SD**	**%**	**Mean**	**SD**	**%**
Vascular Macrophytes									
Callitriche palustris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	0.04	0.09	0.80	1.14	2.79	8.42	0.00	0.00	0.00
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton gramineus	0.71	1.10	12.81	0.27	0.66	1.99	0.00	0.00	0.00
Potamogeton richardsonii	0.32	0.40	5.79	0.89	0.94	6.61	0.18	0.30	1.81
Potamogeton spp.	0.42	0.85	7.50	0.08	0.15	0.58	0.57	0.95	5.59
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia pectinatus	0.06	0.15	1.11	0.66	1.61	4.86	1.56	2.98	15.34
Stuckenia vaginatus	3.32	7.14	59.74	7.45	7.02	55.14	6.35	11.17	62.41
Nonvascular Macrophytes									
Aquatic moss	0.00	0.00	0.00	3.03	3.22	22.40	1.51	1.99	14.85
Chara spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Filamentous algae	0.64	1.13	11.49	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified	0.04	0.10	0.77	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**5.57**	**7.38**	**100.00**	**13.51**	**7.52**	**100.00**	**10.17**	**9.24**	**100.00**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

Table 2. Continued.

Area	7: Bay East of Rabbit Creek			8: Clark Lake		
	Mean	SD	%	Mean	SD	%
Vascular Macrophytes						
Callitriche palustris	0.00	0.00	0.00	2.22	6.27	31.51
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	0.00
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	0.00	0.00
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton gramineus	1.74	4.59	12.83	0.00	0.00	0.00
Potamogeton richardsonii	1.63	2.39	12.06	3.89	7.71	55.34
Potamogeton spp.	0.00	0.00	0.00	0.33	0.92	4.64
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia pectinatus	1.47	2.55	10.83	0.05	0.14	0.72
Stuckenia vaginatus	8.69	15.06	64.17	0.55	1.55	7.79
Nonvascular Macrophytes						
Aquatic moss	0.02	0.04	0.11	0.00	0.00	0.00
Chara spp.	0.00	0.00	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	0.00
Filamentous algae	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**13.54**	**17.44**	**100.00**	**7.03**	**11.14**	**100.00**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

Table 3. Summary of mean abundance (individuals/m^2), +/- one standard deviation (SD), and overall percent composition (%) of major epiphytic invertebrate groups collected in association with macrophyte sampling in Gull Lake, Clark Lake, and portions of the Nelson River between Birthday and Gull rapids, late summer, 2003. Individual abundances may not add up to totals due to rounding.

Area	1: Pahwaypanik Bay					2: John Garson Bay				
	Mean	SD	Mean	SD	%	Mean	SD	Mean	SD	%
Mesh Size (µm)	400		500		Overall	400		500		Overall
Annelida										
Oligochaeta	13	16	17	14	17.8	22	33	16	18	33.9
Hirudinea	0	0	7	12	4.2	0	0	0	0	0.0
Total Annelida	**13**	**16**	**24**	**24**	**22.0**	**22**	**33**	**16**	**18**	**33.9**
Crustacea										
Ostracoda	9	15	10	8	10.7	1	2	0	0	0.9
Amphipoda	1	1	9	15	5.6	0	1	1	2	1.6
Decapoda	0	0	0	0	0.0	0	0	0	0	0.0
Total Crustacea	**10**	**16**	**18**	**21**	**16.4**	**1**	**2**	**1**	**2**	**2.4**
Arachnida										
Acarina	0	0	2	4	1.4	0	0	0	0	0.0
Araneae	0	0	0	0	0.0	0	0	0	0	0.0
Total Arachnida	**0**	**0**	**2**	**4**	**1.4**	**0**	**0**	**0**	**0**	**0.0**
Mollusca										
Bivalvia										
Pisidiidae	0	0	11	19	6.5	0	0	0	0	0.0
Gastropoda	1	1	12	12	7.5	1	1	13	25	12.1
Total Mollusca	**1**	**1**	**23**	**23**	**14.0**	**1**	**1**	**13**	**25**	**12.1**
Hydrozoa	0	0	1	1	0.5	0	0	1	2	0.9
Insecta										
Odonata										
Anisoptera	0	0	0	0	0.0	0	0	0	0	0.0
Zygoptera										
Coenagrionidae	0	0	0	0	0.0	0	0	0	0	0.0
Coleoptera										
Dytiscidae	0	0	1	1	0.5	0	0	0	0	0.0
Haliplidae	0	0	2	4	1.4	0	0	0	0	0.0
Gyrinidae	0	0	0	0	0.0	0	0	0	0	0.2
Hemiptera										
Corixidae	0	0	1	1	0.5	0	0	2	3	1.4
Ephemeroptera										
Baetidae	0	0	0	0	0.0	0	0	0	0	0.2
Caenidae	0	0	1	1	0.5	0	0	0	0	0.3
Ephemeridae	0	0	0	0	0.0	0	0	0	0	0.0
Heptageniidae	0	0	0	0	0.0	0	0	0	0	0.0
Leptophlebiidae	0	0	0	0	0.0	0	0	0	0	0.0
Siphlonuridae	0	0	0	0	0.0	0	0	0	0	0.0
Trichoptera										
Hydropsychidae	0	0	0	0	0.0	0	0	0	0	0.0
Leptoceridae	0	0	0	0	0.0	0	0	0	0	0.2
Limnephilidae	0	0	0	0	0.0	0	0	0	0	0.0
Phryganeidae	0	0	0	0	0.0	0	0	0	0	0.2
Polycentropodidae	0	0	0	0	0.0	0	0	0	0	0.0
Diptera										
Ceratopogonidae	1	1	13	23	8.4	0	0	0	0	0.0
Chironomidae	21	23	37	38	34.1	25	26	30	27	48.3
Dolichopodidae	0	0	1	1	0.5	0	0	0	0	0.0
Total Insecta	**21**	**24**	**56**	**67**	**45.8**	**26**	**26**	**32**	**30**	**50.7**
TOTAL INVERTEBRATES	**45**	**57**	**125**	**139**	**100.0**	**50**	**54**	**64**	**64**	**100.0**

Table 3. Continued.

Area	3: Kahpowinik Bay					4: Tub Bay				
	Mean	SD	Mean	SD	%	Mean	SD	Mean	SD	%
Mesh Size (µm)	400		500		Overall	400		500		Overall
Annelida										
Oligochaeta	11	22	52	104	25.2	4	4	4	6	6.2
Hirudinea	0	0	0	0	0.0	0	0	2	3	1.4
Total Annelida	**11**	**22**	**52**	**104**	**25.2**	**4**	**4**	**6**	**7**	**7.6**
Crustacea										
Ostracoda	2	4	1	2	1.3	1	2	1	1	1.4
Amphipoda	1	1	7	14	3.1	1	1	7	9	6.0
Decapoda	0	0	0	0	0.0	0	0	1	1	0.6
Total Crustacea	**3**	**5**	**8**	**17**	**4.4**	**2**	**2**	**9**	**10**	**8.1**
Arachnida										
Acarina	0	0	0	1	0.1	0	0	0	0	0.2
Araneae	0	0	0	0	0.0	0	0	0	0	0.0
Total Arachnida	**0**	**0**	**0**	**1**	**0.1**	**0**	**0**	**0**	**0**	**0.2**
Mollusca										
Bivalvia										
Pisidiidae	0	0	0	0	0.0	0	0	0	0	0.0
Gastropoda	0	1	105	211	42.3	1	3	34	52	28.1
Total Mollusca	**0**	**1**	**105**	**211**	**42.3**	**1**	**3**	**34**	**52**	**28.1**
Hydrozoa	0	1	1	2	0.5	0	0	0	0	0.0
Insecta										
Odonata										
Anisoptera	0	0	0	0	0.0	0	0	0	0	0.0
Zygoptera										
Coenagrionidae	0	0	0	1	0.1	0	0	0	0	0.0
Coleoptera										
Dytiscidae	0	0	1	2	0.4	0	0	0	0	0.2
Haliplidae	0	0	0	0	0.0	0	0	0	0	0.2
Gyrinidae	0	0	1	1	0.2	0	0	0	1	0.3
Hemiptera										
Corixidae	0	0	2	5	1.0	0	0	11	19	9.0
Ephemeroptera										
Baetidae	0	0	0	0	0.0	0	0	1	2	1.1
Caenidae	0	1	0	1	0.2	0	0	0	0	0.2
Ephemeridae	0	0	0	0	0.0	0	0	0	0	0.2
Heptageniidae	0	0	0	0	0.0	0	0	0	0	0.0
Leptophlebiidae	0	0	0	1	0.1	0	0	0	0	0.0
Siphlonuridae	0	0	0	0	0.0	0	0	1	2	0.6
Trichoptera										
Hydropsychidae	0	0	0	0	0.0	0	0	0	0	0.0
Leptoceridae	0	0	0	0	0.0	0	0	0	0	0.0
Limnephilidae	0	0	0	0	0.0	0	0	0	0	0.0
Phryganeidae	0	0	0	0	0.0	0	0	0	1	0.3
Polycentropodidae	0	0	0	0	0.0	0	0	0	0	0.2
Diptera										
Ceratopogonidae	0	0	0	1	0.1	0	0	0	0	0.2
Chironomidae	18	35	46	92	25.4	14	23	41	52	43.7
Dolichopodidae	0	0	0	0	0.0	0	0	0	0	0.0
Total Insecta	**18**	**36**	**51**	**102**	**27.5**	**14**	**23**	**56**	**72**	**56.1**
TOTAL INVERTEBRATES	**32**	**64**	**218**	**436**	**100.0**	**21**	**28**	**105**	**133**	**100.0**

Table 3. Continued.

Area	5: Caribou Island					6: John Kitch Bay				
	Mean	SD	Mean	SD	%	Mean	SD	Mean	SD	%
Mesh Size (µm)	400		500		Overall	400		500		Overall
Annelida										
Oligochaeta	8	10	13	13	6.7	7	11	5	4	8.1
Hirudinea	0	0	2	2	0.5	0	0	1	3	1.0
Total Annelida	**8**	**10**	**15**	**13**	**7.2**	**7**	**11**	**7**	**5**	**9.0**
Crustacea										
Ostracoda	0	0	0	0	0.1	0	1	0	0	0.3
Amphipoda	4	6	32	29	11.1	1	1	3	4	2.5
Decapoda	0	0	0	0	0.0	0	0	1	2	0.5
Total Crustacea	**4**	**6**	**32**	**29**	**11.2**	**2**	**1**	**3**	**5**	**3.3**
Arachnida										
Acarina	1	1	0	0	0.2	0	0	0	1	0.2
Araneae	0	0	0	0	0.0	0	1	0	0	0.2
Total Arachnida	**1**	**1**	**0**	**0**	**0.2**	**0**	**1**	**0**	**1**	**0.3**
Mollusca										
Bivalvia										
Pisidiidae	0	0	0	1	0.1	0	0	0	1	0.3
Gastropoda	4	3	151	92	48.5	0	1	24	21	16.3
Total Mollusca	**4**	**3**	**151**	**92**	**48.6**	**0**	**1**	**25**	**22**	**16.7**
Hydrozoa	0	0	0	0	0.0	0	0	0	0	0.0
Insecta										
Odonata										
Anisoptera	0	0	0	0	0.0	0	0	0	0	0.0
Zygoptera										
Coenagrionidae	0	0	0	0	0.0	0	0	0	0	0.0
Coleoptera										
Dytiscidae	0	0	0	0	0.0	0	0	0	0	0.0
Haliplidae	0	0	0	0	0.1	0	0	0	0	0.0
Gyrinidae	0	0	0	0	0.0	0	0	0	0	0.0
Hemiptera										
Corixidae	0	0	5	7	1.7	0	1	6	8	4.3
Ephemeroptera										
Baetidae	0	0	1	1	0.3	0	0	0	1	0.3
Caenidae	0	0	0	0	0.0	0	0	0	0	0.0
Ephemeridae	0	0	0	0	0.1	0	1	1	1	0.8
Heptageniidae	0	0	0	0	0.0	0	0	0	0	0.0
Leptophlebiidae	0	0	0	1	0.1	0	0	0	0	0.0
Siphlonuridae	0	0	0	0	0.0	0	0	0	0	0.0
Trichoptera										
Hydropsychidae	0	0	0	0	0.0	0	0	0	0	0.0
Leptoceridae	0	0	0	0	0.0	0	0	0	0	0.0
Limnephilidae	0	0	0	0	0.0	0	0	0	0	0.0
Phryganeidae	0	0	2	2	0.5	0	0	2	2	1.1
Polycentropodidae	0	0	0	0	0.0	0	0	0	0	0.0
Diptera										
Ceratopogonidae	0	0	0	1	0.1	0	0	0	0	0.0
Chironomidae	30	17	64	42	29.8	19	19	78	94	64.1
Dolichopodidae	0	0	0	0	0.0	0	0	0	0	0.0
Total Insecta	**30**	**17**	**74**	**46**	**32.7**	**19**	**19**	**87**	**93**	**70.6**
TOTAL INVERTEBRATES	**47**	**35**	**271**	**162**	**100.0**	**28**	**31**	**122**	**116**	**100.0**

Table 3. Continued.

Area	7: Bay East of Rabbit Creek					8: Clark Lake				
	Mean	SD	Mean	SD	%	Mean	SD	Mean	SD	%
Mesh Size (µm)	400		500		Overall	400		500		Overall
Annelida										
Oligochaeta	11	11	8	14	9.8	9	15	7	12	13.8
Hirudinea	0	0	1	1	0.3	0	0	0	1	0.3
Total Annelida	**11**	**11**	**9**	**15**	**10.1**	**9**	**15**	**7**	**13**	**14.1**
Crustacea										
Ostracoda	1	2	0	1	0.8	0	1	0	1	0.7
Amphipoda	0	0	9	14	4.6	0	0	8	13	6.7
Decapoda	0	0	0	0	0.0	0	0	0	1	0.3
Total Crustacea	**1**	**2**	**9**	**15**	**5.4**	**0**	**1**	**8**	**14**	**7.6**
Arachnida										
Acarina	0	0	0	0	0.0	0	0	0	0	0.0
Araneae	0	0	0	0	0.0	0	0	0	0	0.0
Total Arachnida	**0**	**0**	**0**	**0**	**0.0**	**0**	**0**	**0**	**0**	**0.0**
Mollusca										
Bivalvia										
Pisidiidae	0	0	1	3	0.6	0	0	0	0	0.1
Gastropoda	0	1	55	63	28.0	0	1	15	28	13.4
Total Mollusca	**1**	**1**	**56**	**64**	**28.6**	**0**	**1**	**15**	**28**	**13.5**
Hydrozoa	0	0	0	0	0.0	0	0	0	0	0.0
Insecta										
Odonata										
Anisoptera	0	1	0	0	0.2	0	0	0	0	0.0
Zygoptera										
Coenagrionidae	0	0	0	0	0.0	0	0	0	0	0.0
Coleoptera										
Dytiscidae	0	0	0	0	0.0	0	0	0	0	0.1
Haliplidae	0	0	0	1	0.2	0	0	0	0	0.0
Gyrinidae	0	0	0	0	0.0	0	0	0	0	0.1
Hemiptera										
Corixidae	0	0	0	1	0.2	0	0	4	8	3.8
Ephemeroptera										
Baetidae	0	0	0	0	0.0	0	0	0	0	0.3
Caenidae	0	0	0	1	0.2	0	0	0	0	0.0
Ephemeridae	0	0	1	2	0.3	0	0	0	0	0.0
Heptageniidae	0	0	0	0	0.0	0	0	0	0	0.1
Leptophlebiidae	0	1	0	0	0.3	0	0	0	0	0.1
Siphlonuridae	0	0	0	0	0.0	0	0	0	0	0.0
Trichoptera										
Hydropsychidae	0	0	0	0	0.1	0	0	0	0	0.0
Leptoceridae	0	0	0	0	0.1	0	0	0	0	0.1
Limnephilidae	0	0	0	1	0.2	0	0	0	0	0.0
Phryganeidae	0	0	0	0	0.0	0	0	0	1	0.4
Polycentropodidae	0	0	0	0	0.0	0	0	0	0	0.1
Diptera										
Ceratopogonidae	0	0	0	1	0.2	0	0	0	0	0.1
Chironomidae	26	28	81	95	54.1	16	21	50	59	58.9
Dolichopodidae	0	0	0	0	0.0	0	0	0	0	0.0
Total Insecta	**26**	**28**	**84**	**94**	**55.9**	**16**	**21**	**57**	**65**	**64.8**
TOTAL INVERTEBRATES	**39**	**40**	**157**	**166**	**100.0**	**26**	**34**	**87**	**104**	**100.0**

