BOAT TRAFFIC IMPACT STUDY
Head Lake
Village of Haliburton
August 2022

RIVERSTONE
ENVIRONMENTAL SOLUTIONS INC.

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August 8, 2022
RS# 2021-173

2784805 Ontario Inc.
Attention: Mr. Eugene Shcolyar
18 Erica Road,
Thornhill, ON, L4J 2G1

SUBJECT: Boat Capacity Study, Head Lake, Municipality of Dysart et al., County of Haliburton

Dear Mr. Shcolyar:

RiverStone Environmental Solutions Inc. is pleased to provide you with the attached report.

Please contact us if there are any questions regarding the report, or if further information is required.

Best regards,

RiverStone Environmental Solutions Inc.

Report prepared by:

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Senior Ecologist / Principal

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1 BACKGROUND

RiverStone Environmental Solutions Inc. (hereafter "RiverStone") was retained by 2784805 Ontario Inc., to complete a Boat Traffic Impact Study for a proposed 3 phase development at 77 Wallings Road in the village of Haliburton (hereafter "subject property"). The subject property has approximately 88 m of frontage on Head Lake and is in a "settlement area" as designated in the County of Haliburton Official Plan. The subject property is the location of the former Ministry of Natural Resources and Forests (MNRF) firebase. The current owner is seeking to include docking facilities as part of the proposed development and a boating impact study has therefore been prepared.

Boating Traffic Impact Studies are typically completed in response to development proposals along waterfront properties that have the potential to add a considerable number of boats to a waterbody. The objective of a boating impact study is to understand the current boating patterns in time and space, model predicted increases in boating traffic and changes in safety based on a development proposal, as well as provide a baseline for future comparison.

2 CUMULATIVE BOATING ACTIVITY

2.1 Methodology

In general, a boating traffic impact study is used to quantify the current boat traffic occurring on a lake during the summer months, covering time and space, in a manner that quantifies a variety of possible activity levels ranging from busy to average. A predetermined safety area (or allowance) is assigned to each type of boat observed within the study area of the lake. Through this process we can calculate a current boating activity level which is used as a baseline, to which the proposed development is added.

A standardized number and type of boats are added to the existing boating activity levels to represent how the proposed development will elevate existing boat traffic. If the cumulative safety areas for all boats (existing and proposed) exceeds the area of the lake (or specified area of a lake or isolated bay), then the lake is considered over capacity for boating and an increase in boating activity would be unsafe.

To quantify the boating activity within Head Lake a cumulative boating activity survey was completed. The survey methodology was comprised of two parts, both of which were conducted between 1000 h and 1800 h on four (4) separate days during the summer of 2021. Staff were on site by 9:30 each morning with official observations beginning at 10 am. The first counts involved documenting usage by both boat type and activity level (slow, fast, towing a skier or tube) traversing two imaginary transect lines that delineate the study area (Line 1 and 2, **Figure 1**). The second measure of boat traffic was a count of all boats within the study area in discrete ten-minute intervals. The study area included, the narrow connection that joins Head Lake with Grass Lake, the public boat launch, and a public beach and park area (**Figure 1**). To the extent possible, surveys were completed on days with good boating weather (**Table 1**). Surveys were completed on two (2) regular weekend days, one (1) holiday Monday, and one (1) weekday. Tuesday was chosen for a regular weekday to capture any increase in boat traffic associated with market day in town. Dates selected were based on weather and weekdays/weekends. Overcast, cool, windy days were not selected as study days, so that maximum boat counts were collected.

Line 1 was placed at the west end of the lake to measure the intensity of boating traffic traveling between Grass Lake and Head Lake. Line 2 was used as measure of the number of boats using the available surface area in Head Lake.

Table 1. Dates, climatic conditions and classifications of boating surveys on Head Lake in 2021.

