Fish community assessment and inventory of SARA-listed fishes in Point Pelee National Park, Ontario, 2021

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Barnucz, J., Gáspárdy, R.C., Colm, J.E., and Drake, D.A.R. 2024. Fish community assessment and inventory of SARA-listed fishes in Point Pelee National Park, Ontario, 2021. Can. Data Rep. Fish. Aquat. Sci. 1408: vii + 34 p.

Point Pelee National Park (PPNP) contains several fish species listed under the *Species at Risk Act* (Lake Chubsucker [*Erimyzon succetta*]; Grass Pickerel [*Esox americanus vermiculatus*]; Spotted Gar [*Lepisosteus oculatus*]; Warmouth [*Lepomis gulosus*]; Channel Darter [*Percina copelandi*]), but fish community sampling has occurred infrequently. In August 2021, Fisheries and Oceans Canada conducted fish community sampling in Girardin Pond, Lake Pond, and Redhead Pond to evaluate the composition of the fish community. Fyke net sampling in Girardin and Redhead Pond included 24 net sets across 24 sampling locations with total soak time of 495 hours. Bag seine sampling in Lake Pond included seven sampling locations with total effort of 21 seine hauls. Fyke net catches totaled 333 fishes representing 14 species with Warmouth (n=107), Pumpkinseed (*Lepomis gibbosus*; n=82), young of year *Lepomis* sp. (n=56), Bluegill (*Lepomis macrochirus*, n=52), and Golden Shiner (*Notemigonus crysoleucas,* n=13) being the most abundant species. Bag seine catches totaled 413 fishes representing 14 species with young of year *Lepomis* sp. (n=107), Yellow Perch (*Perca flavescens*, n=91), Tubenose Goby (*Proterorhinus semilunaris*, n=84), Bluegill (n=45) and Largemouth Bass (*Micropterus salmoides*, n=24) being the most abundant species. Altogether, a total of 109 Warmouth, one Spotted Gar, two Grass Pickerel, and two Lake Chubsucker were captured.

RÉSUMÉ

Barnucz, J., Gáspárdy, R.C., Colm, J.E., and Drake, D.A.R. 2024. Fish community assessment and inventory of SARA-listed fishes in Point Pelee National Park, Ontario, 2021. Can. Data Rep. Fish. Aquat. Sci. 1408: vii + 34 p.

Le Parc national de la Pointe-Pelée (PNPP) abrite plusieurs espèces inscrites en vertu de la *Loi sur les espèces en péril* (sucet de lac [*Erimyzon succetta*]; brochet vermiculé [*Esox americanus vermiculatus*]; lépisosté tacheté [*Lepisosteus oculatus*]; crapet sac-à-lait [Lepomis gulosus)]; et fouille-roche gris [*Percina copelandi*]), mais l'échantillonnage de la communauté de poissons n'a pas été réalisé de manière fréquente. En août 2021, Pêches et Océans Canada a effectué un échantillonnage de la communauté de poissons dans les étangs Girardin, Lake et Redhead afin d'évaluer la composition de la communauté de poissons. L'échantillonnage au verveux dans les étangs Girardin et Redhead comprenait 24 traits de filet dans 24 lieux d'échantillonnage, avec un temps d'immersion total de 495 heures. L'échantillonnage à la senne avec poche dans l'étang Lake comprenait sept sites d'échantillonnage avec un effort total de 21 traits de senne. Les prises au verveux ont totalisé 333 poissons représentant 14 espèces, les espèces les plus abondantes étant le crapet sac-à-lait (n=107), le crapet soleil (*Lepomis gibbosus;* n=82), des jeunes de l'année des espèces du genre *Lepomis* (n=56), le crapet arlequin (*Lepomis macrochirus*, n=52), et le méné jaune (*Notemigonus crysoleucas,* n=13). Les prises à la senne ont totalisé 413 poissons représentant 14 espèces, les espèces les plus abondantes étant des jeunes de l'année des espèces du genre *Lepomis* (n=107), la perche jaune (*Perca flavescens*, n=91), le gobie à nez tubulaire (*Proterorhinus semilunaris*, n=84), le crapet arlequin (n=45) et l'achigan à grande bouche (*Micropterus salmoides*, n=24). Au total, 109 crapets sac-à-lait, un lépisosté tacheté, deux brochets vermiculés et deux sucets de lac ont été capturés.

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* of 2002 (SARA). To inform scientific aspects of the recovery process, DFO regularly conducts field sampling to satisfy several 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 the sampling of SARA-listed fishes and their habitat.

Point Pelee National Park (PPNP) contains several fish species listed under the *Species at Risk Act* (Lake Chubsucker [*Erimyzon succetta*]; Grass Pickerel [*Esox americanus vermiculatus*]; Spotted Gar [*Lepisosteus oculatus*]; Warmouth [*Lepomis gulosus*]; Channel Darter [*Percina copelandi*]), but the fish community has been sampled infrequently and without standardized effort over the past several decades. To address this issue, DFO conducted a fish community survey of PPNP in the open waters of Lake Pond, East Cranberry Pond, and West Cranberry Pond in 2019 (Barnucz et al. 2021). In 2021, DFO conducted additional fish community sampling in PPNP within the open waters of Girardin Pond, Redhead Pond, and Lake Pond to further evaluate the composition of the fish community and distribution of SARA-listed species. Although the primary objective of the 2021 sampling was to understand the composition and spatial distribution of the fish community with an emphasis on SARA-listed fishes within focal ponds (Girardin, Redhead, and Lake ponds), the data collected from this work will also help support the development of monitoring protocols for wetland fishes. This data report summarizes findings from the 2021 sampling efforts.

METHODS

FISH COMMUNITY SAMPLING

Fyke Net Sampling

Fyke net sampling in Girardin Pond occurred August 9th through 11th and in Redhead Pond on August 17th and 18th (Table 1a). A total of 12 fyke nets were set in 12 unique site locations (hereafter, ‘sites’) in both Girardin Pond and Redhead Pond (Table 1a, Table 1b, Figure 1). In both Girardin Pond and Redhead Pond, areas that could be effectively fished with fyke nets (water depths < 2 m near the shoreline) were first identified, and then sites were systematically placed around the perimeter of both ponds to provide suitable coverage of the perimeter given the time available for sampling (Figure 1).

Fyke nets had a 0.6 m x 1.2 m box opening followed by 0.6 m diameter hoops attached to a 7.6 m x 0.6 m lead (Figure 2). The entire net was constructed of 3 mm (1/8”) mesh, but nets were equipped with a large-mesh (~5 cm) protective screen over the opening of the box to deter turtles from entering the net. Each fyke net had a zipper installed on the top of the box to allow for the easy removal of large fishes and incidental turtle captures, and also allowed for a large float to be inserted to ensure that captured turtles could reach the water’s surface (Larocque et al. 2012). A second zipper was utilized in the funnel of the fyke net to add a second float to enhance turtle recovery and allow for easier removal of turtles from the fyke nets.

The lead and cod of each fyke net were secured using steel rebar. During net deployment, efforts were made to secure the lead to the shore or patches of dense

macrophytes, which encouraged fishes to enter the net (Figure 3). At some sampling sites, water depth (i.e., >1.5 m) and substrate conditions (e.g. too soft) did not allow for full deployment of the net lead and lead length was shortened to properly secure the net. The lead length of each fyke net was recorded at each site. Fyke net wings were not deployed for any sets because water depths at the majority of sites did not allow for effective wing deployment. In Girardin Pond, 1.8 m rebar was used to secure the lead and cod end of all fyke-nets but was subsequently increased to 2.4 m rebar in Redhead Pond to improve net stability. Fyke sampling effort was measured as net soak time in hours. Fyke nets typically fished for a period of approximately 18 to 23 hours depending on travel time and site access to each sampling location. Fyke net catches were emptied into bins with water for processing.

Seine Net Sampling

Seven sites were sampled with a seine net along the east shore of Lake Pond (Table 1c, Figure 1). These sampling locations were fished on August 4th, 16th, and 17th, 2021 (Table 1c). Due to high water levels in Lake Pond, seining sites were selected as areas with water depth < 1.5 m and predominantly sandy substrate; these site attributes allowed staff to effectively pull seine nets while wading. Seining sites were located between the Lake Erie breach and the southeast corner of Lake Pond (Figure 1).

Fishes were sampled with a bag seine, which was 9 m long x 1.8 m tall with a 1.8 m x 1.8 m x 1.8 m bag. The entire seine net was constructed of 3 mm heavy delta mesh. The field crew sampled each site by slowly pulling the seine through the sampling site. Sampling effort was measured as the number of seine hauls per sampling location. Three consecutive seine hauls repeated over the same approximate area were completed at each site and covered approximately 100 m^2 total. Upon completion, the bag seine was retrieved and captured fishes were removed and placed into bins with fresh water aboard the sampling vessel. Fishes were processed per haul, rather than the aggregate catch per site.

Sample Processing and Identification

Fishes captured in each fyke net or seine haul were identified to species level (where possible), enumerated, and the minimum and maximum total length (TL; mm) of each species was recorded. In addition, individual total lengths (mm) and weights (g) were taken of each captured SARA-listed species. At least one representative specimen of each species at each fyke and seine site was retained as a voucher, either by digital photograph or as a physical voucher. Priority was given to using photo vouchers as a condition of the Parks Canada sampling permits. When required, physical vouchers were preserved in 10% buffered Formalin and species identification was confirmed in the laboratory. All photo and physical vouchers were identified based on Holm et al. (2019a,b) and Holm and Burridge (2019). Because Warmouth and Spotted Gar were tagged in 2019 (Barnucz et al. 2021), these species were evaluated for the presence of PIT tags in 2021 using a Biomark^{TM} 610 pit tag reader. Attention was also given to the occurrence of turtle species in fyke net sets as a sampling permit condition. Turtles captured during fyke net sampling were identified to species and recorded.

HABITAT SAMPLING

For fyke sampling locations, habitat measurements were collected immediately following net deployment. For seining sites, habitat measurements were collected immediately after seining. Three depth measurements (m) were taken at representative depths within the sampling site using a meter stick. Surface water temperature (°C), conductivity (µS), turbidity (NTU), and dissolved oxygen (mg/L) were measured near the centre of the site using a YSI® EXO2 multiparameter sonde. Additional turbidity measurements (m) were collected using a 120

cm Fieldmaster® turbidity tube. Air temperature (°C) was measured using a Kestrel® 3000 pocket wind meter. Site location (latitude, longitude) was determined using a Garmin® Montana 600 handheld GPS unit. The proportion of the site covered by aquatic macrophyte classes (submerged, emergent, floating, and open water) was assessed visually to a total of 100% and the dominant class was recorded. In addition, all macrophytes observed at each site were identified to the lowest taxonomic level possible, and the dominant taxonomic group was recorded. Macrophytes were sampled using two different methods. The first method was a visual assessment of all macrophytes by the field crew. All species observed within the sampling area were identified, to the lowest taxonomic unit (e.g. species) and noted on the field sheet. The second method was using a long handled garden rake to help further identify submerged aquatic vegetation (SAV) species and the SAV density. This rake method was similar to Wagner and Mikulyuk (2012).