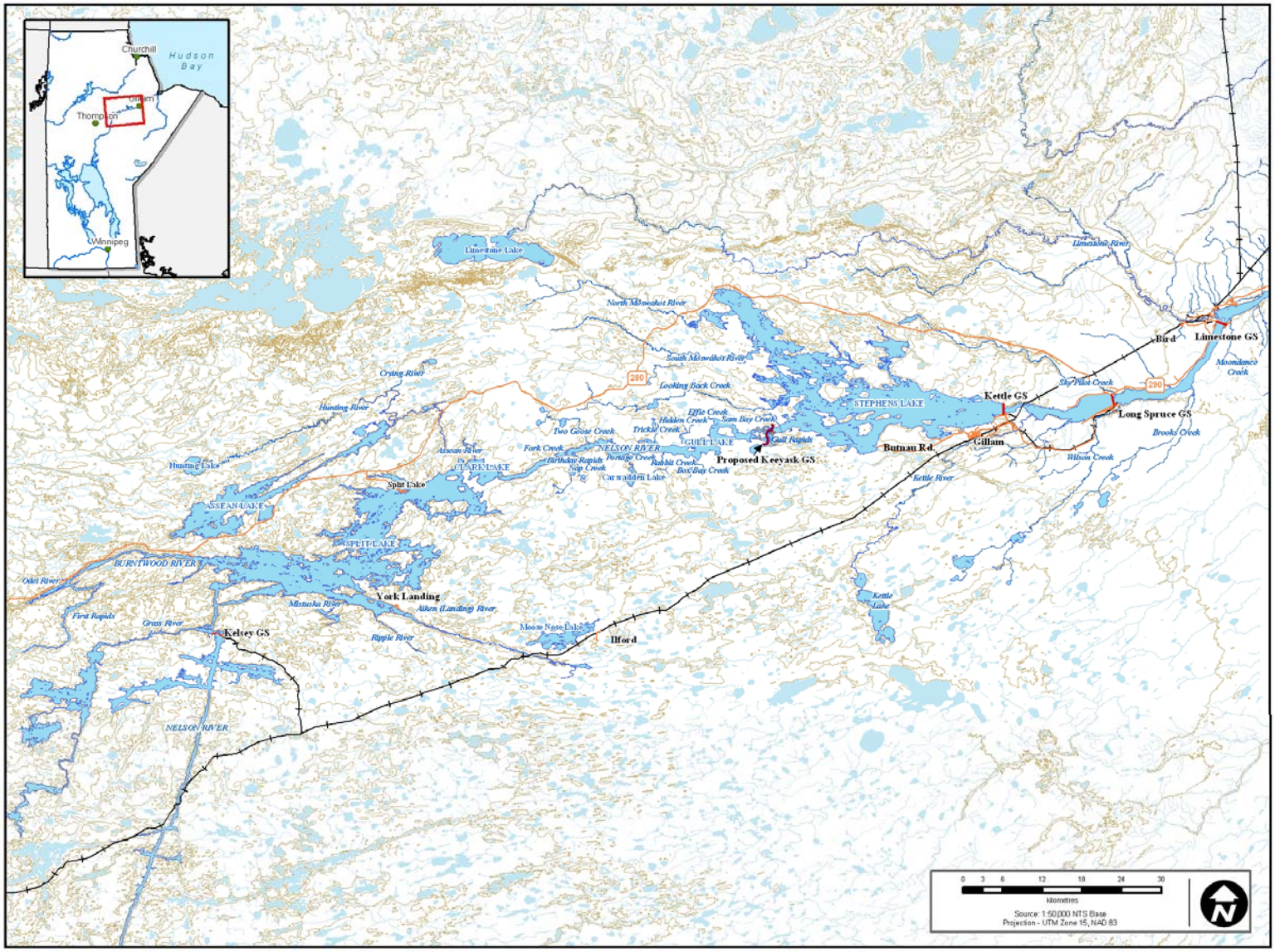

Figure 1. Map of the Keeyask Study Area showing proposed and existing hydroelectric development.

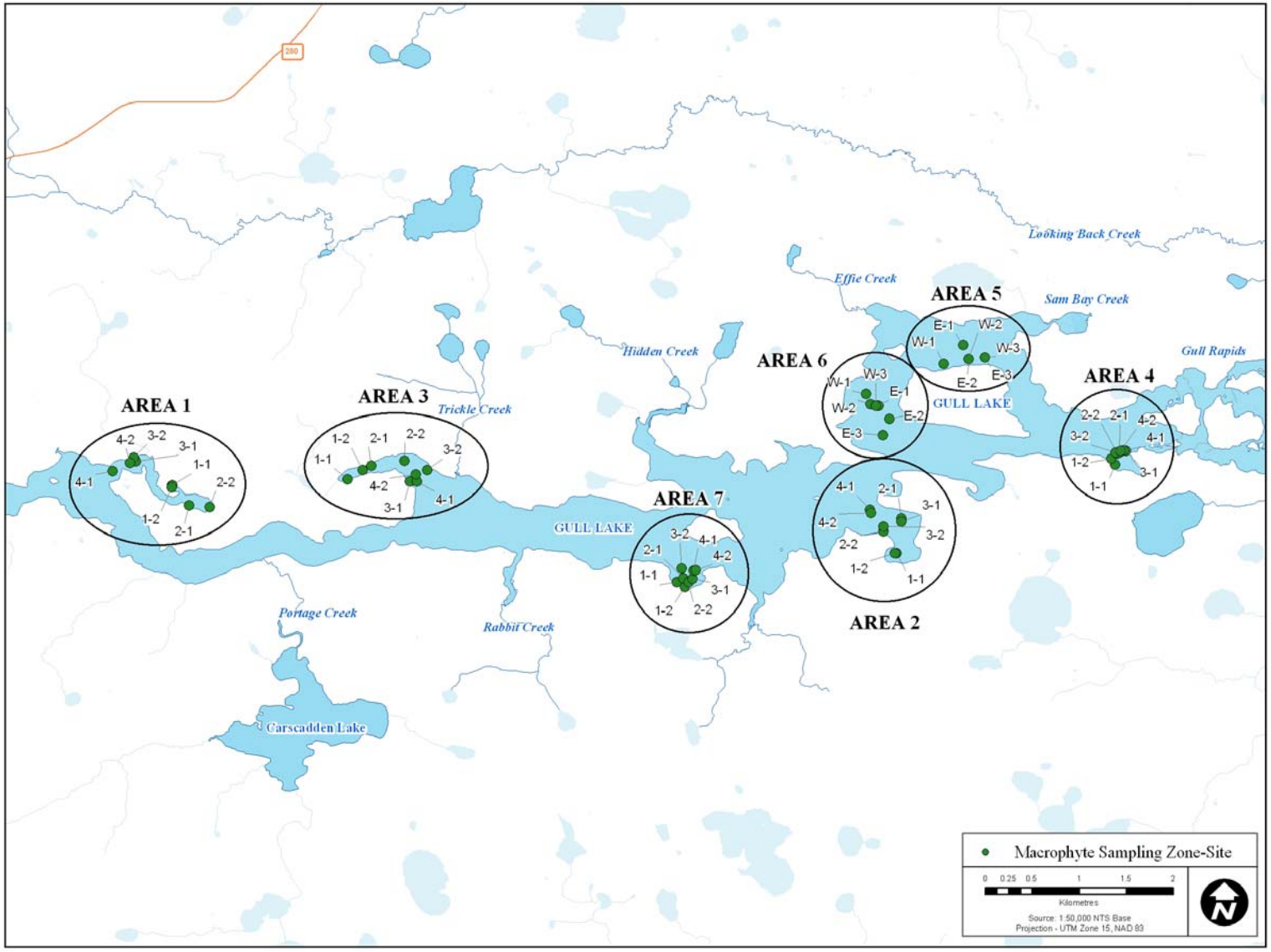

Figure 2. Aquatic macrophyte and associated epiphytic invertebrate sampling sites in the Nelson River between Birthday and Gull rapids, late summer 2003.

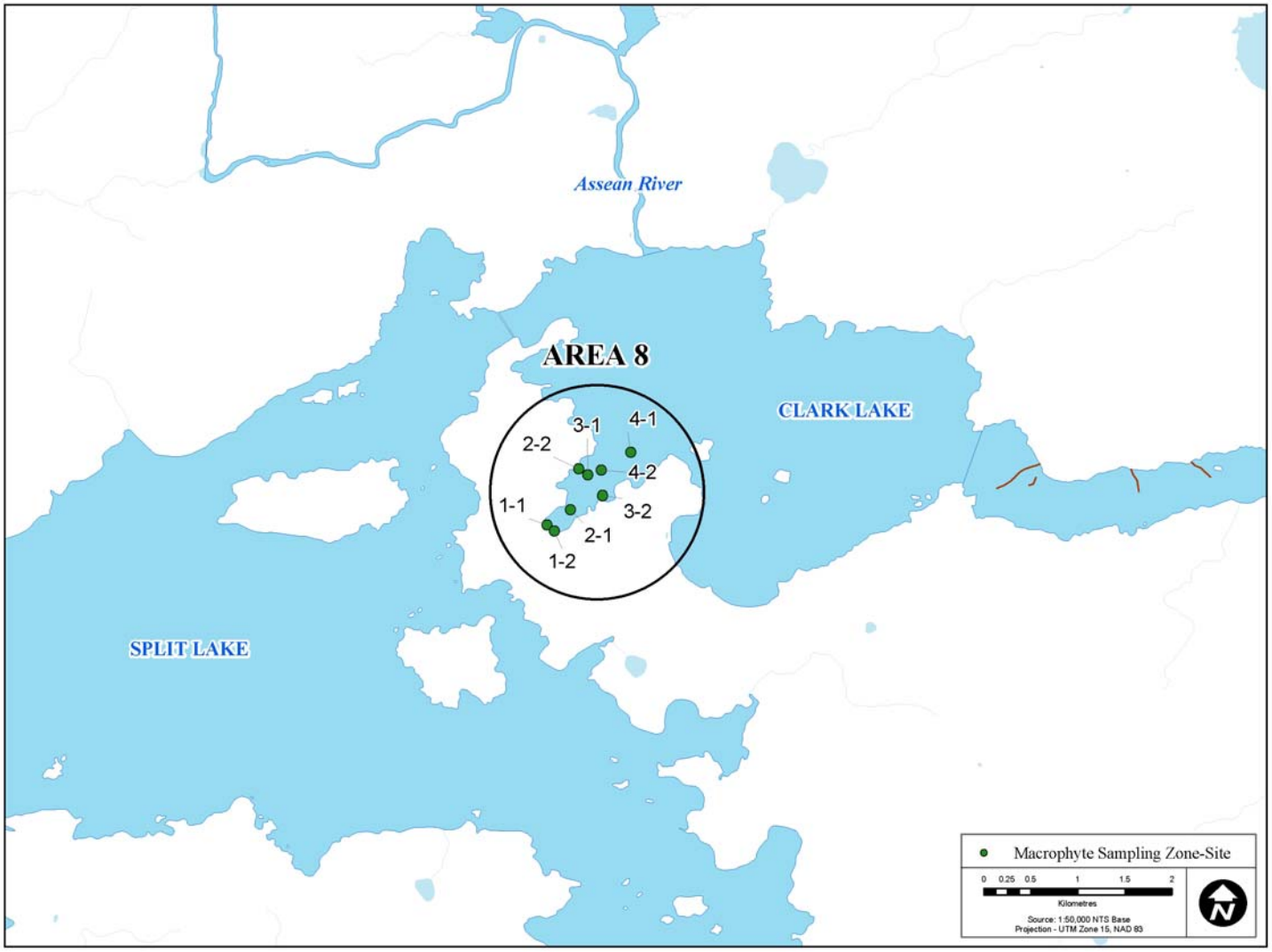

Figure 3. Aquatic macrophyte and associated epiphytic invertebrate sampling sites within Clark Lake, late summer 2003.

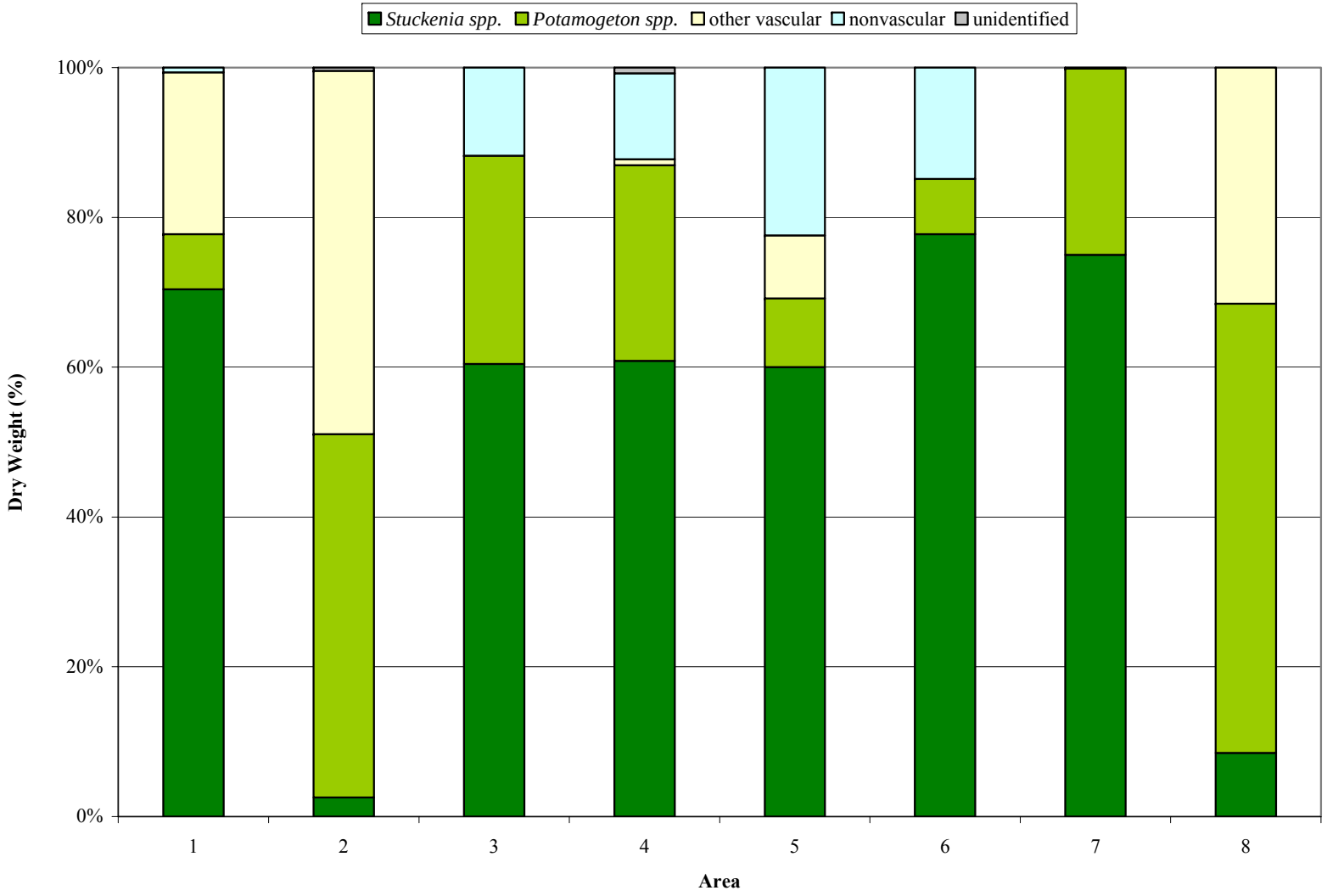

Figure 4. Mean percent dry weight (%) of *Stuckenia* spp., *Potamogeton* spp., and other vascular and nonvascular macrophytes collected within eight areas in Gull Lake, Clark Lake, and portions of the Nelson River between Birthday and Gull rapids, late summer 2003. Areas refer to figures 2 and 3.