Date	Weather	Classification	Survey Time
Saturday July 17, 2021	20°C–25°C Sunny (20-80% cloud cover) Calm	Normal Weekend	1000–1800 h
Monday August 2, 2021	18°C–23°C Sunny (< 20% cloud cover) Calm - Light winds	Holiday Monday	1000–1800 h
Tuesday August 3, 2021	19°C–24°C Sunny (< 20% cloud cover) Calm – Light winds	Normal Weekday	1000–1800 h
Saturday August 14, 2021	18°C–22°C Sunny (< 20% cloud cover) Calm – Light winds	Normal Weekend	1000–1800 h

2.2 Results

All surveys were conducted on days considered good boating weather, during the appropriate season. As such, the results of this study are indicative of the boating traffic on Head Lake. RiverStone observed the following:

1. The most active day for boating on Head Lake was Monday August 2nd, with over 260 boats crossing both centre lines combined. The second busiest day was Saturday July 17th, with nearly 200 boats passing the centre lines (**Table 2, Table 3**).

2. Bow riders were the most common boat to use the bay each day the survey was completed (**Table 2, Table 3**). Some of these had skiers or tubers in tow.

3. Very few non-powered boats (i.e., canoes, kayaks, rowboats, windsurfers, paddleboats, etc.) were observed to cross the centre line (**Table 2, Table 3**).

4. Line 2, was found to have slightly higher boating traffic compared to Line 1 however, the differences are negligible (**Table 2, Table 3**).

5. The number and composition of the boat traffic was generally consistent between the two zones across all four survey days (**Table 2, Table 3**).

Table 2. Total boats by type passing the imaginary center line 1 between 10:00am and 6:00 pm on four survey days in 2021. See **Appendix 1** for boat type definitions

Type of Vessel	Saturday July 17	Monday August 2	Tuesday August 3	Saturday August 14
PWC	14	15	6	9
Skiff	7	38	20	7

Type of Vessel	Saturday July 17	Monday August 2	Tuesday August 3	Saturday August 14
Bow Rider	39	38	32	18
Skiboat	6	9	3	10
Wakeboarder	0	0	0	0
Wakesurfer	0	0	0	0
Pontoon	17	25	8	13
Commercial Barge	1	0	0	4
Cruiser	26	0	0	15
Plane	0	0	0	5
Windsurfer	16	0	0	0
Sail boats	0	0	0	0
Canoe	3	1	0	0
Kayak	0	0	0	0
Stand Up Paddle Board	1	0	0	0
Antique Wood Boat	0	2	0	9
Total	**70**	**128**	**69**	**56**
Boats/hour				
Max	48	50	24	21
Mean	9	16	9	7

Table 3. Total boats by type passing the imaginary center line 2 between 10:00am and 6:00 pm on four survey days in 2021

Type of Vessel	Saturday July 17	Monday August 2	Tuesday August 3	Saturday August 14
PWC	35	20	6	7
Skiff	5	38	16	20
Bow Rider	52	43	35	22
Skiboat	4	9	1	10

Type of Vessel	Saturday July 17	Monday August 2	Tuesday August 3	Saturday August 14
Wakeboarder	0	0	0	0
Tube	13	0	0	1
Pontoon	18	22	9	12
Commercial Barge	0	0	0	0
Cruiser	0	0	1	0
Plane	0	2	0	3
Windsurfer	0	0	0	0
Sail boats	0	0	0	0
Canoe	1	1	0	1
Kayak	0	0	0	1
Stand Up Paddle Board	0	0	0	0
Antique Wood Boat	0	3	0	10
Total	**128**	**138**	**68**	**87**
Boats/hour				
Max	57	51	35	31
Mean	16	22	35	11

3 BOATING CAPACITY ANALYSIS

3.1 Methodology

Boating capacity analysis is based on the premise that the area occupied by a boat within a waterbody is proportional to the size and speed of the vessel. A canoe, therefore, occupies less space than a slow-moving runabout, but a runabout with a skier in tow occupies more space than a slow moving houseboat. Within a given waterbody, a 30 m buffer from the shoreline is "unusable boating water" and is removed from the total surface area of the lake to determine the available boating area. Head Lake was divided into a single study area to capture the boating capacity of the lake associated with traffic both within the lake and traveling to and from the adjacent Grass Lake (**Figure 1**). The study area had 23.4 ha of boating area.

