

Mark-recapture Sampling for Lake Chubsucker (*Erimyzon suetta*) and Grass Pickerel (*Esox americanus vermiculatus*) in L-Lake, Ontario, 2018

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ABSTRACT

Barnucz, J., and Drake, D.A.R. 2020. Mark-recapture Sampling for Lake Chubsucker (*Erimyzon suetta*) and Grass Pickerel (*Esox americanus vermiculatus*) in L-Lake, Ontario, 2018. Can. Data Rep. Fish. Aquat. Sci. 1347: vii + 28 p.

In August and September 2018, seining surveys were conducted to determine the abundance, distribution, and habitat use of Lake Chubsucker (*Erimyzon suetta*) and Grass Pickerel (*Esox americanus vermiculatus*) in L-Lake, which is located near Port Franks, Ontario. In August 2018, forty three sites were sampled, which were located approximately every 50 m around the perimeter of L-Lake. These locations were sampled a second time in September 2018. In both sample periods, sites were sampled using a 9 m x 1.8 m bag seine, which was fished within an enclosure constructed of a 23 m x 2.4 m straight seine. Captured Lake Chubsucker greater than 60 mm total length (TL) and Grass Pickerel greater than 100 mm TL received visual implant elastomer tags.. A total of 39 Lake Chubsucker and 15 Grass Pickerel were captured across both sampling periods, with 34 Lake Chubsucker captured (21 tagged) and 12 Grass Pickerel captured (6 tagged) in sampling period one, and five Lake Chubsucker and three Grass Pickerel captured in period two. There were no recaptures of tagged fish in sampling period two. Captured non-target fish species were not recorded. At most sampling sites, water clarity was high and dense submerged vegetation cover was prominent. The dominant submerged macrophyte within sampling sites across both sampling period was *Chara* spp.

RÉSUMÉ

Barnucz, J., and Drake, D.A.R. 2021. Mark-recapture Sampling for Lake Chubsucker (*Erimyzon suetta*) and Grass Pickerel (*Esox americanus vermiculatus*) in L-Lake, Ontario, 2018. Can. Data Rep. Fish. Aquat. Sci. 1347: vii + 28 p.

En août et septembre 2018, des relevés par pêche à la senne ont été menés afin de déterminer la répartition et l'utilisation de l'habitat du sucet de lac (*Erimyzon suetta*) et du brochet vermiculé (*Esox americanus vermiculatus*) dans le lac L, qui est situé près de Port Franks (Ontario). En août 2018, 43 sites situés environ tous les 50 m autour du périmètre du lac L ont été échantillonnés. Ces emplacements ont été échantillonnés une deuxième fois en septembre 2018. Pendant les deux périodes d'échantillonnage, les sites ont été échantillonnés au moyen d'une senne avec poche de 9 m x 1,8 m; la pêche était pratiquée à l'intérieur d'une enceinte faite d'une senne droite de 23 m x 2,4 m. Les sucets de lac dont la longueur totale dépassait 60 mm et les brochets vermiculés dont la longueur totale dépassait 100 mm ont été marqués d'implants visibles d'élastomère. Un total de 39 sucets de lac et de 15 brochets vermiculés ont été capturés pendant les deux périodes d'échantillonnage; 34 sucets de lac (21 marqués) et 12 brochets vermiculés (6 marqués) ont été capturés pendant la première période, et 5 sucets de lac et 3 brochets vermiculés ont été capturés pendant la deuxième période. Il n'y a eu aucune recapture de poissons marqués pendant la deuxième période d'échantillonnage. Les poissons capturés qui ne faisaient pas partie des espèces ciblées n'ont pas été consignés. À la plupart des sites d'échantillonnage, la clarté de l'eau était élevée et une végétation dense et submergée était dominante. Pendant les deux périodes d'échantillonnage, les macrophytes submergés dominants aux sites d'échantillonnage étaient Chara spp.

INTRODUCTION

Fisheries and Oceans Canada (DFO) has the responsibility to provide for the protection and recovery of fishes listed under the *Species at Risk Act* (SARA) of 2002. To inform scientific aspects of the recovery process, DFO regularly conducts field sampling to satisfy research objectives for SARA-listed fishes, such as evaluating the distribution and abundance of species, determining species-habitat relationships, and better understanding the influence of threats and recovery actions. DFO data reports are published to support the Species at Risk Program by providing an overview of field activities and to provide a medium for archiving data associated with sampling SARA-listed fishes and their habitat.

This data report summarizes targeted field sampling by DFO in 2018 to better understand the distribution, abundance, and habitat features of Lake Chubsucker (*Erimyzon suetta*) and Grass Pickerel (*Esox americanus vermiculatus*) in L-Lake near Port Franks, Ontario. L-Lake is an isolated oxbow lake of the Ausable River and is considered to support one of the healthiest populations of Lake Chubsucker in Canada (DFO 2011; DFO 2020). A high priority action for the recovery of Lake Chubsucker in Canada is the development and implementation of standardized population and habitat monitoring for extant populations (Staton et al 2010). Similarly, Beauchamp et al. (2012) described a lack of information about Grass Pickerel in L-Lake, owing to the species' recent discovery in 2007. Given the paucity of quantitative population estimates for Lake Chubsucker and Grass Pickerel, the goal of this study was to determine the utility of depletion seining and mark-recapture sampling to estimate population size, distribution, and habitat features of both species in L-Lake (Bouvier and Mandrak. 2011, Beauchamp et al. 2012).

METHODS

STUDY SYSTEM AND SITE SELECTION

Fish sampling was conducted in L-Lake during August and September 2018. The first sampling period began on August 14th and ended on August 22nd 2018, representing a sampling period of 5 days. The second sampling period began on September 10th and ended on September 13th 2018, representing a sampling period of 4 days. A total of 43 sites were sampled during the first period (Figure 1). Sites during the August period were selected to occur around the 2 km perimeter of L-Lake based on a systematic, 50 m spacing interval (Figure 1). However, in some cases, site placement along the perimeter of the lake was not possible due to nearshore depths of greater than 1.5 metres. Selected sites were most often located against the shoreline, but in some cases, sites were located offshore to avoid potential snags (e.g., large woody debris). All sites sampled during the first period were revisited during the second period, but in some cases, site locations were modified slightly during the second period due to minor increases in water level between August and September. Sites were accessed using a 5 metre jon boat powered with a twenty horsepower long-tailed, surface-drive motor.

FISH SPECIES AT RISK SAMPLING

A straight seine (23 m long x 2.4 m wide; heavy delta 3 mm mesh) was deployed upon arrival at a sampling site to create a four sided enclosure (approximate enclosure area of 30 m²), which was held in place with four lengths of 2.4 m rebar positioned vertically in the substrate (Figure 2). The purpose of the enclosure was to prevent escapement of fishes and facilitate depletion seining. Once the enclosure was secure, the sampling crew entered the enclosure and deployed a bag seine (9 m long x 1.8 m wide, with 1.8 m x 1.8 m x 1.8 m bag, entire net constructed of 3 mm heavy delta mesh)(Figure 2). The field crew sampled the entire enclosure

by slowly moving the seine around the perimeter of the inside of the enclosure. Upon completion the bag seine was retrieved and captured fishes were removed and placed into bins with fresh water aboard the sampling vessel. The seining procedure occurred five times in succession at each site, with fishes placed into separate holding bins per haul. Only Lake Chubsucker and Grass Pickerel were retained in holding bins; all other species were quickly returned to the water following capture. Lake Chubsucker and Grass Pickerel were measured for individual length [total length (TL), mm] and mass (g).

FISH TAGGING METHODS

Only Lake Chubsucker greater than ~50 mm TL and Grass Pickerel greater than ~100 mm TL were selected for tagging. Grass Pickerel and Lake Chubsucker that satisfied the size-based tagging criteria were sedated in a clove oil solution [10 parts ethanol (95%) to 1 part of clove oil]. The solution was added to fresh, oxygenated water at a concentration of 0.4 ml of clove oil solution per litre of water. Oxygen concentrations in holding bins were maintained using fresh water and supplemented with aquarium air stones and pumps. Tagging occurred by inserting Visible Implant Elastomer compound (VIE; Northwest Marine Technology, Inc.) under the skin of both Grass Pickerel and Lake Chubsucker using a 0.3 cc insulin syringe with a 29 gauge (0.2 mm diameter) needle. Each capture site was assigned a unique tagging location on the fishes body, as well as a unique colour combination (Figure 3, Figure 4). In some cases, Lake Chubsucker or Grass Pickerel satisfying the length criteria were not tagged at the discretion of the field crew, owing to concerns about fish health. Following tagging, fishes were held until tagged fishes were able to swim freely in a recovery tank of freshwater. Fishes were only tagged during the first sampling period. The presence of tags on captured Lake Chubsucker and Grass Pickerel was noted during the second sampling period.

HABITAT SAMPLING

All habitat features, including aquatic macrophytes, were assessed immediately after fish sampling was completed. A total of nine habitat variables were assessed including site depth (m), air temperature (°C), water temperature (°C), conductivity (µS), dissolved oxygen (mg/L), turbidity tube (m) and turbidity (NTU). Three depth measurements were taken that were representative of depths within the sampling site. Surface water temperature (°C), conductivity (µS), turbidity (NTU) and dissolved oxygen (mg/L) was measured using a YSI® EXO2 Multiparameter Sonde Unit. Turbidity measurements (m) were collected using a 1.2 m Fieldmaster® turbidity tube. Air temperature (°C) was measured using a Kestrel® wind meter. Site location (latitude, longitude) was determined using a Garmin® handheld GPS unit. Aquatic macrophytes were assessed at each site using two methods. The first method involved visual assessment of the percent surficial coverage of four macrophyte classes (submerged, emergent, floating, and open water). The most visually dominant aquatic macrophyte species or taxonomic group at each site was also recorded. The second method utilized the submerged aquatic vegetation (SAV) assessment method from Wagner and Mikulyuk (2012). The SAV method involved submerging a garden rake vertically through the water column to the lake bed within the sampling enclosure. The rake was then twisted 360° and pulled vertically to the water's surface. The relative density of macrophytes on the rake were assessed with the following index: no macrophytes present (SAV score = 0), 1 – 25% of the rake is full (SAV score = 1), 25% to 100% of rake is full (SAV score = 2), and greater than 100% of rake is full (SAV score = 3). All macrophytes on the rake were identified to nearest taxonomic group, and rake samples were photographed for future reference.

SAMPLING PERMITS AND DATA ARCHIVING

Sampling for this project was conducted under Species at Risk Act Permit Number 18-PCAA-00025. Seining, fish anesthesia, and tagging were conducted under Animal Use Protocol AUP 1968 and Standard Operating Protocols GWACC-116, GWACC-105, and GWACC-130, approved by the DFO and Environment and Climate Change Canada Animal Care Committee (operated under approval of the Canadian Council on Animal Care). Data associated with the collections in this report are housed under the project code “2018-LCST-” in the Biodiversity Science database within the Great Lakes Laboratory for Fisheries and Aquatic Sciences. Every effort has been made to ensure the accuracy of data contained in this report; however, results may be updated as part of ongoing data verification procedures. Data associated with this report may be obtained by contacting the Great Lakes Laboratory for Fisheries and Aquatic Sciences.

RESULTS

FISH SPECIES AT RISKSAMPLING

Sampling date and locations for both periods are summarized in Tables 1a and 1b. Each of the 43 sites were visited across both sampling periods, resulting in a total of 430 seine hauls (Table 1a, Table 1b).

Lake Chubsucker

Thirty nine Lake Chubsucker were captured across both sampling periods (Table 2a, Table 3a, Figure 5a, Figure 5b) Captured Lake Chubsucker ranged from 42 – 233 mm TL and 0.6 – 157 g, likely representing multiple age classes. A total of 34 Lake Chubsucker were captured from 16 of 43 sites during the first sampling period (Table 3a; 42 – 186 mm TL; 0.6 – 87.3 g; Figure 5, Figure 5b). Of these, 21 were tagged, with tagged individuals ranging between 49 – 186 mm TL and 1.2 – 87.3 g. A total of 5 Lake Chubsucker were captured from 3 of 43 sites during second sampling period (Table 3a, Figure 5a, Figure 5b; 77 – 223 mm TL; 26.4 – 157 g). No tagged Lake Chubsucker were captured during the second period.

Grass Pickerel

Fifteen Grass Pickerel were captured across both sampling periods (Table 2b, Table 3b, Figure 6a, and Figure 6b). Captured Grass Pickerel ranged from 59 – 247 mm and 0.9 – 123 g, likely representing multiple age classes. A total of 12 Grass Pickerel were captured from 12 of 43 sites during the first sampling period. (Table 3b, Figure 6a, Figure 6b; 59 to 247 mm TL; 0.9 to 123 g). Of these, 6 were tagged, with tagged individuals ranging from 89 – 247 mm TL and 3.7 – 123 g (Table 3b). A total of three Grass Pickerel were captured from two of 43 sites during the second sampling period (Table 3b, Figure 6a, Figure 6b; 68 – 209 mm TL, 1.5 – 58.1 g). No tagged Grass Pickerel were captured during the second period.