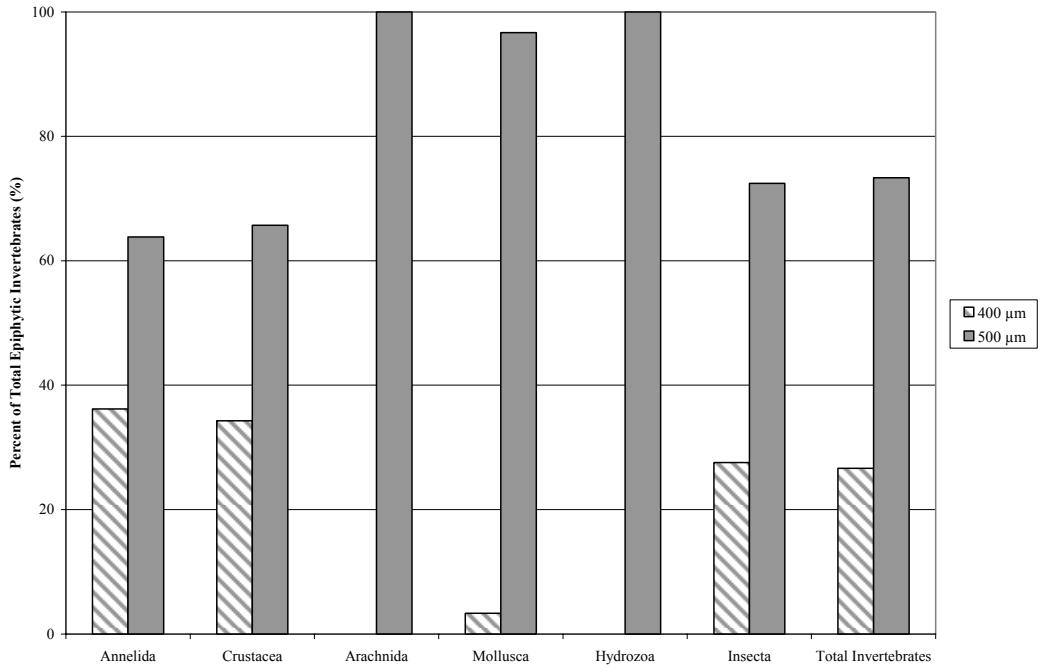

Figure 5. Percent of total epiphytic invertebrates (%) retained in each mesh size (400 and 500 µm) in Area 1: Pahwaypanik Bay, late summer 2003.

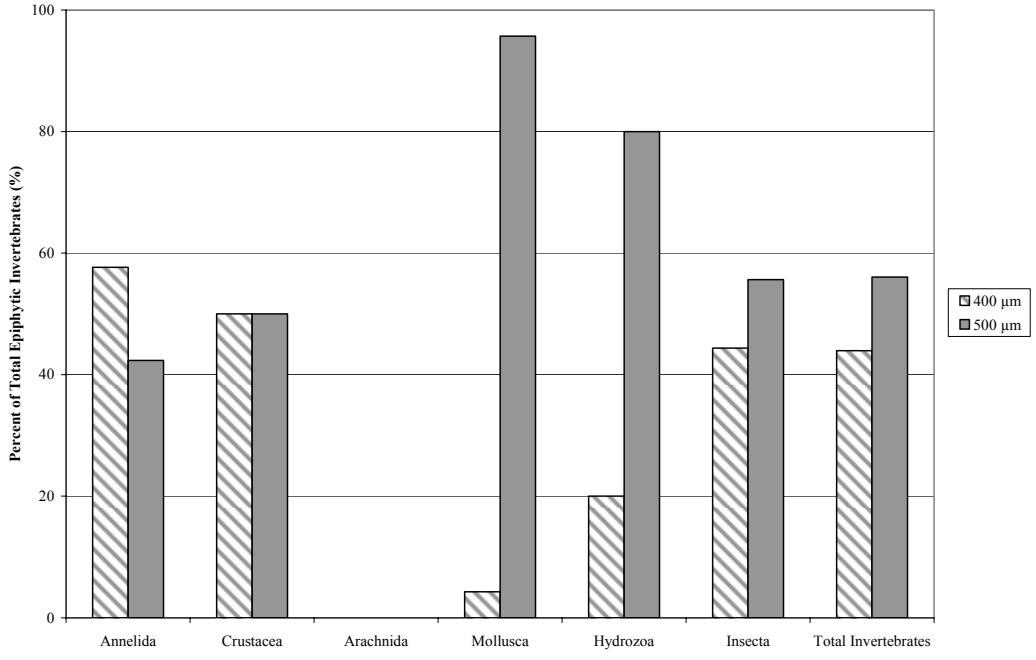

Figure 6. Percent of total epiphytic invertebrates (%) retained in each mesh size (400 and 500 µm) in Area 2: John Garson Bay, late summer 2003.

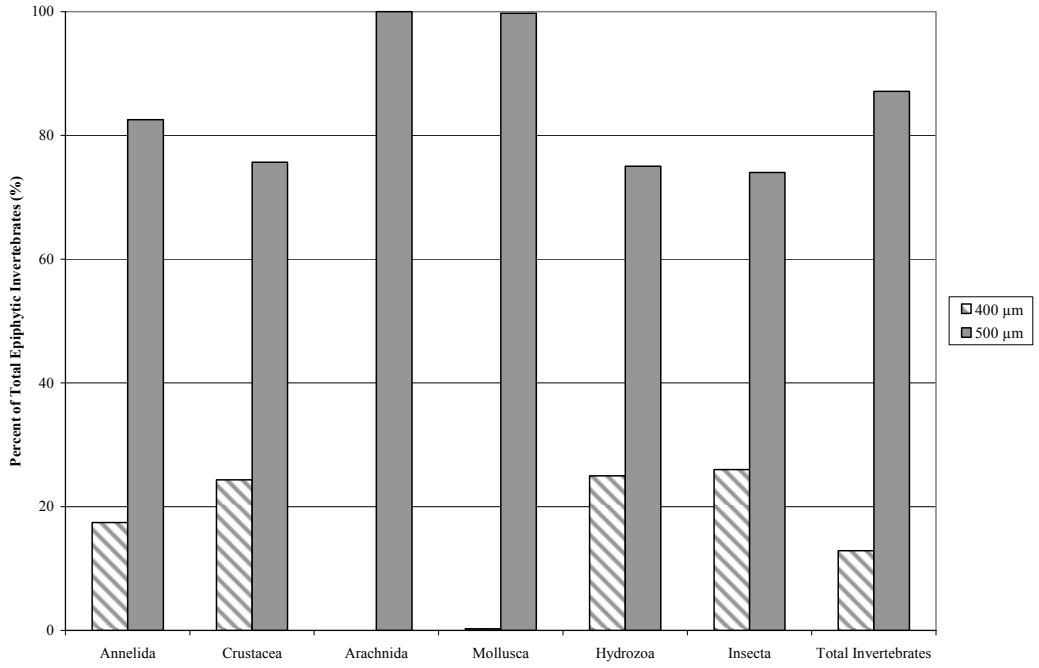

Figure 7. Percent of total epiphytic invertebrates (%) retained in each mesh size (400 and 500 µm) in Area 3: Kahpowinik Bay, late summer 2003.

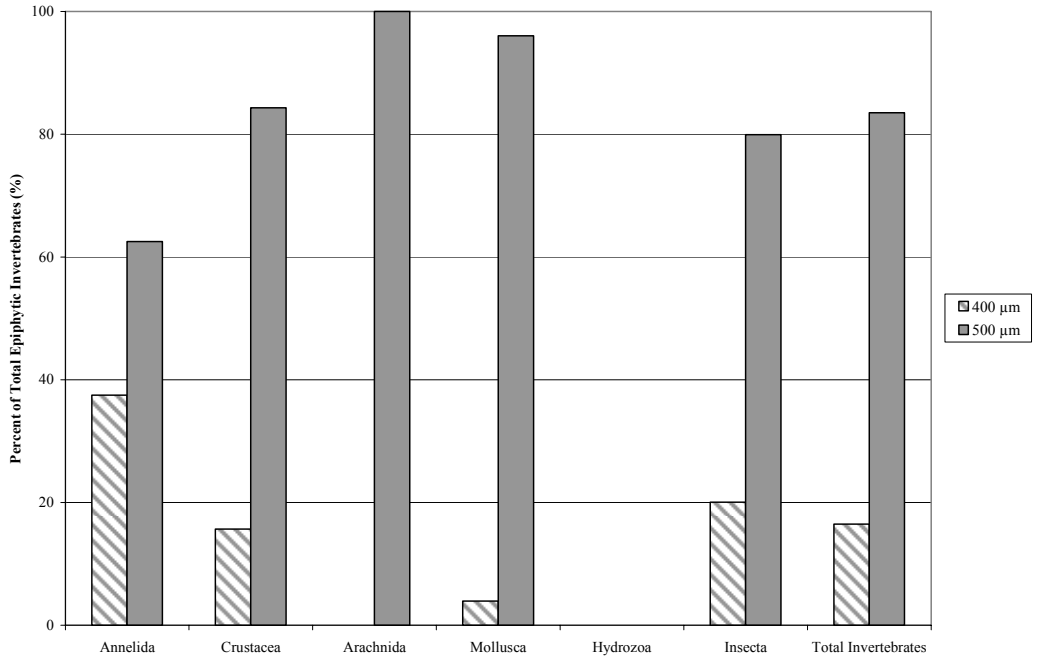

Figure 8. Percent of total epiphytic invertebrates (%) retained in each mesh size (400 and 500 µm) in Area 4: Tub Bay, late summer 2003.

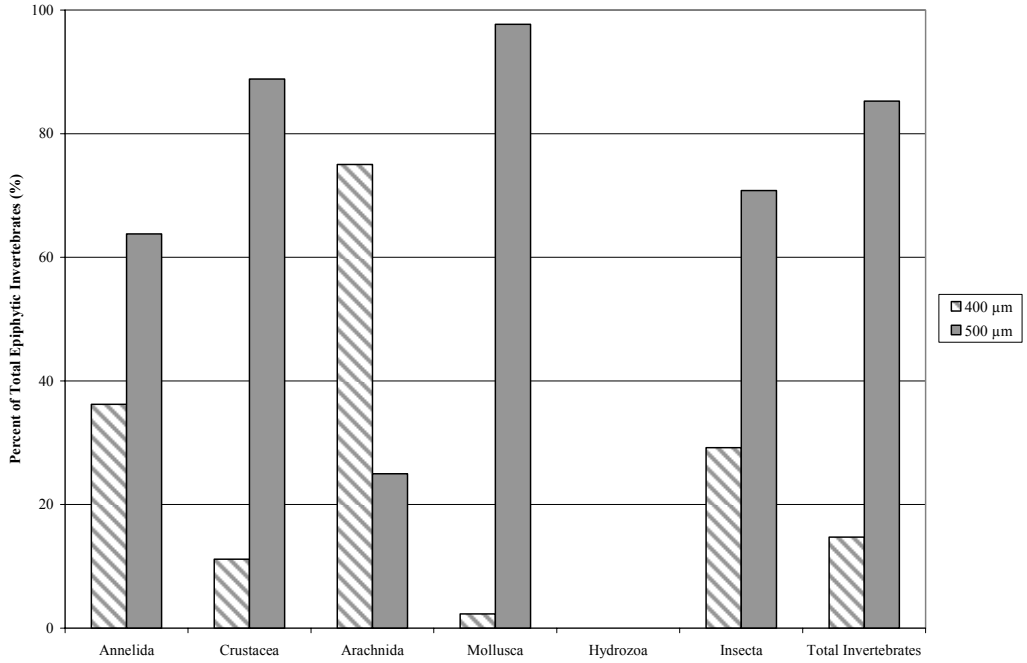

Figure 9. Percent of total epiphytic invertebrates (%) retained in each mesh size (400 and 500 µm) in Area 5: Caribou Island, late summer 2003.

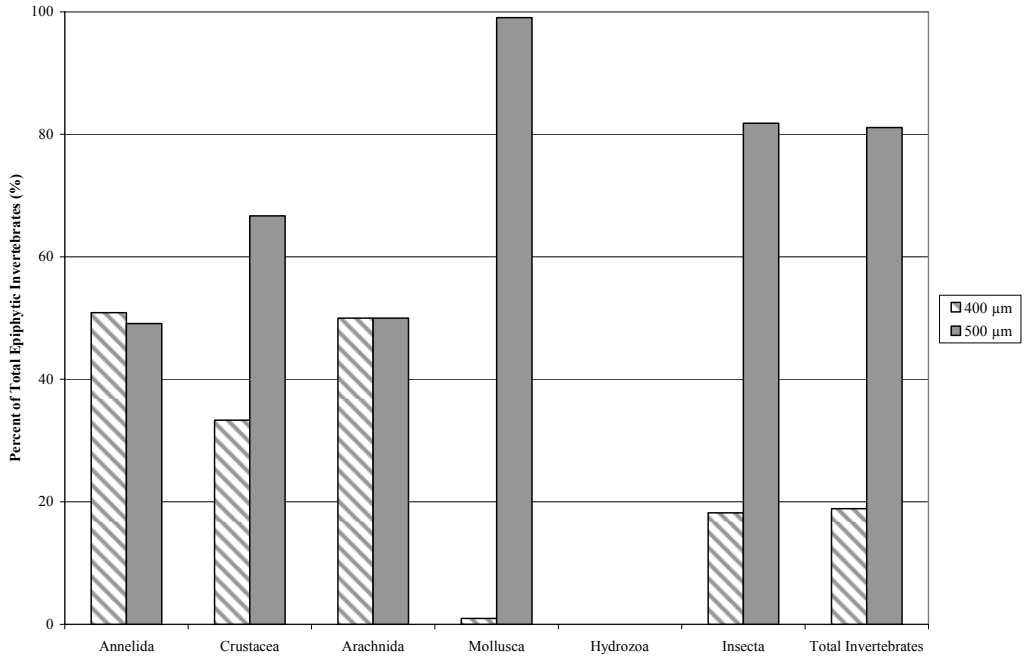

Figure 10. Percent of total epiphytic invertebrates (%) retained in each mesh size (400 and 500 µm) in Area 6: John Kitch Bay, late summer 2003.