SAMPLING PERMITS AND DATA ARCHIVING

Sampling for this project was conducted under Parks Canada Species at Risk Act Authorization Permit PPNP-2019-32658 and Parks Canada Research and Collection Permit Number PP-2019-32658. Fyke netting and seining were conducted under Animal Use Standard Operating Protocol GWACC-115 and GWACC-116, 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 “2021-PPNP” 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

EFFORT AND FISH COMMUNITY SAMPLING

Fyke Net Sampling – Girardin Pond

Sampling effort in Girardin Pond ranged from 18.35 to 23.23 hours (mean: 20.69 hours) (Table 2). A total of 104 fishes representing 12 species were captured. Based on pooled catch data, the most abundant species were Warmouth (n=45), Pumpkinseed (*Lepomis gibbosus*) (n=20), young of year *Lepomis* sp. (n=18), Bluegill (n=7) and Bowfin (*Amia calva*; n=3) (Table 4; Figure 4, Appendix 1). No invasive fish species were captured.

Three SARA-listed fish species were captured in Girardin Pond including Warmouth, Lake Chubsucker, and Spotted Gar (Figure 1). A single Lake Chubsucker was captured (Site 9; 32 mm TL) (Table 5a) but was too small to be weighed accurately. A single Spotted Gar was also captured (Site 12; 432 mm TL, 270 g) (Figure 1, Table 5c, Figure 7a). Forty-five Warmouth were captured, representing occurrence at ten of twelve sites (Figure 1, Table 4). Warmouth ranged from 19 – 143 mm TL (mean: 53 mm TL; n = 45) and from 5.2 – 54.1 g (mean 16.5 g; n = 16) (Table 5d, Figure 8a, Figure 8b).

Fyke Net Sampling – Redhead Pond

Sampling effort in Redhead Pond ranged from 20.10 hours to 21.02 hours (mean: 20.55 hours) (Table 3). A total of 230 fishes representing 11 species were captured. Based on pooled catch data, the most abundant species in Redhead Pond were Warmouth (n=62), Pumpkinseed (n=62), Bluegill (*Lepomis macrochirus*) (n=45), young of year *Lepomis* sp. (n=38), and Golden

Shiner (*Notemigonus crysoleucas*; n=11) (Table 4, Figure 5, Appendix 1). No invasive fish species were captured.

Three SARA-listed fish species were captured in Redhead Pond, including Grass Pickerel, Warmouth and Lake Chubsucker (Figure 1). One Lake Chubsucker was captured (Site 24, 44 mm TL, 0.8 g) (Figure 5, Figure 7b, Table 5a), along with two Grass Pickerel (138 and 139 mm TL; 12.3 and 13.6 g, respectively) (Figure 1, Figure 7c, Table 5b). Sixty-two Warmouth were captured, representing occurrence at 11 of 12 sites (Table 5e, Figure 7d). Warmouth ranged from 15 – 175 mm TL (mean: 65 mm TL) and from 0.20 – 123.10 g (mean 13.53 g) (Table 5e, Figure 8a, Figure 8b).

Seine Net Sampling – Lake Pond

Seven sampling locations were surveyed along the east shore of Lake Pond, resulting in a total of 21 seine hauls. A total of 413 fishes representing 14 species were captured. Based on pooled catch data, the most abundant species were young of year *Lepomis* sp. (n=107), Yellow Perch (n=91), Tubenose Goby (*Proterorhinus semilunaris*) (n=84), Bluegill (n=45) and Largemouth Bass (*Micropterus salmoides*; n=24) (Table 4, Figure 6, Appendix 1). Invasive Tubenose Goby (n=84) was captured at six of seven seining sites in Lake Pond and ranged from 31 – 58 mm TL (Table 6, Figure 7e). Invasive Round Goby (n=4) was captured at one site in Lake Pond and ranged from 40 – 63 mm TL (Table 6).

Warmouth was the only SARA-listed fish species captured at seining sites in Lake Pond. Two Warmouth specimens were captured at two sites (Sites 26, 29) (Figure 1, Table 5f). The two Warmouth specimens were 20 mm and 81 mm TL (Table 5f, Figure 8a, Figure 8b). Only one specimen of the two specimens captured were weighed.

None of the captured Warmouth or Spotted Gar in any of the study ponds indicated the presence of a PIT tag.

HABITAT SAMPLING

Aquatic Habitat Assessment – Girardin Pond

Habitat sampling was completed at all 12 sites in Girardin Pond. Water temperature ranged from 20.49 – 28.50 °C (mean: 24.13 °C) (Table 7a). Conductivity ranged from 233.6 – 308.2 µS (mean: 255.7 µS) (Table 7a). Dissolved oxygen ranged from 0.33 – 13.82 mg/L (mean: 5.67 mg/L) (Table 7a). The pH ranged from 7.10 – 8.69 (mean: 7.71) (Table 7a). Turbidity tube ranged from 0.63 – 1.25 m (mean: 1.13 m) (Table 7a). Turbidity ranged from 0.82 – 10.66 NTU (mean: 5.04 NTU) (Table 7a). The mean site depth ranged from 0.78 – 1.45 m with a grand mean of 1.14 m (Table 7a). Air temperature ranged from 24.9 – 33.2 °C (mean: 28.0 °C) (Table 7a).

At the 12 sites sampled in Girardin Pond, the emergent macrophyte cover ranged from 0 – 20% (mean: 7%); floating cover ranged from 5 – 45% (mean: 20%); submerged cover ranged from 45 – 90% (mean: 71%); and open water ranged from 0 – 10% (mean: 2%) (Table 8a). The most common dominant macrophyte class observed across all sites was submerged (12 sites) (Table 8a). The most common aquatic macrophyte genera observed in Girardin Pond were *Ceratophyllum* sp. (12 sites), *Brasenia* sp. (10 sites), *Heteranthera* sp. (10 sites), *Elodea* sp. (8 sites) and *Nuphar* sp. (8 sites) (Table 9, Figure 9). All macrophyte data is summarized in Appendix 2.

Aquatic Habitat Assessment – Redhead Pond

Habitat sampling was completed at all 12 sites in Redhead Pond. Water temperature ranged from 22.70 – 26.40 °C (mean: 24.31 °C) (Table 7b). Conductivity ranged from 270.0 – 335.8 µS (mean: 305.0 µS) (Table 7b). Dissolved oxygen ranged from 2.25 – 10.04 mg/L (mean: 5.44 mg/L) (Table 7b). The pH ranged from 7.53 – 8.53 (mean: 7.86) (Table 7b). Turbidity tube ranged from 0.88 – 1.25 m (mean: 1.1 m) (Table 7b). Turbidity ranged from 0.71 – 5.55 NTU (mean: 2.72 NTU) (Table 7b). The mean depth ranged from 0.57 – 1.55 m with a grand mean of 1.18 m (Table 7b). Air temperature ranged from 22.8 – 31.1 °C (mean: 26.2 °C)(Table 7b).

At the 12 sites sampled in Redhead Pond, the emergent cover ranged from 0 – 15% (mean: 4%); floating cover ranged from 20 – 50% (mean: 37%); submerged cover ranged from 30 – 80% (mean: 51%); and open water ranged from 0 – 35% (mean: 8%) (Table 8b). The most common dominant macrophyte class observed across all sites was submerged (9 sites) (Table 8b). The most common aquatic macrophyte genera observed in Redhead Pond were *Nuphar* sp. (12 sites), *Elodea* sp. (11 sites), *Ceratophyllum* sp. (10 sites), *Myriophyllum* sp. (10 sites) and *Utricularia* sp. (10 sites) (Table 9, Figure 9). All macrophyte data is summarized in Appendix 2.

Aquatic Habitat Assessment – Lake Pond

Habitat sampling was competed at all 7 sites in Lake Pond. Water temperature ranged from 22.24 – 26.10 °C (mean: 23.29 °C) (Table 7c). Conductivity ranged from 244.4 – 278.9 µS (mean: 254.3 µS) (Table 7c). Dissolved oxygen ranged from 5.75 – 12.58 mg/L (mean: 7.51 mg/L) (Table 7c). The pH ranged from 7.96 – 9.31 (mean: 8.46) (Table 7c). Turbidity tube ranged from 0.84 – 1.25 m (mean: 1.19 m) (Table 7c). Turbidity ranged from 0.84 – 7.86 NTU (mean: 2.66 NTU) (Table 7c). The mean depth ranged from 0.39 – 1.20 m with a grand mean of 0.96 m (Table 7c). Air temperature ranged from 21.7 – 29.9 °C (mean: 24.8 °C) (Table 7c).

At the seven sites sampled in Lake Pond, the emergent macrophyte cover ranged from 0 – 5% (mean: 1%); floating cover ranged from 0 – 10% (mean: 2%); submerged cover ranged from 40 – 90% (mean: 61%); and open water ranged from 10 – 50% (mean: 36%) (Table 8c). The most common dominant macrophyte class observed across all sites was submerged (6 sites) (Table 8c). The most common aquatic macrophyte genera observed in Lake Pond were *Ceratophyllum* sp. (6 sites), *Najas* sp. (6 sites), *Myriophyllum* sp. (5 sites), *Chara* sp. (3 sites) and *Elodea* sp. (3 sites) (Table 9, Figure 9). All macrophyte data is summarized in Appendix 2.

TURTLE DETECTIONS

In 2021, several turtle species were detected during fyke netting. A total of 24 turtles from 3 species were detected across Girardin and Redhead ponds (Table 10; Appendix 3,4). Ten Midland Painted Turtles (*Chrysemys picta marginata*) were captured across three sampling sites in Girardin Pond (Table 10; Appendix 3,4a). Another seven Painted Turtles were captured across four sampling sites in Redhead Pond (Table 10; Appendix 3,4a). One Northern Map Turtle (*Graptemys geographica*) was captured in Redhead Pond (Table 10; Appendix 3,4b). Seven Eastern Musk Turtles (*Sternotherus odoratus*) were captured in Redhead Pond across four sampling sites (Table 10; Appendix 3,4c).