The boating capacity analysis was completed from a single count of all boats by type and speed, within the survey area (**Figure 1**) every ten minutes. Count data for each boat type and speed were then multiplied by the appropriate area value (**Table 4**) and summed to generate the total boating area currently in use. The total was then compared to the amount of useable boating area in Head Lake to identify times when the lake is overcapacity.

To simulate potential additional traffic that may occur because of development an additional 15 boats were added to the observations on each of the four days. The boating area currently in use was then recalculated based on the additional traffic. Boats added were varied across boat type and speed of travel. On August 2nd and 3rd all 15 additional boats were added during a single hour to show the maximum intensity. Additional boats added on July 17th and August 24th were distributed evenly throughout the entire observation period. The results were graphed for ease of comparison with the original data

Table 4. Lake surface area requirements for various boat types and activities.

Boat Type	Speed/Activity	Required Lake Surface Area (ha)
PWC	SLOW	1.5
	FAST	3
	SKIER	6
Skiff	SLOW	1.5
	FAST	3
Bow Rider	SLOW	0.5
	FAST	1.5
Skiboat	SLOW	1.5
	FAST	3
	SKIER	6
	TUBE	6
Wakeboarder	ALL	3
Wakesurfer	ALL	3
Pontoon	STOP	0.5
	MOVING	3
Commercial Barge	STOP	0.5
	MOVING	2
Cruiser	STOP	0.5
	MOVING	3
Others	STOP	0.5
	MOVING	2
Sail Powered		
Windsurfer	ALL	1
Sail boats	ALL	1
Paddle /Oar Powered		

Boat Type	Speed/Activity	Required Lake Surface Area (ha)
Canoe	ALL	0.5
Kayak	ALL	0.5
Stand Up Paddle Board	ALL	0.5
Paddleboat	ALL	0.5

3.2 Results

Figure 2 shows the results of the recreational capacity of the study area. The recreational capacity of the study area is based on the useable lake surface area for Head Lake during each period, with a period count being defined as the number of boats, type, and speed that crossed lines 1 and 2 during the discrete 10-minute intervals.

From the analysis RiverStone found that:

- Boating activity on Head Lake was found to be under capacity during all days surveyed (**Figure 2**).
- When additional boats were added to simulate development, boating activity on Head Lake was found to be under capacity during all days surveyed (**Figure 3**)

These results suggest that generally the current amount of boating activity in Head Lake is not at capacity and there is room to increase the number of boats within the lake. An additional 15 boats were added to the data collected to simulate the increased traffic associated with the proposed development. These boats were varied among boat types observed and allocated at various time points throughout the day. Head Lake remained below capacity for each of the four days with the addition of the simulated boating activity.

4 POLICY IMPLICATIONS, SUMMARY AND RECOMMENDATIONS

4.1 County of Haliburton Official Plan (2017)

The County of Haliburton Official Plan does not provide direction on the scope or requirements of a Boating Impact Assessment.

4.2 Municipality of Dysart et al. Official Plan (2017)

The municipality of Dysart et al. outlines the requirements for a boating capacity study in section 17.5.4.

> A boating capacity study will demonstrate to Council's satisfaction that the boating activity generated by the proposed development will not unduly add to existing aquatic recreational stresses, conflicts, and hazards, and that any impacts can be mitigated so that the lake's recreational attractiveness will be maintained or enhanced. A boating study will, as a minimum requirement, include:
>
> – an inventory of the existing development, including public access points, on the lake;
>
> – an inventory of all proposed development on the lake; and – a survey of all boating activity. As a minimum requirement, the survey:

- is to include all motorized and non-motorized boats; - is to include the July 1st and the August 1st long weekends;