HABITAT SAMPLING

Period 1

Habitat variables were measured at all sampling locations ($n = 43$) during the first sampling period. Air temperature ranged from 19 °C to 31.1 °C with a mean of 24.7 °C (Table 4a). Water temperature ranged from 21.6 °C to 27.6 °C with a mean of 24.6 °C (Table 4a). Conductivity ranged from 326.8 µS to 409 µS with a mean of 364.46 µS (Table 4a). Dissolved oxygen ranged from 0.44 mg/L to 9.55 mg/L with a mean of 4.80 mg/L (Table 4a). Turbidity tube ranged from 0.38 m to 1.17 m with a mean of 0.80 m (Table 4a). Turbidity ranged from 0.96 NTU to 154.10

NTU with a mean of 10.49 NTU (Table 4a). The mean depth at each site ranged from 0.55 m to 1.13 m with a grand mean of 0.81 m (Table 4a). Emergent macrophyte coverage ranged from 0% to 90% with a mean of 5.81% (Table 5a). Floating macrophyte coverage ranged from 5% to 85% with a mean of 27.33% (Table 5a). Submerged macrophyte coverage ranged from 0% to 95% with a mean of 64.77% (Table 5a). Open water coverage ranged from 0% to 30% with a mean of 2.56% (Table 5a). The most dominant macrophyte coverage based on the visual assessment method was submerged, which occurred at 76% (33 sites) of the 43 sampling sites (Table 5a). The dominant aquatic macrophyte genera included *Chara* spp. (20 sites), *Utricularia* sp. (9 sites), *Brasenia* sp. (8 sites), and *Nymphaea* sp. (6 sites) (Table 6a). The most frequently occurring macrophyte genera across all sampling sites included *Nymphaea* sp. (39 sites), *Brasenia* sp. (30 sites), *Utricularia* sp. (26 sites), *Chara* spp. (25 sites), *Ceratophyllum* sp. (11 sites) and *Typha* sp. (11 sites) (Table 6a, Figure 7a). Density of submerged aquatic vegetation (SAV) as determined by the rake method during period two ranged from 1 to 3 (mean 1.88) (Table 7a). The SAV index for all sampling sites was 2 (18 sites), 1 (13 sites) and 3 (10 sites) (Table 7a). The most dominant SAV genera observed among all rake samples was *Utricularia* sp., which occurred at 48% of the sampling sites (Table 7a).

Period 2

Habitat variables were measured at all sampling locations ($n = 43$) during the second sampling period ($n = 43$). Air temperature ranged from 15.7 °C to 26.0°C with a mean of 20.4 °C (Table 4b). Water temperature ranged from 16.7 °C to 19.8 °C with a mean of 18.2 °C (Table 4b). Conductivity ranged from 326.6 µS to 402.5 µS with a mean of 366.73 µS (Table 4b). Dissolved oxygen ranged from 1.67 mg/L to 7.62 mg/L with a mean of 4.72 mg/L (Table 4b). Turbidity tube exceeded 1.2 metres at all sampling sites during period 2. Turbidity ranged from 0.78 NTU to 13.85 NTU with a mean of 3.90 NTU (Table 4b). The mean depth at each site ranged from 0.48 m to 0.90 m with a grand mean of 0.72 m (Table 4b). Emergent macrophyte coverage ranged from 0% to 25% with a mean of 4.77% (Table 5b). Floating macrophyte coverage ranged from 0% to 50% with a mean of 17.56% (Table 5b). Submerged macrophyte coverage ranged from 40% to 85% with a mean of 53.37% (Table 5b). Open water coverage ranged from 0% to 55% with a mean of 24.30% (Table 5b). The most dominant macrophyte coverage type was submerged, which occurred at 79% (34 sites) of the 43 sampling sites in period 1 (Table 5b). The dominant aquatic macrophyte genera observed within each sampling site included *Chara* spp. (35 sites), *Ceratophyllum* sp. (3 sites), *Brasenia* sp. (3 sites), *Nymphaea* sp. (2 sites) (Table 6b). The dominant aquatic macrophyte genera observed within each site included *Chara* spp. (42 sites), *Brasenia* sp. (30 sites), *Utricularia* sp. (25 sites), *Nymphaea* sp. (22 sites), and *Potamogeton* sp. (21 sites) (Table 6b, Figure 7b). Density of submerged aquatic vegetation (SAV) as determined by the rake method during period two ranged from 1 to 3 (mean 1.77) (Table 7b). The SAV index for all sampling sites was 2 (21 sites), 1 (15 sites) and 3 (6 sites) (Table 7b). The most dominant SAV macrophyte genera observed among all sites was *Chara* spp. (41 sites). The most dominant SAV genera observed among all rake samples was *Chara* spp., which occurred at 95% of the sampling sites (Table 7b).

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Table 1a. Site code, field number, sampling date, and site location (latitude, longitude) for sites sampled for Lake Chubsucker and Grass Pickerel in L-Lake, August 2018.

| Site Code | Field Number | Date | Latitude | Longitude |
|------------------|-----------------------|-------------|-----------------|------------------|
| Site 1-1 | 2018-LCST-140818-001A | 14-Aug-18 | 43.22606 | -81.90762 |
| Site 1-2 | 2018-LCST-140818-002A | 14-Aug-18 | 43.22578 | -81.90835 |
| Site 1-3 | 2018-LCST-140818-003A | 14-Aug-18 | 43.22544 | -81.90784 |
| Site 1-4 | 2018-LCST-140818-004A | 14-Aug-18 | 43.22508 | -81.90741 |
| Site 1-5 | 2018-LCST-140818-005A | 14-Aug-18 | 43.22441 | -81.90735 |
| Site 1-6 | 2018-LCST-140818-006A | 14-Aug-18 | 43.22400 | -81.90773 |
| Site 1-7 | 2018-LCST-140818-007A | 14-Aug-18 | 43.22396 | -81.90839 |
| Site 1-8 | 2018-LCST-150818-001A | 15-Aug-18 | 43.22411 | -81.90910 |
| Site 1-9 | 2018-LCST-150818-002A | 15-Aug-18 | 43.22428 | -81.90986 |
| Site 1-10 | 2018-LCST-150818-003A | 15-Aug-18 | 43.22428 | -81.91048 |
| Site 1-11 | 2018-LCST-150818-004A | 15-Aug-18 | 43.22424 | -81.91111 |
| Site 1-12 | 2018-LCST-150818-005A | 15-Aug-18 | 43.22450 | -81.91233 |
| Site 1-13 | 2018-LCST-150818-006A | 15-Aug-18 | 43.22445 | -81.91290 |
| Site 1-14 | 2018-LCST-150818-007A | 15-Aug-18 | 43.22459 | -81.91354 |
| Site 1-15 | 2018-LCST-150818-008A | 15-Aug-18 | 43.22474 | -81.91442 |
| Site 1-16 | 2018-LCST-160818-001A | 16-Aug-18 | 43.22480 | -81.91546 |
| Site 1-17 | 2018-LCST-160818-002A | 16-Aug-18 | 43.22475 | -81.91618 |
| Site 1-18 | 2018-LCST-160818-003A | 16-Aug-18 | 43.22469 | -81.91675 |
| Site 1-19 | 2018-LCST-160818-004A | 16-Aug-18 | 43.22465 | -81.91735 |
| Site 1-20 | 2018-LCST-210818-001A | 21-Aug-18 | 43.22573 | -81.90733 |
| Site 1-21 | 2018-LCST-210818-002A | 21-Aug-18 | 43.22532 | -81.90700 |
| Site 1-22 | 2018-LCST-210818-003A | 21-Aug-18 | 43.22485 | -81.90668 |
| Site 1-23 | 2018-LCST-210818-004A | 21-Aug-18 | 43.22434 | -81.90665 |
| Site 1-24 | 2018-LCST-210818-005A | 21-Aug-18 | 43.22387 | -81.90691 |
| Site 1-25 | 2018-LCST-210818-006A | 21-Aug-18 | 43.22359 | -81.90762 |
| Site 1-26 | 2018-LCST-210818-007A | 21-Aug-18 | 43.22358 | -81.90838 |
| Site 1-27 | 2018-LCST-210818-008A | 21-Aug-18 | 43.22372 | -81.90905 |
| Site 1-28 | 2018-LCST-210818-009A | 21-Aug-18 | 43.22383 | -81.90968 |
| Site 1-29 | 2018-LCST-210818-010A | 21-Aug-18 | 43.22392 | -81.91043 |
| Site 1-30 | 2018-LCST-210818-011A | 21-Aug-18 | 43.22387 | -81.91114 |
| Site 1-31 | 2018-LCST-220818-001A | 22-Aug-18 | 43.22398 | -81.91192 |
| Site 1-32 | 2018-LCST-220818-002A | 22-Aug-18 | 43.22404 | -81.91274 |
| Site 1-33 | 2018-LCST-220818-003A | 22-Aug-18 | 43.22432 | -81.91444 |
| Site 1-34 | 2018-LCST-220818-004A | 22-Aug-18 | 43.22469 | -81.91397 |
| Site 1-35 | 2018-LCST-220818-005A | 22-Aug-18 | 43.22478 | -81.91499 |
| Site 1-36 | 2018-LCST-220818-006A | 22-Aug-18 | 43.22430 | -81.91808 |
| Site 1-37 | 2018-LCST-220818-007A | 22-Aug-18 | 43.22457 | -81.91834 |
| Site 1-38 | 2018-LCST-220818-008A | 22-Aug-18 | 43.22461 | -81.91785 |
| Site 1-39 | 2018-LCST-220818-009A | 22-Aug-18 | 43.22462 | -81.91747 |
| Site 1-40 | 2018-LCST-220818-010A | 22-Aug-18 | 43.22467 | -81.91706 |
| Site 1-41 | 2018-LCST-220818-011A | 22-Aug-18 | 43.22473 | -81.91654 |
| Site 1-42 | 2018-LCST-220818-012A | 22-Aug-18 | 43.22478 | -81.91623 |
| Site 1-43 | 2018-LCST-220818-013A | 22-Aug-18 | 43.22483 | -81.91526 |

Table 1b. Site code, field number, sampling date, and site location (latitude, longitude) for Lake Chubsucker and Grass Pickerel in L-Lake, September 2018.

| Site Code | Field Number | Date | Latitude | Longitude |
|------------------|-----------------------|-------------|-----------------|------------------|
| Site 2-1 | 2018-LCST-100918-001A | 10-Sep-18 | 43.22578 | -81.90835 |
| Site 2-2 | 2018-LCST-100918-002A | 10-Sep-18 | 43.22544 | -81.90784 |
| Site 2-3 | 2018-LCST-100918-003A | 10-Sep-18 | 43.22508 | -81.90741 |
| Site 2-4 | 2018-LCST-100918-004A | 10-Sep-18 | 43.22441 | -81.90735 |
| Site 2-5 | 2018-LCST-100918-005A | 10-Sep-18 | 43.22400 | -81.90773 |
| Site 2-6 | 2018-LCST-110918-001A | 11-Sep-18 | 43.22396 | -81.90839 |
| Site 2-7 | 2018-LCST-110918-002A | 11-Sep-18 | 43.22411 | -81.90910 |
| Site 2-8 | 2018-LCST-110918-003A | 11-Sep-18 | 43.22428 | -81.90986 |
| Site 2-9 | 2018-LCST-110918-004A | 11-Sep-18 | 43.22428 | -81.91048 |
| Site 2-10 | 2018-LCST-110918-005A | 11-Sep-18 | 43.22424 | -81.91111 |
| Site 2-11 | 2018-LCST-110918-006A | 11-Sep-18 | 43.22450 | -81.91233 |
| Site 2-12 | 2018-LCST-110918-007A | 11-Sep-18 | 43.22445 | -81.91290 |
| Site 2-13 | 2018-LCST-110918-008A | 11-Sep-18 | 43.22459 | -81.91354 |
| Site 2-14 | 2018-LCST-110918-009A | 11-Sep-18 | 43.22469 | -81.91397 |
| Site 2-15 | 2018-LCST-110918-010A | 11-Sep-18 | 43.22474 | -81.91442 |
| Site 2-16 | 2018-LCST-110918-011A | 11-Sep-18 | 43.22478 | -81.91499 |
| Site 2-17 | 2018-LCST-110918-012A | 11-Sep-18 | 43.22483 | -81.91526 |
| Site 2-18 | 2018-LCST-110918-013A | 11-Sep-18 | 43.22480 | -81.91546 |
| Site 2-19 | 2018-LCST-120918-001A | 12-Sep-18 | 43.22606 | -81.90762 |
| Site 2-20 | 2018-LCST-120918-002A | 12-Sep-18 | 43.22573 | -81.90733 |
| Site 2-21 | 2018-LCST-120918-003A | 12-Sep-18 | 43.22532 | -81.90700 |
| Site 2-22 | 2018-LCST-120918-004A | 12-Sep-18 | 43.22485 | -81.90668 |
| Site 2-23 | 2018-LCST-120918-005A | 12-Sep-18 | 43.22434 | -81.90665 |
| Site 2-24 | 2018-LCST-120918-006A | 12-Sep-18 | 43.22387 | -81.90691 |
| Site 2-25 | 2018-LCST-120918-007A | 12-Sep-18 | 43.22359 | -81.90762 |
| Site 2-26 | 2018-LCST-120918-008A | 12-Sep-18 | 43.22457 | -81.91834 |
| Site 2-27 | 2018-LCST-120918-009A | 12-Sep-18 | 43.22430 | -81.91808 |
| Site 2-28 | 2018-LCST-120918-010A | 12-Sep-18 | 43.22465 | -81.91735 |
| Site 2-29 | 2018-LCST-120918-011A | 12-Sep-18 | 43.22469 | -81.91675 |
| Site 2-30 | 2018-LCST-120918-012A | 12-Sep-18 | 43.22478 | -81.91623 |
| Site 2-31 | 2018-LCST-120918-013A | 12-Sep-18 | 43.22432 | -81.91444 |
| Site 2-32 | 2018-LCST-120918-014A | 12-Sep-18 | 43.22404 | -81.91274 |
| Site 2-33 | 2018-LCST-130918-001A | 13-Sep-18 | 43.22461 | -81.91785 |
| Site 2-34 | 2018-LCST-130918-002A | 13-Sep-18 | 43.22462 | -81.91747 |
| Site 2-35 | 2018-LCST-130918-003A | 13-Sep-18 | 43.22467 | -81.91706 |
| Site 2-36 | 2018-LCST-130918-004A | 13-Sep-18 | 43.22473 | -81.91654 |
| Site 2-37 | 2018-LCST-130918-005A | 13-Sep-18 | 43.22475 | -81.91618 |
| Site 2-38 | 2018-LCST-130918-006A | 13-Sep-18 | 43.22398 | -81.91192 |
| Site 2-39 | 2018-LCST-130918-007A | 13-Sep-18 | 43.22387 | -81.91114 |
| Site 2-40 | 2018-LCST-130918-008A | 13-Sep-18 | 43.22392 | -81.91043 |
| Site 2-41 | 2018-LCST-130918-009A | 13-Sep-18 | 43.22383 | -81.90968 |
| Site 2-42 | 2018-LCST-130918-010A | 13-Sep-18 | 43.22372 | -81.90905 |
| Site 2-43 | 2018-LCST-130918-011A | 13-Sep-18 | 43.22358 | -81.90838 |