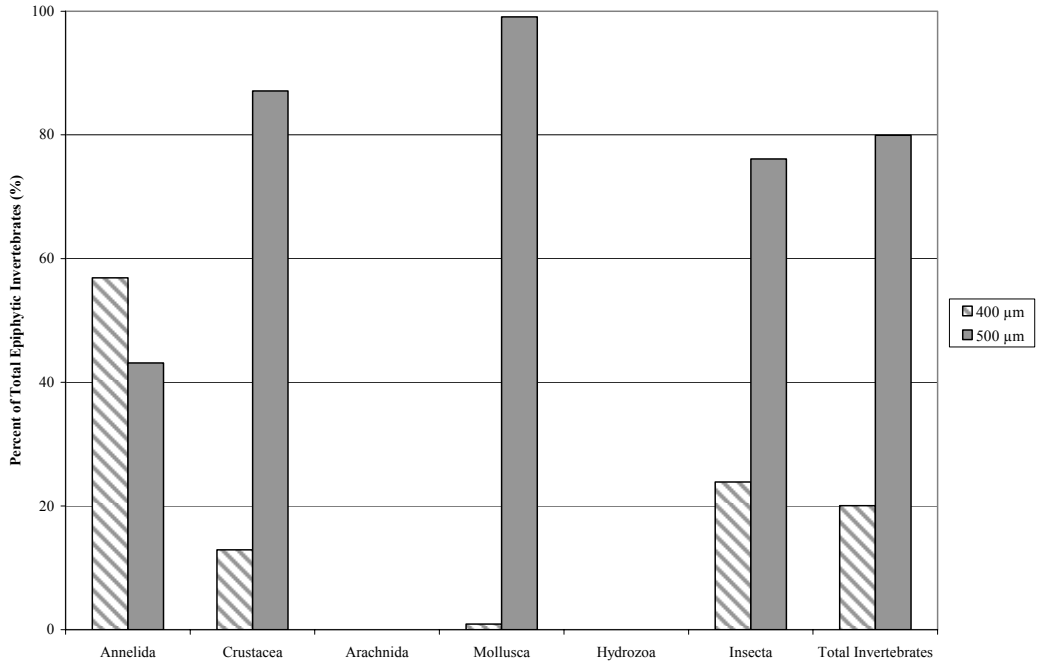

Figure 11. Percent of total epiphytic invertebrates (%) retained in each mesh size (400 and 500 µm) in Area 7: Bay East of Rabbit Creek, late summer 2003.

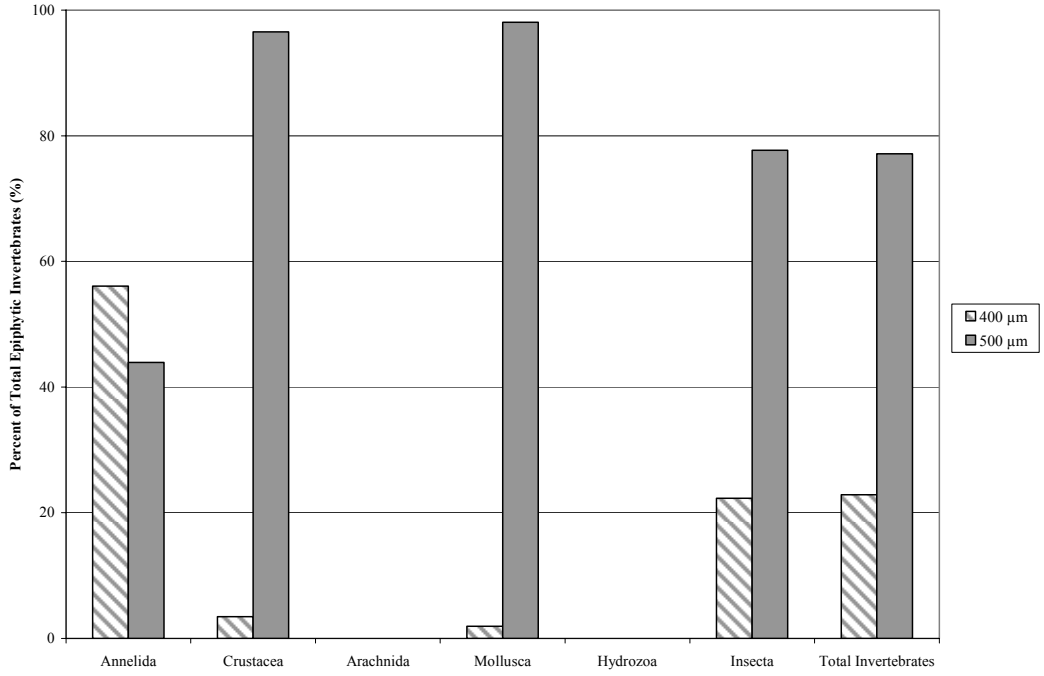

Figure 12. Percent of total epiphytic invertebrates (%) retained in each mesh size (400 and 500 µm) in Area 8: Clark Lake, late summer 2003.

APPENDIX 1.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Sample Processing

Sorting aquatic invertebrate samples involves removing aquatic macro-invertebrates from the organic and inorganic material within each sample.

Sorting Samples

- All sorting is done using a 3x desktop magnifier with lamp;
- All sorted samples are checked by a second laboratory technician;
- Any additional invertebrates collected during the checking process are combined with the original sample, but counted separately; and
- Sorting efficiency must be ≥ 95%. Anything less, and the sample must be re-sorted.

Verification of Taxonomic Identification

To verify the taxonomic identifications and improve consistency among taxonomists, North/South Consultants Inc. communicates with taxonomic specialists on a regular basis.

Sample Identification

- Once samples have been identified to the appropriate taxonomic level by an in-house taxonomist, a sample subset is selected for review by an external taxonomist for accuracy in taxonomic identification and enumeration of individuals;
- For each project, 10% of the identified samples from each in-house taxonomist are randomly selected and sent to a taxonomic specialist for QA/QC;
- All uncertain and unknown organisms are also sent to the specialist;
- Misidentifications and/or enumeration discrepancies are noted on the laboratory datasheet;
- The target overall accuracy objective is 90% for invertebrate identification and enumeration. The taxonomic specialist's identification/enumeration values will be used where deviations (that fall within the acceptable limit) exist; and
- All samples that fall outside the target accuracy objectives will be re-identified and/or re-enumerated.

Data Processing

Data processing involves entering the data from the laboratory data sheet into an excel spreadsheet. Data sheets include: the date of sample, name of waterbody, site location, type of sample, sample sorter, sample verifier, taxonomic identification, and enumeration list. Once raw data has been entered into the template spreadsheet, a second technician checks and verifies entered data and formulae. A final verification or spot-check is conducted by the report author.

APPENDIX 2.

ADDITIONAL DATA COLLECTED: AQUATIC MACROPHYTE MAPPING

Page

Table A2-1. Aquatic macrophyte mapping information for the Nelson River between Birthday and Gull rapids (including Gull Lake), late summer 2003.

Macrophyte Bed ID	UTM Coordinates (NAD 83)[1]			Average Depth (m)
	Zone	Easting[1]	Northing[1]	
1	15	335981	6244067	0.38
2	15	340038	6243509	0.26
3	15	343501	6243877	0.51
4	15	345208	6245184	0.32
5b	15	351626	6245327	0.38
5a	15	351047	6244995	0.38
6	15	351132	6243027	0.48
7	15	352502	6245378	0.26
8	15	353555	6245572	0.63
9	15	360296	6245433	0.61
10	15	358185	6246658	0.78
11	15	357007	6247753	0.59
12	15	355186	6244163	1.36
13	15	354894	6246499	0.97
14	15	357711	6248337	0.64
15a	15	355397	6248463	0.60
15b	15	355993	6248105	0.73

[1] UTM coordinates taken from the centre of each macrophyte bed.

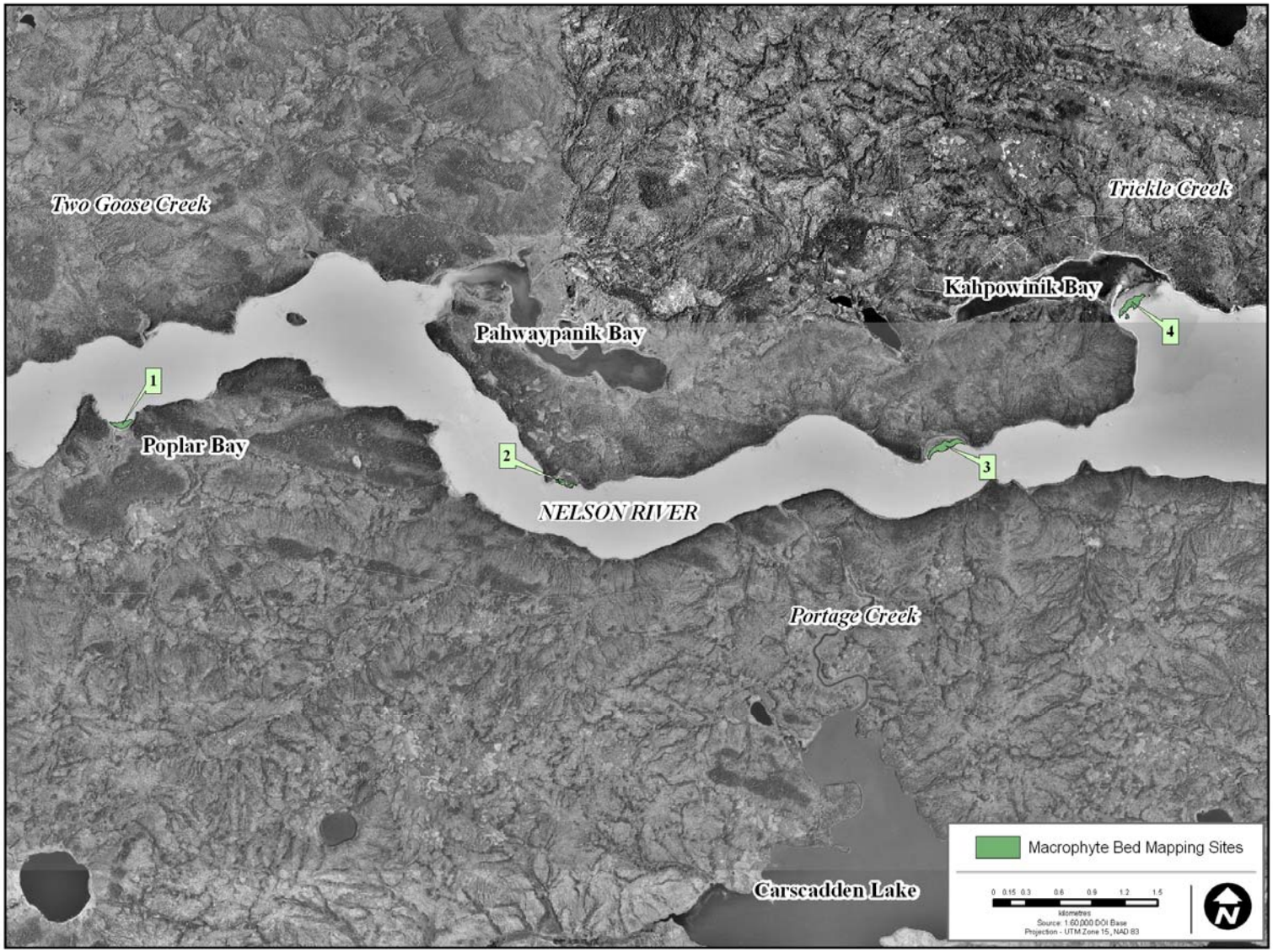

Figure A2-1. Aquatic macrophyte bed locations in the Nelson River, upstream of Gull Lake, late summer 2003.

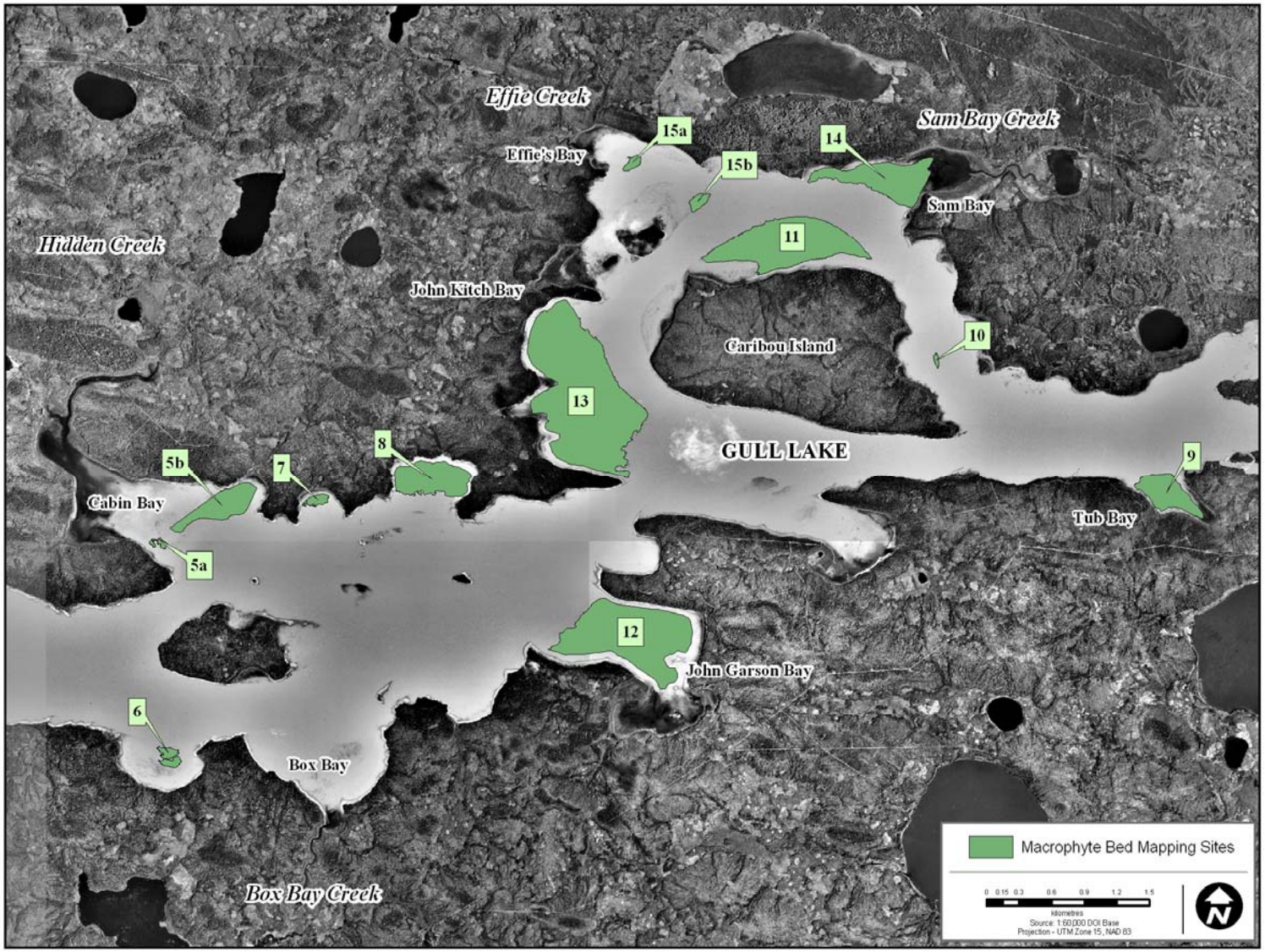

Figure A2-2. Aquatic macrophyte bed locations in the Nelson River, upstream and within Gull Lake, late summer 2003.

APPENDIX 3.

DETAILED DRY WEIGHT AND COMPOSITION OF AQUATIC MACROPHTYES COLLECTED IN THE KEEYASK STUDY AREA, LATE SUMMER 2003.

