# Assessing recreational angling in Algonquin Provincial Park

**Technical Report TR-35**

Science and Research Branch

Ministry of Natural Resources and Forestry

Ontario

Science and Research Technical Report TR-35

# Assessing recreational angling in Algonquin Provincial Park

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# Summary

Algonquin Provincial Park has long been viewed as a destination for recreational anglers, particularly for those targeting brook trout (*Salvelinus fontinalis*) and lake trout (*Salvelinus namaycush*). We used 2014 to 2018 data from the park's camping reservation system in combination with voluntary angler survey information to examine patterns of angler activity in the park in space and time. The proportion of camping parties intending to fish was highest in spring (April and May), declining during the summer months (June to August). Camping reservation data also revealed a seasonal transition in target species by anglers, from exclusively trout in the spring to include bass and other species in the summer when the fishing seasons for other species opened. Of the total number of angling parties from 2016 to 2018, 67% were backcountry angling parties while 33% were campground angling parties. Most backcountry trout angling trips started from a limited number of access points. The spatial distribution and intensity (rod hours per day of angling) of backcountry trout and bass angling parties are described. Angler survey data demonstrated greater average fishing effort by campground anglers (3.3 average rod hours per angling day) compared to backcountry anglers (2.9 average rod hours per angling day). In contrast, average trout catch rates were higher amongst backcountry anglers than amongst campground anglers. From 2016 to 2018, average backcountry trout angler catch per unit effort (CUE) was 0.27 fish per rod hour while average campground trout angler CUE was 0.11. Average bass catch rates were also higher among backcountry anglers than campground anglers. From 2016 to 2018, backcountry bass angler CUE was 1.14 fish per rod hour while average campground bass angler CUE was 0.33. Trout release rates of about 60% remained consistent with rates reported from historical angler surveys conducted in the park. These findings demonstrate the value of the unique camping reservation data set in a landscape-scale context and the importance of angler engagement in fisheries monitoring via voluntary angler surveys.

# Résumé

## Évaluation de la pêche sportif dans le parc provincial Algonquin

Depuis belle lurette, le parc provincial Algonquin est une destination de choix pour les pêcheurs sportifs, surtout ceux qui taquinent l'omble de fontaine (*Salvelinus fontinalis*) et le touladi (*Salvelinus namaycush*). À partir des données recueillies par le système de réservation des terrains de camping du parc pour les années 2014 à 2018 et des réponses à des sondages menés auprès des pêcheurs, nous avons étudié leurs activités dans le parc en fonction du temps et du lieu. C'est au printemps (en avril et en mai) que la proportion de séjours de pêche en camping est la plus élevée; elle diminue en été (de juin à août). Les données sur les réservations aux terrains de camping révèlent aussi une variation saisonnière des espèces ciblées par les pêcheurs; uniquement la truite au printemps, à laquelle s'ajoutent l'achigan et d'autres espèces en été, à l'ouverture de la saison de pêche pour celles-ci. Sur l'ensemble des séjours de pêche effectués de 2016 à 2018, 67 % se sont faits dans l'arrière-pays, comparativement à 33 % dans les terrains de camping. La plupart des séjours de pêche à la truite dans l'arrière-pays partaient d'un petit nombre de points d'accès. Nous décrivons la distribution spatiale et l'intensité (nombre d'heures de pêche par journée de pêche) des séjours

de pêche à la truite et à l'achigan dans l'arrière-pays. Les données des sondages menés auprès des pêcheurs montrent que le nombre moyen d'heures de pêche par jour était plus important pour les pêcheurs en camping que pour ceux de l'arrière-pays (3,3 h comparativement à 2,9 h). Au contraire, le nombre moyen de truites prises était plus élevé chez les pêcheurs de l'arrière-pays. De 2016 à 2018, la moyenne des prises par unité d'effort (PUE) chez les pêcheurs de truite de l'arrière-pays était de 0,27 poisson par heure de pêche, comparativement à 0,11 pour les pêcheurs de truite des terrains de camping. En moyenne, les taux de prise d'achigans étaient aussi plus élevés chez les pêcheurs de l'arrière-pays que chez ceux des terrains de camping. De 2016 à 2018, le PUE des pêcheurs d'achigans de l'arrière-pays était de 1,14 par heure de pêche, comparativement à 0,33 pour ceux des terrains de camping. Les taux de mise en liberté (environ 60 %) sont restés constants par rapport à ceux de sondages antérieurs menés dans le parc. Ces résultats démontrent la valeur unique des données sur les réservations aux terrains de camping du parc dans le contexte du territoire dans son ensemble, et l'importance de la participation des pêcheurs à la surveillance des pêches par des sondages.

# Acknowledgements

The authors acknowledge the Algonquin Park anglers who have participated in angling surveys in the park as well as those who will participate in future surveys. The Algonquin Park Angling Survey information is critical to understanding the park's recreational fishery. We thank Ontario Parks, the camping reservation service provider, and all the Algonquin Park permit office staff who supported the implementation of this project. Thank you to the many summer contract staff who helped to collect and enter survey data as well as the Algonquin Fisheries Assessment Unit staff who provided early angling survey data and implemented previous angling survey programs in the park. We also thank Lisa Buse, Justin Trumpickas, Mike Parna, Paul Gelok, and Kyla Standeven for their editing contributions to this report.

# Contents

# Introduction

Since its inception, Algonquin Provincial Park (hereafter referred to as Algonquin Park) has been a destination for experienced and first-time anglers alike. A 1916 Grand Trunk Railway advertisement reads:

> "The land of fishing thrills. A sportsman's paradise where the cool waters of wild, unspoiled lakes and rivers give the salmon [lake trout] and speckled trout [brook trout] and gamy black bass fighting qualities to delight the most ardent angler, making Algonquin Park (Ontario) a vacation territory to dream about."

With over 1,300 lakes, 3,700 kilometres of rivers and streams, and abundant remote backcountry wilderness, each year the park welcomes thousands of visitors hoping to catch an Algonquin Park fish. Sixty species of fish have been detected in the park, some of which were introduced in past decades (Ridgway et al. 2017). Natural populations of brook trout (*Salvelinus fontinalis*) and lake trout (*Salvelinus namaycush*), the primary species of interest for many Algonquin Park anglers, are dispersed throughout hundreds of lakes with brook trout also present in many river and stream systems. While this natural distribution is the result of post-glacial fish movements, during the early to mid-twentieth century the distribution of trout and other species such as smallmouth bass (*Micropterus dolomieu)* expanded by way of authorized and unauthorized introductions (Mitchell et al. 2017). *Put-grow-take* stocking of brook trout and splake (a hybrid between brook trout and lake trout) continues to the present day primarily to divert angling effort from natural populations and provide accessible trout opportunities in high-use areas such as the Highway 60 corridor. Overall, recreational angling has played a major role in Algonquin Park's history and related park management decisions.

Fishing seasons and daily harvest limits are two general approaches for managing recreational fisheries. Currently, recreational angling in the park is restricted to between the fourth Saturday in April and November 30 each year, with various sport fishing seasons falling within this period. Since 1989, trout and bass limits have remained consistent in Algonquin Park, including both species specific and aggregate daily harvest limits (Mitchell et al. 2017 and Appendix 1). Aggregate limits refer to a combined total harvest of two or more species while not exceeding individual species limits.

During the recreational angling season, anglers are drawn to Algonquin Park, with many planning an overnight trip in the park's backcountry or a stay at a developed campground facility. Visitors looking to hike and canoe into the backcountry can choose from a variety of camping experiences including canoe camping, backpacking, or a stay in a historic ranger cabin. Algonquin Park boasts over 2,000 kilometres of canoe routes and 3 backpacking trails with loop routes ranging from 6 to 88 kilometres long. Access to Algonquin Park's interior is controlled through designated entry points (Figure 1, Appendix 2), with camping permits issued at 19 offices in and around the park (Figure 2).

Since 1999, Ontario Parks has provided park visitors with camping reservation services through a centralized digital reservation system. This system is used to record information about camping parties including camping locations, dates of stay, and party size. Over 400 backcountry camping locations (Figure 3) are reservable, with individual campsites available on a first come-first serve basis. Visitors reserve a camping location for each night of their trip and can otherwise travel through the interior as they please. The number of backcountry permits granted for a given camping location is tracked in the reservation system to ensure daily campsite availability is not exceeded. On average, from 2014 to 2018 over 24,000 backcountry camping parties visited Algonquin Park each year, with 10% using the backpacking routes. The park also offers visitors a variety of front country camping experiences at 12 vehicle-accessible campgrounds (Figure 3). From 2016 to 2018, on average, over 35,000 parties used these campgrounds each year.

Since 1936, the Lake Opeongo access point angler survey has captured information about recreational angling and the demographics of the fishery on Algonquin Park's largest lake. While this survey provides valuable and detailed insights into the status and population dynamics of lake trout and smallmouth bass in Lake Opeongo, it is not designed to offer insights at landscape scale. To understand park-wide angler behaviour as well as effort and harvest levels, a cost effective and more expansive method was needed. Modifications to the park's camping reservation (CR) system provided information about park visitors' angling intentions, while targeted voluntary angler surveys provided information on waterbody-specific effort and harvest. Here, we focus on the development and implementation of these two interlinked initiatives and summarize the 2014 to 2018 results.

The temporal and spatial dynamics of fishing effort and harvest affect landscape scale fisheries management (Hunt et al. 2007). The ability to combine angler survey data with spatially explicit camping itineraries from the CR system provides a data set unique to Algonquin Park. This data set reveals previously unknown spatial and temporal angling trends in the park that can be used to inform planning for sustainable fisheries management.

In this report we describe Algonquin Park's recreational angling at landscape scale. We demonstrate the value of the CR system and angler engagement via voluntary angler surveys to support informed fisheries management in the park. With threats such as climate warming and invasive species affecting natural trout populations across Ontario, Algonquin Park's protected aquatic landscape is important for sustaining cold water fish such as brook trout and lake trout and the recreational fisheries they support.