Table 2a. Summary of Lake Chubsucker capture locations (site code, number of individuals detected, field number, sampling date, latitude-longitude) in L-Lake, 2018. .

| Site Code | Number of Individuals | Field Number | Date | Latitude | Longitude |
|--------------|-----------------------|-----------------------|-----------|----------|-----------|
| Site 1-5 | 1 | 2018-LCST-140818-005A | 14-Aug-18 | 43.22441 | -81.90735 |
| Site 1-10 | 5 | 2018-LCST-150818-003A | 15-Aug-18 | 43.22428 | -81.91048 |
| Site 1-14 | 1 | 2018-LCST-150818-007A | 15-Aug-18 | 43.22459 | -81.91354 |
| Site 1-15 | 1 | 2018-LCST-150818-008A | 15-Aug-18 | 43.22474 | -81.91442 |
| Site 1-16 | 7 | 2018-LCST-160818-001A | 16-Aug-18 | 43.22480 | -81.91546 |
| Site 1-17 | 4 | 2018-LCST-160818-002A | 16-Aug-18 | 43.22475 | -81.91618 |
| Site 1-18 | 2 | 2018-LCST-160818-003A | 16-Aug-18 | 43.22469 | -81.91675 |
| Site 1-19 | 3 | 2018-LCST-160818-004A | 16-Aug-18 | 43.22465 | -81.91735 |
| Site 1-23 | 1 | 2018-LCST-210818-004A | 21-Aug-18 | 43.22434 | -81.90665 |
| Site 1-25 | 1 | 2018-LCST-210818-006A | 21-Aug-18 | 43.22359 | -81.90762 |
| Site 1-34 | 1 | 2018-LCST-220818-004A | 22-Aug-18 | 43.22469 | -81.91397 |
| Site 1-39 | 1 | 2018-LCST-220818-009A | 22-Aug-18 | 43.22462 | -81.91747 |
| Site 1-40 | 3 | 2018-LCST-220818-010A | 22-Aug-18 | 43.22467 | -81.91706 |
| Site 1-41 | 1 | 2018-LCST-220818-011A | 22-Aug-18 | 43.22473 | -81.91654 |
| Site 1-42 | 1 | 2018-LCST-220818-012A | 22-Aug-18 | 43.22478 | -81.91623 |
| Site 1-43 | 1 | 2018-LCST-220818-013A | 22-Aug-18 | 43.22483 | -81.91526 |
| Site 2-1 | 1 | 2018-LCST-100918-001A | 10-Sep-18 | 43.22578 | -81.90835 |
| Site 2-4 | 2 | 2018-LCST-110918-004A | 11-Sep-18 | 43.22428 | -81.91048 |
| Site 2-33 | 2 | 2018-LCST-130918-001A | 13-Sep-18 | 43.22461 | -81.91785 |
| Total | 39 | | | | |

Table 2b. Summary of Grass Pickerel capture locations (site code, number of individuals detected, field number, sampling date, latitude-longitude) in L-Lake, 2018.

| Site Code | Number of Individuals | Field Number | Date | Latitude | Longitude |
|--------------|-----------------------|-----------------------|-----------|----------|-----------|
| Site 1-1 | 1 | 2018-LCST-140818-001A | 14-Aug-18 | 43.22606 | -81.90762 |
| Site 1-2 | 1 | 2018-LCST-140818-002A | 14-Aug-18 | 43.22578 | -81.90835 |
| Site 1-16 | 1 | 2018-LCST-160818-001A | 16-Aug-18 | 43.2248 | -81.91546 |
| Site 1-17 | 1 | 2018-LCST-160818-002A | 16-Aug-18 | 43.22475 | -81.91618 |
| Site 1-20 | 1 | 2018-LCST-210818-001A | 21-Aug-18 | 43.22573 | -81.90733 |
| Site 1-21 | 1 | 2018-LCST-210818-002A | 21-Aug-18 | 43.22532 | -81.90700 |
| Site 1-24 | 1 | 2018-LCST-210818-005A | 21-Aug-18 | 43.22387 | -81.90691 |
| Site 1-27 | 1 | 2018-LCST-210818-008A | 21-Aug-18 | 43.22372 | -81.90905 |
| Site 1-28 | 1 | 2018-LCST-210818-009A | 21-Aug-18 | 43.22383 | -81.90968 |
| Site 1-29 | 1 | 2018-LCST-210818-010A | 21-Aug-18 | 43.22392 | -81.91043 |
| Site 1-33 | 1 | 2018-LCST-220818-003A | 22-Aug-18 | 43.22432 | -81.91444 |
| Site 1-37 | 1 | 2018-LCST-220818-007A | 22-Aug-18 | 43.22457 | -81.91834 |
| Site 2-4 | 1 | 2018-LCST-100918-004A | 10-Sep-18 | 43.22441 | -81.90735 |
| Site 2-33 | 2 | 2018-LCST-130918-001A | 13-Sep-18 | 43.22461 | -81.91785 |
| Total | 15 | | | | |

Table 3a. Summary of Lake Chubsucker tagging data from L-Lake sampling in 2018.

| Site Code | Field Number | Total Length (mm) | Weight (g) | Tag Location | Colour | Latitude | Longitude |
|-----------|-----------------------|-------------------|------------|---------------|--------|----------|-----------|
| Site 1-5 | 2018-LCST-140817-002A | 57 | 1.7 | Anal-Left | Yellow | 43.22441 | -81.90735 |
| Site 1-10 | 2018-LCST-150818-003A | 45 | 0.9 | No Tag | n/a | 43.22428 | -81.91048 |
| Site 1-10 | 2018-LCST-150818-003A | 47 | 0.9 | No Tag | n/a | 43.22428 | -81.91048 |
| Site 1-10 | 2018-LCST-150818-003A | 49 | 1.6 | No Tag | n/a | 43.22428 | -81.91048 |
| Site 1-10 | 2018-LCST-150818-003A | 53 | 1.8 | No Tag | n/a | 43.22428 | -81.91048 |
| Site 1-10 | 2018-LCST-150818-003A | 55 | 1.6 | No Tag | n/a | 43.22428 | -81.91048 |
| Site 1-14 | 2018-LCST-150818-007A | 51 | 1.8 | Pelvic-Left | Yellow | 43.22459 | -81.91354 |
| Site 1-15 | 2018-LCST-150818-007A | 52 | 1.3 | Pectoral-Left | Yellow | 43.22474 | -81.91442 |
| Site 1-16 | 2018-LCST-160818-001A | 43 | 0.8 | No Tag | n/a | 43.22480 | -81.91546 |
| Site 1-16 | 2018-LCST-160818-001A | 44 | 0.9 | No Tag | n/a | 43.22480 | -81.91546 |
| Site 1-16 | 2018-LCST-160818-001A | 47 | 1.1 | No Tag | n/a | 43.22480 | -81.91546 |
| Site 1-16 | 2018-LCST-160818-001A | 53 | 1.6 | Dorsal-Left | Red | 43.22480 | -81.91546 |
| Site 1-16 | 2018-LCST-160818-001A | 55 | 1.7 | Dorsal-Left | Red | 43.22480 | -81.91546 |
| Site 1-16 | 2018-LCST-160818-001A | 59 | 2.2 | Dorsal-Left | Red | 43.22480 | -81.91546 |
| Site 1-16 | 2018-LCST-160818-001A | 60 | 2.4 | Dorsal-Left | Red | 43.22480 | -81.91546 |
| Site 1-17 | 2018-LCST-160818-002A | 49 | 1.4 | No Tag | n/a | 43.22475 | -81.91618 |
| Site 1-17 | 2018-LCST-160818-002A | 55 | 1.8 | Caudal-Left | Red | 43.22475 | -81.91618 |
| Site 1-17 | 2018-LCST-160818-002A | 58 | 1.6 | Caudal-Left | Red | 43.22475 | -81.91618 |
| Site 1-17 | 2018-LCST-160818-002A | 161 | 52.9 | Caudal-Left | Red | 43.22475 | -81.91618 |
| Site 1-18 | 2018-LCST-160818-003A | 50 | 1.3 | Anal-Left | Red | 43.22469 | -81.91675 |
| Site 1-18 | 2018-LCST-160818-003A | 120 | 19.6 | Anal-Left | Red | 43.22469 | -81.91675 |
| Site 1-19 | 2018-LCST-160818-004A | 49 | 1.2 | Pelvic-Left | Red | 43.22465 | -81.91735 |
| Site 1-19 | 2018-LCST-160818-004A | 50 | 1.4 | Pelvic-Left | Red | 43.22465 | -81.91735 |
| Site 1-19 | 2018-LCST-160818-004A | 186 | 87.3 | Pelvic-Left | Red | 43.22465 | -81.91735 |
| Site 1-23 | 2018-LCST-210818-004A | 46 | 0.9 | No Tag | n/a | 43.22434 | -81.90665 |
| Site 1-25 | 2018-LCST-210818-006A | 53 | 1.6 | Left-Keel | Red | 43.22359 | -81.90762 |
| Site 1-34 | 2018-LCST-220818-004A | 61 | 3.0 | Left-Ventral | Red | 43.22469 | -81.91397 |
| Site 1-39 | 2018-LCST-220818-009A | 180 | 85.4 | Left-Ventral | Red | 43.22462 | -81.91747 |
| Site 1-40 | 2018-LCST-220818-010A | 106 | 14.8 | Left-Ventral | Red | 43.22467 | -81.91706 |
| Site 1-40 | 2018-LCST-220818-010A | 151 | 46.3 | Left-Ventral | Red | 43.22467 | -81.91706 |
| Site 1-40 | 2018-LCST-220818-010A | 165 | 63.4 | Left-Ventral | Red | 43.22467 | -81.91706 |
| Site 1-41 | 2018-LCST-220818-011A | 51 | 1.6 | No Tag | n/a | 43.22473 | -81.91654 |
| Site 1-42 | 2018-LCST-220818-012A | 42 | 0.6 | No Tag | n/a | 43.22478 | -81.91623 |
| Site 1-43 | 2018-LCST-220818-013A | 46 | 1.5 | No Tag | n/a | 43.22483 | -81.91526 |

| Site Code | Field Number | Total Length (mm) | Weight (g) | Tag Location | Colour | Latitude | Longitude |
|------------------|-----------------------|--------------------------|-------------------|---------------------|---------------|-----------------|------------------|
| Site 2-1 | 2018-LCST-100918-001A | 126 | 26.4 | No Tag | n/a | 43.22578 | -81.90835 |
| Site 2-4 | 2018-LCST-110918-004A | 77 | 50 | No Tag | n/a | 43.22441 | -81.90735 |
| Site 2-4 | 2018-LCST-110918-004A | 223 | 157 | No Tag | n/a | 43.22441 | -81.90735 |
| Site 2-33 | 2018-LCST-130918-001A | 162 | 57.3 | No Tag | n/a | 43.22461 | -81.91785 |
| Site 2-33 | 2018-LCST-130918-001A | 186 | 92.3 | No Tag | n/a | 43.22461 | -81.91785 |

Table 3b. Summary of Grass Pickerel tagging data from L-Lake sampling in 2018.