Page

Table A3-1. Mean dry weight (g/m²) +/- one standard deviation (SD) for vascular and nonvascular macrophyte samples collected in Area 1: Pahwaypanik Bay, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**1: Pahwaypanik Bay**												
Zone	**1[2]**		**2[2]**		**3**						**4**		
Site	**1**	**2**	**1**	**2**	**1**		**2**				**1**		**2[2]**
Subsample					**A[3]**	**B[2]**	**A**	**B**	**Mean**	**SD**	**A[3]**	**B[2]**	
Vascular Macrophytes													
Callitriche palustris	n.s.	n.s.	n.s.	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	n.s.	n.s.
Hippuris vulgaris	n.s.	n.s.	n.s.	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	n.s.	n.s.
Lemna trisulca	n.s.	n.s.	n.s.	n.s.	1.19	n.s.	0.00	0.00	0.00	0.00	0.00	n.s.	n.s.
Myriophyllum sibiricum	n.s.	n.s.	n.s.	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	n.s.	n.s.
Polygonum amphibium	n.s.	n.s.	n.s.	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	n.s.	n.s.
Potamogeton gramineus	n.s.	n.s.	n.s.	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	n.s.	n.s.
Potamogeton richardsonii	n.s.	n.s.	n.s.	n.s.	1.09	n.s.	0.00	0.00	0.00	0.00	1.26	n.s.	n.s.
Potamogeton spp.	n.s.	n.s.	n.s.	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	n.s.	n.s.
Sagittaria cuneata	n.s.	n.s.	n.s.	n.s.	5.70	n.s.	0.00	0.00	0.00	0.00	0.00	n.s.	n.s.
Stuckenia pectinatus	n.s.	n.s.	n.s.	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	n.s.	n.s.
Stuckenia vaginatus	n.s.	n.s.	n.s.	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	22.44	n.s.	n.s.
Nonvascular Macrophytes													
Aquatic moss	n.s.	n.s.	n.s.	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	n.s.	n.s.
Chara spp.	n.s.	n.s.	n.s.	n.s.	0.18	n.s.	0.00	0.00	0.00	0.00	0.02	n.s.	n.s.
Cyanophycota[1]	n.s.	n.s.	n.s.	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	n.s.	n.s.
Filamentous algae	n.s.	n.s.	n.s.	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	n.s.	n.s.
Unidentified	n.s.	n.s.	n.s.	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	n.s.	n.s.
TOTAL MACROPHYTES	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**8.15**	**n.s.**	**0.00**	**0.00**	**0.00**	**0.00**	**23.72**	**n.s.**	**n.s.**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

[2] n.s. = no sample due to lack of water.

[3] hand grab sample; no duplicate.

Table A3-2. Mean dry weight (g/m²) +/- one standard deviation (SD) for vascular and nonvascular macrophyte samples collected in Area 2: John Garson Bay, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**2: John Garson Bay**													
Zone	**1**				**2**								**3**	
Site	**1**		**2**		**1**				**2**				**1**	
Subsample	**A[3]**	**B[2]**	**A[3]**	**B[2]**	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**	**A**	**B**
Vascular Macrophytes														
Callitriche palustris	0.00	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hippuris vulgaris	20.99	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lemna trisulca	1.11	n.s.	1.55	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	0.00	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Polygonum amphibium	0.21	n.s.	97.39	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton gramineus	0.00	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	10.12	2.41	6.27	5.45	0.00	0.00
Potamogeton richardsonii	0.00	n.s.	0.00	n.s.	0.00	173.50	86.75	122.69	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton spp.	0.00	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sagittaria cuneata	0.00	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia pectinatus	0.00	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia vaginatus	0.00	n.s.	0.00	n.s.	0.19	0.00	0.09	0.13	0.00	1.24	0.62	0.88	0.00	0.00
Nonvascular Macrophytes														
Aquatic moss	0.00	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chara spp.	0.00	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Filamentous algae	0.00	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified	1.10	n.s.	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**23.41**	**n.s.**	**98.94**	**n.s.**	**0.19**	**173.50**	**86.85**	**122.56**	**10.12**	**3.66**	**6.89**	**4.57**	**0.00**	**0.00**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

[2] n.s. = no sample due to lack of water.

[3] hand grab sample; no duplicate.

Table A3-2. Continued.

Area	2: John Garson Bay													
Zone	3						4							
Site	1		2				1				2			
Subsample	Mean	SD	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Vascular Macrophytes														
Callitriche palustris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton gramineus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton richardsonii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.28	23.19	28.23	7.14
Potamogeton spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia pectinatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia vaginatus	0.00	0.00	0.00	11.32	5.66	8.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nonvascular Macrophytes														
Aquatic moss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chara spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Filamentous algae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**0.00**	**0.00**	**0.00**	**11.32**	**5.66**	**8.01**	**0.00**	**0.00**	**0.00**	**0.00**	**33.28**	**23.19**	**28.23**	**7.14**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

Table A3-3. Mean dry weight (g/m²) +/- one standard deviation (SD) for vascular and nonvascular macrophyte samples collected in Area 3: Kahpowinik Bay, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**3: Kahpowinik Bay**											
Zone	**1[2]**		**2[2]**		**3**							
Site	**1**	**2**	**1**	**2**	**1**				**2**			
Subsample					**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**
Vascular Macrophytes												
Callitriche palustris	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hippuris vulgaris	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lemna trisulca	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Polygonum amphibium	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton gramineus	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	5.24	0.00	2.62	3.70
Potamogeton richardsonii	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton spp.	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.70	0.00	0.35	0.50
Sagittaria cuneata	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia pectinatus	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	9.13	3.79	6.46	3.78
Stuckenia vaginatus	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nonvascular Macrophytes												
Aquatic moss	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	2.00	0.00	1.00	1.41
Chara spp.	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyanophycota[1]	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.52	0.00	0.26	0.37
Filamentous algae	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified	n.s.	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**0.00**	**0.00**	**0.00**	**0.00**	**17.60**	**3.79**	**10.69**	**9.76**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

[2] n.s. = no sample due to lack of water.

Table A3-3. Continued.

Area	3: Kahpowinik Bay							
Zone	4							
Site	1				2			
Subsample	A	B	Mean	SD	A	B	Mean	SD
Vascular Macrophytes								
Callitriche palustris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton gramineus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton richardsonii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia pectinatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia vaginatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nonvascular Macrophytes								
Aquatic moss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chara spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Filamentous algae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

Table A3-4. Mean dry weight (g/m²) +/- one standard deviation (SD) for vascular and nonvascular macrophyte samples collected in Area 4: Tub Bay, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**4: Tub Bay**													
Zone	**1**								**2**					
Site	**1**				**2**				**1**				**2**	
Subsample	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**	**A**	**B**
Vascular Macrophytes														
Callitriche palustris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	0.47	0.00	0.23	0.33	0.07	0.00	0.03	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton gramineus	4.15	0.00	2.08	2.94	1.17	3.23	2.20	1.45	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton richardsonii	1.15	0.73	0.94	0.30	1.31	0.00	0.65	0.93	0.00	0.00	0.00	0.00	0.68	0.00
Potamogeton spp.	0.00	0.75	0.38	0.53	0.00	4.26	2.13	3.01	0.00	0.00	0.00	0.00	0.00	0.00
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia pectinatus	0.00	0.00	0.00	0.00	0.00	0.74	0.37	0.52	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia vaginatus	1.05	0.00	0.53	0.74	0.00	3.14	1.57	2.22	0.00	0.00	0.00	0.00	16.20	19.50
Nonvascular Macrophytes														
Aquatic moss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chara spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Filamentous algae	0.00	2.09	1.04	1.47	0.00	5.59	2.79	3.95	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified	0.00	0.00	0.00	0.00	0.51	0.00	0.26	0.36	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**6.82**	**3.57**	**5.20**	**2.30**	**3.06**	**16.95**	**10.01**	**9.82**	**0.00**	**0.00**	**0.00**	**0.00**	**16.87**	**19.50**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

Table A3-4. Continued.

Area	**4: Tub Bay**											
Zone	**2**		**3**								**4[2]**	
Site	**2**		**1**				**2**				**1**	**2**
Subsample	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**		
Vascular Macrophytes												
Callitriche palustris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Potamogeton gramineus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Potamogeton richardsonii	0.34	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Potamogeton spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Stuckenia pectinatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Stuckenia vaginatus	17.85	2.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Nonvascular Macrophytes												
Aquatic moss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Chara spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Filamentous algae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
Unidentified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.	t.d.
TOTAL MACROPHYTES	**18.19**	**1.86**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**t.d.**	**t.d.**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

[2] t.d. = too deep to sample.

Table A3-5. Mean dry weight (g/m²) +/- one standard deviation (SD) for vascular and nonvascular macrophyte samples collected in Area 5: Caribou Island, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**5: Caribou Island**											
Zone	**East**											
Site	**1**				**2**				**3**			
Subsample	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**
Vascular Macrophytes												
Callitriche palustris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton gramineus	3.23	0.00	1.62	2.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton richardsonii	0.00	0.26	0.13	0.19	0.00	0.80	0.40	0.57	0.00	2.15	1.07	1.52
Potamogeton spp.	0.00	0.00	0.00	0.00	0.77	0.00	0.39	0.55	0.17	0.00	0.08	0.12
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia pectinatus	0.00	0.00	0.00	0.00	2.37	5.50	3.94	2.21	0.00	0.00	0.00	0.00
Stuckenia vaginatus	0.00	7.74	3.87	5.47	0.00	0.00	0.00	0.00	2.20	28.66	15.43	18.71
Nonvascular Macrophytes												
Aquatic moss	5.47	5.83	5.65	0.26	8.52	7.61	8.07	0.65	1.54	2.75	2.15	0.86
Chara spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Filamentous algae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**8.70**	**13.83**	**11.27**	**3.63**	**11.67**	**13.91**	**12.79**	**1.59**	**3.90**	**33.56**	**18.73**	**20.97**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

Table A3-5. Continued.

Area	5: Caribou Island									
Zone	West									
Site	1				2		3			
Subsample	A	B	Mean	SD	A[3]	B[2]	A	B	Mean	SD
Vascular Macrophytes										
Callitriche palustris	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	6.82	n.s.	0.00	0.00	0.00	0.00
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Potamogeton gramineus	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Potamogeton richardsonii	0.00	0.00	0.00	0.00	2.50	n.s.	0.36	2.14	1.25	1.26
Potamogeton spp.	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Stuckenia pectinatus	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Stuckenia vaginatus	0.00	0.00	0.00	0.00	11.31	n.s.	15.39	12.77	14.08	1.86
Nonvascular Macrophytes										
Aquatic moss	0.00	0.00	0.00	0.00	0.00	n.s.	0.11	4.48	2.30	3.08
Chara spp.	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Filamentous algae	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Unidentified	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**0.00**	**0.00**	**0.00**	**0.00**	**20.64**	**n.s.**	**15.86**	**19.39**	**17.62**	**2.49**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

[2] n.s. = no sample due to lack of water.

[3] hand grab sample; no duplicate.

Table A3-6. Mean dry weight (g/m²) +/- one standard deviation (SD) for vascular and nonvascular macrophyte samples collected in Area 6: John Kitch Bay, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**6: John Kitch Bay**								
Zone	**East**								
Site	**1**				**2[2]**	**3**			
Subsample	**A**	**B**	**Mean**	**SD**		**A**	**B**	**Mean**	**SD**
Vascular Macrophytes									
Callitriche palustris	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
Hippuris vulgaris	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
Lemna trisulca	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
Polygonum amphibium	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
Potamogeton gramineus	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
Potamogeton richardsonii	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
Potamogeton spp.	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
Sagittaria cuneata	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
Stuckenia pectinatus	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
Stuckenia vaginatus	1.52	10.35	5.94	6.24	t.d.	0.00	51.60	25.80	36.49
Nonvascular Macrophytes									
Aquatic moss	2.31	0.00	1.16	1.64	t.d.	0.00	0.00	0.00	0.00
Chara spp.	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
Filamentous algae	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
Unidentified	0.00	0.00	0.00	0.00	t.d.	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**3.84**	**10.35**	**7.09**	**4.60**	**t.d.**	**0.00**	**51.60**	**25.80**	**36.49**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

[2] t.d. = too deep to sample.

Table A3-6. Continued.

Area	6: John Kitch Bay									
Zone	West									
Site	1				2		3			
Subsample	A	B	Mean	SD	A[3]	B[2]	A	B	Mean	SD
Vascular Macrophytes										
Callitriche palustris	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Potamogeton gramineus	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Potamogeton richardsonii	0.481	0.00	0.24	0.34	0.00	n.s.	0.47	0.89	0.68	0.30
Potamogeton spp.	1.31	0.00	0.66	0.93	0.00	n.s.	0.00	4.37	2.19	3.09
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Stuckenia pectinatus	0.00	0.00	0.00	0.00	6.84	n.s.	1.910	0.00	0.95	1.35
Stuckenia vaginatus	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Nonvascular Macrophytes										
Aquatic moss	0.57	0.00	0.28	0.40	1.16	n.s.	0.97	8.94	4.95	5.64
Chara spp.	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Filamentous algae	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
Unidentified	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**2.36**	**0.00**	**1.18**	**1.67**	**8.00**	**n.s.**	**3.34**	**14.20**	**8.77**	**7.68**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

[2] n.s. = no sample due to lack of water.

[3] hand grab sample; no duplicate.

Table A3-7. Mean dry weight (g/m²) +/- one standard deviation (SD) for vascular and nonvascular macrophyte samples collected in Area 7: Bay East of Rabbit Creek, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**7: Bay East of Rabbit Creek**											
Zone	**1**								**2**			
Site	**1**				**2**				**1**		**2**	
Subsample	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**	**A[3]**	**B[2]**	**A[3]**	**B[2]**
Vascular Macrophytes												
Callitriche palustris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
Potamogeton gramineus	24.31	0.00	12.15	17.19	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
Potamogeton richardsonii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.76	n.s.	6.05	n.s.
Potamogeton spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
Stuckenia pectinatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.92	n.s.	4.34	n.s.
Stuckenia vaginatus	0.00	51.85	25.93	36.67	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
Nonvascular Macrophytes												
Aquatic moss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
Chara spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
Filamentous algae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
Unidentified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.s.	0.00	n.s.
TOTAL MACROPHYTES	**24.31**	**51.85**	**38.08**	**19.48**	**0.00**	**0.00**	**0.00**	**0.00**	**7.68**	**n.s.**	**10.39**	**n.s.**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

[2] n.s. = no sample due to lack of water.

[3] hand grab sample; no duplicate.

Table A3-7. Continued.

Area	7: Bay East of Rabbit Creek												
Zone	3								4				
Site	1				2				1				2 [2]
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD	
Vascular Macrophytes													
Callitriche palustris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Potamogeton gramineus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Potamogeton richardsonii	6.15	1.10	3.62	3.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Potamogeton spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Stuckenia pectinatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Stuckenia vaginatus	7.89	61.89	34.89	38.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Nonvascular Macrophytes													
Aquatic moss	0.21	0.00	0.11	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Chara spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Filamentous algae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
Unidentified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	t.d.
TOTAL MACROPHYTES	**14.25**	**62.99**	**38.62**	**34.46**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**t.d.**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

[2] t.d. = too deep to sample.

Table A3-8. Mean dry weight (g/m²) +/- one standard deviation (SD) for vascular and nonvascular macrophyte samples collected in Area 8: Clark Lake, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**8: Clark Lake**											
Zone	**1**								**2**			
Site	**1**				**2**				**1**			
Subsample	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**
Vascular Macrophytes												
Callitriche palustris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton gramineus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton richardsonii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.42	20.71	29.29
Potamogeton spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia pectinatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.40	0.57
Stuckenia vaginatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nonvascular Macrophytes												
Aquatic moss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chara spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Filamentous algae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.81**	**41.42**	**21.12**	**28.72**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

Table A3-8. Continued.

Area	8: Clark Lake											
Zone	2				3							
Site	2				1				2			
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Vascular Macrophytes												
Callitriche palustris	0.00	35.44	17.72	25.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton gramineus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton richardsonii	20.82	0.00	10.41	14.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton spp.	0.00	0.00	0.00	0.00	0.00	5.22	2.61	3.69	0.00	0.00	0.00	0.00
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia pectinatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia vaginatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nonvascular Macrophytes												
Aquatic moss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chara spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Filamentous algae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**20.82**	**35.44**	**28.13**	**10.34**	**0.00**	**5.22**	**2.61**	**3.69**	**0.00**	**0.00**	**0.00**	**0.00**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

Table A3-8. Continued.