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Table 1. *Sampling locations in Point Pelee National Park ponds in 2021 using fyke nets (MFN) in a) Girardin Pond and b) Redhead Pond and using seine nets (SN) in c) Lake Pond.*

a) Girardin Pond

Site number	Field number	Date	Latitude	Longitude	Gear
1	2021-PPNP-090821-001A	09-Aug-21	41.96159	-82.52062	MFN
2	2021-PPNP-090821-002A	09-Aug-21	41.96063	-82.51884	MFN
3	2021-PPNP-090821-003A	09-Aug-21	41.95973	-82.51792	MFN
4	2021-PPNP-090821-004A	09-Aug-21	41.95892	-82.51645	MFN
5	2021-PPNP-100821-001A	10-Aug-21	41.96005	-82.51972	MFN
6	2021-PPNP-100821-002A	10-Aug-21	41.95968	-82.52087	MFN
7	2021-PPNP-100821-003A	10-Aug-21	41.95711	-82.51953	MFN
8	2021-PPNP-100821-004A	10-Aug-21	41.96066	-82.52066	MFN
9	2021-PPNP-110821-001A	11-Aug-21	41.95690	-82.51768	MFN
10	2021-PPNP-110821-002A	11-Aug-21	41.95745	-82.51620	MFN
11	2021-PPNP-110821-003A	11-Aug-21	41.95837	-82.51522	MFN
12	2021-PPNP-110821-004A	11-Aug-21	41.95812	-82.51359	MFN

b) Redhead Pond

Site number	Field number	Date	Latitude	Longitude	Gear
13	2021-PPNP-170821-001A	17-Aug-21	41.95570	-82.50571	MFN
14	2021-PPNP-170821-002A	17-Aug-21	41.95485	-82.50730	MFN
15	2021-PPNP-170821-003A	17-Aug-21	41.95384	-82.50859	MFN
16	2021-PPNP-170821-004A	17-Aug-21	41.95300	-82.50822	MFN
17	2021-PPNP-170821-005A	17-Aug-21	41.95213	-82.50777	MFN
18	2021-PPNP-170821-006A	17-Aug-21	41.95132	-82.50767	MFN
19	2021-PPNP-180821-001A	18-Aug-21	41.95010	-82.50541	MFN
20	2021-PPNP-180821-002A	18-Aug-21	41.95132	-82.50523	MFN
21	2021-PPNP-180821-003A	18-Aug-21	41.95224	-82.50511	MFN
22	2021-PPNP-180821-004A	18-Aug-21	41.95337	-82.50490	MFN
23	2021-PPNP-180821-005A	18-Aug-21	41.95406	-82.50484	MFN
24	2021-PPNP-180821-006A	18-Aug-21	41.95487	-82.50495	MFN

c) Lake Pond

Site number	Field number	Date	Latitude	Longitude	Gear
25	2021-PPNP-040821-001A	04-Aug-21	41.96493	-82.50450	SN
26	2021-PPNP-160821-001B	16-Aug-21	41.95942	-82.50517	SN
27	2021-PPNP-160821-002B	16-Aug-21	41.95961	-82.50542	SN
28	2021-PPNP-160821-003B	16-Aug-21	41.95953	-82.50574	SN
29	2021-PPNP-170821-001B	17-Aug-21	41.96277	-82.50500	SN
30	2021-PPNP-170821-002B	17-Aug-21	41.96299	-82.50496	SN
31	2021-PPNP-170821-003B	17-Aug-21	41.96339	-82.50496	SN

Table 2. *Sampling effort in Girardin Pond, Point Pelee National Park (2021)*

Site number	Date set	Set time (hh:mm)	Date retrieved	Retrieval time (hh:mm)	Effort (h)	Lead length (m)	Gear
1	09-Aug-21	13:56	10-Aug-21	8:40	18.73	7.6	Fyke Net
2	09-Aug-21	14:23	10-Aug-21	8:53	18.50	7.6	Fyke Net
3	09-Aug-21	14:49	10-Aug-21	9:12	18.38	7.6	Fyke Net
4	09-Aug-21	15:19	10-Aug-21	9:40	18.35	7.6	Fyke Net
5	10-Aug-21	12:01	11-Aug-21	9:10	21.15	1.0	Fyke Net
6	10-Aug-21	12:22	11-Aug-21	9:43	21.35	2.0	Fyke Net
7	10-Aug-21	12:49	11-Aug-21	10:06	21.18	2.0	Fyke Net
8	10-Aug-21	13:27	11-Aug-21	8:44	19.28	2.0	Fyke Net
9	11-Aug-21	11:47	12-Aug-21	10:05	22.30	7.6	Fyke Net
10	11-Aug-21	12:04	12-Aug-21	10:48	22.73	7.6	Fyke Net
11	11-Aug-21	12:20	12-Aug-21	11:24	23.07	7.6	Fyke Net
12	11-Aug-21	12:40	12-Aug-21	11:54	23.23	7.6	Fyke Net
Min	**-**	**-**	**-**	**-**	**18.35**	**1.0**	
Mean	**-**	**-**	**-**	**-**	**20.69**	**5.7**	
Max	**-**	**-**	**-**	**-**	**23.23**	**7.6**	

Table 3*. Sampling effort in Redhead Pond, Point Pelee National Park (2021)*

Site number	Date set	Set time (hh:mm)	Date retrieved	Retrieval time (hh:mm)	Effort (h)	Lead length (m)	Gear
13	17-Aug-21	12:21	18-Aug-21	8:40	20.32	7.6	Fyke Net
14	17-Aug-21	12:46	18-Aug-21	8:52	20.10	7.6	Fyke Net
15	17-Aug-21	13:02	18-Aug-21	9:25	20.38	7.6	Fyke Net
16	17-Aug-21	13:20	18-Aug-21	9:48	20.47	7.6	Fyke Net
17	17-Aug-21	13:46	18-Aug-21	10:12	20.43	7.6	Fyke Net
18	17-Aug-21	14:03	18-Aug-21	10:33	20.50	7.6	Fyke Net
19	18-Aug-21	12:32	19-Aug-21	8:56	20.40	7.6	Fyke Net
20	18-Aug-21	12:47	19-Aug-21	9:23	20.60	7.6	Fyke Net
21	18-Aug-21	13:02	19-Aug-21	9:44	20.70	7.6	Fyke Net
22	18-Aug-21	13:14	19-Aug-21	10:01	20.78	7.6	Fyke Net
23	18-Aug-21	13:27	19-Aug-21	10:23	20.93	7.6	Fyke Net
24	18-Aug-21	13:37	19-Aug-21	10:38	21.02	7.6	Fyke Net
Min	**-**	**-**	**-**	**-**	**20.10**	**7.6**	
Mean	**-**	**-**	**-**	**-**	**20.55**	**7.6**	
Max	**-**	**-**	**-**	**-**	**21.02**	**7.6**	

Table 4. *Total fishes captured in fyke nets (FN) in Girardin and Redhead ponds, and by seine net (SN) in Lake Pond, 2021.*

		FN			SN	
Common name	**Scientific name**	**Girardin Pond**	**Redhead Pond**	**FN Total**	**Lake Pond**	**Total captured**
Rock Bass	*Ambloplites rupestris*	0	0	**0**	4	**4**
Black Bullhead	*Ameiurus melas*	2	1	**3**	2	**5**
Yellow Bullhead	*Ameiurus natalis*	1	1	**2**	1	**3**
Bowfin	*Amia calva*	3	3	**6**	0	**6**
Lake Chubsucker*	*Erimyzon sucetta*	1	1	**2**	0	**2**
Grass Pickerel*	*Esox americanus vermiculatus*	0	2	**2**	0	**2**
Northern Pike	*Esox lucius*	1	0	**1**	0	**1**
Brook Silverside	*Labidesthes sicculus*	0	0	**0**	2	**2**
Spotted Gar*	*Lepisosteus oculatus*	1	0	**1**	0	**1**
Pumpkinseed	*Lepomis gibbosus*	20	62	**82**	12	**94**
Warmouth*	*Lepomis gulosus*	45	62	**107**	2	**109**
Bluegill	*Lepomis macrochirus*	7	45	**52**	45	**97**
Sunfish sp. (YOY)	*Lepomis* sp.	18	38	**56**	107	**163**
Largemouth Bass	*Micropterus salmoides*	0	0	**0**	24	**24**
Round Goby	*Neogobius melanostomus*	0	0	**0**	4	**4**
Golden Shiner	*Notemigonus crysoleucas*	2	11	**13**	2	**15**
Tadpole Madtom	*Noturus gyrinus*	0	1	**1**	10	**11**
Yellow Perch	*Perca flavescens*	0	0	**0**	91	**91**
Black Crappie	*Pomoxis nigromaculatus*	1	3	**4**	23	**27**
Tubenose Goby	*Proterorhinus semilunaris*	0	0	**0**	84	**84**
Central Mudminnow	*Umbra limi*	1	0	**1**	0	**1**
	Total individuals	**103**	**230**	**333**	**413**	**746**
	Number of species	**12**	**11**	**14**	**14**	**20**

*SARA-listed species

Table 5. *Total length (TL; mm) and mass (g) of SARA-listed species: a) Lake Chubsucker, b) Grass Pickerel, c) Spotted Gar, d) Warmouth (Girardin), e) Warmouth (Redhead), and f) Warmouth (Lake Pond). An asterisk (*) indicates that the individual was not weighed.*

a) *Lake Chubsucker (Erimyzon sucetta), n=2*

Site number	Pond name	TL (mm)	Mass (g)
9	Girardin	32	*
24	Redhead	44	0.8
-	**Mean**	**38**	*****

b) *Grass Pickerel (Esox americanus vermiculatus), n=2*

Site number	Pond name	TL (mm)	Mass (g)
14	Redhead	138	12.3
14	Redhead	139	13.6
-	**Mean**	**138.5**	**12.95**

c) *Spotted Gar (Lepisosteus oculatus), n=1*

Site number	Pond name	TL (mm)	Mass (g)
12	Girardin	432	270

d) *Warmouth (Lepomis gulosus), Girardin Pond, n= 45*

Site number	Pond name	TL (mm)	Mass (g)
2	Girardin	21	*
2	Girardin	23	*
2	Girardin	19	*
3	Girardin	105	*
3	Girardin	23	*
3	Girardin	26	*
3	Girardin	28	*
4	Girardin	82	*
5	Girardin	114	29.9
5	Girardin	74	7.6
5	Girardin	74	8.1
5	Girardin	69	6.4
5	Girardin	136	51.2
5	Girardin	76	8.1
5	Girardin	25	*
6	Girardin	24	*
7	Girardin	116	10.7
8	Girardin	143	54.1
8	Girardin	27	*
8	Girardin	29	*
8	Girardin	75	7.0
9	Girardin	29	*
9	Girardin	27	*
9	Girardin	29	*
9	Girardin	27	*
9	Girardin	28	*

Site number	Pond name	TL (mm)	Mass (g)
9	Girardin	28	*
9	Girardin	39	*
9	Girardin	26	*
9	Girardin	30	*
9	Girardin	28	*
9	Girardin	30	*
10	Girardin	82	10.1
10	Girardin	33	*
10	Girardin	36	*
10	Girardin	82	13.8
10	Girardin	84	9.7
10	Girardin	75	6.8
10	Girardin	80	9.2
11	Girardin	29	*
11	Girardin	31	*
11	Girardin	111	26.2
12	Girardin	28	*
12	Girardin	33	*
12	Girardin	63	5.2
	Mean	**19.00**	**5.20**
	Min	**53.27**	**16.51**
	Max	**143.00**	**54.10**

e) Warmouth (Lepomis gulosus), Redhead Pond, n= 62

Site number	Pond name	TL (mm)	Mass (g)
14	Redhead	99	21.3
14	Redhead	100	19.9
14	Redhead	85	11.3
14	Redhead	74	7.3
15	Redhead	82	9.8
15	Redhead	155	76.6
16	Redhead	175	123.1
16	Redhead	84	11.2
16	Redhead	77	9.5
16	Redhead	74	7.5
17	Redhead	90	13.8
17	Redhead	75	8.1
17	Redhead	79	9.4
17	Redhead	69	5.7
17	Redhead	76	7.4
17	Redhead	70	6.5
17	Redhead	80	8.8
17	Redhead	122	38.8
17	Redhead	86	13.0
17	Redhead	84	10.3
17	Redhead	75	7.7
17	Redhead	86	11.3