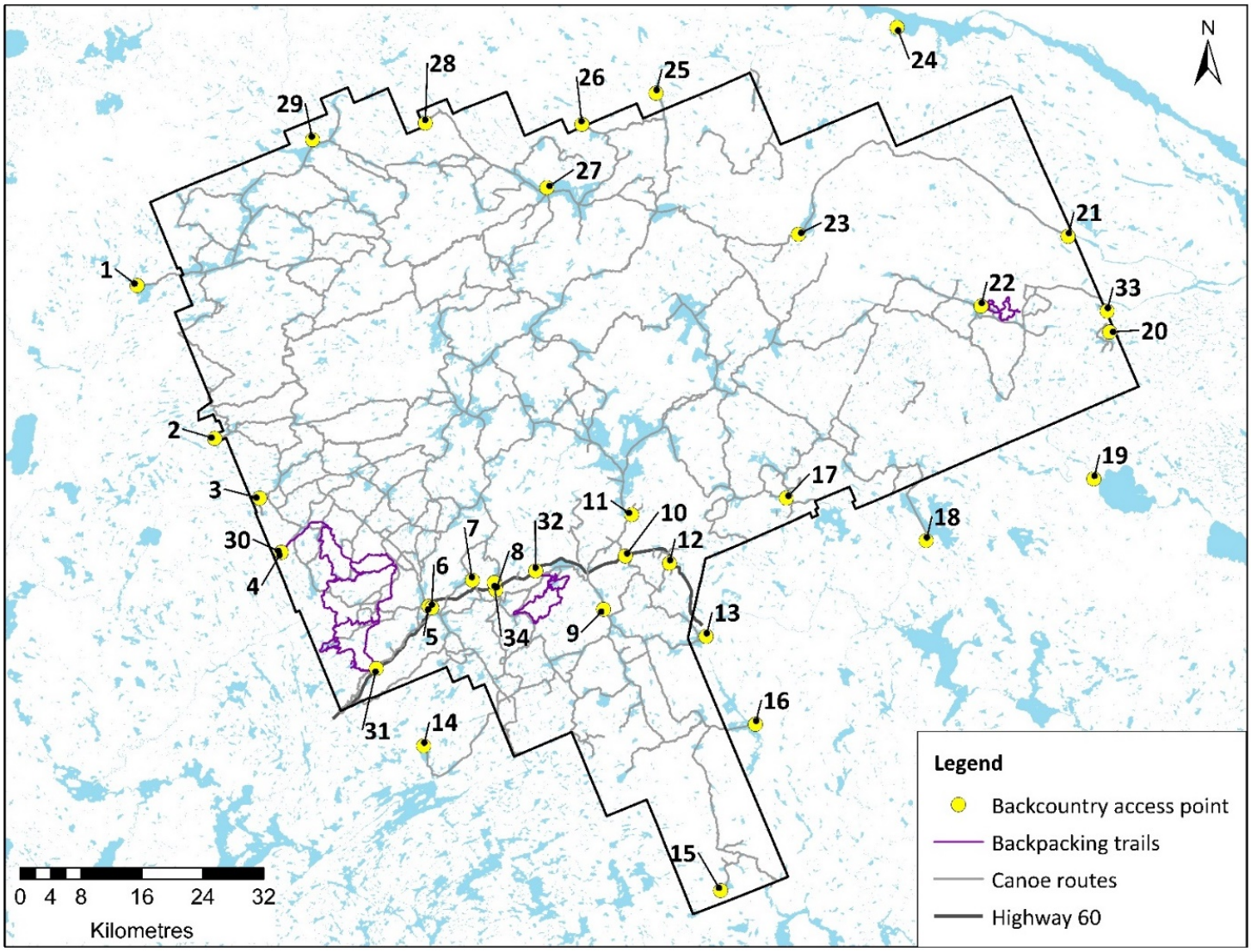


**Figure 1.** Algonquin Provincial Park boundary, canoe routes, backpacking trails, and backcountry access points. A full list of access point names corresponding to the number labels is available in Appendix 2.

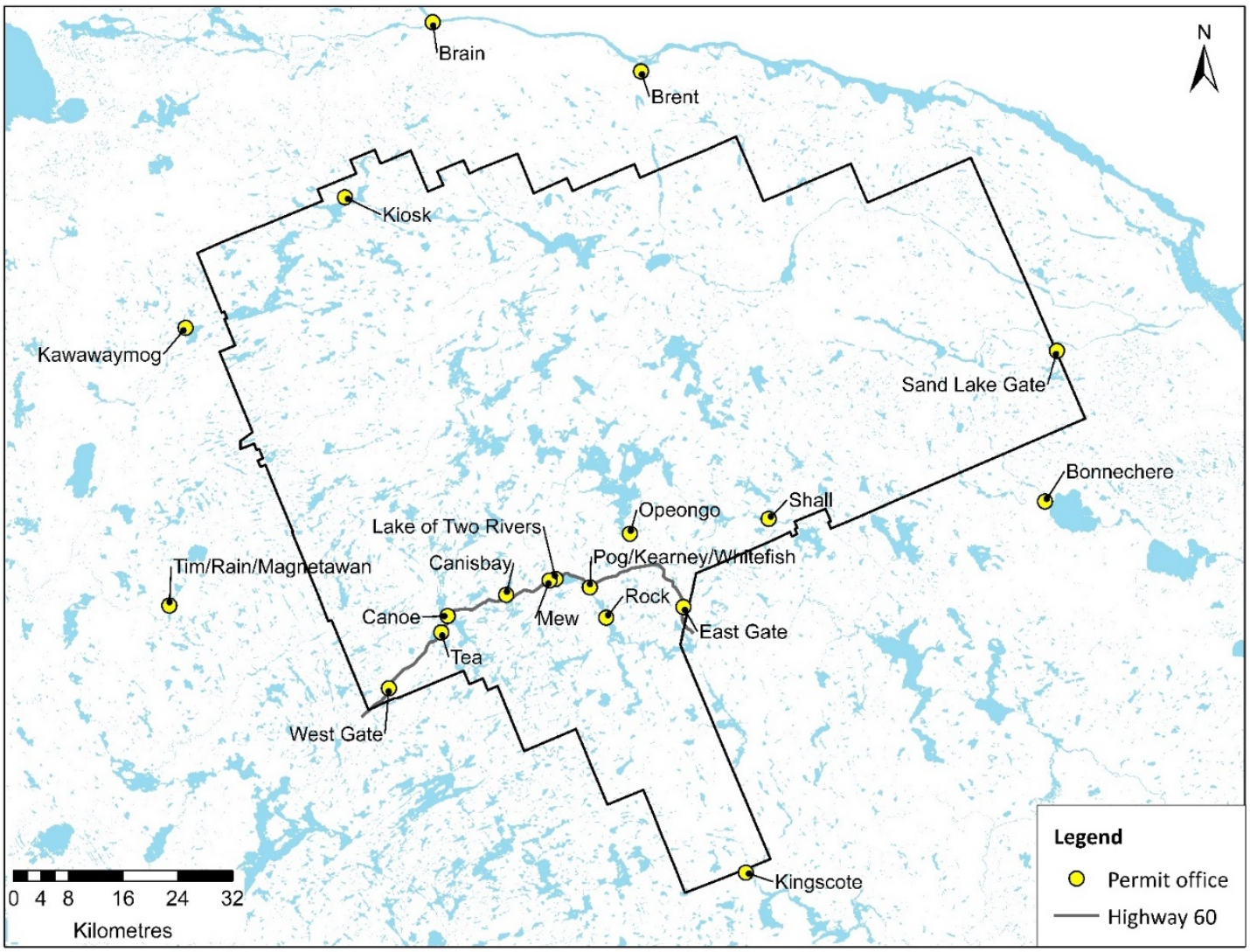


**Figure 2.** Locations where Algonquin Provincial Park permits can be obtained in relation to the park boundary and Highway 60.

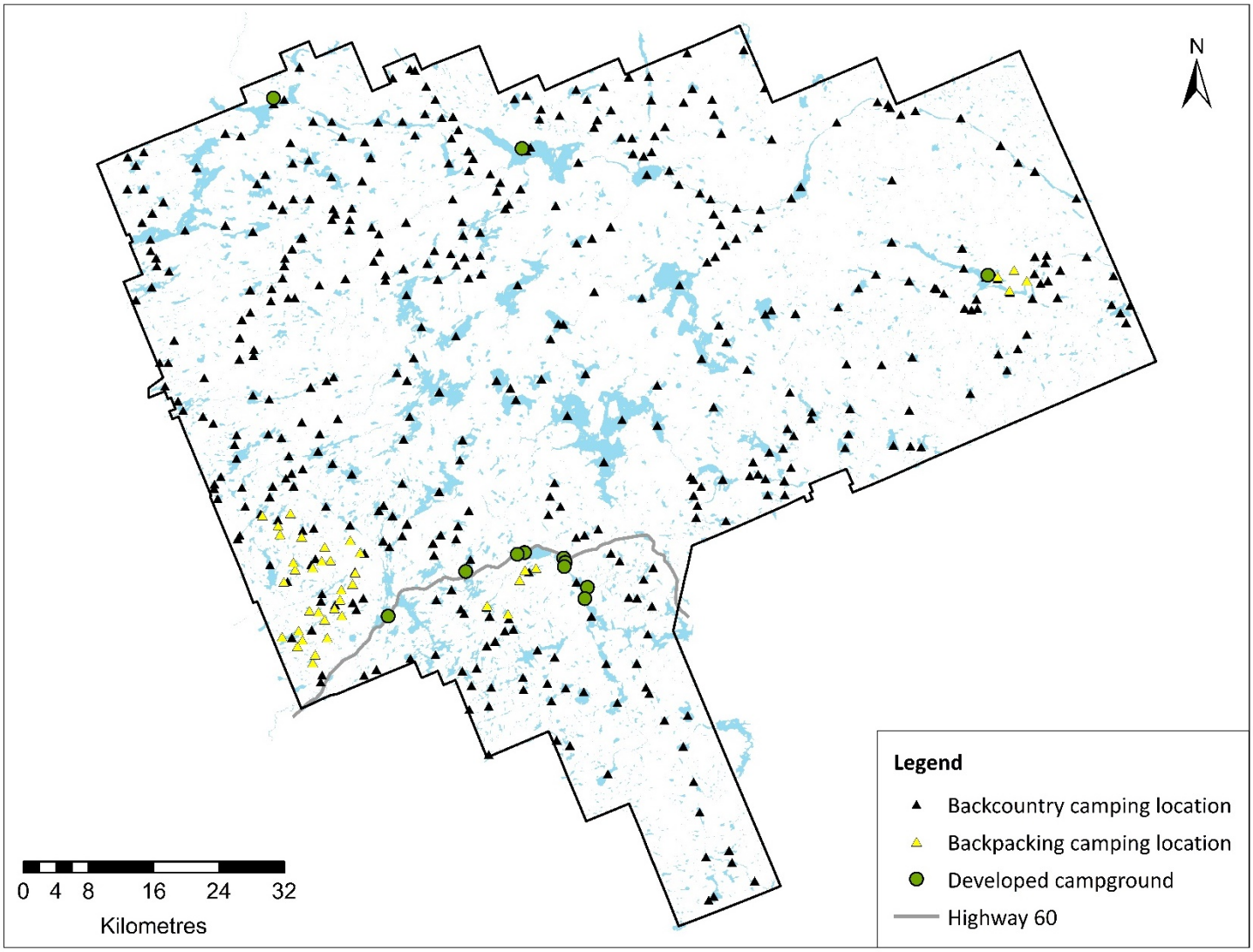


**Figure 3.** Algonquin Provincial Park backcountry camping and developed campground locations. Backcountry camping locations may represent multiple individual campsites. The number of campsites per camping location varies from lake to lake and along different rivers.

# Algonquin Park Angling Survey

Angling surveys have supported fisheries management in Algonquin Park for more than 80 years. Throughout this time, the Lake Opeongo angler survey has provided information about the lake trout and smallmouth bass fishery of that lake. The development and implementation of historical and modern-day Algonquin Park angling surveys from 1936 to 2013 are outlined in Appendix 3. Below we describe the development of the current Algonquin Park Angling Survey (2014 to present) as it relates to the CR system.

Beginning in the late 1990s, the Algonquin Fisheries Assessment Unit (AFAU) initiated a park-wide angling survey used to gather information about fishing activity, catch, and harvest in the Algonquin Park backcountry (Appendix 3). Beginning in the 2014 camping season, through collaboration between Ontario Parks, AFAU staff, and the reservation service provider (RSP), Algonquin Park's reservation system was modified to collect additional angling-related information. During the 2014 season, all backcountry camping parties registering for a permit were asked the following question by permit office staff: "Is anyone in your party angling for trout?" The party's response was recorded in the CR system as *Yes*, *No*, or, if the party did not wish to respond, *Refused*. All parties that responded *Yes* were given an angling survey package. Instructions in the package directed the angling party to record the reservation number printed on their camping permit or return their permit along with their completed survey form. This allowed the reported angling activity to be matched with the party's camping itinerary recorded in the CR system. These data combined provide tremendous insight into angler behaviour and movement across the Algonquin Park landscape.

Following the success of the 2014 CR system modification, AFAU and Harkness Lab staff worked with Ontario Parks and the RSP to restructure the original angling-related question for the 2015 season as follows:

1) "Will anyone in your party be fishing?" with response options of *Yes* or *No*

and, if the party responded *Yes* to question 1,

2) "What species will you be fishing for?" with response options of *Trout*, *Bass*, *Other*, or *Unsure*

Responses to these questions were recorded in the CR system for all backcountry camping parties. Parties that indicated they would be targeting trout were given a survey package.