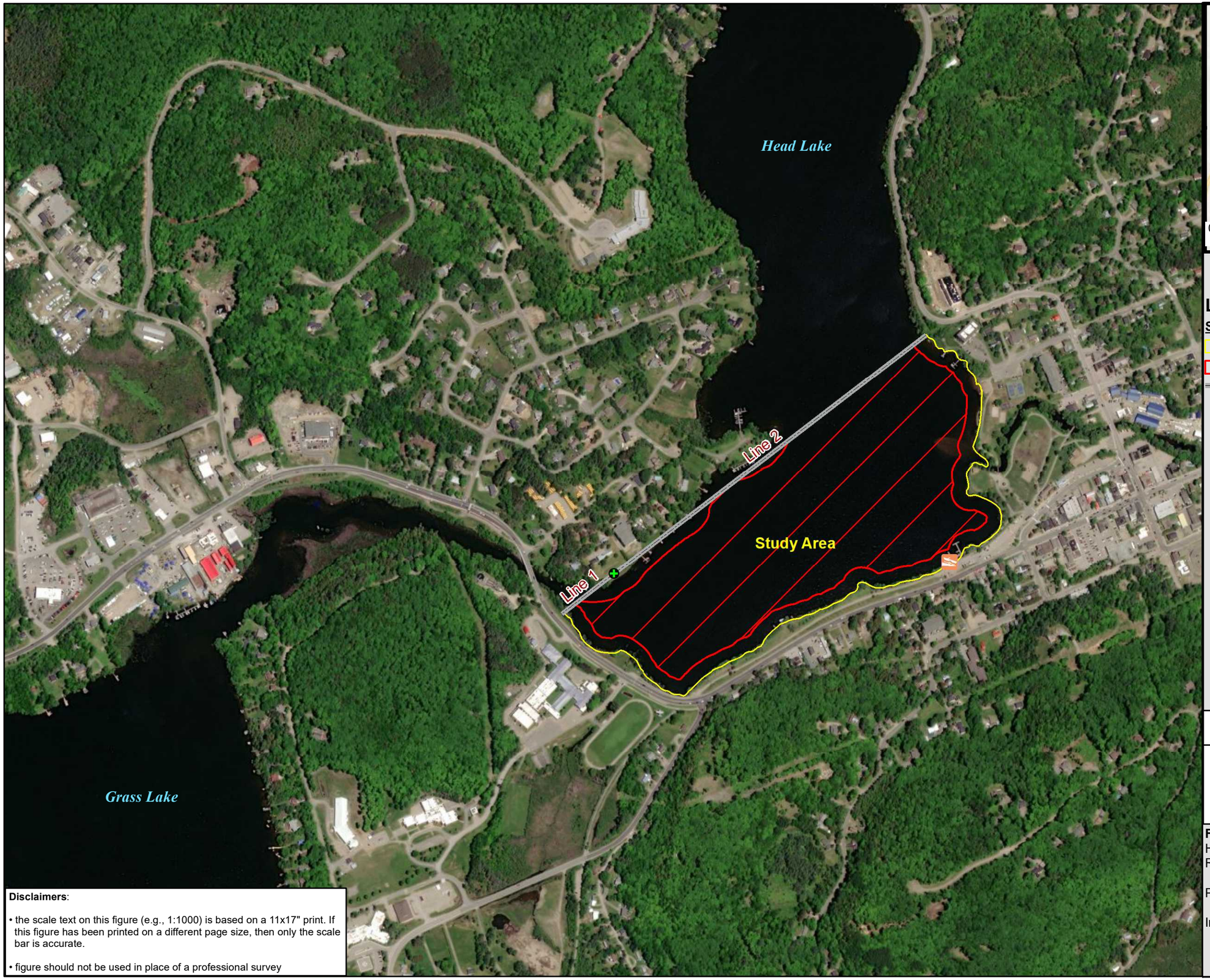
- is to be conducted over a continuous eight hour period beginning at 9:00 a.m.; and