Site number	Pond name	TL (mm)	Mass (g)
18	Redhead	76	5.9
18	Redhead	91	15.4
18	Redhead	78	9.3
18	Redhead	23	*
18	Redhead	32	*
18	Redhead	90	14.9
19	Redhead	57	3.3
19	Redhead	35	0.7
19	Redhead	36	0.7
19	Redhead	37	0.7
19	Redhead	33	4.0
19	Redhead	22	*
20	Redhead	38	*
20	Redhead	29	0.2
20	Redhead	81	10.5
20	Redhead	20	*
20	Redhead	33	0.5
21	Redhead	91	12.9
21	Redhead	89	13.3
22	Redhead	21	*
22	Redhead	39	1.0
22	Redhead	20	*
22	Redhead	32	0.3
22	Redhead	35	0.7
22	Redhead	73	7.1
22	Redhead	129	46.9
22	Redhead	20	*
22	Redhead	15	*
22	Redhead	23	*
22	Redhead	23	*
22	Redhead	26	*
22	Redhead	26	*
22	Redhead	29	0.2
23	Redhead	77	8.5
23	Redhead	88	12.7
23	Redhead	100	19.4
23	Redhead	37	0.6
24	Redhead	75	9.8
24	Redhead	85	13.0
24	Redhead	87	12.2
	Mean	**15.00**	**0.20**
	Min	**65.29**	**13.53**
	Max	**175.00**	**123.10**

f) Warmouth (Lepomis gulosus), Lake Pond, n=2

Site number	Pond name	TL (mm)	Mass (g)
26	Lake	81	10.8

Site number	Pond name	TL (mm)	Mass (g)
29	Lake	20	*
	Mean	**50**	*

Table 6. *Summary of the invasive species, Round Goby (Neogobius melanostomus) and Tubenose Goby* (Proterorhinus semilunaris*), detected during seining in Lake Pond, Point Pelee National Park, 2021.*

Site number	Species	Number captured	TL (mm) min.	TL (mm) max.
25	Round Goby	4	40	63
25	Tubenose Goby	3	32	58
27	Tubenose Goby	1	40	40
28	Tubenose Goby	1	51	51
29	Tubenose Goby	27	31	51
30	Tubenose Goby	25	31	58
31	Tubenose Goby	27	32	57
Total	**Round Goby**	**4**	**40**	**63**
Total	**Tubenose Goby**	**84**	**31**	**58**

Table 7. *Abiotic habitat data from a) Girardin Pond, b) Redhead Pond, c) Lake Pond, Point Pelee National Park, 2021.*

a) Girardin Pond

Site number	Water temp. (°C)	Conductivity (µS)	DO (mg/L)	pH	Turbidity tube (m)	Turbidity (NTU)	Mean depth (m)	Air temp. (°C)
1	23.00	265.0	4.46	7.26	> 1.20	2.25	0.91	29.5
2	23.93	268.5	5.80	7.60	> 1.20	6.03	1.01	30.3
3	26.50	233.6	13.82	8.69	> 1.20	4.45	1.13	29.7
4	28.50	262.6	10.90	8.44	> 1.20	5.35	1.12	28.9
5	24.19	268.4	2.35	7.50	> 1.20	5.55	1.37	26.7
6	22.60	308.2	1.03	7.26	0.63	7.55	1.28	27.3
7	22.10	265.0	0.33	7.10	0.74	10.66	1.28	29.3
8	25.34	246.4	7.65	7.99	0.98	10.53	1.15	33.2
9	20.49	236.3	3.70	7.31	> 1.20	0.82	1.06	24.9
10	24.24	236.3	6.42	7.81	> 1.20	1.70	1.15	25
11	24.32	240.9	6.48	7.84	> 1.20	2.74	1.21	25
12	24.40	237.2	5.08	7.68	> 1.20	2.85	1.04	26.3
Min	**20.49**	**233.6**	**0.33**	**7.10**	**0.63**	**0.82**	**0.78**	**24.9**
Mean	**24.13**	**255.7**	**5.67**	**7.71**	**1.13**	**5.04**	**1.14**	**28.0**
Max	**28.50**	**308.2**	**13.82**	**8.69**	**> 1.20**	**10.66**	**1.45**	**33.2**

b) Redhead Pond

Site number	Water temp. (°C)	Conductivity (µS)	DO (mg/L)	pH	Turbidity tube (m)	Turbidity (NTU)	Mean depth (m)	Air temp (°C)
13	22.88	272.2	2.25	7.53	0.88	4.33	1.25	30.4
14	25.12	270.0	6.95	7.69	1.16	0.89	1.11	27.9
15	25.61	286.1	7.60	7.79	> 1.20	2.41	1.24	
16	26.40	295.9	9.21	7.89	> 1.20	3.32	1.23	29.6
17	23.46	289.0	3.70	7.71	> 1.20	0.71	1.01	31.1
18	25.73	303.3	10.04	8.53	1.11	1.33	1.15	24.7
19	22.70	325.8	4.54	7.89	1.08	5.55	1.16	22.8
20	23.53	319.2	5.21	7.95	> 1.20	3.59	1.05	22.8
21	23.65	327.6	3.47	7.77	> 1.20	3.71	1.43	23.3
22	23.81	335.8	2.66	7.75	> 1.20	5.27	1.08	23.5
23	24.81	319.7	6.53	8.02	> 1.20	0.81	1.40	25.3
24	24.02	315.1	3.15	7.84	1.12	0.76	1.00	26.7
Min	**22.70**	**270.0**	**2.25**	**7.53**	**0.88**	**0.71**	**0.57**	**22.8**
Mean	**24.31**	**305.0**	**5.44**	**7.86**	**1.18**	**2.72**	**1.18**	**26.2**
Max	**26.40**	**335.8**	**10.04**	**8.53**	**> 1.20**	**5.55**	**1.55**	**31.1**

c) Lake Pond

Site number	Water temp. (°C)	Conductivity (µS)	DO (mg/L)	pH	Turbidity tube (m)	Turbidity (NTU)	Mean depth (m)	Air temp (°C)
25	26.10	253.7	12.58	9.31	0.84	7.86	0.77	29.9
26	23.36	278.9	5.75	7.96	> 1.20	0.90	0.92	24.9
27	23.24	261.1	6.33	8.23	> 1.20	2.53	1.06	24.1
28	23.30	249.3	7.60	8.57	> 1.20	3.34	1.14	25.4
29	22.24	245.4	6.63	8.37	> 1.20	0.84	0.92	21.7
30	22.30	247.0	6.57	8.30	> 1.20	2.19	0.92	23.2
31	22.46	244.4	7.14	8.45	> 1.20	0.96	1.02	24.5
Min	**22.24**	**244.4**	**5.75**	**7.96**	**0.84**	**0.84**	**0.39**	**21.7**
Mean	**23.29**	**254.3**	**7.51**	**8.46**	**1.19**	**2.66**	**0.96**	**24.8**
Max	**26.10**	**278.9**	**12.58**	**9.31**	**1.25**	**7.86**	**1.20**	**29.9**

Table 8. *Aquatic vegetation classification (percent composition) from a) Girardin Pond, b) Redhead Pond, and c) Lake Pond, Point Pelee National Park, 2021.*

a) Girardin Pond

Site number	Emergent	Floating	Submerged	Open water	Dominant class	Dominant sp. of aq. vegetation
1	10	45	45	0	Submerged	bladderwort
2	10	15	75	0	Submerged	water-stargrass
3	5	25	70	0	Submerged	coontail
4	5	35	60	0	Submerged	coontail
5	20	5	75	0	Submerged	coontail
6	5	5	80	10	Submerged	coontail
7	5	5	90	0	Submerged	coontail
8	10	10	80	0	Submerged	coontail
9	5	45	50	0	Submerged	coontail
10	5	20	70	5	Submerged	coontail
11	0	5	90	5	Submerged	coontail
12	0	30	65	5	Submerged	bladderwort
Min	**0**	**5**	**45**	**0**	**-**	**-**
Mean	**7**	**20**	**71**	**2**	**Submerged**	**coontail**
Max	**20**	**45**	**90**	**10**	**-**	**-**

b) Redhead Pond

Site number	Emergent	Floating	Submerged	Open water	Dominant class	Dominant sp. of aq. vegetation
13	0	20	80	0	Submerged	coontail
14	5	40	50	5	Submerged	coontail
15	0	30	65	5	Submerged	coontail
16	5	45	50	0	Submerged	coontail
17	0	50	50	0	Submerged	coontail
18	5	45	50	0	Submerged	coontail
19	5	20	65	10	Submerged	coontail
20	0	50	35	15	Floating	yellow pond lily
21	0	50	40	10	Floating	Canadian waterweed
22	5	30	30	35	Open Water	milfoil sp.
23	10	40	50	0	Submerged	coontail
24	15	25	50	10	Submerged	coontail
Min	**0**	**20**	**30**	**0**	**-**	**-**
Mean	**4**	**37**	**51**	**8**	**Submerged**	**coontail**
Max	**15**	**50**	**80**	**35**	**-**	**-**

c) Lake Pond

Site number	Emergent	Floating	Submerged	Open water	Dominant class	Dominant sp. of aq. vegetation
25	0	10	40	50	Open Water	yellow pond lily
26	0	0	70	30	Submerged	naiad sp.
27	5	5	50	40	Submerged	naiad sp.
28	0	0	90	10	Submerged	naiad sp.
29	5	0	55	40	Submerged	stonewort sp.
30	0	0	60	40	Submerged	stonewort sp.
31	0	0	60	40	Submerged	stonewort sp.
Min	**0**	**0**	**40**	**10**	**-**	**-**
Mean	**1**	**2**	**61**	**36**	**Submerged**	**-**
Max	**5**	**10**	**90**	**50**	**-**	**-**

Table 9. *Frequency of occurrence (total number of sites) of aquatic macrophyte species at sites sampled by fyke net (FN) in Girardin (n=12) and Redhead (n=12) ponds, and by seine net (SN) in Lake Pond (n=7), Point Pelee National Park, 2021.*

		FN		SN
Scientific name	**Common name**	**Girardin Pond**	**Redhead Pond**	**Lake Pond**
algae sp.	algae sp.	1	0	2
Brasenia schreberi	watershield	10	9	1
Ceratophyllum demersum	coontail	12	10	6
Chara sp.	stonewort sp.	0	2	3
Elodea canadensis	Canadian waterweed	8	11	3
Heteranthera dubia	water star-grass	10	7	2
Limnobium spongia	North American frog-bit	4	5	0
Myriophyllum sibiricum	northern milfoil	0	1	0
Myriophyllum sp.	milfoil sp.	4	10	5
Najas sp.	naiad sp.	0	0	6
Nuphar variegata	yellow pond lily	8	12	2
Nymphaea sp.	water lily sp.	5	8	1
Phragmites sp.	reed sp.	2	1	1
Pontederia cordata	pickerelweed	1	4	0
Potamogeton crispus	curly-leaf pondweed	0	0	1
Potamogeton natans	floating pondweed	3	4	0
Potamogeton sp.	pondweed sp.	0	1	0
Scirpoides sp.	bullrush sp.	1	1	1
Sparganium sp.	bur-reed sp.	0	1	0
Typha sp.	cattail sp.	2	0	0
Utricularia sp.	bladderwort	10	10	5
Vallisneria americana	water celery	0	0	4
Zizania sp.	wild rice	3	0	0
	Number of Taxa	**16**	**17**	**15**