Area	8: Clark Lake							
Zone	4							
Site	1				2			
Subsample	A	B	Mean	SD	A	B	Mean	SD
Vascular Macrophytes								
Callitriche palustris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hippuris vulgaris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lemna trisulca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Myriophyllum sibiricum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Polygonum amphibium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton gramineus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton richardsonii	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potamogeton spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sagittaria cuneata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia pectinatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stuckenia vaginatus	0.00	8.77	4.38	6.20	0.00	0.00	0.00	0.00
Nonvascular Macrophytes								
Aquatic moss	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chara spp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyanophycota[1]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Filamentous algae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unidentified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL MACROPHYTES	**0.00**	**8.77**	**4.38**	**6.20**	**0.00**	**0.00**	**0.00**	**0.00**

[1] Scientific name updated according to the Integrated Taxonomic Information System (2006): old name Cyanophyta (blue-green algae).

APPENDIX 4.

DETAILED ABUNDANCE AND COMPOSITION OF EPIPHYTIC INVERTEBRATES COLLECTED IN THE KEEYASK STUDY AREA, LATE SUMMER 2003.

Page

Table A4-1. Abundance (individuals/m²) of epiphytic invertebrates collected in Area 1: Pahwaypanik Bay, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	1: Pahwaypanik Bay											
Zone	1[1]		2[1]		3							
Site	1	2	1	2	1				2			
Subsample					A[2]	B[1]	A[2]	B[1]	A	B	Mean	SD
Mesh Size (µm)					400		500		400			
Annelida												
Oligochaeta	n.s.	n.s.	n.s.	n.s.	31	n.s.	26	n.s.	0	0	0	0
Hirudinea	n.s.	n.s.	n.s.	n.s.	0	n.s.	21	n.s.	0	0	0	0
Total Annelida	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**31**	**n.s.**	**48**	**n.s.**	**0**	**0**	**0**	**0**
Crustacea												
Ostracoda	n.s.	n.s.	n.s.	n.s.	26	n.s.	14	n.s.	0	0	0	0
Amphipoda	n.s.	n.s.	n.s.	n.s.	2	n.s.	26	n.s.	0	0	0	0
Decapoda	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Total Crustacea	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**29**	**n.s.**	**40**	**n.s.**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	n.s.	n.s.	n.s.	n.s.	0	n.s.	7	n.s.	0	0	0	0
Araneae	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Total Arachnida	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**0**	**n.s.**	**7**	**n.s.**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	n.s.	n.s.	n.s.	n.s.	0	n.s.	33	n.s.	0	0	0	0
Gastropoda	n.s.	n.s.	n.s.	n.s.	2	n.s.	12	n.s.	0	0	0	0
Total Mollusca	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**2**	**n.s.**	**45**	**n.s.**	**0**	**0**	**0**	**0**
Hydrozoa	n.s.	n.s.	n.s.	n.s.	0	n.s.	2	n.s.	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Dytiscidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	2	n.s.	0	0	0	0
Haliplidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	7	n.s.	0	0	0	0
Gyrinidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Hemiptera												
Corixidae - *adult*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Corixidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	2	n.s.	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Caenidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Ephemeridae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Heptageniidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Leptophlebiidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Siphlonuridae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Leptoceridae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Leptoceridae - *pupa*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Limnephilidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Phryganeidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Polycentropodidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	n.s.	n.s.	n.s.	n.s.	2	n.s.	40	n.s.	0	0	0	0
Chironomidae - *larva*	n.s.	n.s.	n.s.	n.s.	45	n.s.	76	n.s.	0	0	0	0
Chironomidae - *pupa*	n.s.	n.s.	n.s.	n.s.	0	n.s.	0	n.s.	0	0	0	0
Dolichopodidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	n.s.	2	n.s.	0	0	0	0
Total Insecta	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**48**	**n.s.**	**131**	**n.s.**	**0**	**0**	**0**	**0**
TOTAL INVERTEBRATES	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**110**	**n.s.**	**274**	**n.s.**	**0**	**0**	**0**	**0**

[1] n.s. = no sample due to lack of water.

[2] hand grab sample at shallow site; no duplicate.

Table A4-1. Continued.

Area	1: Pahwaypanik Bay								
Zone	3				4				
Site	2				1				2[1]
Subsample	A	B	Mean	SD	A[2]	B[1]	A[2]	B[1]	
Mesh Size (µm)	500				400		500		
Annelida									
Oligochaeta	0	0	0	0	10	n.s.	24	n.s.	n.s.
Hirudinea	0	0	0	0	0	n.s.	0	n.s.	n.s.
Total Annelida	**0**	**0**	**0**	**0**	**10**	**n.s.**	**24**	**n.s.**	**n.s.**
Crustacea									
Ostracoda	0	0	0	0	0	n.s.	14	n.s.	n.s.
Amphipoda	0	0	0	0	0	n.s.	0	n.s.	n.s.
Decapoda	0	0	0	0	0	n.s.	0	n.s.	n.s.
Total Crustacea	**0**	**0**	**0**	**0**	**0**	**n.s.**	**14**	**n.s.**	**n.s.**
Arachnida									
Acarina	0	0	0	0	0	n.s.	0	n.s.	n.s.
Araneae	0	0	0	0	0	n.s.	0	n.s.	n.s.
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**n.s.**	**0**	**n.s.**	**n.s.**
Mollusca									
Bivalvia									
Pisidiidae	0	0	0	0	0	n.s.	0	n.s.	n.s.
Gastropoda	0	0	0	0	0	n.s.	24	n.s.	n.s.
Total Mollusca	**0**	**0**	**0**	**0**	**0**	**n.s.**	**24**	**n.s.**	**n.s.**
Hydrozoa	0	0	0	0	0	n.s.	0	n.s.	n.s.
Insecta									
Odonata									
Anisoptera - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Zygoptera									
Coenagrionidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Coleoptera									
Dytiscidae - *adult*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Dytiscidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Haliplidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Gyrinidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Hemiptera									
Corixidae - *adult*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Corixidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Ephemeroptera									
Baetidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Caenidae - *larva*	0	0	0	0	0	n.s.	2	n.s.	n.s.
Ephemeridae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Heptageniidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Leptophlebiidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Siphlonuridae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Trichoptera									
Hydropsychidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Leptoceridae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Leptoceridae - *pupa*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Limnephilidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Phryganeidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Polycentropodidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Diptera									
Ceratopogonidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Chironomidae - *larva*	0	0	0	0	17	n.s.	36	n.s.	n.s.
Chironomidae - *pupa*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Dolichopodidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	n.s.
Total Insecta	**0**	**0**	**0**	**0**	**17**	**n.s.**	**38**	**n.s.**	**n.s.**
TOTAL INVERTEBRATES	**0**	**0**	**0**	**0**	**26**	**n.s.**	**100**	**n.s.**	**n.s.**

[1] n.s. = no sample due to lack of water.

[2] hand grab sample at shallow site; no duplicate.

Table A4-2. Abundance (individuals/m²) and mean +/- one standard deviation (SD) of epiphytic invertebrates collected in Area 2: John Garson Bay, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**2: John Garson Bay**													
Zone	**1[1]**		**2**											
Site	**1**	**2**	**1**								**2**			
Subsample			**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**
Mesh Size (µm)			**400**				**500**				**400**			
Annelida														
Oligochaeta	n.s.	n.s.	7	26	17	13	5	33	19	20	21	29	25	5
Hirudinea	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Total Annelida	**n.s.**	**n.s.**	**7**	**26**	**17**	**13**	**5**	**33**	**19**	**20**	**21**	**29**	**25**	**5**
Crustacea														
Ostracoda	n.s.	n.s.	2	2	2	0	0	0	0	0	7	0	4	5
Amphipoda	n.s.	n.s.	0	0	0	0	0	5	2	3	2	2	2	0
Decapoda	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**n.s.**	**n.s.**	**2**	**2**	**2**	**0**	**0**	**5**	**2**	**3**	**10**	**2**	**6**	**5**
Arachnida														
Acarina	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**n.s.**	**n.s.**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca														
Bivalvia														
Pisidiidae	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	n.s.	n.s.	0	0	0	0	2	14	8	8	0	0	0	0
Total Mollusca	**n.s.**	**n.s.**	**0**	**0**	**0**	**0**	**2**	**14**	**8**	**8**	**0**	**0**	**0**	**0**
Hydrozoa	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Insecta														
Odonata														
Anisoptera - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera														
Coenagrionidae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera														
Dytiscidae - *adult*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	n.s.	n.s.	0	0	0	0	0	2	1	2	0	0	0	0
Hemiptera														
Corixidae - *adult*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Corixidae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeroptera														
Baetidae - *larva*	n.s.	n.s.	0	0	0	0	0	2	1	2	0	0	0	0
Caenidae - *larva*	n.s.	n.s.	0	0	0	0	0	2	1	2	0	0	0	0
Ephemeridae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera														
Hydropsychidae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	2	0	1	2
Leptoceridae - *pupa*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	n.s.	n.s.	0	0	0	0	0	2	1	2	0	0	0	0
Polycentropodidae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Diptera														
Ceratopogonidae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	n.s.	n.s.	7	112	60	74	2	98	50	67	29	17	23	8
Chironomidae - *pupa*	n.s.	n.s.	0	0	0	0	0	0	0	0	5	0	2	3
Dolichopodidae - *larva*	n.s.	n.s.	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**n.s.**	**n.s.**	**7**	**112**	**60**	**74**	**2**	**107**	**55**	**74**	**36**	**17**	**26**	**13**
TOTAL INVERTEBRATES	**n.s.**	**n.s.**	**17**	**140**	**79**	**88**	**10**	**160**	**85**	**106**	**67**	**48**	**57**	**13**

[1] n.s. = no sample due to lack of water.

Table A4-2. Continued.

Area	2: John Garson Bay											
Zone	2				3							
Site	2				1							
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	500				400				500			
Annelida												
Oligochaeta	31	29	30	2	0	0	0	0	0	0	0	0
Hirudinea	0	0	0	0	0	0	0	0	0	0	0	0
Total Annelida	**31**	**29**	**30**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Crustacea												
Ostracoda	0	0	0	0	0	0	0	0	0	0	0	0
Amphipoda	10	0	5	7	0	0	0	0	0	0	0	0
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**10**	**0**	**5**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Mollusca	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	10	0	5	7	0	0	0	0	0	0	0	0
Corixidae - *larva*	7	0	4	5	0	0	0	0	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	83	36	60	34	0	0	0	0	0	0	0	0
Chironomidae - *pupa*	2	2	2	0	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**102**	**38**	**70**	**45**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL INVERTEBRATES	**143**	**67**	**105**	**54**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table A4-2. Continued.

Area	2: John Garson Bay											
Zone	3								4			
Site	2								1			
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	400				500				400			
Annelida												
Oligochaeta	0	14	7	10	0	10	5	7	0	0	0	0
Hirudinea	0	0	0	0	0	0	0	0	0	0	0	0
Total Annelida	**0**	**14**	**7**	**10**	**0**	**10**	**5**	**7**	**0**	**0**	**0**	**0**
Crustacea												
Ostracoda	0	0	0	0	0	0	0	0	0	0	0	0
Amphipoda	0	0	0	0	0	2	1	2	0	0	0	0
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**2**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	0	7	4	5	0	17	8	12	0	0	0	0
Total Mollusca	**0**	**7**	**4**	**5**	**0**	**17**	**8**	**12**	**0**	**0**	**0**	**0**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Corixidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	0	31	15	22	0	38	19	27	0	0	0	0
Chironomidae - *pupa*	0	0	0	0	0	2	1	2	0	0	0	0
Dolichopodidae -*larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**0**	**31**	**15**	**22**	**0**	**40**	**20**	**29**	**0**	**0**	**0**	**0**
TOTAL INVERTEBRATES	**0**	**52**	**26**	**37**	**0**	**69**	**35**	**49**	**0**	**0**	**0**	**0**

Table A4-2. Continued.

Area	2: John Garson Bay											
Zone	4											
Site	1				2							
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	500				400				500			
Annelida												
Oligochaeta	0	0	0	0	95	76	86	13	71	19	45	37
Hirudinea	0	0	0	0	0	0	0	0	0	0	0	0
Total Annelida	**0**	**0**	**0**	**0**	**95**	**76**	**86**	**13**	**71**	**19**	**45**	**37**
Crustacea												
Ostracoda	0	0	0	0	0	0	0	0	0	0	0	0
Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	0	0	0	0	0	0	0	0	83	43	63	29
Total Mollusca	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**83**	**43**	**63**	**29**
Hydrozoa	0	0	0	0	0	2	1	2	10	0	5	7
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	0	0	0	0	0	2	1	2
Corixidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	0	0	0	2	0	1	2	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	0	0	0	0	33	69	51	25	57	33	45	17
Chironomidae - *pupa*	0	0	0	0	0	2	1	2	5	0	2	3
Dolichopodidae -*larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**0**	**0**	**0**	**0**	**36**	**71**	**54**	**25**	**62**	**36**	**49**	**19**
TOTAL INVERTEBRATES	**0**	**0**	**0**	**0**	**131**	**150**	**140**	**13**	**226**	**98**	**162**	**91**

Table A4-3. Abundance (individuals/m²) and mean +/- one standard deviation (SD) of epiphytic invertebrates collected in Area 3: Kahpowinik Bay, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	3: Kahpowinik Bay											
Zone	1[1]		2[1]		3							
Site	1	2	1	2	1							
Subsample					A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)					400				500			
Annelida												
Oligochaeta	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Hirudinea	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Total Annelida	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Crustacea												
Ostracoda	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Amphipoda	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Decapoda	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Total Crustacea	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Araneae	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Total Arachnida	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Gastropoda	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Total Mollusca	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Hydrozoa	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Haliplidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Corixidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Caenidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Chironomidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Chironomidae - *pupa*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	n.s.	n.s.	n.s.	n.s.	0	0	0	0	0	0	0	0
Total Insecta	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL INVERTEBRATES	**n.s.**	**n.s.**	**n.s.**	**n.s.**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

[1] n.s. = no sample due to lack of water.

Table A4-3. Continued.

Area	3: Kahpowinik Bay											
Zone	3								4			
Site	2								1			
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	400				500				400			
Annelida												
Oligochaeta	60	29	44	22	305	112	208	136	0	0	0	0
Hirudinea	0	0	0	0	0	0	0	0	0	0	0	0
Total Annelida	**60**	**29**	**44**	**22**	**305**	**112**	**208**	**136**	**0**	**0**	**0**	**0**
Crustacea												
Ostracoda	12	5	8	5	5	5	5	0	0	0	0	0
Amphipoda	0	5	2	3	45	12	29	24	0	0	0	0
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**12**	**10**	**11**	**2**	**50**	**17**	**33**	**24**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	0	0	0	0	0	2	1	2	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**2**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	0	2	1	2	738	105	421	448	0	0	0	0
Total Mollusca	**0**	**2**	**1**	**2**	**738**	**105**	**421**	**448**	**0**	**0**	**0**	**0**
Hydrozoa	2	0	1	2	0	7	4	5	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	2	0	1	2	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	2	0	1	2	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	2	2	2	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	2	2	2	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	7	2	5	3	0	0	0	0
Corixidae - *larva*	0	0	0	0	5	5	5	0	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	2	1	2	2	0	1	2	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	2	0	1	2	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	2	0	1	2	0	0	0	0
Chironomidae - *larva*	119	21	70	69	300	64	182	167	0	0	0	0
Chironomidae - *pupa*	0	0	0	0	2	0	1	2	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**119**	**24**	**71**	**67**	**331**	**76**	**204**	**180**	**0**	**0**	**0**	**0**
TOTAL INVERTEBRATES	**193**	**64**	**129**	**91**	**1424**	**319**	**871**	**781**	**0**	**0**	**0**	**0**

Table A4-3. Continued.