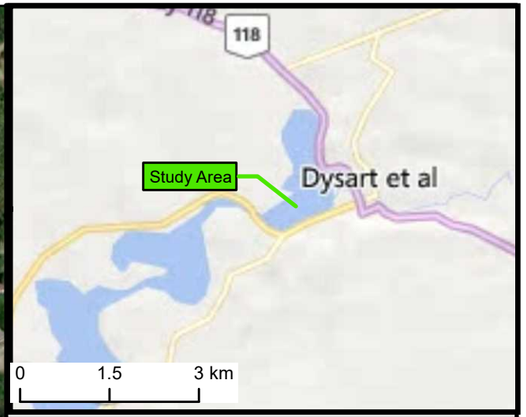
- is to identify and tabulate the type of watercraft and map the location of the activity.

Due to the timing of the study commencement, RiverStone was unable to complete boating surveys on the July 1, long weekend. That said, in our 15 years of completing boating studies, many times specific long weekends are not able to be surveyed due to inclement weather. For the current survey, weekend, long weekends, and weekday weather (including Market Day) were carefully considered as part of the study. It is our opinion that the having undertaken a survey on the July 1 weekend would not have altered the outcome of the study.

5 SUMMARY

The results of the boating impact study indicate that the current boating activities in our defined study area of Head Lake are well below the threshold of available boating area. Based on **Figure 2**, boating capacity was typically well below 50% of the available capacity and approached capacity on only three occasions. As such, the proposed increase in docking facilities at 77 Wallings Road have a low likelihood of resulting in boating activities in Head Lake causing an exceedance in the recreational carrying capacity of the lake. If the proposed development results in an additional 15 boats on the water simultaneously the study area would remain below capacity through out the sampling period. An additional 15 boats of varied type, speed and time of use would not exceed the carrying capacity of the study area.





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Legend

Study Boundaries

- Study Area
- Useable Surface Area - 23.4 Ha (57.9 Ac)
- Observation Line
- Boat Study View Point
- Boat Launch - Government Dock

Orthorectified aerial photo - n.d.

Scale	RS Project No.	Date Last Updated	By
1:7,500	2021-173	Jan 26, 2022	JG

0 110 220 Metres

RiverStone Environmental Solutions Inc.

Disclaimers:

- the scale text on this figure (e.g., 1:1000) is based on a 11x17" print. If this figure has been printed on a different page size, then only the scale bar is accurate.
- figure should not be used in place of a professional survey

Figure 1. Location Of Study Area
Head Lake - Boating Capacity Study (77 Wallings Road, Haliburton)