***Table 10**. Summary of turtles captured in fyke nets in Girardin and Redhead ponds, recorded for Point Pelee National Park reporting.*

Site number	Waterbody	Eastern Musk Turtle	Northern Map Turtle	Painted Turtle	Total individuals
6	Girardin Pond	0	0	3	**3**
11	Girardin Pond	0	0	3	**3**
12	Girardin Pond	0	0	4	**4**
14	Redhead Pond	0	0	1	**1**
15	Redhead Pond	0	0	3	**3**
16	Redhead Pond	1	0	1	**2**
17	Redhead Pond	0	0	1	**1**
19	Redhead Pond	2	0	0	**2**
22	Redhead Pond	2	1	0	**3**
24	Redhead Pond	2	0	0	**2**
Total individuals		**7**	**1**	**16**	**24**
Freq. occurrence		**4**	**1**	**7**	**10**

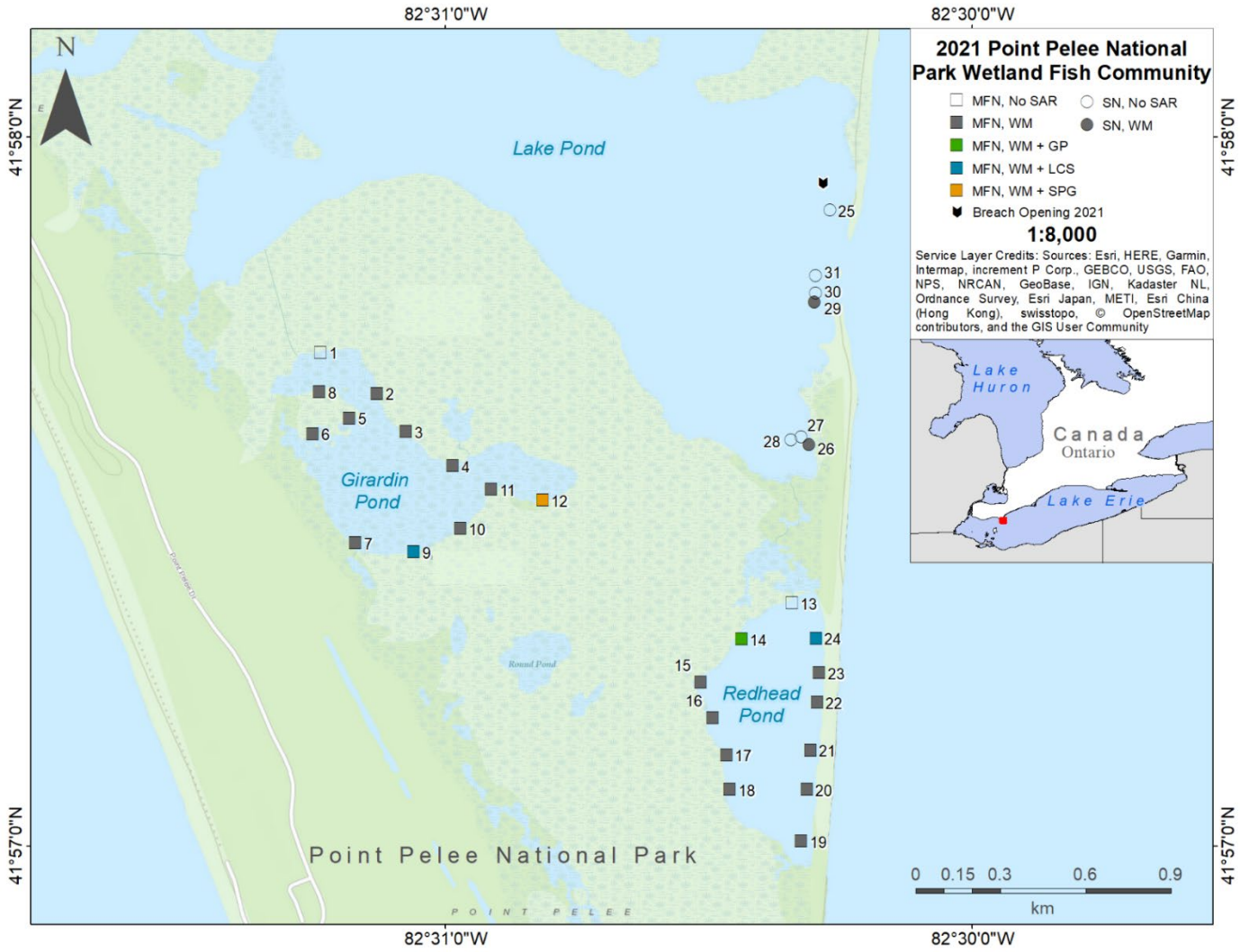


Figure 1. *Sampling locations for the 2021 fish community inventory of Point Pelee National Park using seine nets (SN) and mini fyke nets (MFN). Detections of four SARA-listed fish species (SAR) are indicated; Warmouth (WM), Grass Pickerel (GP), Lake Chubsucker (LCS), and Spotted Gar (SPG).*

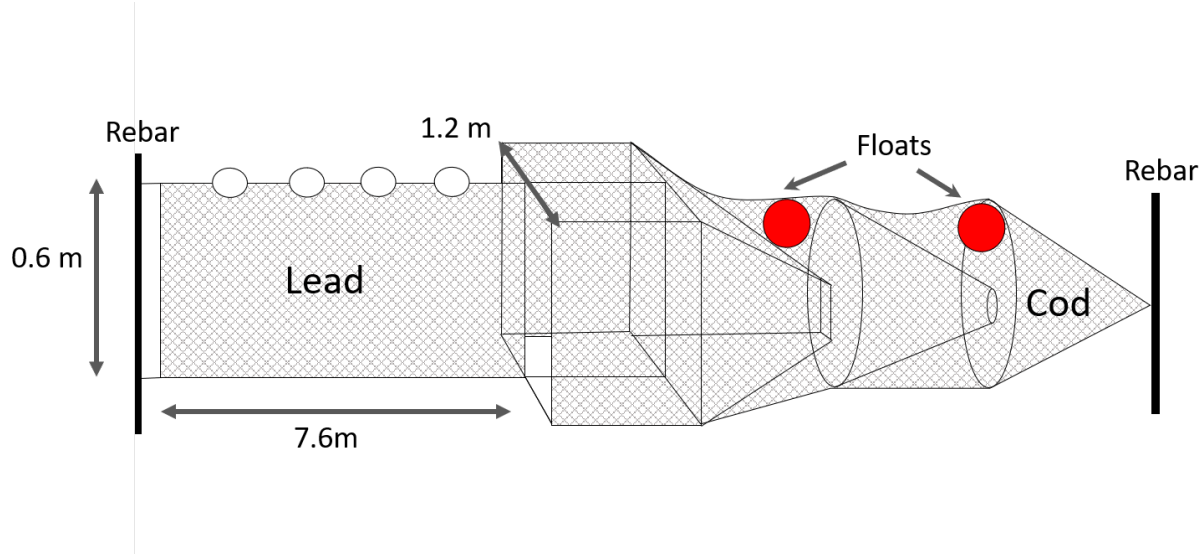


Figure 1*. Schematic of fyke net layout for Point Pelee National Park sampling in 2021 (not to scale).*

Figure 2. *Site picture with fyke net in Redhead Pond, PPNP, 2021 (Site #14)*

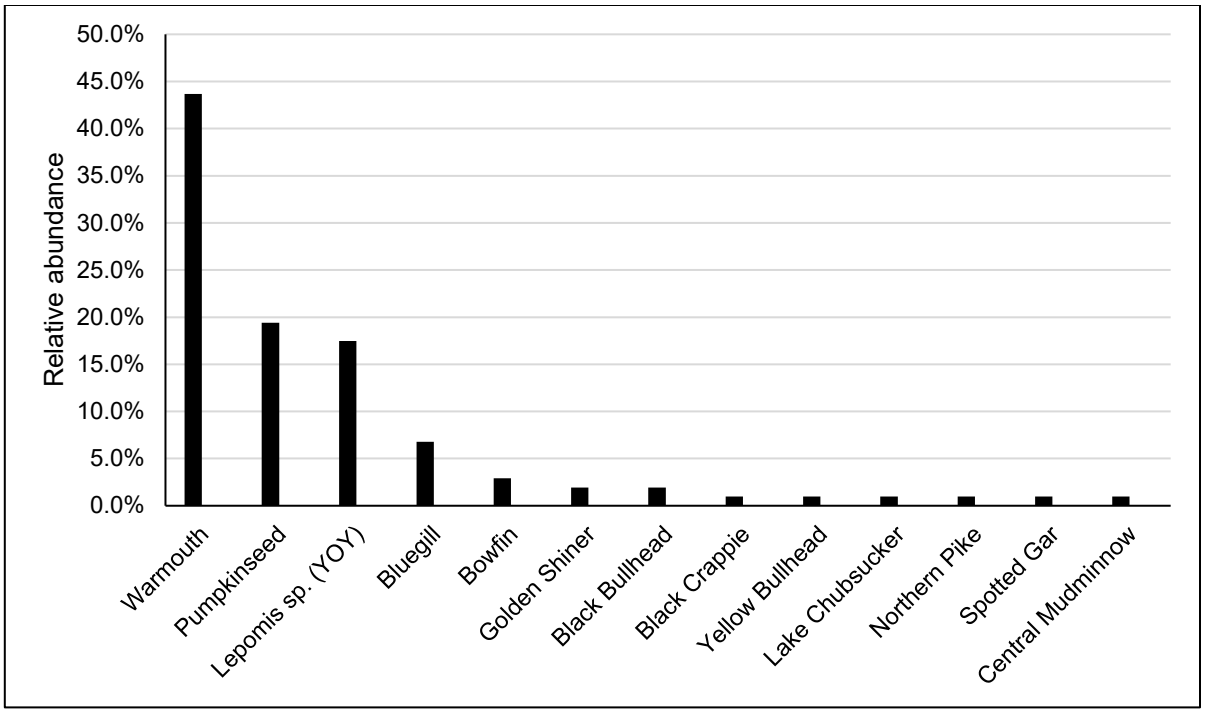


Figure 4 *Relative abundance of fishes (pooled raw abundance) captured by fyke nets in Girardin Pond, Point Pelee National Park (2021).*