In spring 2016, the survey was expanded to include campground angling parties as well as those targeting smallmouth and largemouth bass (*Micropterus salmoides)*. To capture activity at all 12 campgrounds in Algonquin Park, the Lake of Two Rivers, Pog Lake, and Tea Lake campground offices were added to the survey distribution locations (Figure 2), bringing the number of distribution locations to 19. These permit offices function as entrances to Algonquin Park campgrounds and backcountry access points (both canoe and backpacking), representing optimal locations to connect with anglers and promote the survey. As the in-person point of contact for camping visitors, permit office operators can deliver direct survey communication

and effectively determine a party's eligibility to participate. In 2016, all angling parties that indicated they would be targeting trout or bass received a survey package. The 2017 and 2018 surveys operated under the same protocols as used in 2016 (Figure 4).

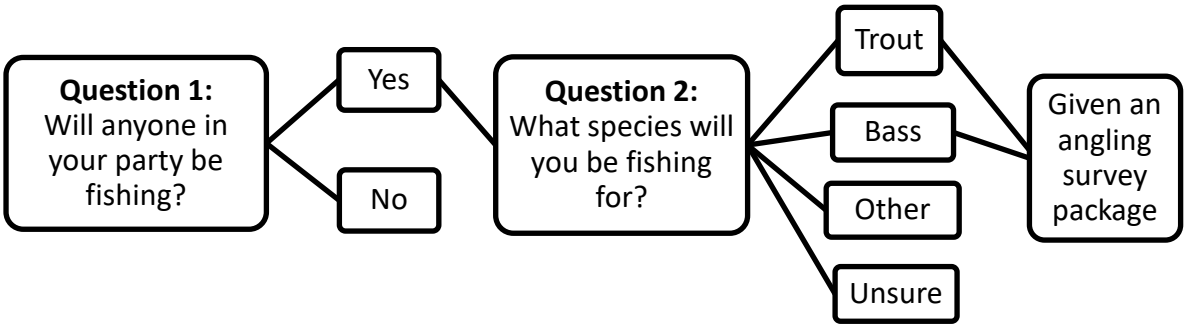


**Figure 4.** The angling-specific question process used by Algonquin Provincial Park permit office staff when registering backcountry and campground parties for a camping permit from 2016 to 2018. Responses to each question were recorded in the park's camping reservation system.

Although the distribution of the modern park-wide angling survey evolved, the information collected remained relatively consistent. Appendix 4 shows the survey form that was distributed to angling parties in 2019 along with a pencil, measuring tape, instruction sheet, and postage-paid envelope. Note that anglers were also directed to indicate their target species on the survey form. Parties that answered both trout and bass as their target species were classified as Unsure. If a party recorded a different species on the survey form than that which they indicated to permit office staff, they were also classified as Unsure. The accompanying instruction sheet (Appendix 5) explains the importance of angler participation and the data they provide, describes how to properly fill out the survey form and accurately measure fish length, and includes reference images to assist with bass species identification.

At the end of each camping season, angling survey data was manually entered into a Microsoft Access database. Annual exports of CR data containing camping itinerary information and angling question responses for all camping parties were also added to the database. Most of the park permit offices used the electronic CR system but, due to computer network limitations, 4 offices (Shall Lake, Kingscote Lake, Kawawaymog Lake, and Brain Lake; Figure 2) relied on a manual permitting system. The same angling-specific question(s) were asked of all camping parties, but responses were recorded on paper. Records from these offices were manually added to the Access database each year.

# Patterns in angler activity

Camping reservation data showed that, although visitors are drawn to Algonquin Park for a variety of reasons, many camping parties planned to include angling as one of their park activities. On average, from 2014 to 2018 about 24,000 parties visited the backcountry each year. Of these parties, about 7,000 (30%) indicated they would be angling. For campground visitors, the proportion of those indicating they would be angling was lower at about 4,000

(12%) of the close to 35,000 total campground parties per year. These results highlight that Algonquin Park attracts visitors with a variety of outdoor interests, including angling.

Many factors may account for year-to-year differences in angling party visitation, including date of ice-out, weather patterns, and social and economic influences. For example, the start date of Algonquin Park's backcountry camping season varied from 2014 to 2018 due to differences in ice-out dates. While the official trout angling season start date of the fourth Saturday in April remained constant, varying backcountry access openings resulted in minor differences in backcountry angling season duration per year (Table 1).

**Table 1.** Algonquin Provincial Park backcountry angling season start and end dates from 2014 to 2018. For this study, the backcountry angling season start date was considered the first date after the fourth Saturday in April that a backcountry camping trip was recorded in the CR system.

| Year | Backcountry angling season start date | Backcountry angling season end date | Total annual backcountry angling season days |
|---|---|---|---|
| 2014 | May 2 | November 30 | 152 |
| 2015 | April 30 | November 30 | 154 |
| 2016 | April 25 | November 30 | 159 |
| 2017 | April 28 | November 30 | 156 |
| 2018 | May 7 | November 30 | 147 |

The annual number of parties that visited Algonquin Park from 2014 to 2018 categorized by camping type and target species is shown in Figure 5. Anglers targeting bass were first identified in the CR system in 2015 and angling information was first recorded for campground parties in 2016. The CR data revealed most angling parties were targeting trout or bass. Between 2015 and 2018, an average of 37% of backcountry angling parties were unsure of their target species (33%) or were targeting other species (4%). A similar pattern was observed in campground anglers, with an average of 36% of parties unsure of their target species (33%) or targeting species other than trout or bass (3%) between 2016 and 2018. On average each year, parties targeting trout in the backcountry represented the largest group of anglers (>3,100 parties annually). While Algonquin Park is a destination for a range of outdoor enthusiasts, the park's world class trout fisheries remain a major attraction for the angling community.

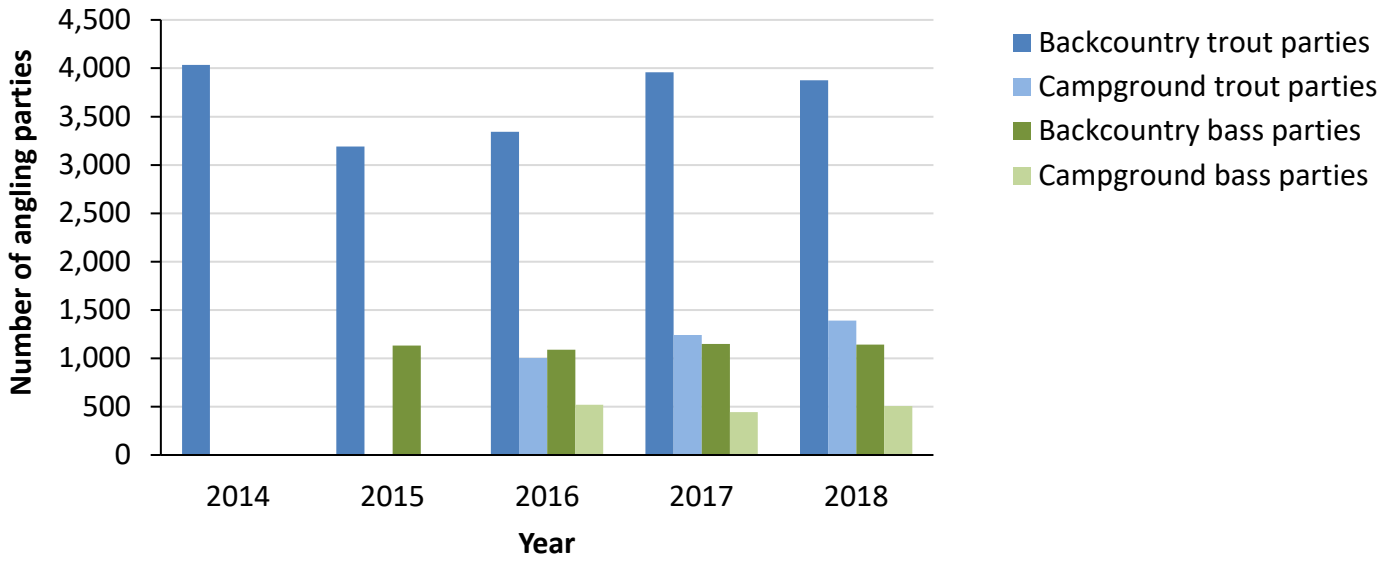


**Figure 5.** Total number of backcountry and campground angling parties targeting trout or bass in Algonquin Provincial Park from 2014 to 2018. (Note: Anglers targeting bass were first identified in the park's camping reservation system in 2015 and angling information was first recorded for campground parties in 2016, hence the missing bars.)

Monthly patterns in angling activity are apparent during the recreational fishing season. For 2015 to 2018 combined, the average number of parties per month entering the backcountry varied across the open water camping season, consistently peaking in August (figures 6 and 7). At certain times during the spring months (April and May), most of the parties camping in the backcountry were angling for trout, however, on average, the spring showed relatively equal proportions of non-angling parties and trout angling parties entering the backcountry. The proportion of non-angling parties increased into the summer months. The diversity of responses for target species amongst angling parties also increased as angling opportunities for bass and other species became available with the onset of their respective angling seasons. Once lake trout and brook trout angling seasons ended on September 30, remaining trout angling parties were likely targeting stocked splake waters while non-trout anglers focused on bass and other species until the end of the backcountry open water season.

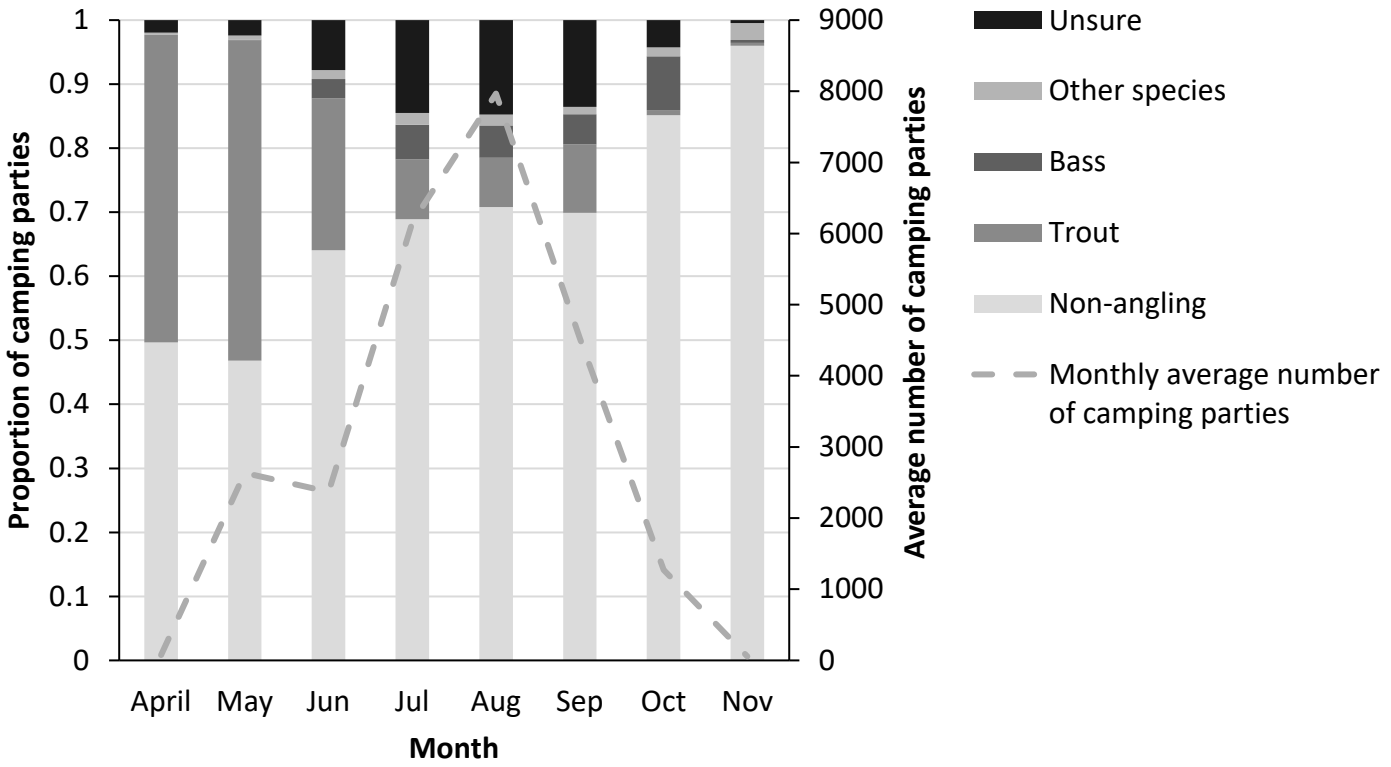


**Figure 6.** Average monthly proportion of backcountry camping parties in each angling target category and average monthly total camping parties in Algonquin Provincial Park, 2015 to 2018 combined.