Area	3: Kahpowinik Bay											
Zone	4											
Site	1				2							
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	500				400				500			
Annelida												
Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0
Hirudinea	0	0	0	0	0	0	0	0	0	0	0	0
Total Annelida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Crustacea												
Ostracoda	0	0	0	0	0	0	0	0	0	0	0	0
Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Mollusca	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Corixidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL INVERTEBRATES	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table A4-4. Abundance (individuals/m²) and mean +/- one standard deviation (SD) of epiphytic invertebrates collected in Area 4: Tub Bay, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**4: Tub Bay**											
Zone	**1**											
Site	**1**								**2**			
Subsample	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**
Mesh Size (µm)	**400**				**500**				**400**			
Annelida												
Oligochaeta	12	2	7	7	29	0	14	20	7	7	7	0
Hirudinea	0	0	0	0	0	0	0	0	0	0	0	0
Total Annelida	**12**	**2**	**7**	**7**	**29**	**0**	**14**	**20**	**7**	**7**	**7**	**0**
Crustacea												
Ostracoda	0	0	0	0	0	0	0	0	0	5	2	3
Amphipoda	5	0	2	3	29	17	23	8	0	2	1	2
Decapoda	0	0	0	0	0	5	2	3	0	0	0	0
Total Crustacea	**5**	**0**	**2**	**3**	**29**	**21**	**25**	**5**	**0**	**7**	**4**	**5**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	14	0	7	10	43	36	39	5	0	0	0	0
Total Mollusca	**14**	**0**	**7**	**10**	**43**	**36**	**39**	**5**	**0**	**0**	**0**	**0**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	2	1	2	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	5	7	6	2	0	0	0	0
Corixidae - *larva*	0	0	0	0	0	10	5	7	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	5	0	2	3	0	0	0	0
Caenidae - *larva*	0	0	0	0	2	0	1	2	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	2	0	1	2	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	10	5	7	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	2	0	1	2	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	2	1	2	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	26	0	13	19	19	60	39	29	10	17	13	5
Chironomidae - *pupa*	0	0	0	0	2	0	1	2	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**26**	**0**	**13**	**19**	**38**	**90**	**64**	**37**	**10**	**17**	**13**	**5**
TOTAL INVERTEBRATES	**57**	**2**	**30**	**39**	**138**	**148**	**143**	**7**	**17**	**31**	**24**	**10**

Table A4-4. Continued.

Area	4: Tub Bay											
Zone	1				2							
Site	2				1							
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	500				400				500			
Annelida												
Oligochaeta	2	5	4	2	0	0	0	0	0	0	0	0
Hirudinea	0	17	8	12	0	0	0	0	0	0	0	0
Total Annelida	**2**	**21**	**12**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Crustacea												
Ostracoda	2	0	1	2	0	0	0	0	0	0	0	0
Amphipoda	5	24	14	13	0	0	0	0	0	0	0	0
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**7**	**24**	**15**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	2	0	1	2	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**2**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	7	52	30	32	0	0	0	0	0	0	0	0
Total Mollusca	**7**	**52**	**30**	**32**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	2	0	1	2	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	2	1	2	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	2	10	6	5	0	0	0	0	0	0	0	0
Corixidae - *larva*	2	7	5	3	0	0	0	0	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	0	5	2	3	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	2	1	2	0	0	0	0	0	0	0	0
Chironomidae - *larva*	2	155	79	108	0	0	0	0	0	0	0	0
Chironomidae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**10**	**181**	**95**	**121**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL INVERTEBRATES	**29**	**279**	**154**	**177**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table A4-4. Continued.

Area	4: Tub Bay											
Zone	2								3			
Site	2								1			
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	400				500				400			
Annelida												
Oligochaeta	5	10	7	3	0	14	7	10	0	0	0	0
Hirudinea	0	0	0	0	2	2	2	0	0	0	0	0
Total Annelida	**5**	**10**	**7**	**3**	**2**	**17**	**10**	**10**	**0**	**0**	**0**	**0**
Crustacea												
Ostracoda	0	7	4	5	7	0	4	5	0	0	0	0
Amphipoda	0	0	0	0	5	5	5	0	0	0	0	0
Decapoda	0	0	0	0	2	2	2	0	0	0	0	0
Total Crustacea	**0**	**7**	**4**	**5**	**14**	**7**	**11**	**5**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	2	0	1	2	138	129	133	7	0	0	0	0
Total Mollusca	**2**	**0**	**1**	**2**	**138**	**129**	**133**	**7**	**0**	**0**	**0**	**0**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	2	0	1	2	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	2	17	10	10	0	0	0	0
Corixidae - *larva*	0	0	0	0	48	26	37	15	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	7	4	5	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	2	1	2	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	55	62	58	5	126	124	125	2	0	0	0	0
Chironomidae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**55**	**62**	**58**	**5**	**179**	**176**	**177**	**2**	**0**	**0**	**0**	**0**
TOTAL INVERTEBRATES	**62**	**79**	**70**	**12**	**333**	**329**	**331**	**3**	**0**	**0**	**0**	**0**

Table A4-4. Continued.

Area	4: Tub Bay													
Zone	3												4[1]	
Site	1				2								1	2
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD		
Mesh Size (µm)	500				400				500					
Annelida														
Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Hirudinea	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Total Annelida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**t.d.**	**t.d.**
Crustacea														
Ostracoda	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Total Crustacea	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**t.d.**	**t.d.**
Arachnida														
Acarina	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Araneae	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**t.d.**	**t.d.**
Mollusca														
Bivalvia														
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Total Mollusca	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**t.d.**	**t.d.**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Insecta														
Odonata														
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Zygoptera														
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Coleoptera														
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Hemiptera														
Corixidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Corixidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Ephemeroptera														
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Trichoptera														
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Diptera														
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Chironomidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Chironomidae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.	t.d.
Total Insecta	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**t.d.**	**t.d.**
TOTAL INVERTEBRATES	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**t.d.**	**t.d.**

[1] t.d. = too deep to sample.

Table A4-5. Abundance (individuals/m²) and mean +/- one standard deviation (SD) of epiphytic invertebrates collected in Area 5: Caribou Island, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**5: Caribou Island**											
Zone	**East**											
Site	**1**								**2**			
Subsample	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**
Mesh Size (µm)	**400**				**500**				**400**			
Annelida												
Oligochaeta	2	5	4	2	7	24	15	12	12	2	7	7
Hirudinea	0	0	0	0	0	2	1	2	0	0	0	0
Total Annelida	**2**	**5**	**4**	**2**	**7**	**26**	**17**	**13**	**12**	**2**	**7**	**7**
Crustacea												
Ostracoda	0	0	0	0	0	0	0	0	2	0	1	2
Amphipoda	2	0	1	2	0	19	10	13	0	5	2	3
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**2**	**0**	**1**	**2**	**0**	**19**	**10**	**13**	**2**	**5**	**4**	**2**
Arachnida												
Acarina	0	2	1	2	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**2**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	2	7	5	3	31	262	146	163	5	0	2	3
Total Mollusca	**2**	**7**	**5**	**3**	**31**	**262**	**146**	**163**	**5**	**0**	**2**	**3**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	5	5	5	0	0	0	0	0
Corixidae - *larva*	0	0	0	0	2	0	1	2	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	2	1	2	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	5	2	3	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	14	48	31	24	52	162	107	77	40	21	31	13
Chironomidae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**14**	**48**	**31**	**24**	**60**	**174**	**117**	**81**	**40**	**21**	**31**	**13**
TOTAL INVERTEBRATES	**21**	**62**	**42**	**29**	**98**	**481**	**289**	**271**	**60**	**29**	**44**	**22**

Table A4-5. Continued.

Area	5: Caribou Island											
Zone	East											
Site	2				3							
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	500				400				500			
Annelida												
Oligochaeta	14	2	8	8	2	12	7	7	7	29	18	15
Hirudinea	2	5	4	2	0	0	0	0	2	0	1	2
Total Annelida	**17**	**7**	**12**	**7**	**2**	**12**	**7**	**7**	**10**	**29**	**19**	**13**
Crustacea												
Ostracoda	0	0	0	0	0	0	0	0	0	0	0	0
Amphipoda	81	64	73	12	0	2	1	2	36	62	49	19
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**81**	**64**	**73**	**12**	**0**	**2**	**1**	**2**	**36**	**62**	**49**	**19**
Arachnida												
Acarina	0	2	1	2	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**2**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	174	224	199	35	0	2	1	2	81	479	280	281
Total Mollusca	**174**	**224**	**199**	**35**	**0**	**2**	**1**	**2**	**81**	**479**	**280**	**281**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	0	0	0	0	12	10	11	2
Corixidae - *larva*	0	0	0	0	0	0	0	0	10	5	7	3
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	5	2	3
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	2	0	1	2	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	2	1	2
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	10	5	7	0	0	0	0	2	2	2	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	138	71	105	47	0	60	30	42	29	126	77	69
Chironomidae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**140**	**81**	**111**	**42**	**0**	**60**	**30**	**42**	**52**	**150**	**101**	**69**
TOTAL INVERTEBRATES	**412**	**379**	**395**	**24**	**2**	**76**	**39**	**52**	**179**	**719**	**449**	**382**

Table A4-5. Continued.

Area	5: Caribou Island											
Zone	West											
Site	1								2			
Subsample	A	B	Mean	SD	A	B	Mean	SD	A[2]	B[1]	A[2]	B[1]
Mesh Size (µm)	400				500				400		500	
Annelida												
Oligochaeta	0	0	0	0	0	0	0	0	29	n.s.	36	n.s.
Hirudinea	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Total Annelida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**29**	**n.s.**	**36**	**n.s.**
Crustacea												
Ostracoda	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Amphipoda	0	0	0	0	0	0	0	0	17	n.s.	48	n.s.
Decapoda	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Total Crustacea	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**17**	**n.s.**	**48**	**n.s.**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	2	n.s.	0	n.s.
Araneae	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**n.s.**	**0**	**n.s.**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	n.s.	2	n.s.
Gastropoda	0	0	0	0	0	0	0	0	10	n.s.	152	n.s.
Total Mollusca	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**n.s.**	**155**	**n.s.**
Hydrozoa	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Hemiptera												
Corixidae - *adult*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Corixidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	2	n.s.
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	2	n.s.
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	2	n.s.
Chironomidae - *larva*	0	0	0	0	0	0	0	0	52	n.s.	67	n.s.
Chironomidae - *pupa*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	n.s.	0	n.s.
Total Insecta	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**52**	**n.s.**	**74**	**n.s.**
TOTAL INVERTEBRATES	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**110**	**n.s.**	**312**	**n.s.**

[1] n.s. = no sample due to lack of water.

[2] hand grab sample at shallow site; no duplicate.

Table A4-5. Continued.

Area	5: Caribou Island							
Zone	West							
Site	3							
Subsample	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	400				500			
Annelida								
Oligochaeta	5	2	4	2	0	2	1	2
Hirudinea	0	0	0	0	2	5	4	2
Total Annelida	**5**	**2**	**4**	**2**	**2**	**7**	**5**	**3**
Crustacea								
Ostracoda	0	0	0	0	0	0	0	0
Amphipoda	2	0	1	2	5	17	11	8
Decapoda	0	0	0	0	0	0	0	0
Total Crustacea	**2**	**0**	**1**	**2**	**5**	**17**	**11**	**8**
Arachnida								
Acarina	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca								
Bivalvia								
Pisidiidae	0	0	0	0	0	0	0	0
Gastropoda	0	7	4	5	31	221	126	135
Total Mollusca	**0**	**7**	**4**	**5**	**31**	**221**	**126**	**135**
Hydrozoa	0	0	0	0	0	0	0	0
Insecta								
Odonata								
Anisoptera - *larva*	0	0	0	0	0	0	0	0
Zygoptera								
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0
Coleoptera								
Dytiscidae - *adult*	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	2	1	2
Gyrinidae - *larva*	0	0	0	0	0	0	0	0
Hemiptera								
Corixidae - *adult*	0	0	0	0	0	5	2	3
Corixidae - *larva*	0	0	0	0	2	5	4	2
Ephemeroptera								
Baetidae - *larva*	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	2	0	1	2
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0
Trichoptera								
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0
Diptera								
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0
Chironomidae - *larva*	31	45	38	10	17	45	31	20
Chironomidae - *pupa*	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0
Total Insecta	**31**	**45**	**38**	**10**	**21**	**57**	**39**	**25**
TOTAL INVERTEBRATES	**38**	**55**	**46**	**12**	**60**	**302**	**181**	**172**

Table A4-6. Abundance (individuals/m²) and mean +/- one standard deviation (SD) of epiphytic invertebrates collected in Area 6: John Kitch Bay, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**6: John Kitch Bay**												
Zone	**East**												
Site	**1**								**2[1]**	**3**			
Subsample	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**		**A**	**B**	**Mean**	**SD**
Mesh Size (µm)	**400**				**500**					**400**			
Annelida													
Oligochaeta	2	0	1	2	0	10	5	7	t.d.	0	0	0	0
Hirudinea	0	0	0	0	0	2	1	2	t.d.	0	0	0	0
Total Annelida	**2**	**0**	**1**	**2**	**0**	**12**	**6**	**8**	**t.d.**	**0**	**0**	**0**	**0**
Crustacea													
Ostracoda	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Amphipoda	2	0	1	2	2	7	5	3	t.d.	0	2	1	2
Decapoda	0	0	0	0	2	5	4	2	t.d.	0	0	0	0
Total Crustacea	**2**	**0**	**1**	**2**	**5**	**12**	**8**	**5**	**t.d.**	**0**	**2**	**1**	**2**
Arachnida													
Acarina	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**t.d.**	**0**	**0**	**0**	**0**
Mollusca													
Bivalvia													
Pisidiidae	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Gastropoda	0	0	0	0	21	36	29	10	t.d.	0	0	0	0
Total Mollusca	**0**	**0**	**0**	**0**	**21**	**36**	**29**	**10**	**t.d.**	**0**	**0**	**0**	**0**
Hydrozoa	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Insecta													
Odonata													
Anisoptera - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Zygoptera													
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Coleoptera													
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Hemiptera													
Corixidae - *adult*	0	0	0	0	5	5	5	0	t.d.	0	0	0	0
Corixidae - *larva*	2	0	1	2	10	19	14	7	t.d.	0	0	0	0
Ephemeroptera													
Baetidae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Trichoptera													
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	2	0	1	2	t.d.	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Diptera													
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Chironomidae - *larva*	14	12	13	2	10	114	62	74	t.d.	0	14	7	10
Chironomidae - *pupa*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	t.d.	0	0	0	0
Total Insecta	**17**	**12**	**14**	**3**	**26**	**138**	**82**	**79**	**t.d.**	**0**	**14**	**7**	**10**
TOTAL INVERTEBRATES	**21**	**12**	**17**	**7**	**52**	**198**	**125**	**103**	**t.d.**	**0**	**17**	**8**	**12**

[1] t.d. = too deep to sample.

Table A4-6. Continued.

Area	6: John Kitch Bay											
Zone	East				West							
Site	3				1							
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	500				400				500			
Annelida												
Oligochaeta	0	0	0	0	2	0	1	2	10	0	5	7
Hirudinea	0	0	0	0	0	0	0	0	0	0	0	0
Total Annelida	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**2**	**10**	**0**	**5**	**7**
Crustacea												
Ostracoda	0	0	0	0	0	0	0	0	0	0	0	0
Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	0	5	2	3	0	0	0	0	24	0	12	17
Total Mollusca	**0**	**5**	**2**	**3**	**0**	**0**	**0**	**0**	**24**	**0**	**12**	**17**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	0	0	0	0	7	0	4	5
Corixidae - *larva*	0	0	0	0	0	0	0	0	2	0	1	2
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	5	0	2	3
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	5	0	2	3
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	0	81	40	57	7	0	4	5	17	0	8	12
Chironomidae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**0**	**81**	**40**	**57**	**7**	**0**	**4**	**5**	**36**	**0**	**18**	**25**
TOTAL INVERTEBRATES	**0**	**86**	**43**	**61**	**10**	**0**	**5**	**7**	**69**	**0**	**35**	**49**

Table A4-6. Continued.