| Site Code | Field Number | Length | Weight | Tag Location | Colour | Latitude | Longitude |
|------------------|-----------------------|---------------|---------------|---------------------|---------------|-----------------|------------------|
| Site 1-1 | 2018-LCST-140817-001A | 181 | 38.5 | Dorsal-Left | Yellow | 43.22606 | -81.90762 |
| Site 1-2 | 2018-LCST-140817-002A | 89 | 3.7 | Caudal-Left | Yellow | 43.22578 | -81.90835 |
| Site 1-16 | 2018-LCST-160818-001A | 127 | 11.2 | Dorsal-Left | Red | 43.2248 | -81.91546 |
| Site 1-17 | 2018-LCST-160818-002A | 122 | 10 | Caudal-Left | Red | 43.22475 | -81.91618 |
| Site 1-20 | 2018-LCST-210818-001A | 60 | 1.1 | No Tag | n/a | 43.22573 | -81.90733 |
| Site 1-21 | 2018-LCST-210818-002A | 68 | 0.9 | No Tag | n/a | 43.22532 | -81.90700 |
| Site 1-24 | 2018-LCST-210818-005A | 59 | 0.9 | No Tag | n/a | 43.22387 | -81.90691 |
| Site 1-27 | 2018-LCST-210818-008A | 73 | 2.4 | No Tag | n/a | 43.22372 | -81.90905 |
| Site 1-28 | 2018-LCST-210818-009A | 68 | 1.9 | No Tag | n/a | 43.22383 | -81.90968 |
| Site 1-29 | 2018-LCST-210818-010A | 247 | 123 | Left-Keel | Red | 43.22392 | -81.91043 |
| Site 1-33 | 2018-LCST-220818-003A | 64 | 1.2 | No Tag | n/a | 43.22432 | -81.91444 |
| Site 1-37 | 2018-LCST-220818-007A | 126 | 12.2 | Left-Ventral | Red | 43.22457 | -81.91834 |
| Site 2-4 | 2018-LCST-100918-004A | 68 | 1.5 | No Tag | n/a | 43.22441 | -81.90735 |
| Site 2-33 | 2018-LCST-130918-001A | 209 | 58.1 | No Tag | n/a | 43.22461 | -81.91785 |
| Site 2-33 | 2018-LCST-130918-003A | 136 | 16.2 | No Tag | n/a | 43.22461 | -81.91785 |

Table 4a. Summary of habitat data from L-Lake sampling during period one (August 2018).

| Site Code | Air Temp (°C) | Water Temp (°C) | Conductivity (µS) | Dissolved Oxygen (mg/L) | Turbidity Tube (m) | Turbidity (NTU) | Mean Depth (m) |
|-------------|---------------|-----------------|-------------------|-------------------------|--------------------|-----------------|----------------|
| Site 1-1 | 28.9 | 25.2 | 334.0 | 3.04 | 0.38 | 2.80 | 0.61 |
| Site 1-2 | 30.2 | 25.4 | 353.4 | 5.20 | 0.58 | 20.33 | 0.93 |
| Site 1-3 | 29.7 | 27.1 | 343.0 | 6.30 | > 1.2 | 13.90 | 0.73 |
| Site 1-4 | 31.1 | 25.9 | 364 | 5.10 | 0.74 | 43.40 | 0.69 |
| Site 1-5 | 30.9 | 26.9 | 352.6 | 2.62 | 0.825 | 32.17 | 1.05 |
| Site 1-6 | 30.6 | 27.6 | 367.6 | 3.05 | 1.01 | 154.10 | 1.13 |
| Site 1-7 | 31.1 | 27.4 | 361.0 | 9.55 | 0.74 | 12.10 | 1.06 |
| Site 1-8 | 24.2 | 25.7 | 359.7 | 5.63 | > 1.20 | 1.48 | 0.76 |
| Site 1-9 | 26.1 | 25.8 | 358.4 | 6.51 | > 1.20 | 7.71 | 0.90 |
| Site 1-10 | 25.7 | 25.8 | 359.6 | 7.31 | 1.13 | 4.01 | 0.81 |
| Site 1-11 | 26.6 | 26.7 | 368.7 | 5.87 | 1.13 | 12.01 | 0.66 |
| Site 1-12 | 27.2 | 27.3 | 385.6 | 8.16 | 0.42 | 2.05 | 1.02 |
| Site 1-13 | 27.5 | 26.5 | 380.2 | 7.31 | 1.17 | 1.53 | 0.76 |
| Site 1-14 | 28.4 | 26.8 | 388.5 | 7.58 | > 1.20 | 10.96 | 0.82 |
| Site 1-15 | 28.5 | 26.7 | 396.1 | 8.28 | 1.16 | 4.01 | 0.84 |
| Site 1-16 | 23.6 | 25.2 | 403.1 | 5.36 | 0.91 | 1.62 | 0.76 |
| Site 1-17 | 25.8 | 25.4 | 409.0 | 4.77 | > 1.20 | 5.37 | 0.73 |
| Site 1-18 | 25.7 | 25.1 | 391.3 | 2.77 | 1.05 | 2.28 | 0.75 |
| Site 1-19 | 26.3 | 24.7 | 378.1 | 4.10 | 0.75 | 8.77 | 0.71 |
| Site 1-20 | 22.3 | 23.9 | 340.0 | 3.24 | 0.66 | 9.24 | 0.72 |
| Site 1-21 | 23.2 | 23.9 | 331.1 | 3.12 | 1.13 | 11.61 | 0.92 |
| Site 1-22 | 23.4 | 23.8 | 326.8 | 3.21 | > 1.20 | 0.96 | 0.64 |
| Site 1-23 | 24.5 | 24.0 | 331.3 | 2.83 | 0.88 | 5.71 | 0.92 |
| Site 1-24 | 24.7 | 24.3 | 340.1 | 3.48 | > 1.20 | 11.10 | 0.83 |
| Site 1-25 | 24.9 | 24.0 | 329.1 | 6.56 | 1.05 | 1.01 | 0.76 |
| Site 1-26 | 25.4 | 24.8 | 345.1 | 7.06 | > 1.20 | 1.50 | 0.65 |
| Site 1-27 | 26.1 | 24.5 | 357.2 | 8.61 | 0.70 | 5.92 | 0.83 |
| Site 1-28 | 26.7 | 24.9 | 364.6 | 6.19 | 0.61 | 1.82 | 0.80 |
| Site 1-29 | 25.7 | 25.1 | 344.6 | 6.46 | > 1.20 | 4.83 | 0.78 |
| Site 1-30 | 24.1 | 25.1 | 365.6 | 7.01 | > 1.20 | 2.21 | 0.75 |
| Site 1-31 | 19 | 22.3 | 360.8 | 3.46 | > 1.20 | 3.12 | 1.02 |
| Site 1-32 | 19.2 | 22.4 | 364.6 | 3.09 | > 1.20 | 3.62 | 0.99 |
| Site 1-33 | 19.2 | 22.0 | 358.9 | 3.38 | 0.59 | 4.39 | 0.55 |
| Site 1-34 | 19.6 | 22.1 | 366.8 | 3.84 | > 1.20 | 6.91 | 0.91 |
| Site 1-35 | 19.5 | 22.0 | 368.9 | 3.48 | 0.42 | 5.58 | 0.98 |
| Site 1-36 | 19.4 | 21.7 | 371.5 | 1.82 | 0.76 | 7.67 | 0.79 |
| Site 1-37 | 19.5 | 21.6 | 359.7 | 0.44 | > 1.20 | 4.10 | 0.76 |
| Site 1-38 | 19.9 | 22.0 | 364.1 | 0.92 | 0.47 | 4.29 | 0.82 |
| Site 1-39 | 20.5 | 22.3 | 372.5 | 1.71 | 0.69 | 1.98 | 0.55 |
| Site 1-40 | 20.7 | 22.2 | 378.5 | 1.21 | > 1.20 | 1.81 | 0.70 |
| Site 1-41 | 20.4 | 22.3 | 391.4 | 5.74 | > 1.20 | 1.72 | 0.84 |
| Site 1-42 | 21.1 | 23.6 | 395.1 | 4.98 | > 1.20 | 6.16 | 0.80 |
| Site 1-43 | 23.2 | 24.0 | 389.4 | 6.09 | > 1.20 | 3.28 | 0.83 |
| Min | 19.0 | 21.6 | 326.80 | 0.44 | 0.38 | 0.96 | 0.55 |
| Mean | 24.7 | 24.6 | 364.46 | 4.80 | 0.80 | 10.49 | 0.81 |
| Max | 31.1 | 27.6 | 409.00 | 9.55 | 1.17 | 154.10 | 1.13 |

Table 4b. Summary of habitat data from L-Lake sampling during period two (September 2018).

| Site Code | Air Temp (°C) | Water Temp (°C) | Conductivity (µS) | Dissolved Oxygen (mg/L) | Turbidity Tube (m) | Turbidity (NTU) | Mean Depth (m) |
|-------------|---------------|-----------------|-------------------|-------------------------|--------------------|-----------------|----------------|
| Site 2-1 | 15.7 | 17.58 | 338.7 | 2.57 | > 1.2 | 13.78 | 0.48 |
| Site 2-2 | 16.9 | 17.88 | 331.0 | 2.34 | > 1.2 | 0.92 | 0.86 |
| Site 2-3 | 16.3 | 17.83 | 326.6 | 1.67 | > 1.2 | 13.85 | 0.90 |
| Site 2-4 | 16.1 | 17.37 | 329.7 | 2.83 | > 1.2 | 9.97 | 0.81 |
| Site 2-5 | 16 | 18.00 | 358.6 | 4.15 | > 1.2 | 4.15 | 0.88 |
| Site 2-6 | 16.5 | 16.80 | 356.2 | 3.14 | > 1.2 | 3.97 | 0.78 |
| Site 2-7 | 16.9 | 16.72 | 356.7 | 3.11 | > 1.2 | 3.62 | 0.80 |
| Site 2-8 | 15.9 | 16.91 | 356.2 | 5.20 | > 1.2 | 5.71 | 0.63 |
| Site 2-9 | 18.8 | 17.16 | 357.8 | 5.95 | > 1.2 | 4.53 | 0.73 |
| Site 2- | 19.4 | 17.71 | 360.7 | 7.32 | > 1.2 | 3.58 | 0.59 |
| Site 2- | 22.3 | 18.45 | 376.6 | 4.95 | > 1.2 | 6.70 | 0.79 |
| Site 2- | 20.1 | 17.55 | 373.4 | 4.65 | > 1.2 | 3.26 | 0.64 |
| Site 2- | 21.1 | 18.89 | 385.3 | 5.66 | > 1.2 | 3.75 | 0.60 |
| Site 2- | 24.1 | 18.63 | 381.0 | 5.85 | > 1.2 | 2.98 | 0.69 |
| Site 2- | 22.2 | 18.92 | 383.2 | 6.38 | > 1.2 | 2.92 | 0.66 |
| Site 2- | 23.4 | 18.81 | 381.1 | 5.73 | > 1.2 | 1.74 | 0.81 |
| Site 2- | 22.7 | 16.83 | 381.8 | 5.71 | > 1.2 | 4.74 | 0.65 |
| Site 2- | 20.1 | 19.77 | 388.0 | 5.99 | > 1.2 | 3.32 | 0.86 |
| Site 2- | 18.5 | 17.36 | 330.0 | 3.26 | > 1.2 | 1.01 | 0.62 |
| Site 2- | 19.2 | 17.64 | 332.6 | 4.40 | > 1.2 | 1.06 | 0.89 |
| Site 2- | 18.5 | 17.79 | 333.2 | 3.73 | > 1.2 | 0.78 | 0.81 |
| Site 2- | 19.4 | 17.75 | 331.6 | 3.41 | > 1.2 | 6.08 | 0.71 |
| Site 2- | 18.8 | 17.49 | 336.2 | 1.92 | > 1.2 | 1.20 | 0.76 |
| Site 2- | 20.8 | 17.47 | 349.1 | 2.81 | > 1.2 | 2.65 | 0.70 |
| Site 2- | 21.3 | 17.77 | 367.2 | 5.24 | > 1.2 | 2.73 | 0.86 |
| Site 2- | 22.3 | 17.66 | 371.9 | 3.51 | > 1.2 | 6.02 | 0.72 |
| Site 2- | 24.5 | 18.74 | 402.5 | 6.25 | > 1.2 | 4.85 | 0.86 |
| Site 2- | 23.4 | 18.08 | 373.4 | 2.65 | > 1.2 | 2.75 | 0.66 |
| Site 2- | 22.8 | 18.91 | 382.4 | 5.61 | > 1.2 | 2.55 | 0.77 |
| Site 2- | 20.3 | 19.16 | 379.8 | 5.61 | > 1.2 | 5.23 | 0.51 |
| Site 2- | 23.2 | 19.47 | 388.6 | 5.59 | > 1.2 | 3.96 | 0.65 |
| Site 2- | 20.2 | 19.51 | 392.2 | 6.36 | > 1.2 | 2.19 | 0.69 |
| Site 2- | 17.4 | 17.99 | 372.0 | 1.71 | > 1.2 | 7.94 | 0.88 |
| Site 2- | 18.8 | 18.13 | 373.5 | 3.15 | > 1.2 | 1.28 | 0.74 |
| Site 2- | 18.8 | 18.75 | 374.4 | 4.91 | > 1.2 | 0.98 | 0.73 |
| Site 2- | 20.3 | 18.49 | 377.4 | 4.88 | > 1.2 | 1.45 | 0.75 |
| Site 2- | 21.1 | 18.50 | 379.1 | 4.29 | > 1.2 | 3.03 | 0.75 |
| Site 2- | 22.8 | 19.20 | 385.2 | 6.46 | > 1.2 | 2.60 | 0.68 |
| Site 2- | 23.5 | 19.48 | 384.1 | 7.39 | > 1.2 | 2.47 | 0.71 |
| Site 2- | 23.6 | 19.71 | 383.3 | 7.62 | > 1.2 | 2.50 | 0.63 |
| Site 2- | 24.5 | 18.77 | 379.9 | 5.76 | > 1.2 | 2.87 | 0.62 |
| Site 2- | 23.9 | 19.00 | 380.1 | 5.78 | > 1.2 | 3.32 | 0.63 |
| Site 2- | 26 | 19.51 | 386.9 | 7.39 | > 1.2 | 2.51 | 0.63 |
| Min | 15.7 | 16.7 | 326.60 | 1.67 | - | 0.78 | 0.48 |
| Mean | 20.4 | 18.2 | 366.73 | 4.72 | - | 3.90 | 0.72 |
| Max | 26.0 | 19.8 | 402.50 | 7.62 | - | 13.85 | 0.90 |