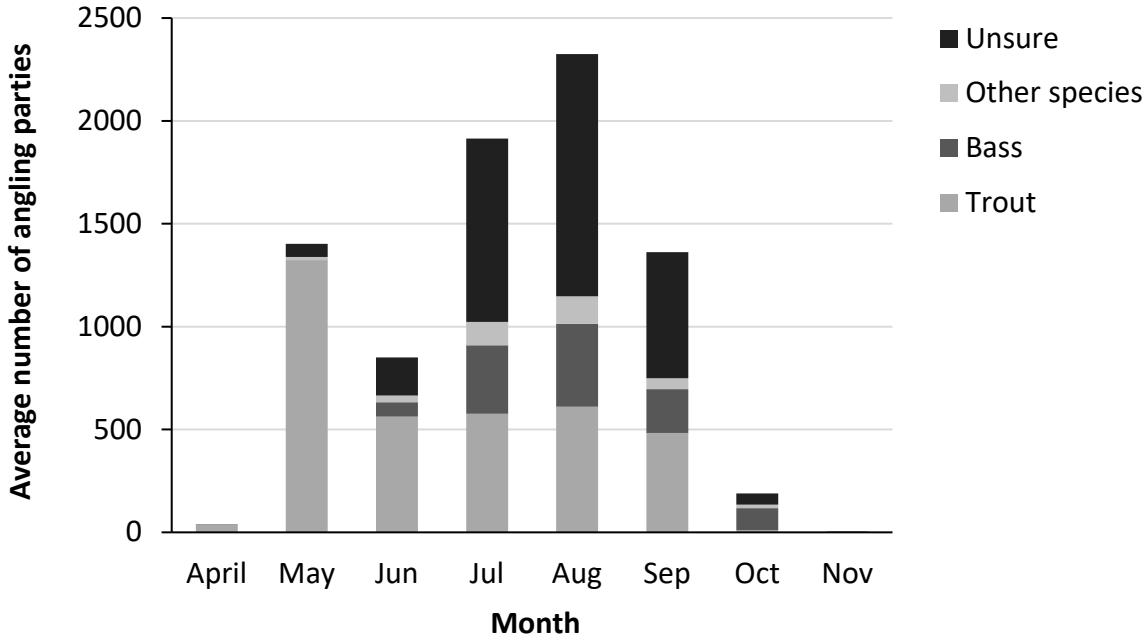


**Figure 7.** Average monthly total backcountry angling parties in each angling target category in Algonquin Provincial Park, 2015 to 2018 combined.

The CR system also provides information about trip duration based on camping party itineraries. The distribution of trip lengths for backcountry and campground angling parties for 2016 and 2018 combined is provided in Figure 8. Campground parties spent the most consecutive nights on a given trip in Algonquin Park. Overall, backcountry and campground angling parties had average trip lengths of 3 and 4 days, respectively. The longest backcountry trip was 23 days covering over 90 kilometres and 9 different camping locations along the Nipissing River.

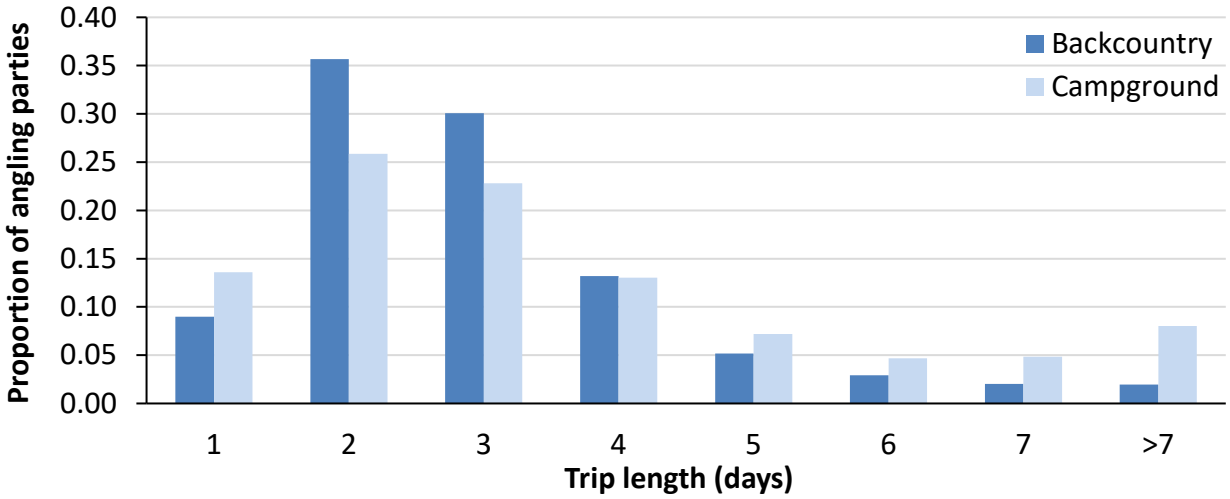


**Figure 8.** Distribution of camping trip duration (days) for backcountry and campground angling parties in Algonquin Provincial Park, 2016 to 2018 combined. Data are based on the trip dates recorded in the park's camping reservation system. (n= 25,572 and 12,480 backcountry and campground angling parties, respectively)

The spatial nature of Algonquin Park's recreational fishery can be demonstrated by analyzing backcountry access point and campground use as well as backcountry trip itinerary information. The park has 34 backcountry access points (Figure 2, Appendix 2). Most trout angling visitors began their camping trips from access points along the Highway 60 corridor (Lake Opeongo, Rock Lake, Smoke Lake, Canoe Lake) or the western access points (Magnetewan Lake, Tim Lake, Rain Lake, Kawawaymog Lake) (figures 9 and 1). Most access points were the starting places for trips of fewer than 200 backcountry angler parties each year.

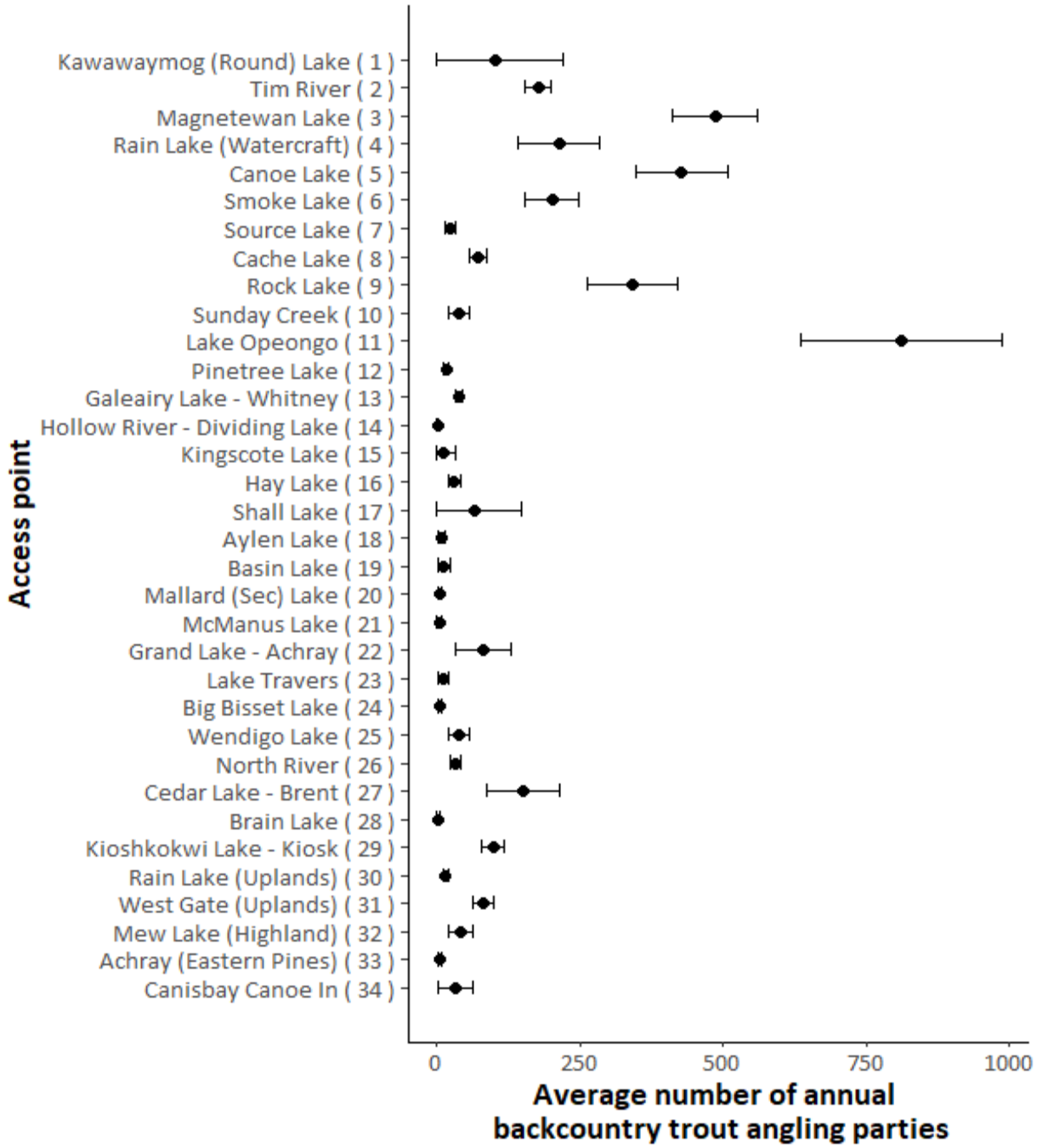


**Figure 9.** Average number (dots) of annual backcountry trout angling parties in Algonquin Provincial Park by access point, 2014 to 2018 combined with 95% confidence intervals (bars).

Itineraries recorded in the CR system provide further insight into the distribution of anglers across the park landscape. Figure 10 shows the average annual number of nights that backcountry trout angling parties spent at Algonquin Park's backcountry camping locations, 2014 to 2018 combined. Note that closures to public camping beginning in September 2014 on Dickson Lake and parts of Lake Lavieille due to a blue-green algae bloom may have limited angling party activity on these waterbodies.