Prepared for: Eugene Shcolyar

Inset: General Location Of Study Area

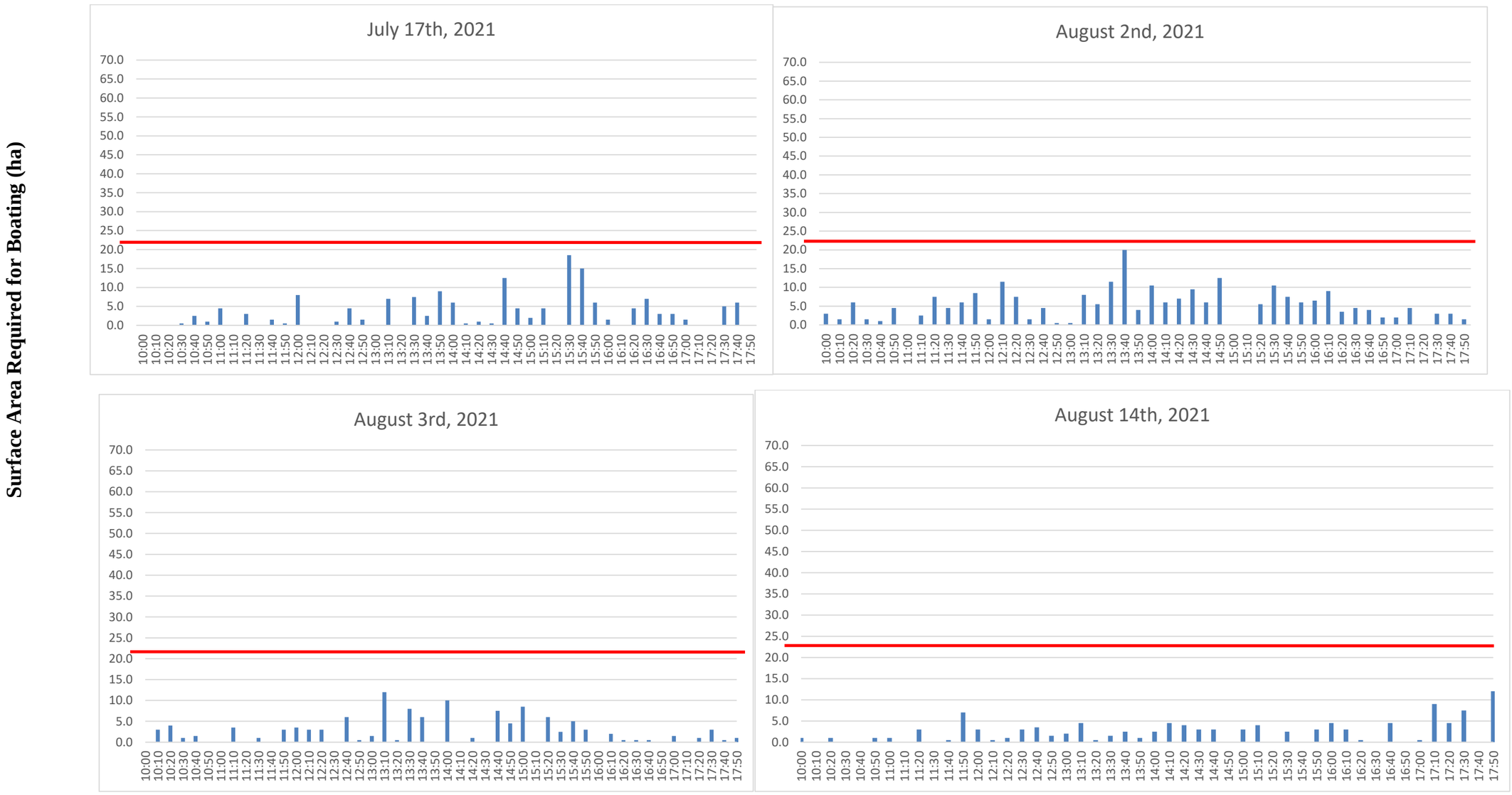

Figure 2. Boating impact assessment for the study area, Head Lake, Haliburton. Red line indicates useable lake surface area (23.4 ha).