Table 5a. Summary of aquatic macrophyte classification from L-Lake sampling during period one (August 2018).

| Site Code | Emergent (%) | Floating (%) | Submerged (%) | Open Water (%) | Dominant Class |
|-------------|--------------|--------------|---------------|----------------|----------------|
| Site 1-1 | 10 | 70 | 15 | 5 | Floating |
| Site 1-2 | 0 | 70 | 15 | 15 | Floating |
| Site 1-3 | 0 | 70 | 15 | 15 | Floating |
| Site 1-4 | 0 | 70 | 10 | 20 | Floating |
| Site 1-5 | 0 | 60 | 10 | 30 | Floating |
| Site 1-6 | 0 | 85 | 10 | 5 | Floating |
| Site 1-7 | 0 | 45 | 45 | 10 | Submerged |
| Site 1-8 | 0 | 60 | 30 | 10 | Floating |
| Site 1-9 | 0 | 10 | 90 | 0 | Submerged |
| Site 1-10 | 0 | 10 | 90 | 0 | Submerged |
| Site 1-11 | 5 | 10 | 85 | 0 | Submerged |
| Site 1-12 | 15 | 35 | 50 | 0 | Submerged |
| Site 1-13 | 0 | 60 | 40 | 0 | Floating |
| Site 1-14 | 0 | 40 | 60 | 0 | Submerged |
| Site 1-15 | 0 | 30 | 70 | 0 | Submerged |
| Site 1-16 | 0 | 10 | 90 | 0 | Submerged |
| Site 1-17 | 0 | 20 | 80 | 0 | Submerged |
| Site 1-18 | 15 | 15 | 70 | 0 | Submerged |
| Site 1-19 | 5 | 15 | 80 | 0 | Submerged |
| Site 1-20 | 5 | 20 | 75 | 0 | Submerged |
| Site 1-21 | 0 | 30 | 70 | 0 | Submerged |
| Site 1-22 | 5 | 15 | 80 | 0 | Submerged |
| Site 1-23 | 15 | 15 | 70 | 0 | Submerged |
| Site 1-24 | 5 | 15 | 80 | 0 | Submerged |
| Site 1-25 | 0 | 5 | 95 | 0 | Submerged |
| Site 1-26 | 5 | 10 | 85 | 0 | Submerged |
| Site 1-27 | 5 | 20 | 75 | 0 | Submerged |
| Site 1-28 | 0 | 10 | 90 | 0 | Submerged |
| Site 1-29 | 90 | 10 | 0 | 0 | Emergent |
| Site 1-30 | 0 | 20 | 80 | 0 | Submerged |
| Site 1-31 | 0 | 20 | 80 | 0 | Submerged |
| Site 1-32 | 10 | 10 | 80 | 0 | Submerged |
| Site 1-33 | 10 | 10 | 80 | 0 | Submerged |
| Site 1-34 | 0 | 5 | 95 | 0 | Submerged |
| Site 1-35 | 10 | 10 | 80 | 0 | Submerged |
| Site 1-36 | 10 | 10 | 80 | 0 | Submerged |
| Site 1-37 | 0 | 80 | 20 | 0 | Floating |
| Site 1-38 | 0 | 30 | 70 | 0 | Submerged |
| Site 1-39 | 5 | 10 | 85 | 0 | Submerged |
| Site 1-40 | 0 | 10 | 90 | 0 | Submerged |
| Site 1-41 | 5 | 5 | 90 | 0 | Submerged |
| Site 1-42 | 5 | 5 | 90 | 0 | Submerged |
| Site 1-43 | 10 | 10 | 80 | 0 | Submerged |
| Min | 0 | 5 | 0 | 0 | - |
| Mean | 5.81 | 27.33 | 64.77 | 2.56 | - |
| Max | 90 | 85 | 95 | 30 | - |

Table 5b. Summary of aquatic macrophyte classification from L-Lake sampling during period two (September 2018).

| Site Code | Emergent (%) | Floating (%) | Submerged (%) | Open Water (%) | Dominant Class |
|-------------|--------------|--------------|---------------|----------------|----------------|
| Site 2-1 | 0 | 40 | 40 | 20 | Floating |
| Site 2-2 | 0 | 40 | 40 | 20 | Floating |
| Site 2-3 | 0 | 40 | 40 | 20 | Floating |
| Site 2-4 | 0 | 45 | 45 | 10 | Floating |
| Site 2-5 | 0 | 45 | 45 | 10 | Submerged |
| Site 2-6 | 0 | 35 | 55 | 10 | Submerged |
| Site 2-7 | 5 | 5 | 50 | 40 | Submerged |
| Site 2-8 | 0 | 20 | 50 | 30 | Submerged |
| Site 2-9 | 5 | 5 | 50 | 40 | Submerged |
| Site 2-10 | 5 | 20 | 50 | 25 | Submerged |
| Site 2-11 | 10 | 10 | 50 | 30 | Submerged |
| Site 2-12 | 5 | 0 | 50 | 45 | Submerged |
| Site 2-13 | 5 | 10 | 50 | 35 | Submerged |
| Site 2-14 | 5 | 5 | 40 | 50 | Open Water |
| Site 2-15 | 0 | 15 | 50 | 35 | Submerged |
| Site 2-16 | 0 | 5 | 70 | 25 | Submerged |
| Site 2-17 | 5 | 5 | 60 | 30 | Submerged |
| Site 2-18 | 0 | 5 | 80 | 15 | Submerged |
| Site 2-19 | 10 | 30 | 50 | 10 | Submerged |
| Site 2-20 | 5 | 15 | 60 | 20 | Submerged |
| Site 2-21 | 5 | 20 | 70 | 5 | Submerged |
| Site 2-22 | 10 | 5 | 75 | 10 | Submerged |
| Site 2-23 | 20 | 10 | 65 | 5 | Submerged |
| Site 2-24 | 25 | 25 | 45 | 5 | Submerged |
| Site 2-25 | 0 | 5 | 85 | 10 | Submerged |
| Site 2-26 | 0 | 50 | 50 | 0 | Submerged |
| Site 2-27 | 0 | 30 | 50 | 20 | Submerged |
| Site 2-28 | 5 | 5 | 70 | 20 | Submerged |
| Site 2-29 | 20 | 30 | 50 | 0 | Submerged |
| Site 2-30 | 5 | 5 | 60 | 30 | Submerged |
| Site 2-31 | 5 | 10 | 80 | 5 | Submerged |
| Site 2-32 | 0 | 25 | 60 | 15 | Submerged |
| Site 2-33 | 5 | 45 | 45 | 5 | Submerged |
| Site 2-34 | 5 | 5 | 40 | 50 | Open Water |
| Site 2-35 | 5 | 20 | 65 | 10 | Submerged |
| Site 2-36 | 5 | 5 | 50 | 40 | Submerged |
| Site 2-37 | 5 | 5 | 40 | 50 | Open Water |
| Site 2-38 | 5 | 10 | 50 | 35 | Submerged |
| Site 2-39 | 0 | 5 | 40 | 55 | Open Water |
| Site 2-40 | 5 | 5 | 40 | 50 | Open Water |
| Site 2-41 | 5 | 20 | 40 | 35 | Submerged |
| Site 2-42 | 5 | 5 | 50 | 40 | Submerged |
| Site 2-43 | 5 | 15 | 50 | 30 | Submerged |
| Min | 0 | 0 | 40 | 0 | - |
| Mean | 4.77 | 17.56 | 53.37 | 24.30 | - |
| Max | 25 | 50 | 85 | 55 | - |

Table 6a. Summary of aquatic macrophyte genera from L-Lake during period one (August 2018).

| Site Code | <i>Nymphaea</i> sp. | <i>Brasenia</i> sp. | <i>Utricularia</i> sp. | <i>Chara</i> spp.. | <i>Ceratophyllum</i> sp. | <i>Typha</i> sp. | <i>Potamogeton</i> sp. | <i>Niad</i> sp. | <i>Sparcanium</i> sp. | <i>Elodea</i> sp. | <i>Myriophyllum</i> sp. | <i>Nuphar</i> sp. | <i>Pontederia</i> sp. | Dominant Vegetation |
|--------------|---------------------|---------------------|------------------------|--------------------|--------------------------|------------------|------------------------|-----------------|-----------------------|-------------------|-------------------------|-------------------|-----------------------|------------------------|
| Site 1-1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Brasenia</i> sp. |
| Site 1-2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Nymphaea</i> sp. |
| Site 1-3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Brasenia</i> sp. |
| Site 1-4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Brasenia</i> sp. |
| Site 1-5 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Brasenia</i> sp. |
| Site 1-6 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Brasenia</i> sp. |
| Site 1-7 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | <i>Brasenia</i> sp. |
| Site 1-8 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | <i>Brasenia</i> sp. |
| Site 1-9 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Utricularia</i> sp. |
| Site 1-10 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Utricularia</i> sp. |
| Site 1-11 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Utricularia</i> sp. |
| Site 1-12 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | <i>Brasenia</i> sp. |
| Site 1-13 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Nymphaea</i> sp. |
| Site 1-14 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Nymphaea</i> sp. |
| Site 1-15 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Nymphaea</i> sp. |
| Site 1-16 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | <i>Utricularia</i> sp. |
| Site 1-17 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | <i>Nymphaea</i> sp. |
| Site 1-18 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Utricularia</i> sp. |
| Site 1-19 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-20 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Utricularia</i> sp. |
| Site 1-21 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Utricularia</i> sp. |
| Site 1-22 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Utricularia</i> sp. |
| Site 1-23 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | <i>Utricularia</i> sp. |
| Site 1-24 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-25 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-26 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-27 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-28 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-29 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-30 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-31 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-32 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | <i>Chara</i> spp.. |
| Site 1-33 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-34 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-35 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-36 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-37 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | <i>Nymphaea</i> sp. |
| Site 1-38 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-39 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-40 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-41 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | <i>Chara</i> spp.. |
| Site 1-42 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Site 1-43 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | <i>Chara</i> spp.. |
| Total | 39 | 30 | 26 | 25 | 11 | 11 | 8 | 7 | 5 | 4 | 3 | 2 | 1 | - |

Table 6b. Summary of aquatic macrophyte genera from L-Lake sampling during period two (September 2018).

| Site Code | <i>Chara</i> spp. | <i>Brasenia</i> sp. | <i>Utricularia</i> sp. | <i>Nymphaea</i> sp. | <i>Potamogeton</i> sp. | <i>Sparganium</i> sp. | <i>Ceratophyllum</i> sp. | <i>Typha</i> sp. | <i>Nuphar</i> sp. | <i>Sagittaria</i> sp. | <i>Myriophyllum</i> sp. | <i>Phragmites</i> sp. | Dominant Vegetation |
|--------------|-------------------|---------------------|------------------------|---------------------|------------------------|-----------------------|--------------------------|------------------|-------------------|-----------------------|-------------------------|-----------------------|--------------------------|
| Site 2-1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | <i>Nymphaea</i> sp. |
| Site 2-2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Brasenia</i> sp. |
| Site 2-3 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-4 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Brasenia</i> sp. |
| Site 2-5 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Brasenia</i> sp. |
| Site 2-6 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-7 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-8 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-9 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-10 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-11 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-12 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-13 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-14 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-15 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-16 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-17 | 1 | 1 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-18 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-19 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-20 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | <i>Nymphaea</i> sp. |
| Site 2-21 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-22 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-23 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-24 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | <i>Chara</i> spp. |
| Site 2-25 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | <i>Ceratophyllum</i> sp. |
| Site 2-26 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | <i>Ceratophyllum</i> sp. |
| Site 2-27 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | <i>Ceratophyllum</i> sp. |
| Site 2-28 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-29 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-30 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-31 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-32 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-33 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-34 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-35 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-36 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-37 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-38 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-39 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-40 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | <i>Chara</i> spp. |
| Site 2-41 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | <i>Chara</i> spp. |
| Site 2-42 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | <i>Chara</i> spp. |
| Site 2-43 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | <i>Chara</i> spp. |
| Total | 42 | 30 | 25 | 22 | 21 | 14 | 7 | 6 | 3 | 3 | 2 | 1 | - |

Table 7a. Submerged aquatic vegetation index values (SAV) and dominant taxa for L-Lake sampling sites during period one (August 2018).