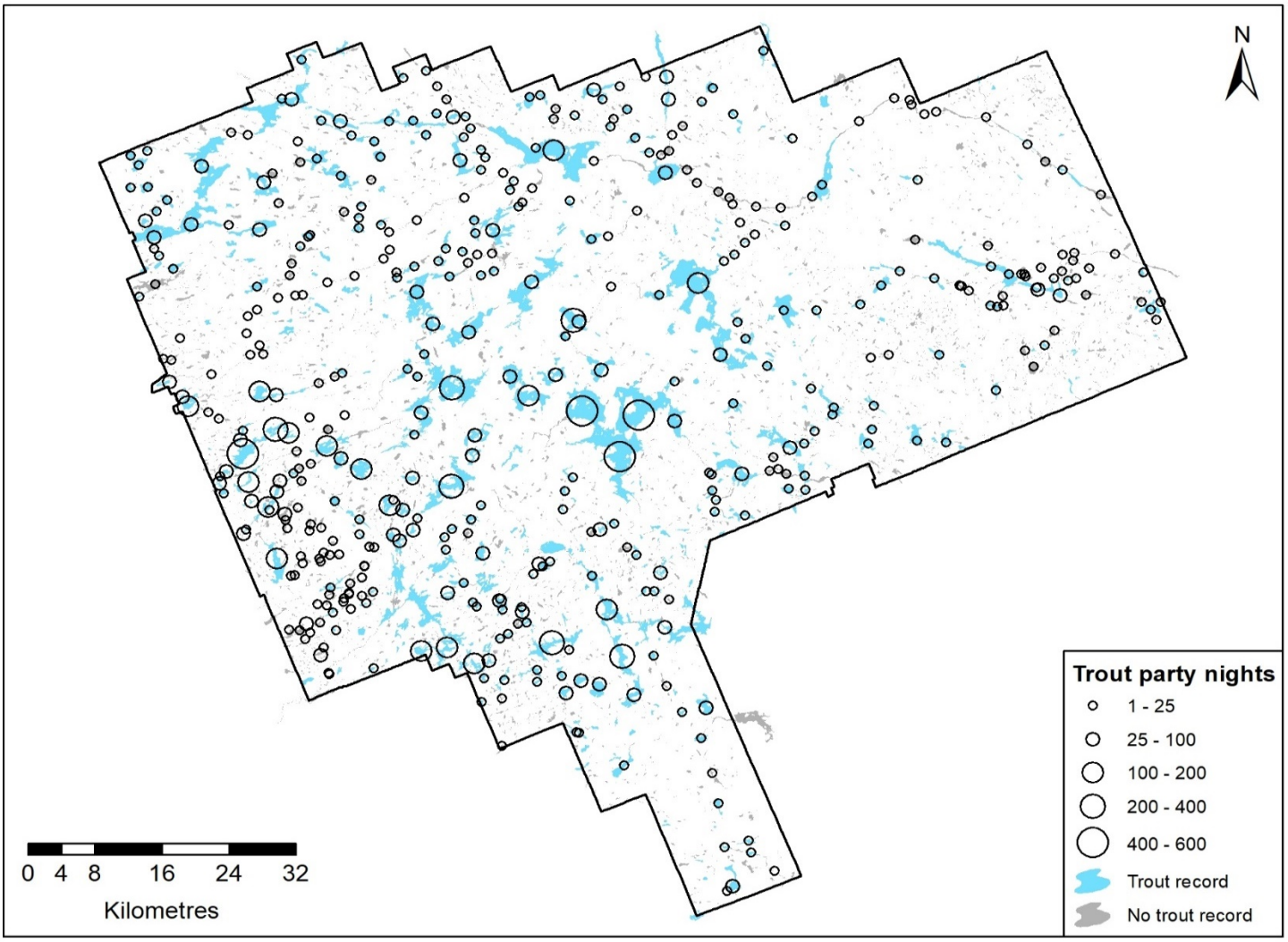


**Figure 10.** Annual average number of nights backcountry trout angling parties spent at Algonquin Provincial Park backcountry camping locations, 2014 to 2018 combined. The larger the circle, the more nights that backcountry trout angling parties camped at the location. Lakes with at least 1 record of trout occurrence are shown in blue.

Figure 11 shows the same information for backcountry bass angling parties, 2015 to 2018 combined. Many of the circles in Figure 11 likely represent bass angling parties that moved among known bass lakes using backcountry canoe routes. They may or may not have fished for bass during this movement. It is possible that limited campsite availability on popular known bass lakes may have resulted in anglers having to camp on adjacent non-bass lakes. That said, angling survey results suggested that some anglers may not know about the presence or absence of bass in backcountry lakes where they may have targeted bass. Big Porcupine Lake and Pen Lake are examples of this phenomenon. Based on angling survey responses, both lakes rank in the top 10 lakes for targeted bass fishing effort. Pen Lake also ranks in the top 10 lakes where bass angling parties spent the greatest average annual number of nights. Big Porcupine and Pen lakes do not appear to contain bass; however, nearby lakes such as Ragged Lake and Rock Lake do. These 2 lakes are encountered before reaching Big Porcupine and Pen Lake, respectively, so bass anglers may assume that bass presence extends into these lakes.

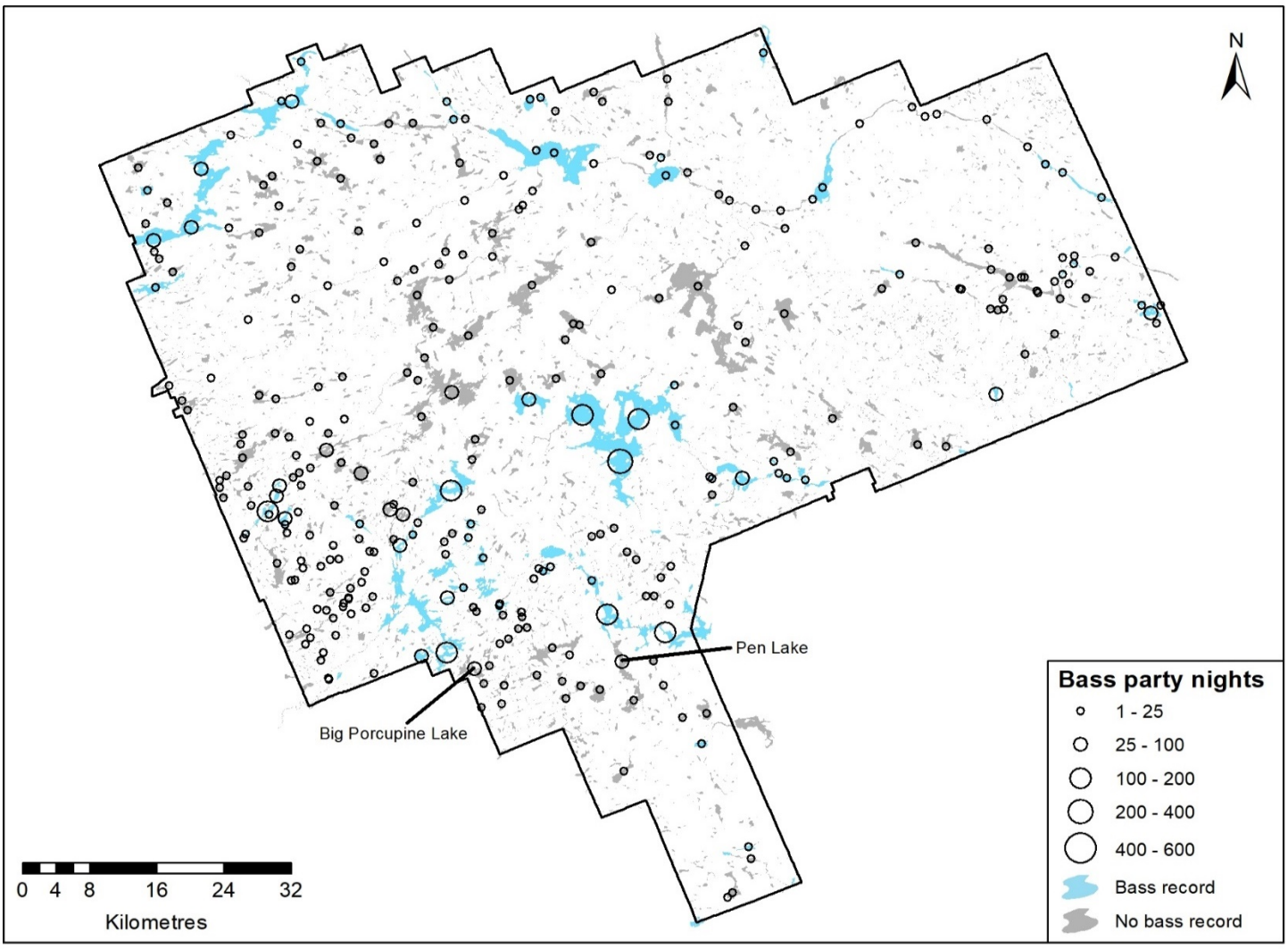


**Figure 11.** Annual average number of nights backcountry bass angling parties spent at Algonquin Provincial Park backcountry camping locations, 2015 to 2018 combined. The larger the circle, the more nights backcountry bass angling parties camped at the location. Lakes with at least 1 record of bass occurrence are shown in blue.

Spatial variability in the distribution of angling effort is suggested by figures 10 and 11, however, angling party nights (nights spent by an angling party at a given camping location) do not necessarily represent angling effort (rod hours). Based on the most recent species records, some angling party nights were spent on lakes that are not known to contain the desired target species. An unknown portion of angling parties may not have fished for their desired target species at these locations. This is especially true for bass, as most backcountry lakes do not contain smallmouth or largemouth bass.

Table 2 shows the top 10 lakes where backcountry trout angling parties spent the most nights, 2014 to 2018 combined. Lake Opeongo, the largest lake in the park with the most campsites for a single lake, far surpasses all other backcountry camping locations with its 3 arms and Annie Bay supporting a cumulative annual average of over 1,400 trout angling party nights (Table 2). This accounts for 12% of the average annual backcountry trout angling party nights spent in the

park. Ralph Bice Lake was next with an annual average of 538 trout angling party nights, followed by Burnt Island, Pen, Big Trout, Louisa, Little Trout, and Big Crow lakes as the only other backcountry camping locations with averages of over 200 trout angling party nights per year.

**Table 2.** Algonquin Provincial Park lakes where backcountry trout angling parties spent the most nights, 2014 to 2018 combined.

| Rank | Waterbody | Average annual nights spent by trout angling parties |
|---|---|---|
| 1 | Lake Opeongo | 1,453 |
| | *South arm* | *437* |
| | *North arm* | *465* |
| | *East arm* | *502* |
| | *Annie Bay* | *49* |
| 2 | Ralph Bice Lake | 538 |
| 3 | Burnt Island Lake | 331 |
| 4 | Pen Lake | 285 |
| 5 | Big Trout Lake | 267 |
| 6 | Lake Louisa | 259 |
| 7 | Little Trout Lake | 215 |
| 8 | Big Crow Lake | 205 |
| 9 | Misty Lake | 189 |
| 10 | Tom Thomson Lake | 183 |

Lake Opeongo also had the highest annual average backcountry bass angling party nights in the period from 2015 to 2018 (Table 3). Combined, Opeongo's Annie Bay and north, south, and east arm campsites had an annual average of 676 bass angling party nights. This was followed by Ragged Lake with 209 bass angling party nights on average per year and North Tea, Rain, Galeairy, Rock, and Burnt Island lakes as the only other camping locations with annual averages of over 100 bass angling party nights.