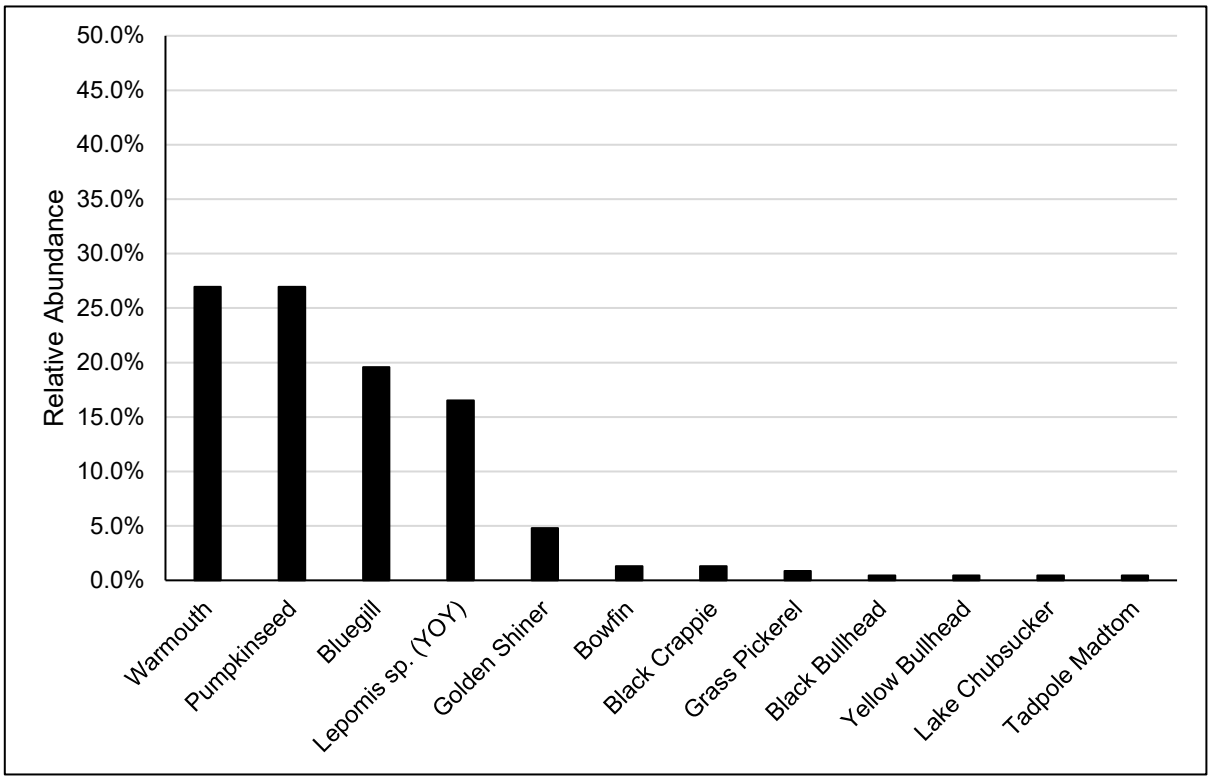


Figure 5 *Relative abundance of fishes (pooled raw abundance) captured by fyke nets in Redhead Pond, Point Pelee National Park (2021).*

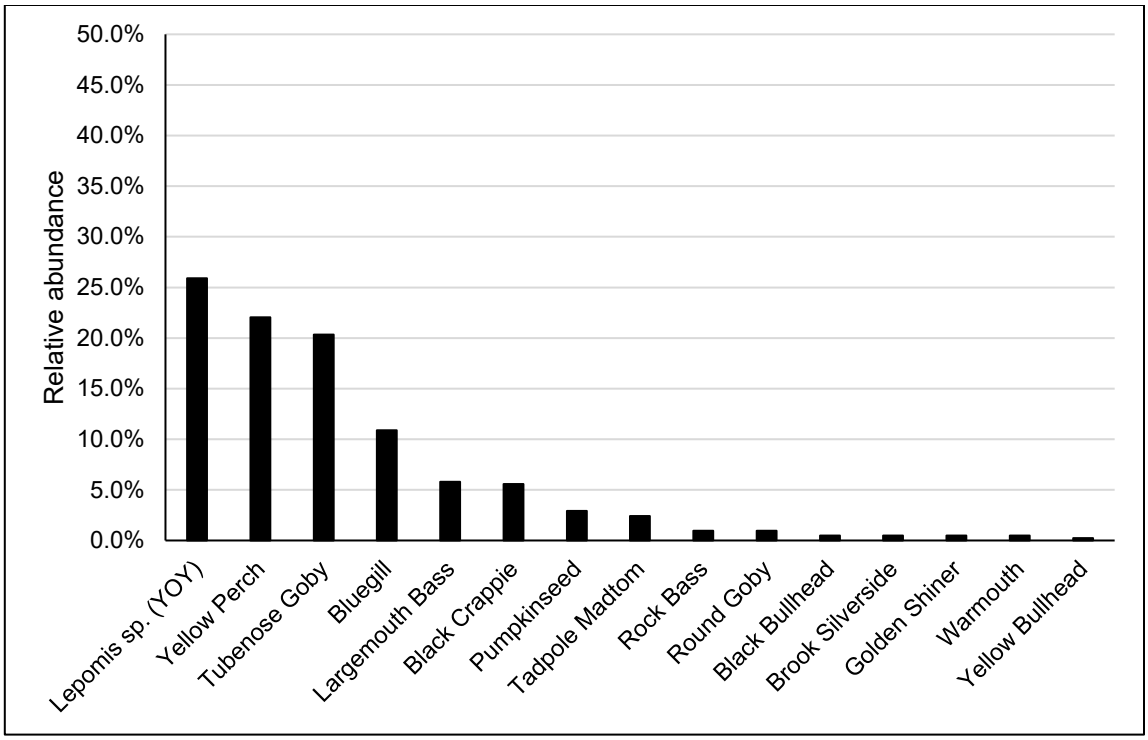


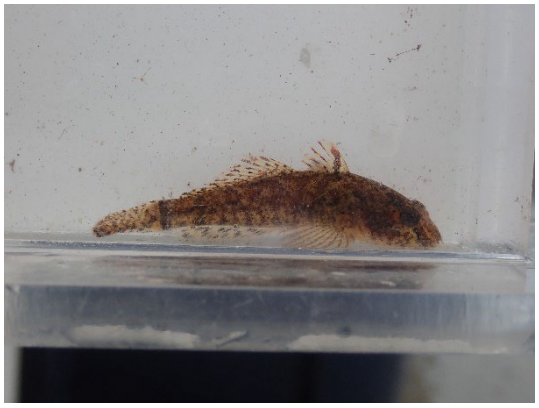
Figure 6. *Relative abundance of fishes (pooled raw abundance) captured by seine nets in Lake Pond, Point Pelee National Park (2021).*

a) Spotted Gar, 432 mm, site #12, Girardin Pond

b) Lake Chubsucker, 44 mm, site #24, Redhead Pond

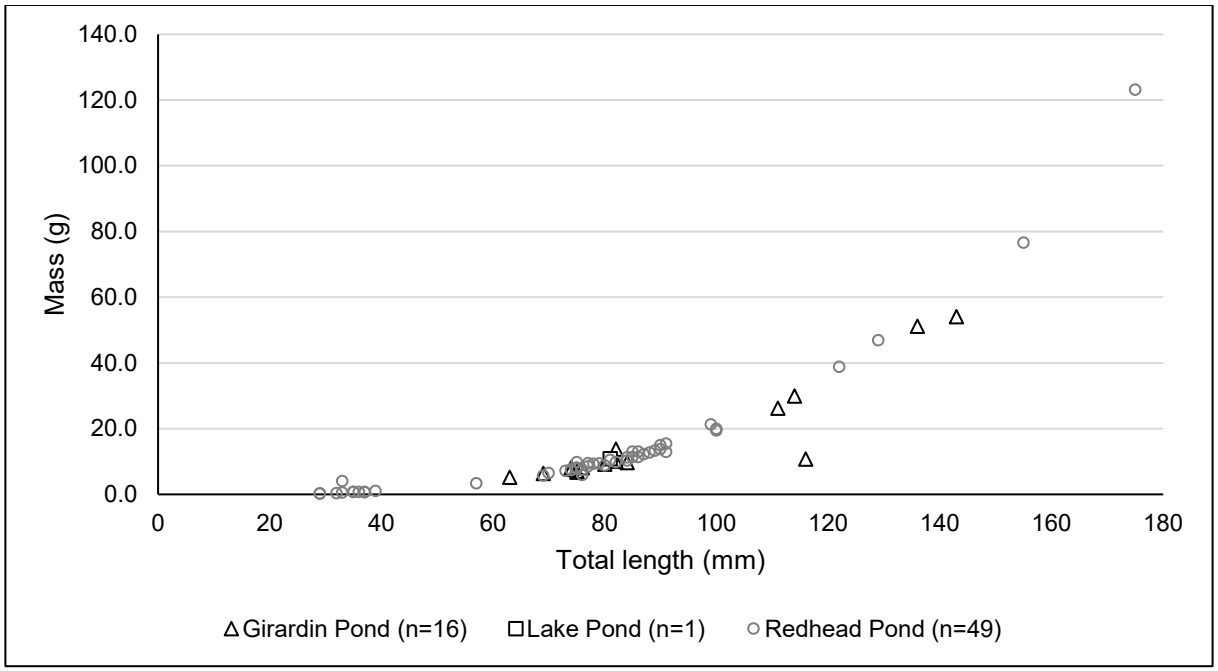
c) Grass Pickerel, 138 mm, site #14, Redhead Pond

d) Warmouth, 175 mm, site #16, Redhead Pond

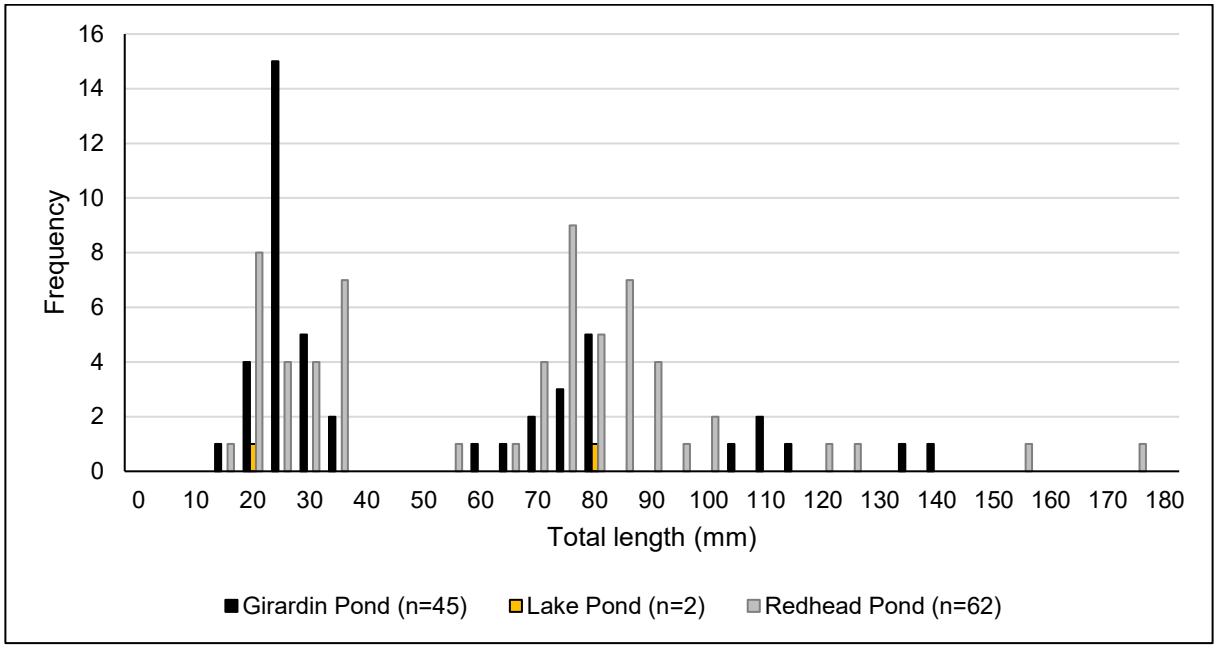


e) Tubenose Goby, 40 mm, site #27, Lake Pond

Figure 7. *Voucher photographs of SARA-listed (a – d) and invasive species (e) captured in fyke net sampling in Girardin and Redhead ponds, and in seine net sampling in Lake Pond, Point Pelee National Park, 2021.*



a) Length-weight relationship (n=66)



b) Length-frequency (bins of 5 mm) (n=109)