| Site Code | Date | Field Number | SAV | Dominant |
|-----------|-----------|-------------------|-----|--------------------------|
| Site 1-1 | 14-Aug-18 | 2018-LCST-140818- | 2 | <i>Brasenia</i> sp. |
| Site 1-2 | 14-Aug-18 | 2018-LCST-140818- | 2 | <i>Utricularia</i> sp. |
| Site 1-3 | 14-Aug-18 | 2018-LCST-140818- | 2 | <i>Utricularia</i> sp. |
| Site 1-4 | 14-Aug-18 | 2018-LCST-140818- | 2 | <i>Utricularia</i> sp. |
| Site 1-5 | 14-Aug-18 | 2018-LCST-140818- | 2 | <i>Utricularia</i> sp. |
| Site 1-6 | 14-Aug-18 | 2018-LCST-140818- | 2 | <i>Utricularia</i> sp. |
| Site 1-7 | 14-Aug-18 | 2018-LCST-140818- | 2 | <i>Utricularia</i> sp. |
| Site 1-8 | 15-Aug-18 | 2018-LCST-150818- | 2 | <i>Utricularia</i> sp. |
| Site 1-9 | 15-Aug-18 | 2018-LCST-150818- | 2 | <i>Utricularia</i> sp. |
| Site 1-10 | 15-Aug-18 | 2018-LCST-150818- | 1 | <i>Utricularia</i> sp. |
| Site 1-11 | 15-Aug-18 | 2018-LCST-150818- | 1 | <i>Utricularia</i> sp. |
| Site 1-12 | 15-Aug-18 | 2018-LCST-150818- | 1 | <i>Utricularia</i> sp. |
| Site 1-13 | 15-Aug-18 | 2018-LCST-150818- | 3 | Pondweed |
| Site 1-14 | 15-Aug-18 | 2018-LCST-150818- | 1 | <i>Utricularia</i> sp. |
| Site 1-15 | 15-Aug-18 | 2018-LCST-150818- | 2 | Pondweed |
| Site 1-16 | 16-Aug-18 | 2018-LCST-160818- | 1 | <i>Utricularia</i> sp. |
| Site 1-17 | 16-Aug-18 | 2018-LCST-160818- | 1 | <i>Utricularia</i> sp. |
| Site 1-18 | 16-Aug-18 | 2018-LCST-160818- | 2 | <i>Utricularia</i> sp. |
| Site 1-19 | 16-Aug-18 | 2018-LCST-160818- | 3 | <i>Chara</i> spp. |
| Site 1-20 | 21-Aug-18 | 2018-LCST-210818- | 1 | <i>Ceratophyllum</i> sp. |
| Site 1-21 | 21-Aug-18 | 2018-LCST-210818- | 1 | <i>Utricularia</i> sp. |
| Site 1-22 | 21-Aug-18 | 2018-LCST-210818- | 1 | <i>Utricularia</i> sp. |
| Site 1-23 | 21-Aug-18 | 2018-LCST-210818- | 2 | <i>Chara</i> spp. |
| Site 1-24 | 21-Aug-18 | 2018-LCST-210818- | 2 | <i>Chara</i> spp. |
| Site 1-25 | 21-Aug-18 | 2018-LSCT-210818- | 3 | <i>Chara</i> spp. |
| Site 1-26 | 21-Aug-18 | 2018-LSCT-210818- | 2 | <i>Chara</i> spp. |
| Site 1-27 | 21-Aug-18 | 2018-LSCT-210818- | 2 | <i>Chara</i> spp. |
| Site 1-28 | 21-Aug-18 | 2018-LSCT-210818- | 1 | <i>Utricularia</i> sp. |
| Site 1-29 | 21-Aug-18 | 2018-LSCT-210818- | 3 | <i>Chara</i> spp. |
| Site 1-30 | 21-Aug-18 | 2018-LSCT-210818- | 1 | <i>Naiad</i> sp. |
| Site 1-31 | 22-Aug-18 | 2018-LSCT-220818- | 1 | Pondweed |
| Site 1-32 | 22-Aug-18 | 2018-LSCT-220818- | 1 | <i>Utricularia</i> sp. |
| Site 1-33 | 22-Aug-18 | 2018-LSCT-220818- | 1 | <i>Chara</i> spp. |
| Site 1-34 | 22-Aug-18 | 2018-LSCT-220818- | 2 | <i>Chara</i> spp. |
| Site 1-35 | 22-Aug-18 | 2018-LSCT-220818- | 3 | <i>Chara</i> spp. |
| Site 1-36 | 22-Aug-18 | 2018-LSCT-220818- | 2 | <i>Chara</i> spp. |
| Site 1-37 | 22-Aug-18 | 2018-LSCT-220818- | 3 | <i>Ceratophyllum</i> sp. |
| Site 1-38 | 22-Aug-18 | 2018-LSCT-220818- | 1 | <i>Utricularia</i> sp. |
| Site 1-39 | 22-Aug-18 | 2018-LSCT-220818- | 3 | <i>Chara</i> spp. |
| Site 1-40 | 22-Aug-18 | 2018-LSCT-220818- | 3 | <i>Chara</i> spp. |
| Site 1-41 | 22-Aug-18 | 2018-LSCT-220818- | 3 | <i>Utricularia</i> sp. |
| Site 1-42 | 22-Aug-18 | 2018-LSCT-220818- | 3 | <i>Chara</i> spp. |
| Site 1-43 | 22-Aug-18 | 2018-LSCT-220818- | 2 | <i>Chara</i> spp. |
| Min | | 1 | - | |
| Mean | | 1.88 | - | |
| Max | | 3 | - | |

Table 7b. Submerged aquatic vegetation (SAV) index values and dominant taxa for L-Lake sampling sites during period two (September 2018).

| Site Code | Date | Field Number | SAV | Dominant |
|------------------|-------------|-----------------------|------------|----------------------|
| Site 2-1 | 10-Sep-18 | 2018-LSCT-100918-001A | 2 | <i>Chara spp.</i> |
| Site 2-2 | 10-Sep-18 | 2018-LCST-100918-002A | 2 | <i>Chara spp.</i> |
| Site 2-3 | 10-Sep-18 | 2018-LCST-100918-003A | 1 | <i>Chara spp.</i> |
| Site 2-4 | 10-Sep-18 | 2018-LCST-100918-004A | 1 | <i>Chara spp.</i> |
| Site 2-5 | 10-Sep-18 | 2018-LCST-100918-005A | 2 | <i>Chara spp.</i> |
| Site 2-6 | 11-Sep-18 | 2018-LCST-110918-001A | 3 | <i>Chara spp.</i> |
| Site 2-7 | 11-Sep-18 | 2018-LCST-110918-002A | 1 | <i>Chara spp.</i> |
| Site 2-8 | 11-Sep-18 | 2018-LCST-110918-003A | 1 | <i>Chara spp.</i> |
| Site 2-9 | 11-Sep-18 | 2018-LCST-110918-004A | 1 | <i>Chara spp.</i> |
| Site 2-10 | 11-Sep-18 | 2018-LCST-110918-005A | 2 | <i>Chara spp.</i> |
| Site 2-11 | 11-Sep-18 | 2018-LCST-110918-006A | 2 | <i>Chara spp.</i> |
| Site 2-12 | 11-Sep-18 | 2018-LCST-110918-007A | 1 | <i>Chara spp.</i> |
| Site 2-13 | 11-Sep-18 | 2018-LCST-110918-008A | 1 | <i>Chara spp.</i> |
| Site 2-14 | 11-Sep-18 | 2018-LCST-110918-009A | 2 | <i>Chara spp.</i> |
| Site 2-15 | 11-Sep-18 | 2018-LCST-110918-010A | 2 | <i>Chara spp.</i> |
| Site 2-16 | 11-Sep-18 | 2018-LCST-110918-011A | 3 | <i>Chara spp.</i> |
| Site 2-17 | 11-Sep-18 | 2018-LCST-110918-012A | 2 | <i>Chara spp.</i> |
| Site 2-18 | 11-Sep-18 | 2018-LCST-110918-013A | 2 | <i>Chara spp.</i> |
| Site 2-19 | 12-Sep-18 | 2018-LCST-120918-001A | 2 | <i>Chara spp.</i> |
| Site 2-20 | 12-Sep-18 | 2018-LCST-120918-002A | 1 | <i>Chara spp.</i> |
| Site 2-21 | 12-Sep-18 | 2018-LCST-120918-003A | 2 | <i>Chara spp.</i> |
| Site 2-22 | 12-Sep-18 | 2018-LCST-120918-004A | 2 | <i>Chara spp.</i> |
| Site 2-23 | 12-Sep-18 | 2018-LCST-120918-005A | 2 | <i>Chara spp.</i> |
| Site 2-24 | 12-Sep-18 | 2018-LCST-120918-006A | 3 | <i>Chara spp.</i> |
| Site 2-25 | 12-Sep-18 | 2018-LCST-120918-007A | 1 | <i>Ceratophyllum</i> |
| Site 2-26 | 12-Sep-18 | 2018-LCST-120918-008A | 3 | <i>Ceratophyllum</i> |
| Site 2-27 | 12-Sep-18 | 2018-LCST-120918-009A | 2 | <i>Chara spp.</i> |
| Site 2-28 | 12-Sep-18 | 2018-LCST-120918-010A | 1 | <i>Chara spp.</i> |
| Site 2-29 | 12-Sep-18 | 2018-LCST-120918-011A | 3 | <i>Chara spp.</i> |
| Site 2-30 | 12-Sep-18 | 2018-LCST-120918-012A | 2 | <i>Chara spp.</i> |
| Site 2-31 | 12-Sep-18 | 2018-LCST-120918-013A | 1 | <i>Chara spp.</i> |
| Site 2-32 | 12-Sep-18 | 2018-LCST-120918-014A | 2 | <i>Chara spp.</i> |
| Site 2-33 | 13-Sep-18 | 2018-LCST-130918-001A | 1 | <i>Chara spp.</i> |
| Site 2-34 | 13-Sep-18 | 2018-LCST-130918-002A | 1 | <i>Chara spp.</i> |
| Site 2-35 | 13-Sep-18 | 2018-LCST-130918-003A | 1 | <i>Chara spp.</i> |
| Site 2-36 | 13-Sep-18 | 2018-LCST-130918-004A | 3 | <i>Chara spp.</i> |
| Site 2-37 | 13-Sep-18 | 2018-LCST-130918-005A | 2 | <i>Chara spp.</i> |
| Site 2-38 | 13-Sep-18 | 2018-LCST-130918-006A | 2 | <i>Chara spp.</i> |
| Site 2-39 | 13-Sep-18 | 2018-LCST-130918-007A | 2 | <i>Chara spp.</i> |
| Site 2-40 | 13-Sep-18 | 2018-LCST-130918-008A | - | <i>Chara spp.</i> |
| Site 2-41 | 13-Sep-18 | 2018-LCST-130918-009A | 2 | <i>Chara spp.</i> |
| Site 2-42 | 13-Sep-18 | 2018-LCST-130918-010A | 1 | <i>Chara spp.</i> |
| Site 2-43 | 13-Sep-18 | 2018-LCST-130918-011A | 2 | <i>Chara spp.</i> |
| Min | | 1 | - | |
| Mean | | 1.77 | - | |
| Max | | 3 | - | |

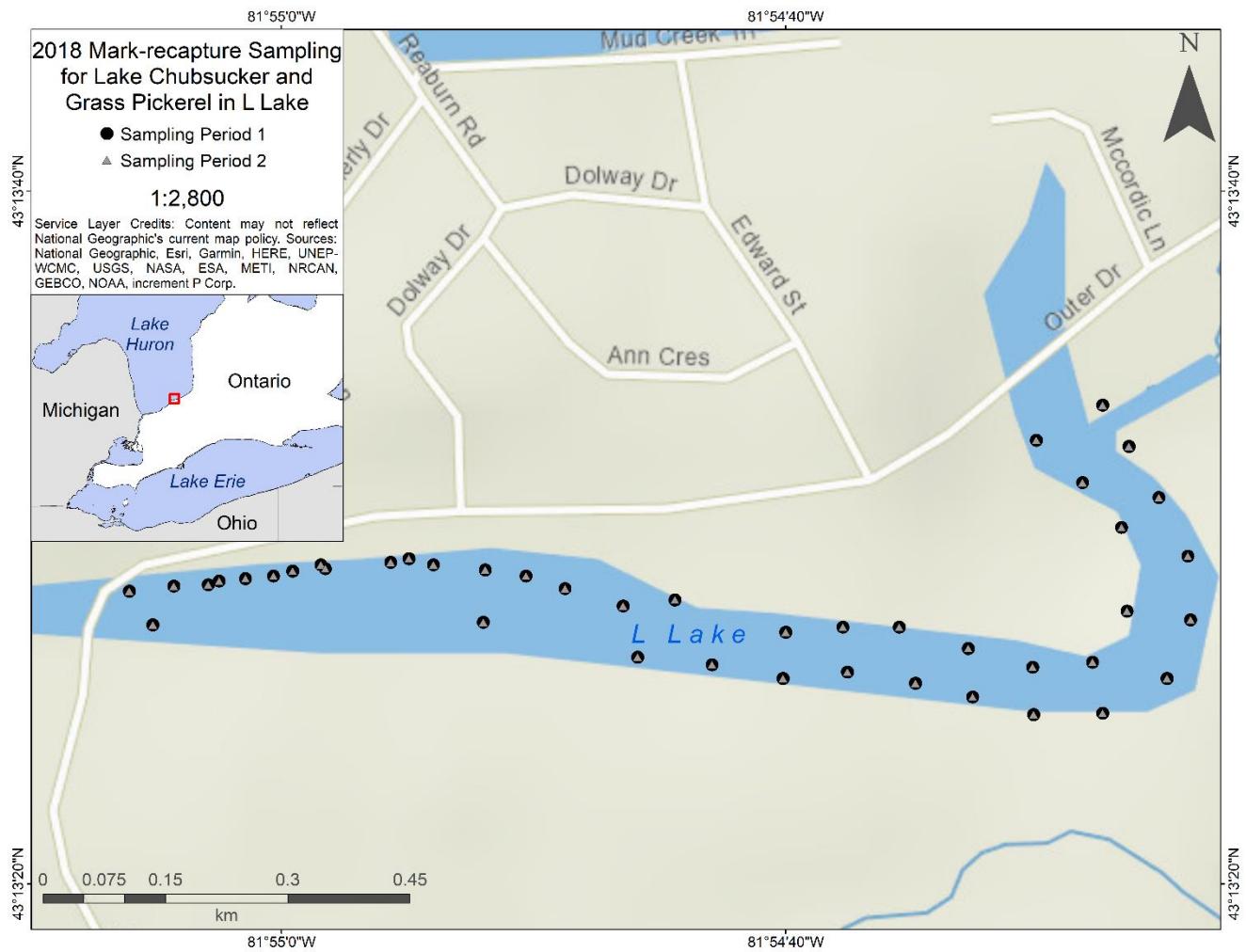


Figure 1. Sites visited for mark-recapture sampling for Lake Chubsucker and Grass Pickerel in L-Lake, August and September 2018.