**Table 3.** Algonquin Provincial Park lakes where backcountry bass angling parties spent the most nights on average, 2015 to 2018 combined.

| Rank | Waterbody | Average annual nights spent by bass angling parties |
|---|---|---|
| 1 | Lake Opeongo | 676 |
| | *South arm* | *274* |
| | *North arm* | *194* |
| | *East arm* | *183* |
| | *Annie Bay* | *25* |
| 2 | Ragged Lake | 209 |
| | *Ragged Lake* | *128* |
| | *Parkside Bay* | *81* |
| 3 | North Tea Lake | 140 |
| | *North Tea east* | *91* |
| | *North Tea west* | *72* |
| 4 | Rain Lake | 131 |
| 5 | Galeairy Lake | 129 |
| 6 | Rock Lake | 122 |
| 7 | Burnt Island Lake | 116 |
| 8 | Pen Lake | 81 |
| 9 | Sec Lake | 74 |
| 10 | Tom Thomson Lake | 65 |

Since 2016, the CR system has also been used to track angling party stays at Algonquin Park campgrounds. Note that, in the CR system, all Coon Lake campground stays are recorded under Rock Lake campground and all Kearney Lake and Whitefish Lake campground stays are recorded under Pog Lake campground. Results from 2016 to 2018 show that Rock Lake campground reservations accounted for 31% of the total campground trout angling party nights (1,252) on average per year. Lake of Two Rivers campground was next highest, with about 15% of average trout angling party nights (695) per year. Combined, Rock and Pog lake campgrounds accounted for 54% of the total campground bass angling party nights (over 500 each) on average per year followed by Mew Lake campground with 13% of average bass angling party nights (250) per year.

# Survey return rates and group coverage

On average, from 2014 to 2018, angling parties returned 11.3% of the surveys distributed each year with backcountry angling parties returning the majority (Table 4). Much of the increase in the number of surveys distributed after 2015 is related to expanding the survey to include campgrounds and angling parties targeting bass. While the total number of surveys distributed by each permit office is tracked annually, the number of surveys distributed to backcountry versus campground angling parties each year is unknown.

**Table 4.** Algonquin Park Angling Survey return rates from 2014 to 2018.

| Year | Total surveys distributed | Surveys returned by backcountry parties | Surveys returned by campground parties | Total surveys returned | Survey return rate (%) |
|---|---|---|---|---|---|
| 2014 | 2,292 | 260 | N/A | 260 | 11.3 |
| 2015 | 1,747 | 254 | N/A | 254 | 14.5 |
| 2016 | 4,159 | 372 | 77 | 449 | 10.8 |
| 2017 | 3,958 | 345 | 55 | 400 | 10.1 |
| 2018 | 4,831 | 371 | 91 | 462 | 9.6 |

The CR data can also be used to determine the *group coverage* for each angling group. Group coverage represents the proportion of parties from a given category that returned a survey. For example, in 2018, 371 backcountry parties returned an angling survey. Of these surveys, 216 were returned by parties targeting trout. The remaining 155 were returned by parties targeting bass and other species or by those unsure of their target species. In the same year, 3,875 backcountry trout angling parties were recorded in the CR system. Thus, the 216 surveys returned by backcountry trout angling parties represent 5.6% of all backcountry trout angling parties. This is not the direct survey return rate as some backcountry trout angling parties may not have received a survey or refused to participate. Figure 12 shows the annual group coverage achieved based on surveys returned by backcountry and campground angling parties from 2014 to 2018.

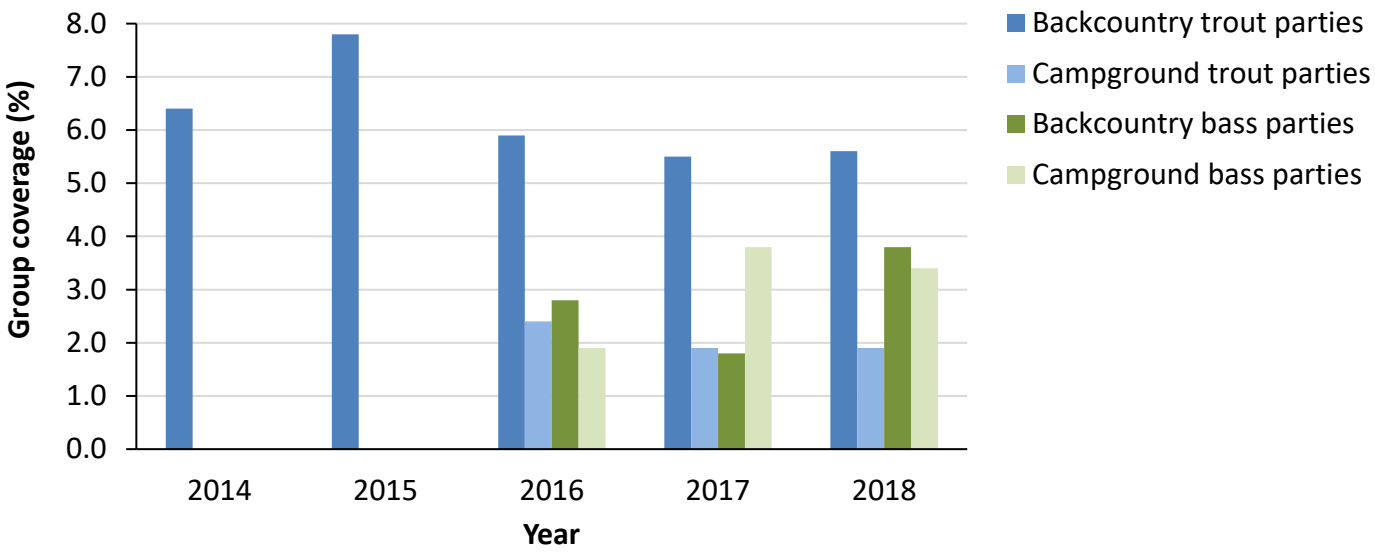


**Figure 12.** Percent group coverage of backcountry and campground target species groups in Algonquin Provincial Park based on the annual number of surveys returned by each group from 2014 to 2018. (Note: surveys were first given out to campground parties and anglers targeting bass in 2016, hence the missing bars.)

# Reported angling effort

Survey results were used to gain insight into the structure and behaviour of angling parties camping in Algonquin Park. Since only trout angling parties participated in the survey in 2014 and 2015, backcountry angling party data for these years were not included in the analysis shown in figures 13 to 15 to better represent the full backcountry and campground angling groups (i.e., inclusive of angling parties targeting all species categories).

The distribution of the number of anglers in a party was similar between backcountry and campground groups, with average party sizes of 2.4 and 2.3 anglers, respectively (Figure 12). Only 8% of backcountry angling parties and 5% of campground angling parties consisted of more than 4 anglers.

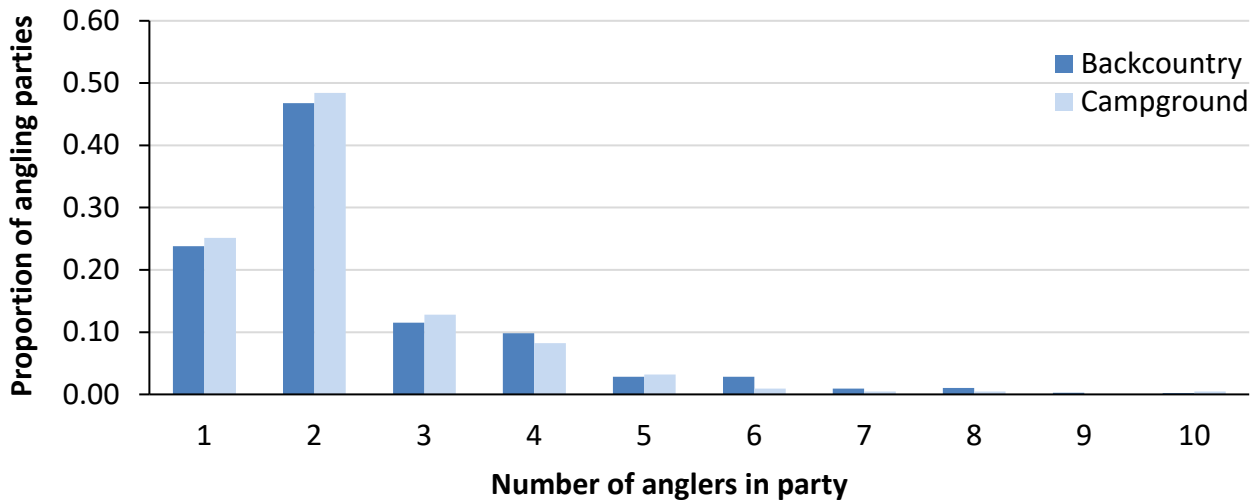


**Figure 13.** Proportion of backcountry and campground angling parties in Algonquin Provincial Park grouped by party size (anglers in party), 2016 to 2018 combined. Numbers reflect the maximum number of anglers reported per party per trip. (n= 1,067 backcountry and 219 campground angling parties)

Over half of angling parties fished only 1 lake or river (54% of backcountry angling parties and 70% of campground angling parties) (Figure 14). Only 9% of backcountry angling parties (93) fished more than 3 waterbodies during their trip. Campground angling parties fished a maximum of 6 waterbodies, with only 4.5% of parties (10) fishing more than 3 waterbodies on their trip. Of the campground parties that fished more than 3 waterbodies, 40% fished at least 1 stocked lake.

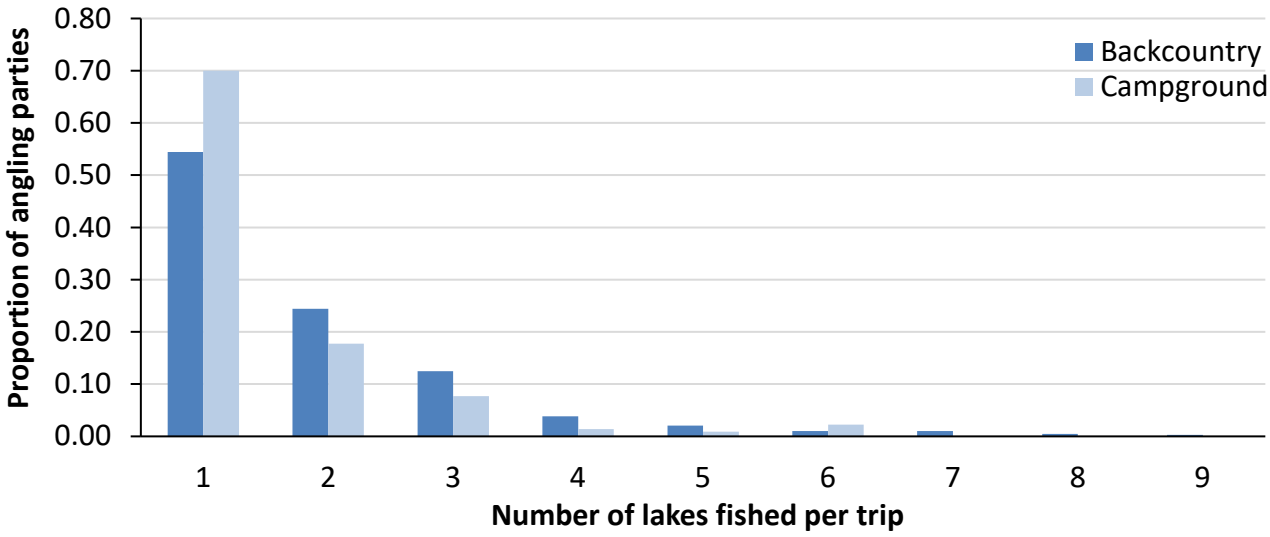


**Figure 14**. Proportion of backcountry and campground angling parties in Algonquin Provincial Park that fished from 1 to 9 different waterbodies on their trip, 2016 to 2018 combined. (n= 1,074 backcountry and 220 campground angling parties)

The voluntary Algonquin Park Angling Survey also provides information for calculating angler effort for each party. Average rod hours per angler per day were calculated for each reported

angling day by dividing the total number of rod hours reported per party per day by the maximum number of anglers reported on the corresponding day. These values were then averaged for each party (see equation below).

$$\frac{Sum(Total\ number\ of\ rod\ hrs/Maximum\ number\ of\ anglers)}{Number\ of\ angling\ days} = Average\ rod\ hours\ per\ angler\ per\ day$$

For example, a party reported angling activity for 2 days. The party reported 1 angler fishing for 4 hours on the first day and 2 anglers fishing for 2 hours on the second day. These reports convert into 4 rod hours per angler on day 1 and 2 hours per angler on day 2. These values are then added together to a total of 6 rod hours per angler and divided by the 2 angling days, resulting in an average of 3 rod hours per angler per day.