Figure 8. *Warmouth length and weight data: a) length-weight relationship, and b) length-frequency of Warmouth captured in Girardin Pond, Lake Pond, and Redhead Pond in Point Pelee National Park, 2021.*

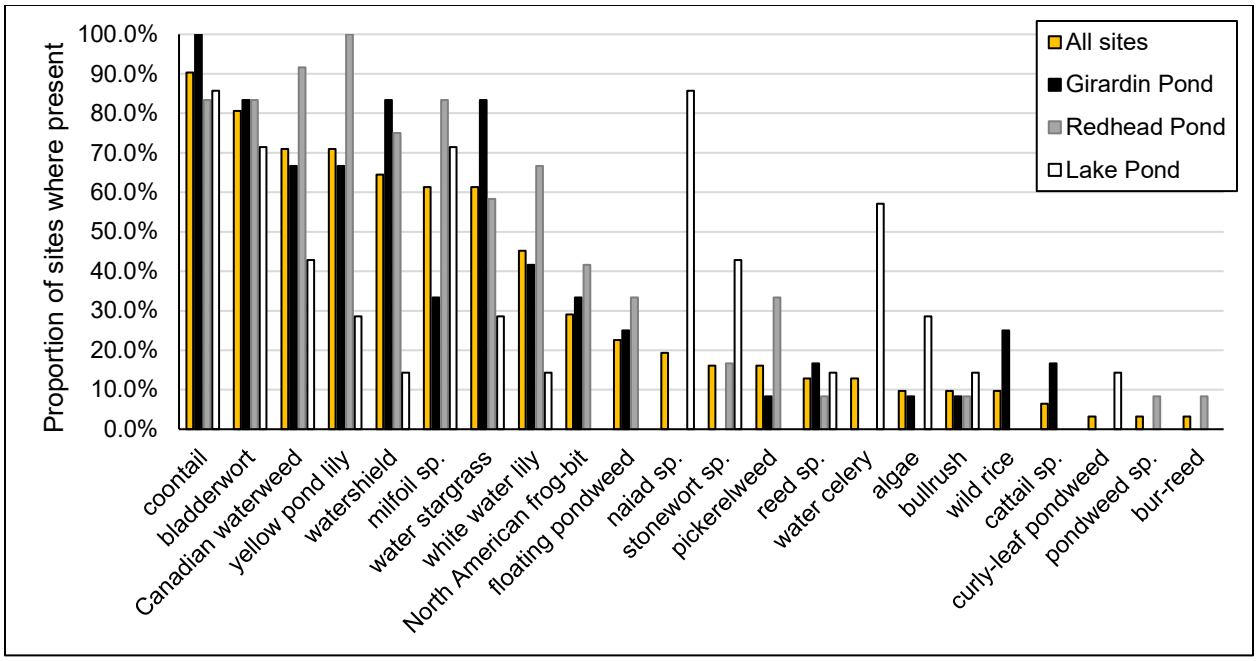


***Figure 9**. Frequency of occurrence of aquatic macrophytes, as proportion of sites within pond where species was present.*

APPENDICES

Appendix 1. *Total number of each species captured per fyke net set in a) Girardin Pond and b) Redhead Pond, and per seine haul in c) Lake Pond.*

a) Girardin Pond

Site number	Field number	Bin number	*Ambloplites rupestris*	*Ameiurus melas*	*Ameiurus natalis*	*Amia calva*	*Erimyzon sucetta*	*Esox americanus vermiculatus*	*Esox lucius*	*Labidesthes sicculus*	*Lepisosteus oculatus*	*Lepomis gibbosus*	*Lepomis gulosus*	*Lepomis macrochirus*	*Lepomis* sp.	*Micropterus salmoides*	*Neogobius melanostomus*	*Notemigonus crysoleucas*	*Noturus gyrinus*	*Perca flavescens*	*Pomoxis nigromaculatus*	*Proterorhinus semilunaris*	*Umbra limi*	Total captured	No. species
1	2021-PPNP-090821-001A	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
2	2021-PPNP-090821-002A	1	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	**4**	**2**
3	2021-PPNP-090821-003A	1	0	0	1	0	0	0	0	0	0	2	4	0	0	0	0	0	0	0	0	0	0	**7**	**3**
4	2021-PPNP-090821-004A	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	**3**	**3**
5	2021-PPNP-100821-001A	1	0	0	0	1	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	**8**	**2**
6	2021-PPNP-100821-002A	1	0	0	0	1	0	0	0	0	0	2	1	2	0	0	0	0	0	0	0	0	0	**6**	**4**
7	2021-PPNP-100821-003A	1	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	**3**	**2**
8	2021-PPNP-100821-004A	1	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	**4**	**1**
9	2021-PPNP-110821-001A	1	0	0	0	0	1	0	0	0	0	4	11	1	16	0	0	0	0	0	0	0	0	**33**	**4**
10	2021-PPNP-110821-002A	1	0	0	0	0	0	0	0	0	0	6	7	1	0	0	0	0	0	0	0	0	0	**14**	**3**
11	2021-PPNP-110821-003A	1	0	2	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	**6**	**3**
12	2021-PPNP-110821-004A	1	0	0	0	1	0	0	0	0	1	2	3	3	2	0	0	2	0	0	1	0	0	**15**	**7**
Total captured		**-**	**0**	**2**	**1**	**3**	**1**	**0**	**1**	**0**	**1**	**20**	**45**	**7**	**18**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**1**	**103**	**12**
Freq. occurrence (No. sites)		**-**	**0**	**1**	**1**	**3**	**1**	**0**	**1**	**0**	**1**	**8**	**11**	**4**	**2**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**1**	**-**	**-**

b) Redhead Pond

Site number	Field number	Bin number	*Ambloplites rupestris*	*Ameiurus melas*	*Ameiurus natalis*	*Amia calva*	*Erimyzon sucetta*	*Esox americanus vermiculatus*	*Esox lucius*	*Labidesthes sicculus*	*Lepisosteus oculatus*	*Lepomis gibbosus*	*Lepomis gulosus*	*Lepomis macrochirus*	*Lepomis* sp.	*Micropterus salmoides*	*Neogobius melanostomus*	*Notemigonus crysoleucas*	*Noturus gyrinus*	*Perca flavescens*	*Pomoxis nigromaculatus*	*Proterorhinus semilunaris*	*Umbra limi*	Total captured	No. species
13	2021-PPNP-170821-001A	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
14	2021-PPNP-170821-002A	1	0	0	1	0	0	2	0	0	0	2	4	3	0	0	0	0	0	0	0	0	0	**12**	**5**
15	2021-PPNP-170821-003A	1	0	1	0	0	0	0	0	0	0	14	2	7	0	0	0	0	0	0	0	0	0	**24**	**4**
16	2021-PPNP-170821-004A	1	0	0	0	0	0	0	0	0	0	1	4	2	0	0	0	0	0	0	0	0	0	**7**	**3**
17	2021-PPNP-170821-005A	1	0	0	0	0	0	0	0	0	0	1	12	4	0	0	0	0	0	0	0	0	0	**17**	**3**
18	2021-PPNP-170821-006A	1	0	0	0	0	0	0	0	0	0	22	6	8	29	0	0	0	0	0	0	0	0	**65**	**3**
19	2021-PPNP-180821-001A	1	0	0	0	1	0	0	0	0	0	1	6	1	3	0	0	11	0	0	0	0	0	**23**	**5**
20	2021-PPNP-180821-002A	1	0	0	0	1	0	0	0	0	0	5	5	6	5	0	0	0	0	0	0	0	0	**22**	**4**
21	2021-PPNP-180821-003A	1	0	0	0	0	0	0	0	0	0	1	2	0	1	0	0	0	1	0	0	0	0	**5**	**3**
22	2021-PPNP-180821-004A	1	0	0	0	0	0	0	0	0	0	13	14	13	0	0	0	0	0	0	2	0	0	**42**	**4**
23	2021-PPNP-180821-005A	1	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	**4**	**1**
24	2021-PPNP-180821-006A	1	0	0	0	1	1	0	0	0	0	2	3	1	0	0	0	0	0	0	1	0	0	**9**	**6**
Total captured		**-**	**0**	**1**	**1**	**3**	**1**	**2**	**0**	**0**	**0**	**62**	**62**	**45**	**38**	**0**	**0**	**11**	**1**	**0**	**3**	**0**	**0**	**230**	**11**
Freq. occurrence (No. sites)		**-**	**0**	**1**	**1**	**3**	**1**	**1**	**0**	**0**	**0**	**10**	**11**	**9**	**4**	**0**	**0**	**1**	**1**	**0**	**2**	**0**	**0**	**-**	**-**

c) Lake Pond

Site number	Field number	Bin number	*Ambloplites rupestris*	*Ameiurus melas*	*Ameiurus natalis*	*Amia calva*	*Erimyzon sucetta*	*Esox americanus vermiculatus*	*Esox lucius*	*Labidesthes sicculus*	*Lepisosteus oculatus*	*Lepomis gibbosus*	*Lepomis gulosus*	*Lepomis macrochirus*	*Lepomis* sp.	*Micropterus salmoides*	*Neogobius melanostomus*	*Notemigonus crysoleucas*	*Noturus gyrinus*	*Perca flavescens*	*Pomoxis nigromaculatus*	*Proterorhinus semilunaris*	*Umbra limi*	Total captured	No. species
25	2021-PPNP-040821-001B	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**1**	**1**
25	2021-PPNP-040821-001B	2	0	1	0	0	0	0	0	0	0	0	0	0	1	4	2	0	0	0	0	1	0	**9**	**4**
25	2021-PPNP-040821-001B	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	1	0	**5**	**2**
26	2021-PPNP-160821-001B	1	0	0	0	0	0	0	0	0	0	4	0	4	3	6	0	1	2	20	5	0	0	**45**	**7**
26	2021-PPNP-160821-001B	2	0	0	0	0	0	0	0	0	0	0	1	0	9	2	0	0	0	0	0	0	0	**12**	**2**
26	2021-PPNP-160821-001B	3	0	0	1	0	0	0	0	0	0	0	0	6	5	2	0	0	0	10	1	0	0	**25**	**5**
27	2021-PPNP-160821-002B	1	0	0	0	0	0	0	0	0	0	4	0	7	7	3	0	0	0	11	5	0	0	**37**	**5**
27	2021-PPNP-160821-002B	2	1	0	0	0	0	0	0	0	0	1	0	3	13	0	0	0	0	14	0	0	0	**32**	**4**
27	2021-PPNP-160821-002B	3	0	0	0	0	0	0	0	0	0	0	0	2	13	0	0	0	0	2	0	1	0	**18**	**3**
28	2021-PPNP-160821-003B	1	0	0	0	0	0	0	0	0	0	0	0	4	2	0	0	1	0	2	2	1	0	**12**	**5**
28	2021-PPNP-160821-003B	2	0	0	0	0	0	0	0	0	0	0	0	3	6	1	0	0	0	5	3	0	0	**18**	**4**
28	2021-PPNP-160821-003B	3	0	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	4	1	0	0	**10**	**3**
29	2021-PPNP-170821-001B	1	2	0	0	0	0	0	0	0	0	0	0	5	8	1	0	0	3	12	4	11	0	**46**	**7**
29	2021-PPNP-170821-001B	2	0	0	0	0	0	0	0	2	0	0	1	0	3	0	0	0	3	1	0	13	0	**23**	**5**
29	2021-PPNP-170821-001B	3	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	3	0	**7**	**3**
30	2021-PPNP-170821-002B	1	1	0	0	0	0	0	0	0	0	0	0	8	0	2	0	0	0	4	0	8	0	**23**	**5**
30	2021-PPNP-170821-002B	2	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	0	0	1	0	4	0	**13**	**3**
30	2021-PPNP-170821-002B	3	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	2	0	13	0	**22**	**2**
31	2021-PPNP-170821-003B	1	0	0	0	0	0	0	0	0	0	2	0	1	6	1	0	0	1	0	0	9	0	**20**	**5**
31	2021-PPNP-170821-003B	2	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	1	1	2	14	0	**25**	**4**
Total captured		-	**4**	**2**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**12**	**2**	**45**	**107**	**24**	**4**	**2**	**10**	**91**	**23**	**84**	**0**	**413**	**14**
Freq. occurrence (No. sites)		-	**3**	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	**2**	**6**	**7**	**7**	**1**	**2**	**3**	**6**	**5**	**6**	**0**	**-**	**-**