Figure 2. Depletion seining in L-Lake during period two (September 2018, site code: 2-17).

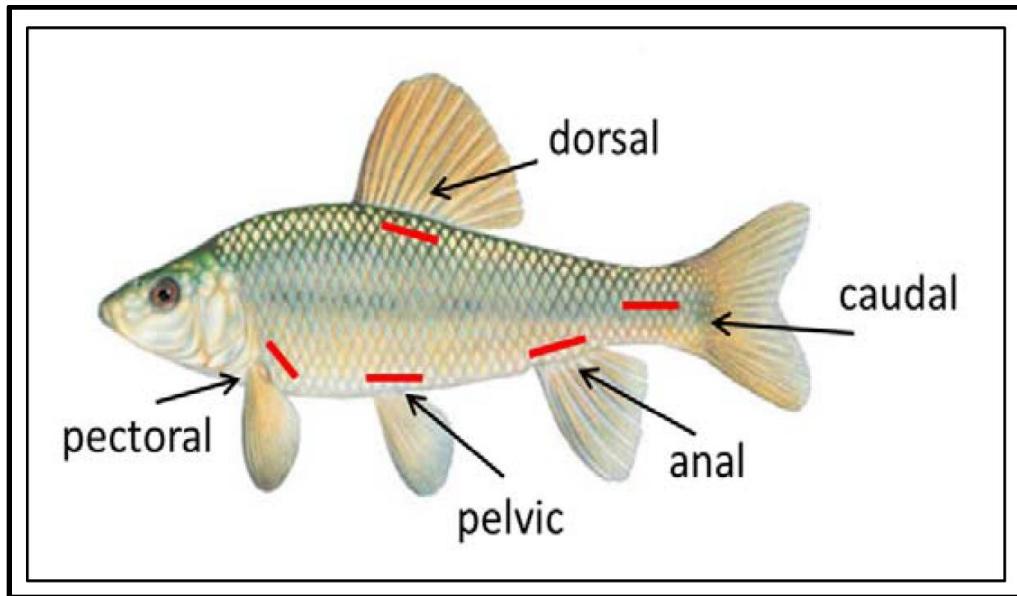


Figure 3a. Visible Implant Elastomer (VIE) tagging locations for Lake Chubsucker and Grass Pickerel in L-Lake, August 2018.



Figure 3b. Example of Visible Implant Elastomer (VIE) tag inserted into the left pectoral tag location on a Lake Chubsucker.



Figure 4. Submerged aquatic vegetation (SAV) sample obtained from L-Lake during period two (September 2018, site code: 2-38).

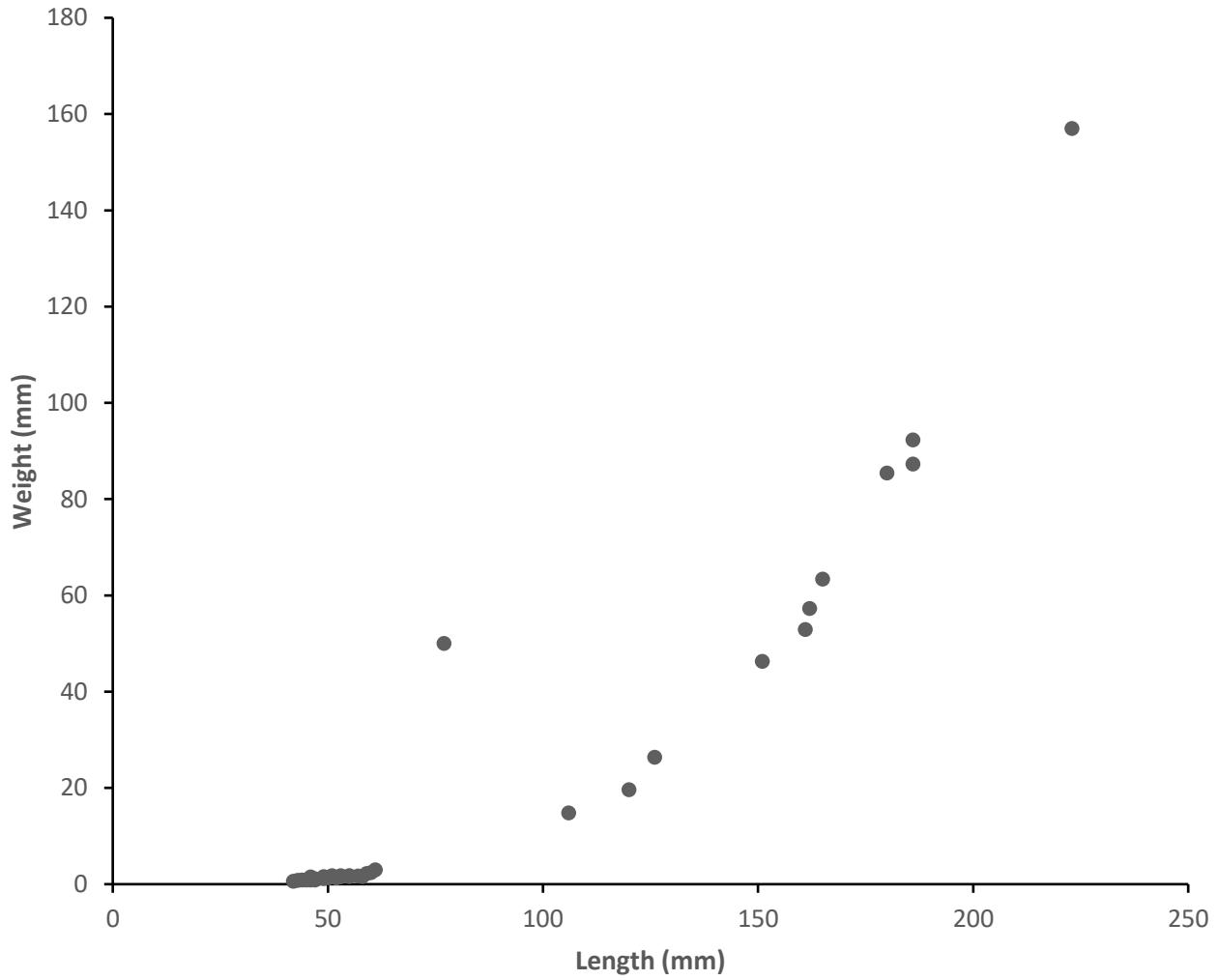


Figure 5a. Total length (mm) and weight (g) of captured Lake Chubsucker from L-Lake during 2018 sampling.

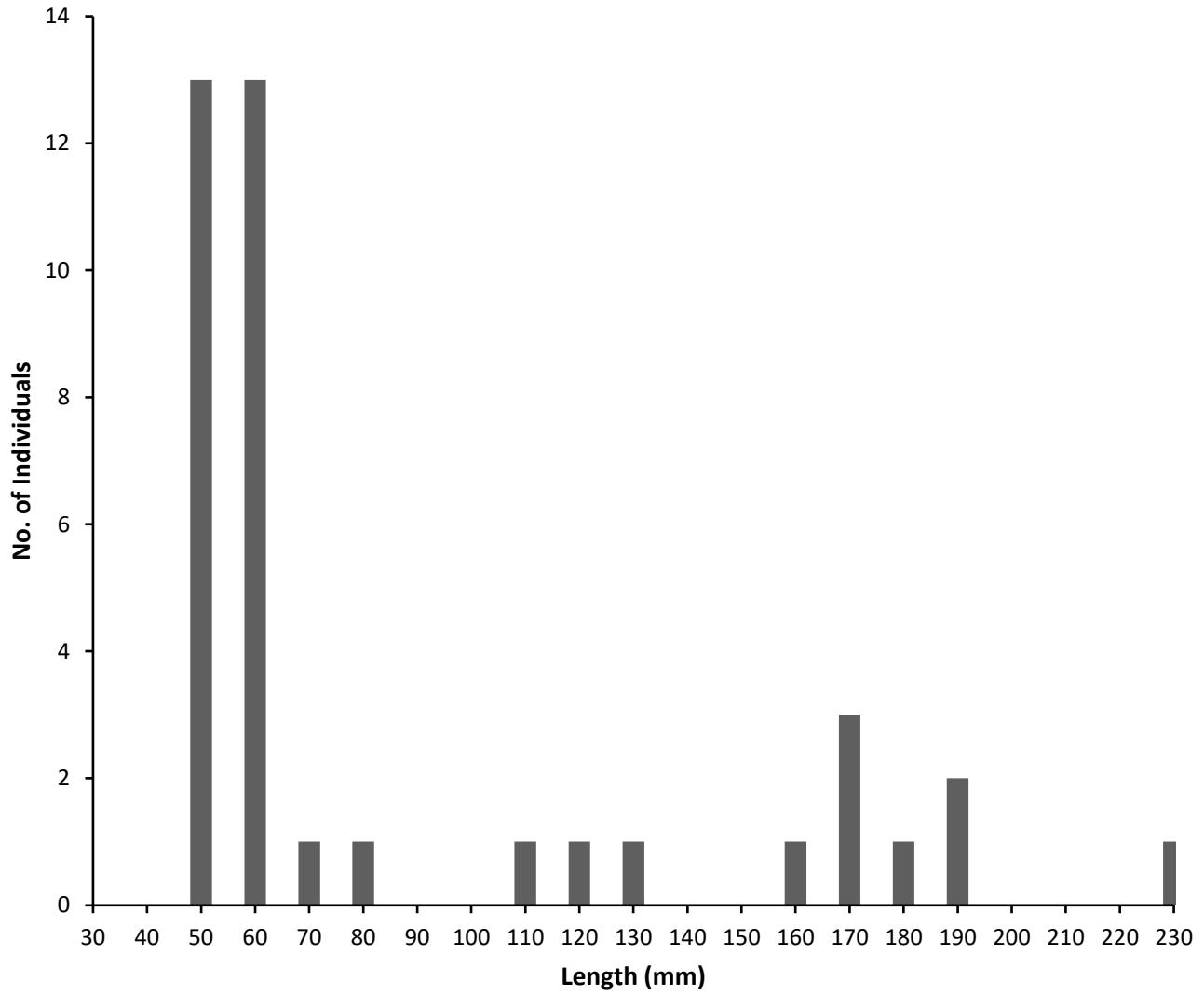


Figure 5b. Length-frequency of captured Lake Chubsucker from L-Lake during 2018 sampling.

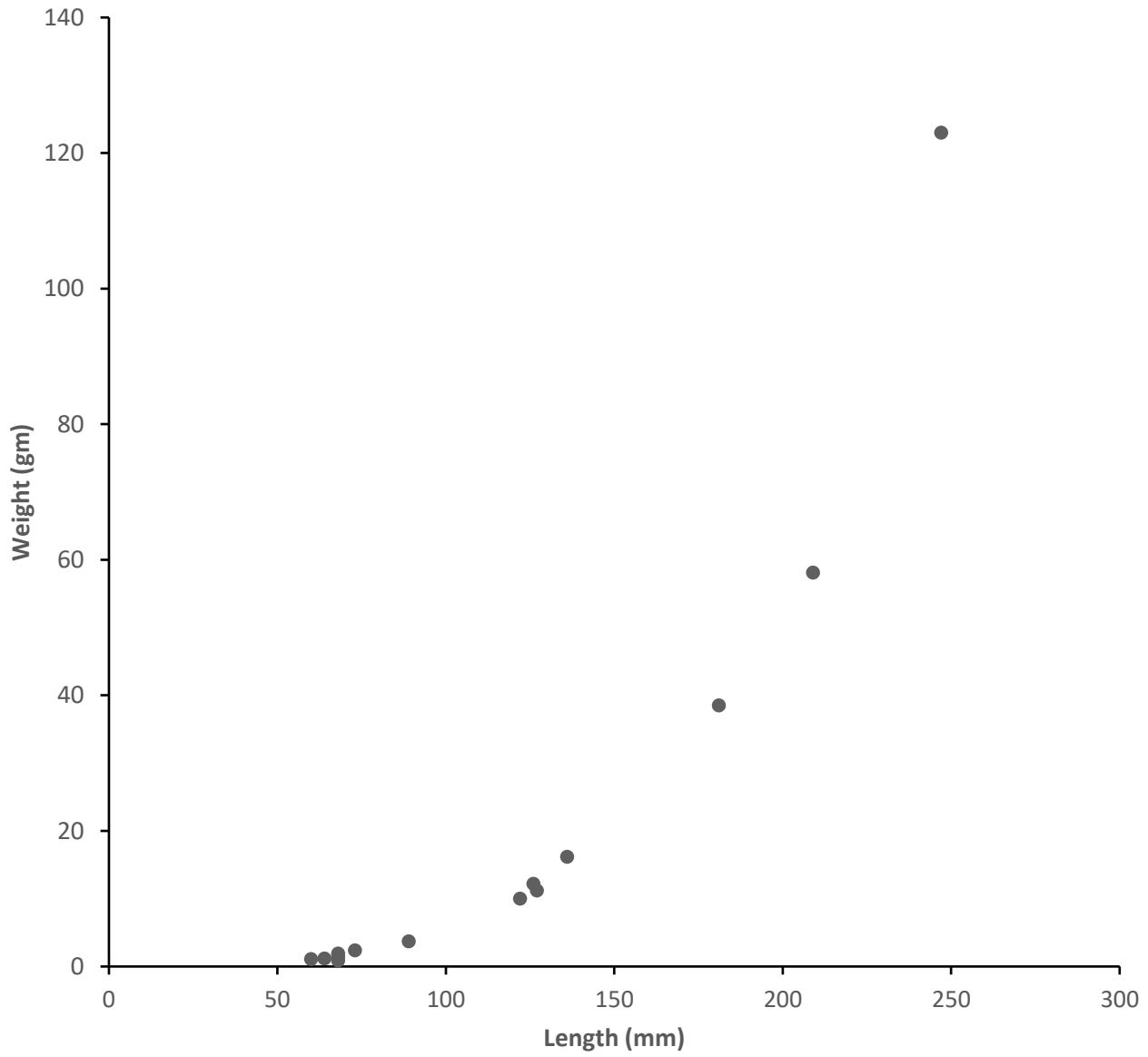


Figure 6a. Total length (mm) and weight (g) of captured Grass Pickerel from L-Lake during 2018 sampling.