For 2016 to 2018 combined, backcountry anglers spent an average of 2.9 hours angling per day while campground anglers spent an average of 3.3 rod hours per day (Figure 15). Twenty-three per cent of backcountry angling parties spent at least 4 rod hours per angler per day while 36% of campground angling parties spent this amount of effort.

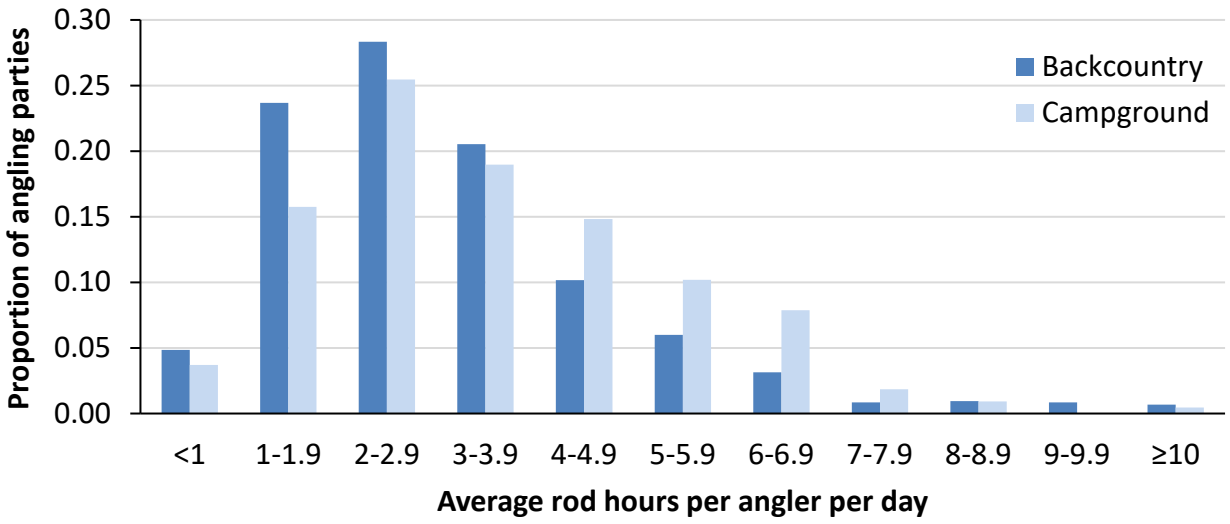


**Figure 15.** Proportion of backcountry and campground angling parties that spent an average of less than 1 to more than 10 rod hours per angler per day in Algonquin Provincial Park, 2016 to 2018 combined. (n= 1,052 backcountry and 216 campground angling parties)

# Reported angling catch, harvest, and release characteristics

In addition to effort, the angler survey also provides lake-specific catch and harvest data that can be valuable to evaluate total estimated harvest and the effects of regulations such as daily possession limits. To avoid bias from possible species misidentification, analysis of catch and harvest data was restricted to species known to occur in each lake (Ridgway et al. 2017). Reference images were provided in the survey instructions to assist anglers with identifying bass species (Appendix 5). Self-reporting surveys can be biased because anglers may under or over report catches for various reasons and may inaccurately complete trip logs, especially at

the end of trips (Cooke et al. 2000). Studies to better understand some of these biases are underway, but their discussion is beyond the scope of this report.

The average annual lake trout catch per unit effort (CUE) of backcountry anglers was consistent from 2014 to 2018, ranging between 0.25 and 0.34 fish per rod hour (Figure 16). Campground angler lake trout CUE was lower, ranging between 0.09 and 0.19. Backcountry angler brook trout CUE was also consistent over these years, ranging between 0.21 and 0.3 while campground angler brook trout CUE was lower, ranging between 0.06 and 0.09.

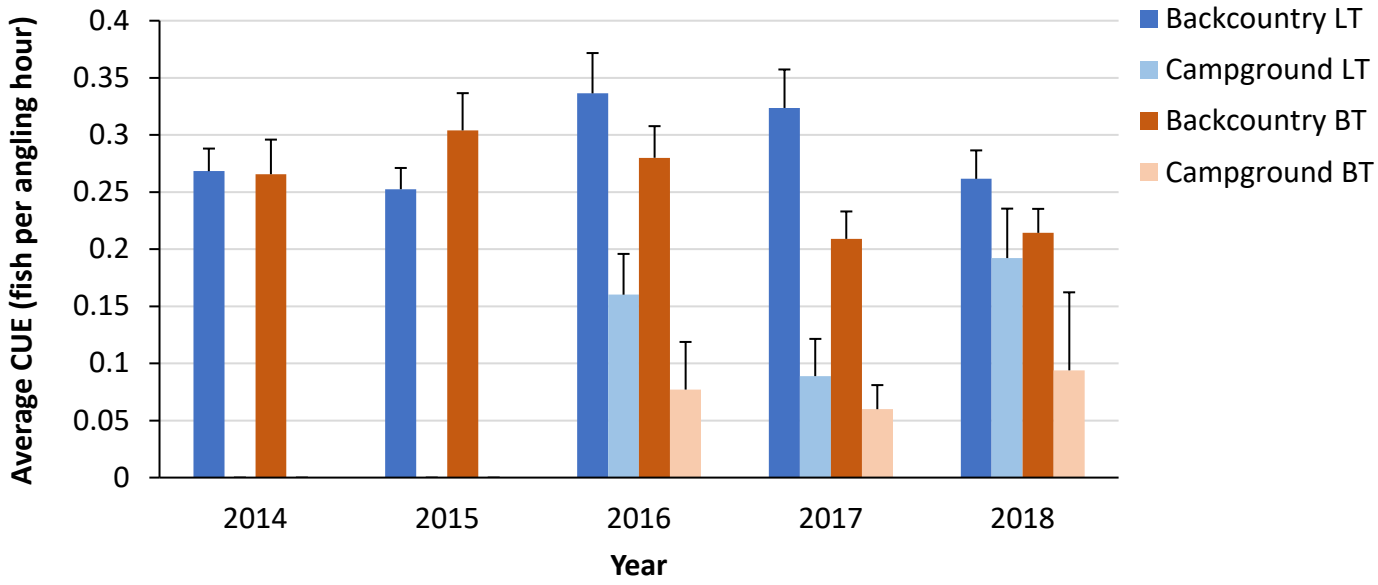


**Figure 16.** Average annual lake trout (LT) and brook trout (BT) catch per unit effort (CUE) of backcountry and campground trout anglers in Algonquin Provincial Park from 2014 to 2018. Average CUE estimates were calculated from n= 3,186, 158, 3,647, and 180 reported backcountry LT, campground LT, backcountry BT, and campground BT CUE values, respectively. Standard error bars are shown for each angling group per year. (Note: Surveys were first given to campground parties in 2016, hence the missing bars.)

Average annual backcountry and campground bass CUE estimates are constrained by small sample sizes, resulting in individual lakes and parties having considerable influence. From 2016 to 2018, backcountry angler smallmouth bass CUE ranged between 0.58 and 1.26 fish per rod hour while campground angler smallmouth bass CUE ranged between 0.48 and 0.76 (Figure 17). Backcountry angler largemouth bass CUE ranged between 0.34 and 3.25 fish per rod hour and campground angler largemouth bass was consistently low, ranging between 0 and 0.17.

Catch per unit effort may also be expressed as the number of rod hours needed to catch a fish (Table 5). About 3 to 4 rod hours were required to capture a trout in the backcountry. On average, campground anglers spent more rod hours to catch 1 fish of any species.

**Table 5.** Average number of targeted rod hours that angling parties spent to catch each target species in Algonquin Provincial Park, from 2014 to 2018 combined for backcountry trout angling parties and 2016 to 2018 combined for backcountry bass and all campground angling parties.

| Species | Average backcountry angler rod hours spent to catch a fish | Average campground angler rod hours spent to catch a fish |
|---|---|---|
| **Lake trout** | 3.5 | 6.8 |
| **Brook trout** | 3.9 | 13.0 |
| **Smallmouth bass** | 1.1 | 1.7 |
| **Largemouth bass** | 0.7 | 10.6 |

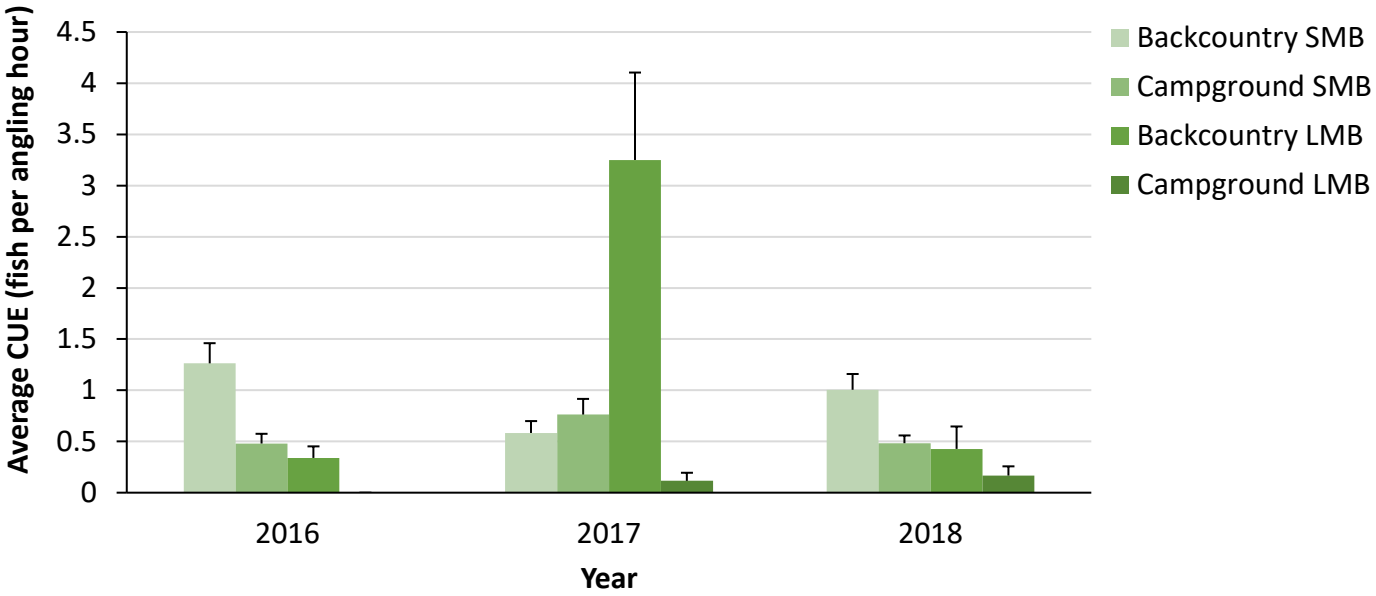


**Figure 17.** Average annual smallmouth bass (SMB) and largemouth bass (LMB) catch per unit effort (CUE) of backcountry and campground bass anglers in Algonquin Provincial Park from 2016 to 2018. Average CUE estimates were calculated from n= 192, 95, 42, and 37 reported backcountry SMB, campground SMB, backcountry LMB, and campground LMB CUE values, respectively. Standard error bars are shown for each angling group per year.