Area	6: John Kitch Bay											
Zone	West											
Site	2				3							
Subsample	A[2]	B[1]	A[2]	B[1]	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	400		500		400				500			
Annelida												
Oligochaeta	26	n.s.	12	n.s.	7	5	6	2	7	2	5	3
Hirudinea	0	n.s.	0	n.s.	0	0	0	0	10	2	6	5
Total Annelida	**26**	**n.s.**	**12**	**n.s.**	**7**	**5**	**6**	**2**	**17**	**5**	**11**	**8**
Crustacea												
Ostracoda	0	n.s.	0	n.s.	5	0	2	3	0	0	0	0
Amphipoda	2	n.s.	0	n.s.	0	2	1	2	7	10	8	2
Decapoda	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Total Crustacea	**2**	**n.s.**	**0**	**n.s.**	**5**	**2**	**4**	**2**	**7**	**10**	**8**	**2**
Arachnida												
Acarina	0	n.s.	0	n.s.	0	0	0	0	2	0	1	2
Araneae	0	n.s.	0	n.s.	0	2	1	2	0	0	0	0
Total Arachnida	**0**	**n.s.**	**0**	**n.s.**	**0**	**2**	**1**	**2**	**2**	**0**	**1**	**2**
Mollusca												
Bivalvia												
Pisidiidae	0	n.s.	2	n.s.	0	0	0	0	0	0	0	0
Gastropoda	0	n.s.	57	n.s.	2	0	1	2	14	29	21	10
Total Mollusca	**0**	**n.s.**	**60**	**n.s.**	**2**	**0**	**1**	**2**	**14**	**29**	**21**	**10**
Hydrozoa	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Corixidae - *larva*	0	n.s.	2	n.s.	0	0	0	0	7	2	5	3
Ephemeroptera												
Baetidae - *larva*	0	n.s.	2	n.s.	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	2	n.s.	0	n.s.	0	0	0	0	0	2	1	2
Heptageniidae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	n.s.	0	n.s.	0	0	0	0	10	0	5	7
Polycentropodidae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Chironomidae - *larva*	50	n.s.	236	n.s.	19	19	19	0	19	50	35	22
Chironomidae - *pupa*	0	n.s.	7	n.s.	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	0	n.s.	0	n.s.	0	0	0	0	0	0	0	0
Total Insecta	**52**	**n.s.**	**248**	**n.s.**	**19**	**19**	**19**	**0**	**36**	**55**	**45**	**13**
TOTAL INVERTEBRATES	**81**	**n.s.**	**319**	**n.s.**	**33**	**29**	**31**	**3**	**76**	**98**	**87**	**15**

[1] n.s. = no sample due to lack of water.

[2] hand grab sample at shallow site; no duplicate.

Table A4-7. Abundance (individuals/m²) and mean +/- one standard deviation (SD) of epiphytic invertebrates collected in Area 7: Bay East of Rabbit Creek, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**7: Bay East of Rabbit Creek**											
Zone	**1**											
Site	**1**								**2**			
Subsample	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**
Mesh Size (µm)	**400**				**500**				**400**			
Annelida												
Oligochaeta	10	36	23	19	24	52	38	20	0	0	0	0
Hirudinea	0	0	0	0	0	2	1	2	0	0	0	0
Total Annelida	**10**	**36**	**23**	**19**	**24**	**55**	**39**	**22**	**0**	**0**	**0**	**0**
Crustacea												
Ostracoda	0	0	0	0	0	0	0	0	0	0	0	0
Amphipoda	2	0	1	2	19	36	27	12	0	0	0	0
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**2**	**0**	**1**	**2**	**19**	**36**	**27**	**12**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	2	0	1	2	105	171	138	47	0	0	0	0
Total Mollusca	**2**	**0**	**1**	**2**	**105**	**171**	**138**	**47**	**0**	**0**	**0**	**0**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Corixidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	0	0	0	5	0	2	3	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	2	1	2	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	2	0	1	2	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	2	0	1	2	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	17	71	44	39	88	121	105	24	0	0	0	0
Chironomidae - *pupa*	0	0	0	0	0	2	1	2	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**17**	**71**	**44**	**39**	**98**	**126**	**112**	**20**	**0**	**0**	**0**	**0**
TOTAL INVERTEBRATES	**31**	**107**	**69**	**54**	**245**	**388**	**317**	**101**	**0**	**0**	**0**	**0**

Table A4-7. Continued.

Area	7: Bay East of Rabbit Creek											
Zone	1				2							
Site	2				1				2			
Subsample	A	B	Mean	SD	A[2]	B[1]	A[2]	B[1]	A[2]	B[1]	A[2]	B[1]
Mesh Size (µm)	500				400		500		400		500	
Annelida												
Oligochaeta	0	0	0	0	12	n.s.	2	n.s.	26	n.s.	2	n.s.
Hirudinea	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Total Annelida	**0**	**0**	**0**	**0**	**12**	**n.s.**	**2**	**n.s.**	**26**	**n.s.**	**2**	**n.s.**
Crustacea												
Ostracoda	0	0	0	0	0	n.s.	0	n.s.	2	n.s.	2	n.s.
Amphipoda	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	31	n.s.
Decapoda	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Total Crustacea	**0**	**0**	**0**	**0**	**0**	**n.s.**	**0**	**n.s.**	**2**	**n.s.**	**33**	**n.s.**
Arachnida												
Acarina	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Araneae	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**n.s.**	**0**	**n.s.**	**0**	**n.s.**	**0**	**n.s.**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	7	n.s.
Gastropoda	0	0	0	0	0	n.s.	19	n.s.	0	n.s.	107	n.s.
Total Mollusca	**0**	**0**	**0**	**0**	**0**	**n.s.**	**19**	**n.s.**	**0**	**n.s.**	**114**	**n.s.**
Hydrozoa	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	n.s.	0	n.s.	2	n.s.	0	n.s.
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Dytiscidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Haliplidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	2	n.s.
Gyrinidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Hemiptera												
Corixidae - *adult*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Corixidae - *larva*	0	0	0	0	0	n.s.	2	n.s.	0	n.s.	0	n.s.
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Caenidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Ephemeridae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	5	n.s.
Heptageniidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Leptophlebiidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	2	n.s.	0	n.s.
Siphlonuridae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Leptoceridae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Leptoceridae - *pupa*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Limnephilidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	2	n.s.
Phryganeidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Polycentropodidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	2	n.s.
Chironomidae - *larva*	0	0	0	0	33	n.s.	105	n.s.	29	n.s.	83	n.s.
Chironomidae - *pupa*	0	0	0	0	0	n.s.	7	n.s.	0	n.s.	5	n.s.
Dolichopodidae - *larva*	0	0	0	0	0	n.s.	0	n.s.	0	n.s.	0	n.s.
Total Insecta	**0**	**0**	**0**	**0**	**33**	**n.s.**	**114**	**n.s.**	**33**	**n.s.**	**100**	**n.s.**
TOTAL INVERTEBRATES	**0**	**0**	**0**	**0**	**45**	**n.s.**	**136**	**n.s.**	**62**	**n.s.**	**250**	**n.s.**

[1] n.s. = no sample due to lack of water.

[2] hand grab sample at shallow site; no duplicate.

Table A4-7. Continued.

Area	7: Bay East of Rabbit Creek											
Zone	3											
Site	1								2			
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	400				500				400			
Annelida												
Oligochaeta	26	10	18	12	7	19	13	8	0	0	0	0
Hirudinea	0	0	0	0	0	5	2	3	0	0	0	0
Total Annelida	**26**	**10**	**18**	**12**	**7**	**24**	**15**	**12**	**0**	**0**	**0**	**0**
Crustacea												
Ostracoda	7	5	6	2	0	0	0	0	0	0	0	0
Amphipoda	0	0	0	0	7	0	4	5	0	0	0	0
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**7**	**5**	**6**	**2**	**7**	**0**	**4**	**5**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	2	0	1	2	0	0	0	0	0	0	0	0
Gastropoda	2	0	1	2	136	100	118	25	0	0	0	0
Total Mollusca	**5**	**0**	**2**	**3**	**136**	**100**	**118**	**25**	**0**	**0**	**0**	**0**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Corixidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	76	69	73	5	174	338	256	116	0	0	0	0
Chironomidae - *pupa*	0	0	0	0	0	5	2	3	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**76**	**69**	**73**	**5**	**174**	**343**	**258**	**120**	**0**	**0**	**0**	**0**
TOTAL INVERTEBRATES	**114**	**83**	**99**	**22**	**324**	**467**	**395**	**101**	**0**	**0**	**0**	**0**

Table A4-7. Continued.

Area	7: Bay East of Rabbit Creek												
Zone	3				4								
Site	2				1								2[1]
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD	
Mesh Size (µm)	500				400				500				
Annelida													
Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Hirudinea	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Total Annelida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**t.d.**
Crustacea													
Ostracoda	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Total Crustacea	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**t.d.**
Arachnida													
Acarina	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Araneae	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**t.d.**
Mollusca													
Bivalvia													
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Total Mollusca	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**t.d.**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Insecta													
Odonata													
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Zygoptera													
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Coleoptera													
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Hemiptera													
Corixidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Corixidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Ephemeroptera													
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Trichoptera													
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Diptera													
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Chironomidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Chironomidae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	t.d.
Total Insecta	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**t.d.**
TOTAL INVERTEBRATES	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**t.d.**

[1] t.d. = too deep to sample.

Table A4-8. Abundance (individuals/m²) and mean +/- one standard deviation (SD) of epiphytic invertebrates collected in Area 8: Clark Lake, late summer 2003. Individual abundances may not add up to totals due to rounding.

Area	**8: Clark Lake**															
Zone	**1**															
Site	**1**								**2**							
Subsample	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**	**A**	**B**	**Mean**	**SD**
Mesh Size (µm)	**400**				**500**				**400**				**500**			
Annelida																
Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hirudinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Annelida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Crustacea																
Ostracoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Arachnida																
Acarina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca																
Bivalvia																
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Mollusca	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insecta																
Odonata																
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera																
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera																
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera																
Corixidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corixidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeroptera																
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera																
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diptera																
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL INVERTEBRATES	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table A4-8. Continued.

Area	8:Clark Lake											
Zone	2											
Site	1								2			
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	400				500				400			
Annelida												
Oligochaeta	2	33	18	22	7	7	7	0	74	12	43	44
Hirudinea	0	0	0	0	0	0	0	0	0	0	0	0
Total Annelida	**2**	**33**	**18**	**22**	**7**	**7**	**7**	**0**	**74**	**12**	**43**	**44**
Crustacea												
Ostracoda	0	0	0	0	0	0	0	0	0	0	0	0
Amphipoda	0	0	0	0	0	79	39	56	0	0	0	0
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**0**	**0**	**0**	**0**	**0**	**79**	**39**	**56**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	0	0	0	0	10	150	80	99	2	0	1	2
Total Mollusca	**0**	**0**	**0**	**0**	**10**	**150**	**80**	**99**	**2**	**0**	**1**	**2**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	2	1	2	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	2	1	2	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Corixidae - *larva*	0	0	0	0	2	0	1	2	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	2	0	1	2	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	2	1	2	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	5	2	3	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	2	1	2	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	5	105	55	71	12	257	135	173	64	12	38	37
Chironomidae - *pupa*	0	0	0	0	2	0	1	2	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**7**	**105**	**56**	**69**	**19**	**271**	**145**	**178**	**64**	**12**	**38**	**37**
TOTAL INVERTEBRATES	**10**	**138**	**74**	**91**	**36**	**507**	**271**	**333**	**140**	**24**	**82**	**82**

Table A4-8. Continued.

Area	8:Clark Lake											
Zone	2				3							
Site	2				1							
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	500				400				500			
Annelida												
Oligochaeta	5	5	5	0	0	21	11	15	0	71	36	51
Hirudinea	0	0	0	0	0	0	0	0	0	2	1	2
Total Annelida	**5**	**5**	**5**	**0**	**0**	**21**	**11**	**15**	**0**	**74**	**37**	**52**
Crustacea												
Ostracoda	0	0	0	0	0	2	1	2	0	7	4	5
Amphipoda	14	7	11	5	0	0	0	0	0	17	8	12
Decapoda	0	5	2	3	0	0	0	0	0	0	0	0
Total Crustacea	**14**	**12**	**13**	**2**	**0**	**2**	**1**	**2**	**0**	**24**	**12**	**17**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	2	1	2
Gastropoda	5	5	5	0	0	0	0	0	0	50	25	35
Total Mollusca	**5**	**5**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**52**	**26**	**37**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	10	2	6	5	0	0	0	0	0	26	13	19
Corixidae - *larva*	10	5	7	3	0	0	0	0	0	14	7	10
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	2	1	2
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	2	1	2
Leptophlebiidae - *larva*	2	0	1	2	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	2	0	1	2	0	0	0	0	0	0	0	0
Chironomidae - *larva*	210	33	121	125	0	26	13	19	0	133	67	94
Chironomidae - *pupa*	5	2	4	2	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**238**	**43**	**140**	**138**	**0**	**26**	**13**	**19**	**0**	**179**	**89**	**126**
TOTAL INVERTEBRATES	**262**	**64**	**163**	**140**	**0**	**50**	**25**	**35**	**0**	**329**	**164**	**232**

Table A4-8. Continued.

Area	8: Clark Lake											
Zone	3								4			
Site	2								1			
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	400				500				400			
Annelida												
Oligochaeta	0	0	0	0	0	0	0	0	0	0	0	0
Hirudinea	0	0	0	0	0	0	0	0	0	0	0	0
Total Annelida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Crustacea												
Ostracoda	0	0	0	0	0	0	0	0	0	2	1	2
Amphipoda	0	0	0	0	0	0	0	0	0	0	0	0
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**2**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	0	0	0	0	0	0	0	0	0	2	1	2
Total Mollusca	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**2**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Corixidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	0	0	0	0	0	0	0	0	0	48	24	34
Chironomidae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**48**	**24**	**34**
TOTAL INVERTEBRATES	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**52**	**26**	**37**

Table A4-8. Continued.

Area	8: Clark Lake											
Zone	4											
Site	1				2							
Subsample	A	B	Mean	SD	A	B	Mean	SD	A	B	Mean	SD
Mesh Size (µm)	500				400				500			
Annelida												
Oligochaeta	0	12	6	8	0	0	0	0	0	0	0	0
Hirudinea	0	2	1	2	0	0	0	0	0	0	0	0
Total Annelida	**0**	**14**	**7**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Crustacea												
Ostracoda	0	0	0	0	0	0	0	0	0	0	0	0
Amphipoda	0	5	2	3	0	0	0	0	0	0	0	0
Decapoda	0	0	0	0	0	0	0	0	0	0	0	0
Total Crustacea	**0**	**5**	**2**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Arachnida												
Acarina	0	0	0	0	0	0	0	0	0	0	0	0
Araneae	0	0	0	0	0	0	0	0	0	0	0	0
Total Arachnida	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mollusca												
Bivalvia												
Pisidiidae	0	0	0	0	0	0	0	0	0	0	0	0
Gastropoda	0	19	10	13	0	0	0	0	0	0	0	0
Total Mollusca	**0**	**19**	**10**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Hydrozoa	0	0	0	0	0	0	0	0	0	0	0	0
Insecta												
Odonata												
Anisoptera - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Zygoptera												
Coenagrionidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Coleoptera												
Dytiscidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Dytiscidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Haliplidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Gyrinidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Hemiptera												
Corixidae - *adult*	0	0	0	0	0	0	0	0	0	0	0	0
Corixidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeroptera												
Baetidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Caenidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Ephemeridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Heptageniidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptophlebiidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Siphlonuridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Trichoptera												
Hydropsychidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Leptoceridae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Limnephilidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Phryganeidae - *larva*	0	2	1	2	0	0	0	0	0	0	0	0
Polycentropodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Diptera												
Ceratopogonidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Chironomidae - *larva*	0	152	76	108	0	0	0	0	0	0	0	0
Chironomidae - *pupa*	0	0	0	0	0	0	0	0	0	0	0	0
Dolichopodidae - *larva*	0	0	0	0	0	0	0	0	0	0	0	0
Total Insecta	**0**	**162**	**81**	**114**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL INVERTEBRATES	**0**	**200**	**100**	**141**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**