Appendix 2. *Presence of aquatic macrophyte species in a) Girardin Pond, b) Redhead Pond, c) Lake Pond, Point Pelee National Park, 2021 (* data not recorded).*

a) Girardin Pond

Site number	Rake depth (m)	SAV rake classification	Algae	*Brasenia schreberi*	*Ceratophyllum demersum*	*Chara* sp.	*Elodea canadensis*	*Heteranthera dubia*	*Limnobium spongia*	*Myriophyllum sibiricum*	*Myriophyllum* sp.	*Najas* sp.	*Nuphar lutea*	*Nymphaea* sp.	*Phragmites* sp.	*Pontederia cordata*	*Potamogeton crispus*	*Potamogeton natans*	*Potamogeton* sp.	Scirpoides sp.	*Sparganium* sp.	*Typha* sp.	*Utricularia* sp.	*Vallisneria americana*	*Zizania* sp.	Total species
1	*	*	0	1	1	0	1	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0	1	0	0	**8**
2	0.78	2	0	1	1	0	1	1	1	0	1	0	1	0	0	1	0	0	0	1	0	0	1	0	0	**10**
3	0.97	2	0	1	1	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	**7**
4	1.14	3	0	1	1	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	**6**
5	1.18	2	0	0	1	0	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	1	**7**
6	1.30	2	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	**6**
7	1.14	2	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**5**
8	1.30	2	0	1	1	0	1	1	1	0	0	0	0	1	1	0	0	1	0	0	0	0	1	0	0	**9**
9	0.93	3	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	**5**
10	1.00	3	0	1	1	0	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	**8**
11	1.30	1	0	1	1	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	**6**
12	1.14	3	0	1	1	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	**7**
Freq. occurrence (no. sites)			**1**	**1**	**10**	**12**	**0**	**8**	**10**	**4**	**0**	**4**	**0**	**8**	**5**	**2**	**1**	**0**	**3**	**0**	**1**	**0**	**2**	**10**	**0**	**3**

b) Redhead Pond

Site number	Rake depth (m)	SAV rake classification	Algae	*Brasenia schreberi*	*Ceratophyllum demersum*	*Chara* sp.	*Elodea canadensis*	*Heteranthera dubia*	*Limnobium spongia*	*Myriophyllum sibiricum*	*Myriophyllum* sp.	*Najas* sp.	*Nuphar lutea*	*Nymphaea* sp.	*Phragmites* sp.	*Pontederia cordata*	*Potamogeton crispus*	*Potamogeton natans*	*Potamogeton* sp.	Scirpoides sp.	*Sparganium* sp.	*Typha* sp.	*Utricularia* sp.	*Vallisneria americana*	*Zizania* sp.	Total species
13	0.91	3	0	0	1	0	1	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	**7**
14	0.96	2	0	1	1	0	1	1	0	1	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	**9**
15	1.20	2	0	1	1	0	1	1	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	**8**
16	1.16	2	0	1	1	0	1	1	0	0	1	0	1	0	0	1	0	1	0	1	0	0	1	0	0	**10**
17	1.27	3	0	1	1	0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	1	0	0	**7**
18	0.96	2	0	1	1	0	1	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	**8**
19	1.25	3	0	0	1	0	1	1	0	0	1	0	1	1	0	0	0	0	0	0	1	0	1	0	0	**8**
20	0.98	2	0	0	0	0	1	1	0	0	1	0	1	1	0	0	0	1	0	0	0	0	1	0	0	**7**
21	1.35	3	0	1	1	0	1	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	**6**
22	1.02	2	0	1	0	1	1	0	1	0	1	0	1	1	0	0	0	1	0	0	0	0	1	0	0	**9**
23	0.93	3	0	1	1	0	1	0	1	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	**8**
24	0.92	3	0	1	1	1	0	0	1	0	1	0	1	1	0	1	0	0	1	0	0	0	1	0	0	**10**
Freq. occurrence (no. sites)			**0**	**9**	**0**	**9**	**10**	**2**	**11**	**7**	**5**	**1**	**10**	**0**	**12**	**8**	**1**	**4**	**0**	**4**	**1**	**1**	**1**	**0**	**10**	**0**

c) Lake Pond

Site number	Rake depth (m)	SAV rake classification	Algae	*Brasenia schreberi*	*Ceratophyllum demersum*	*Chara* sp.	*Elodea canadensis*	*Heteranthera dubia*	*Limnobium spongia*	*Myriophyllum sibiricum*	*Myriophyllum* sp.	*Najas* sp.	*Nuphar lutea*	*Nymphaea* sp.	*Phragmites* sp.	*Pontederia cordata*	*Potamogeton crispus*	*Potamogeton natans*	*Potamogeton* sp.	Scirpoides sp.	*Sparganium* sp.	*Typha* sp.	*Utricularia* sp.	*Vallisneria americana*	*Zizania* sp.	Total species
25	1.23	3	0	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	**6**
26	1.09	1	0	0	1	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	**5**
27	1.28	1	0	1	1	0	1	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	1	0	0	**8**
28	1.30	1	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	**5**
29	1.30	2	1	0	1	1	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	1	1	0	**9**
30	1.40	3	1	0	1	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	**7**
31	0.84	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**3**
Freq. occurrence (no. sites)			**2**	**1**	**2**	**1**	**6**	**3**	**3**	**2**	**0**	**0**	**5**	**6**	**2**	**1**	**1**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**5**	**4**

Appendix 3. *Turtle metrics recorded for each individual turtle detected, recorded for Parks Canada reporting (*data not recorded).*

Site number	Field number	Pond	Common name	Scientific name	Sex	Carapace length (cm)	State	Notches	Released	Photo
6	2021-PPNP-100821-002A	Girardin	Painted Turtle	*Chrysemys picta*	F	*	Weak	*	Yes	Yes
6	2021-PPNP-100821-002A	Girardin	Painted Turtle	*Chrysemys picta*	Unk	*	Weak	*	Yes	No
6	2021-PPNP-100821-002A	Girardin	Painted Turtle	*Chrysemys picta*	Unk	*	Weak	*	Yes	No
11	2021-PPNP-110821-003A	Girardin	Painted Turtle	*Chrysemys picta*	F	15.0	Deceased	No	No	No
11	2021-PPNP-110821-003A	Girardin	Painted Turtle	*Chrysemys picta*	M	11.2	Deceased	No	No	No
11	2021-PPNP-110821-003A	Girardin	Painted Turtle	*Chrysemys picta*	M	12.0	Reactive	No	Yes	No
12	2021-PPNP-110821-004A	Girardin	Painted Turtle	*Chrysemys picta*	M	*	Alive	*	Yes	No
12	2021-PPNP-110821-004A	Girardin	Painted Turtle	*Chrysemys picta*	M	13.0	Reactive	No	Yes	No
12	2021-PPNP-110821-004A	Girardin	Painted Turtle	*Chrysemys picta*	M	13.2	Deceased	No	No	No
12	2021-PPNP-110821-004A	Girardin	Painted Turtle	*Chrysemys picta*	M	9.7	Deceased	No	No	No
14	2021-PPNP-170821-002A	Redhead	Painted Turtle	*Chrysemys picta*	M	12.5	Alive	*	Yes	Yes
15	2021-PPNP-170821-003A	Redhead	Painted Turtle	*Chrysemys picta*	M	12.0	Alive	*	Yes	No
15	2021-PPNP-170821-003A	Redhead	Painted Turtle	*Chrysemys picta*	M	12.2	Alive	*	Yes	No
15	2021-PPNP-170821-003A	Redhead	Painted Turtle	*Chrysemys picta*	F	15.8	Alive	*	Yes	No
16	2021-PPNP-170821-004A	Redhead	Painted Turtle	*Chrysemys picta*	F	16.0	Alive	*	Yes	Yes
17	2021-PPNP-170821-005A	Redhead	Painted Turtle	*Chrysemys picta*	F	15.7	Alive	*	Yes	Yes
22	2021-PPNP-180821-004A	Redhead	Northern Map Turtle	*Graptemys geographica*	Unk	*	Alive	*	Yes	Yes
16	2021-PPNP-170821-004A	Redhead	Eastern Musk Turtle	*Sternotherus odoratus*	Unk	9.2	Alive	*	Yes	Yes
19	2021-PPNP-180821-001A	Redhead	Eastern Musk Turtle	*Sternotherus odoratus*	Unk	*	Alive	*	Yes	Yes
19	2021-PPNP-180821-001A	Redhead	Eastern Musk Turtle	*Sternotherus odoratus*	Unk	*	Alive	*	Yes	Yes
22	2021-PPNP-180821-004A	Redhead	Eastern Musk Turtle	*Sternotherus odoratus*	Unk	*	Alive	*	Yes	Yes
22	2021-PPNP-180821-004A	Redhead	Eastern Musk Turtle	*Sternotherus odoratus*	Unk	*	Alive	*	Yes	Yes
24	2021-PPNP-180821-006A	Redhead	Eastern Musk Turtle	*Sternotherus odoratus*	Unk	*	Alive	*	Yes	Yes
24	2021-PPNP-180821-006A	Redhead	Eastern Musk Turtle	*Sternotherus odoratus*	Unk	*	Alive	*	Yes	Yes

Appendix 4. *Photographs of three species of turtles captured in fyke nets in Girardin and Redhead ponds, Point Pelee National Park, 2021. a) Painted Turtle from site #17, b) Northern Map Turtle from site #22, c) Eastern Musk Turtle from site #24*

a)

b)

c)