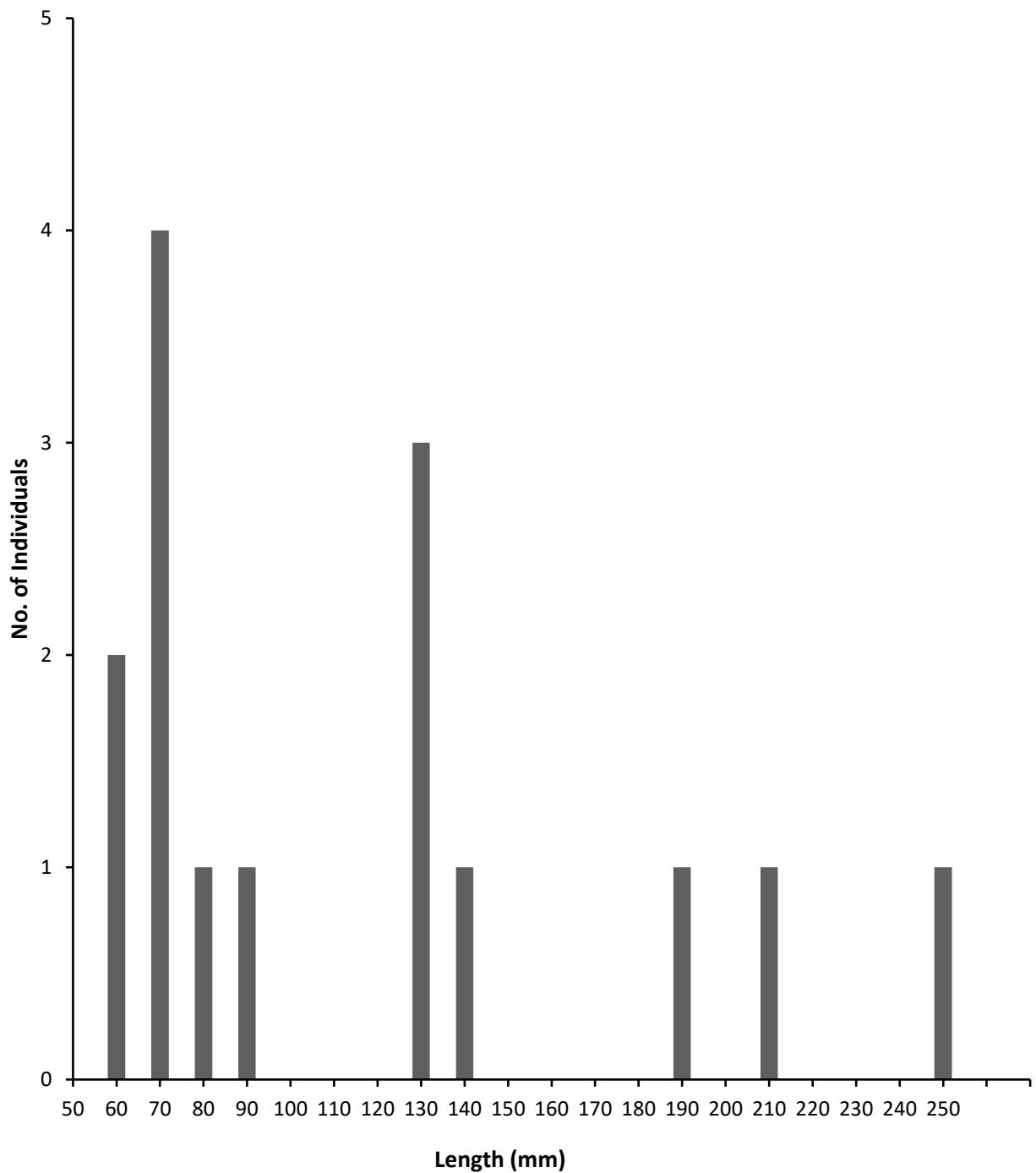


Figure 6b. Length-frequency of captured Grass Pickerel from L-Lake during 2018 sampling.

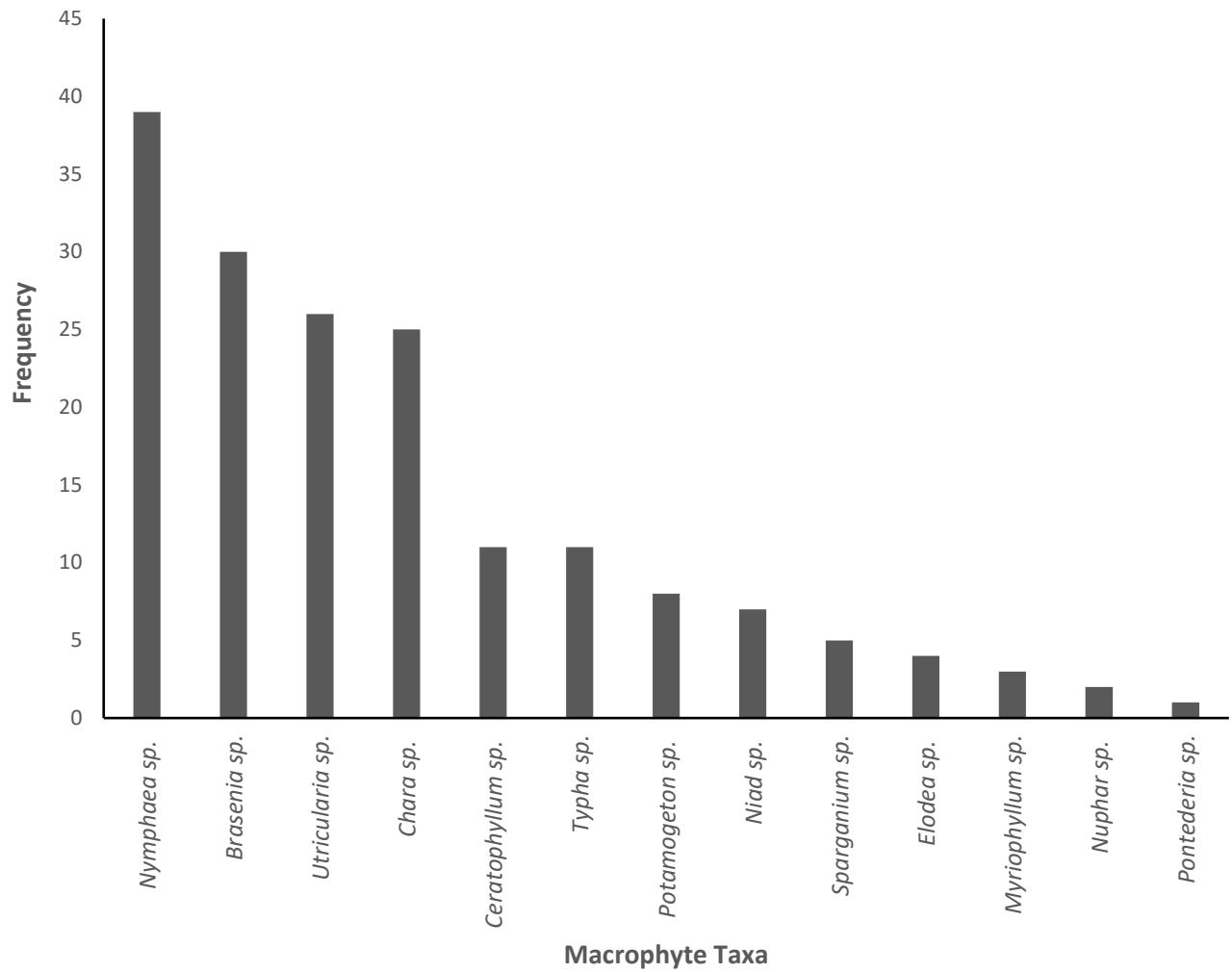


Figure 7a. Frequency of occurrence of aquatic macrophyte genera across all 43 sites in L-Lake during period one (August 2018).

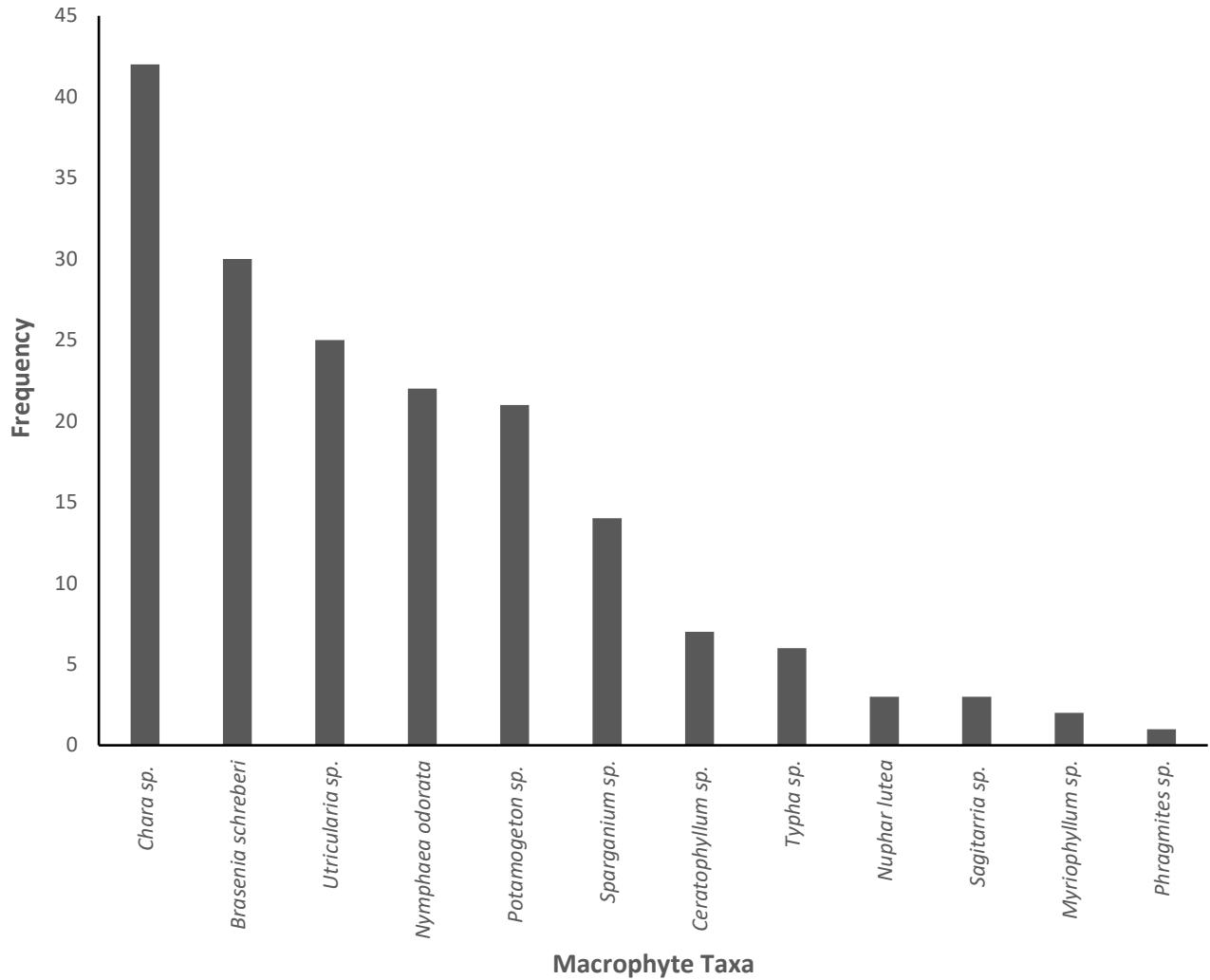


Figure 7b. Frequency of occurrence of aquatic macrophyte genera across all 43 sampling sites in L-Lake during period two (September 2018).