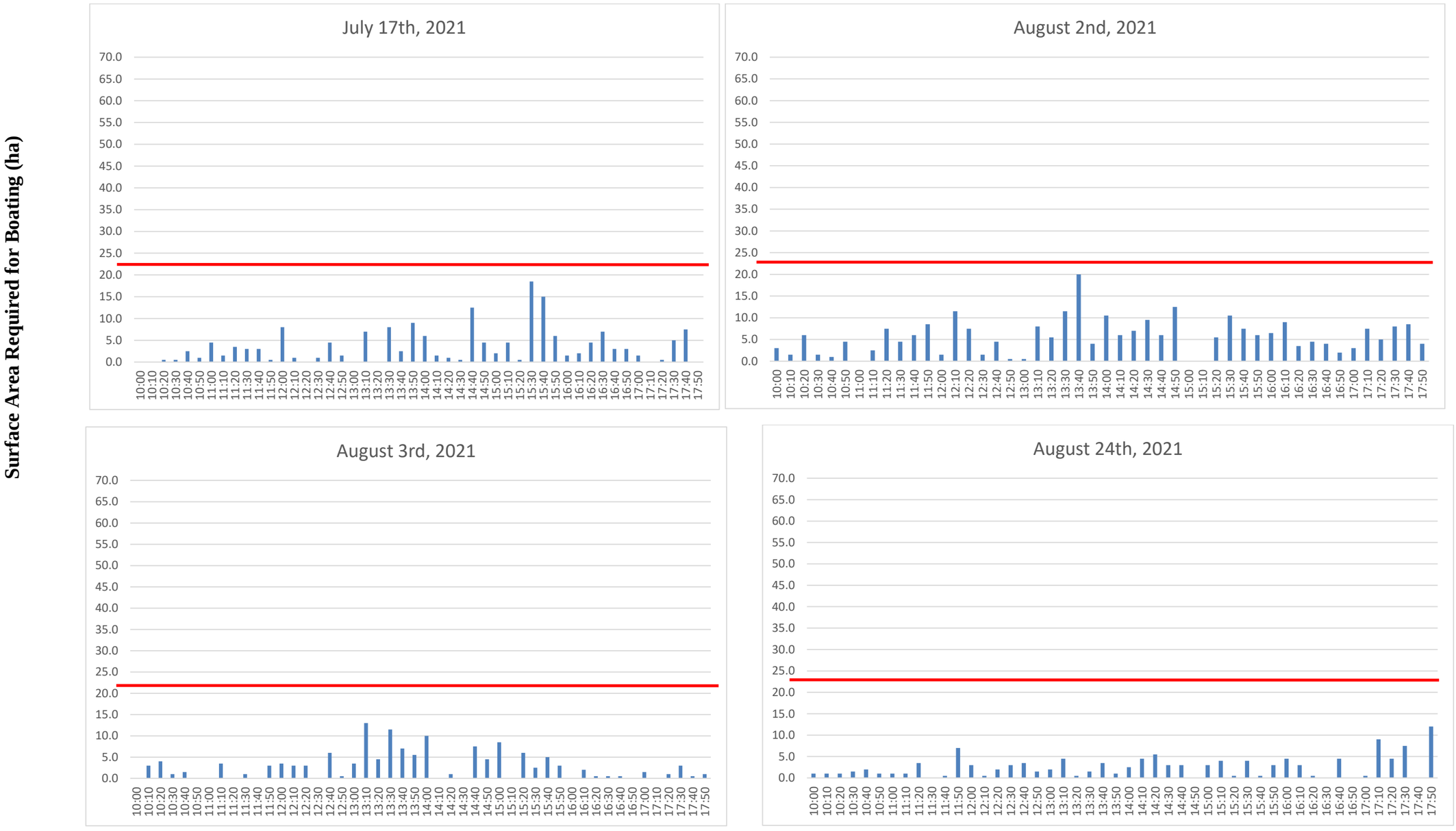

Figure 3. Boating impact assessment with additional 15 boats added to simulate additional traffic that may occur because of the development, Head Lake, Haliburton. Red line indicates useable lake surface area (23.4 ha).

APPENDIX 1: Boat Type Definitions

Personal Watercraft – is a recreational; watercraft that the rider sits or stands on. Models have an inboard engine driving a pump jet to create propulsion.

Skiff- a small runabout boat typically between 10' and 18' with a tiller motor and holds between 1 and 6 people.

Bow Rider – a type of runabout boat with an open bow area where there are extra seats in front of the help station. Bow riders are typically between 17' and 30', use stern drive or outboard engines, and hold between six and ten people.

Skiboat – ski boat is a boat specifically designed to safely tow one or more water skiers, with the engine usually positioned in the midsection of the boat. Wakeboard boats are considered the same class of boat.

Pontoon/Deck Boat – typically floats and balances by means of two pontoons mounted lengthwise and has seating for up to 10-12 people

Houseboat – a boat that has been designed or modified to be used primarily as a human swelling, having sleeping and cooking facilities

Cruiser – the size of the typical cruising boat is currently in the range of 10 to 15 meters, and generally has a cabin(s) for sleeping to allow multiple day trips on the water

Saiboats/windsurfers – small boats powered only by wind

Paddle/oar powered boats – these include canoes, kayaks, rowing skull where movement is generated by paddles or oars