In the Algonquin Park Angling Survey anglers are also asked to provide total length measurements for all fish harvested. This information can provide a better understanding of the total biomass of the annual recreational harvest. These measurements likely have a greater inherent error than might be encountered in a standardized netting survey due to a variety of

factors, including the challenge of measuring fish while in a canoe. Specific instructions provided to anglers in the survey package were intended to help mitigate this error.

The mean total length of the 1,538 lake trout harvested from 2014 to 2018 combined was 456 millimetres (mm). Most (78%) were between 350 mm and 550 mm while only 3% were longer than 650 mm (Figure 18). The mean total length of the 1,440 brook trout harvested was 348 mm. Most (79%) were between 250 mm and 450 mm and less than 1% were longer than 550 mm.

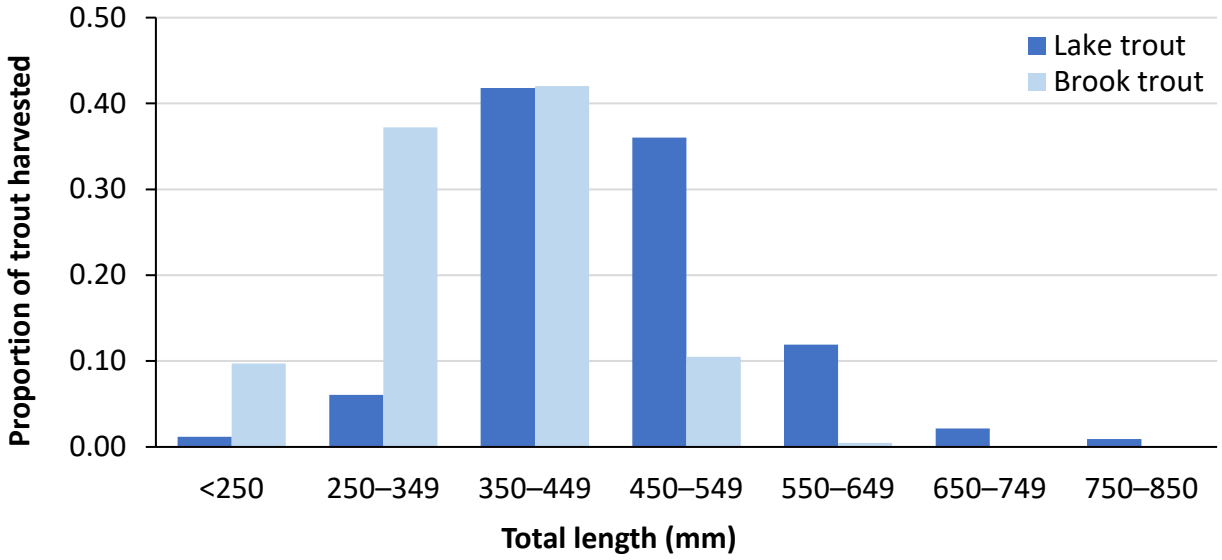


**Figure 18.** Proportion of trout harvested in each total length bin in Algonquin Provincial Park, 2014 to 2018 combined. (n=1,538 lake trout and 1,440 brook trout)

The average total length of the 405 smallmouth bass harvested from 2016 to 2018 combined was 328 mm. Most (75%) were between 250 and 450 mm, while only 0.7% were longer than 550 mm (Figure 19). The mean total length of the 26 largemouth bass harvested was 312 mm with most (60%) between 250 and 450 mm.

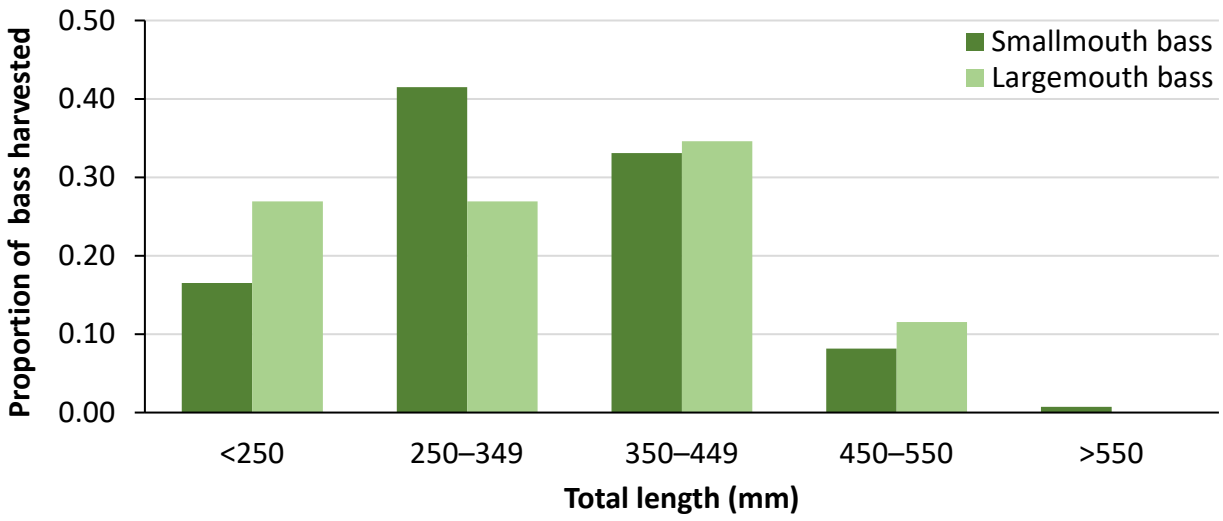


**Figure 19.** Proportion of bass harvested in each total length bin size in Algonquin Provincial Park, 2016 to 2018 combined. (n=405 smallmouth and 26 largemouth bass)

Species-specific release rates can also be estimated from the survey data as anglers were asked to report both catch and harvest. Backcountry trout angling party annual release rates were similar for lake trout and brook trout from 2009 to 2018, ranging between 49 and 67% (Figure 20). The 2009 to 2012 release rates shown in Figure 20 are based on those referenced in annual AFAU angling survey reports. Overall, the average annual lake trout release rate from 2009 to 2018 was 60% and the average annual brook trout release rate was 59%. Campground trout angling party annual release rates were lower than those of backcountry trout angling parties but have increased between 2016 and 2018 from about 32% to about 50%.

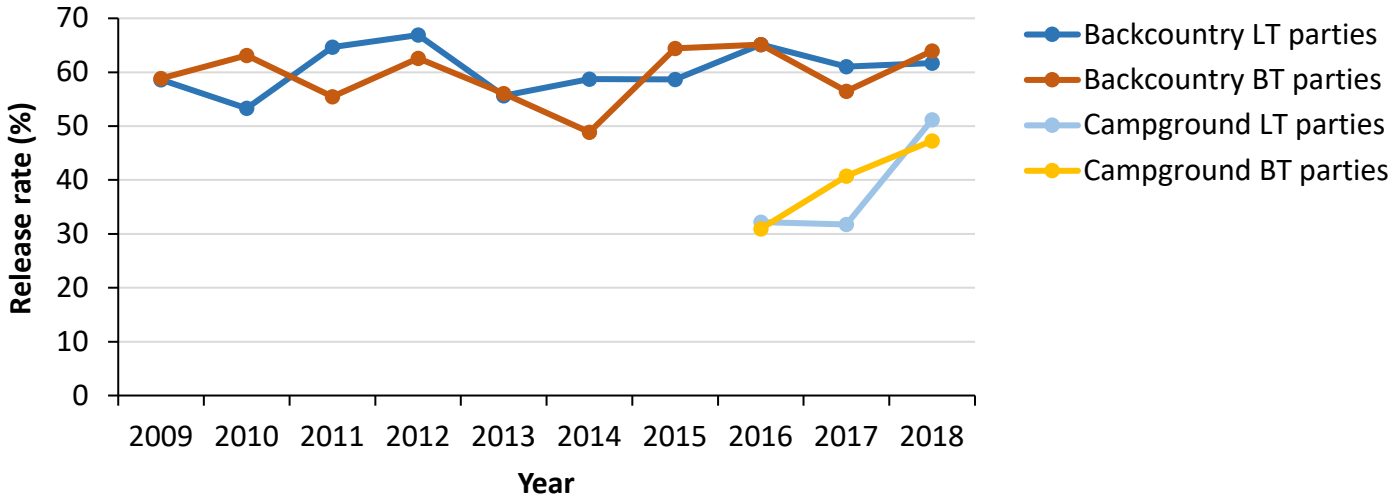


**Figure 20.** Trout release rates for backcountry and campground angling parties in Algonquin Provincial Park from 2009 to 2018. The 2009 to 2012 release rates are based on those referenced in annual Algonquin Fisheries Assessment Unit angling survey reports. (LT=lake trout, BT=brook trout)

Bass release rates are based on relatively small sample sizes. From 2016 to 2018, no strong differences in release rates were evident between backcountry and campground bass angling parties (Figure 21).

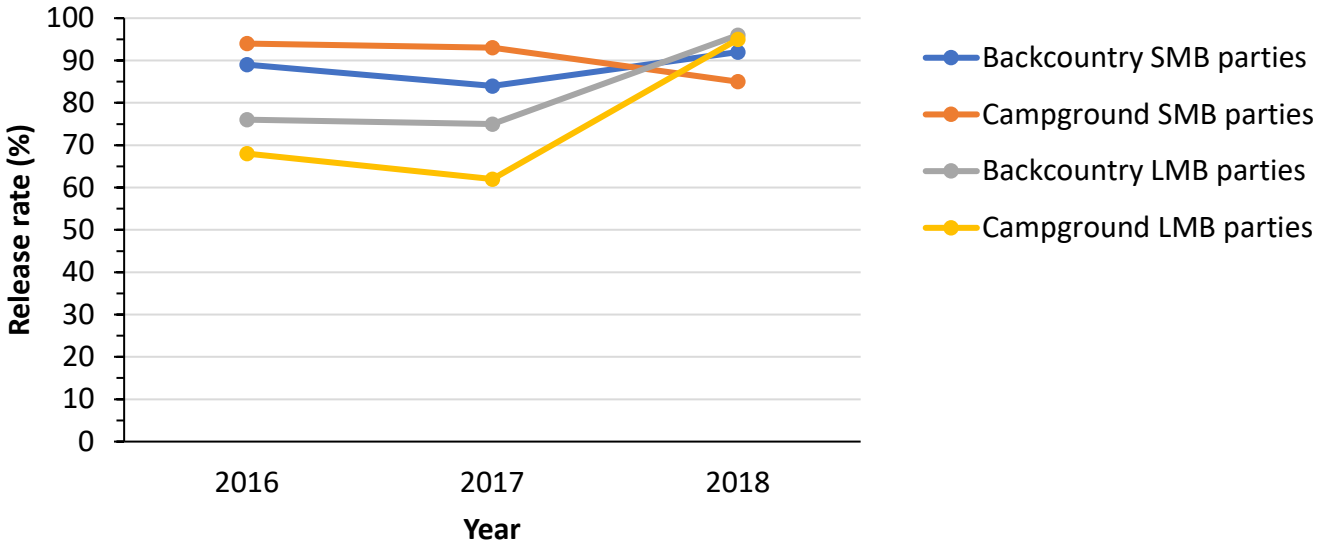


**Figure 21.** Bass release rates of backcountry and campground angling parties in Algonquin Provincial Park from 2016 to 2018. (SMB=smallmouth bass, LMB=largemouth bass)

# Discussion

The Algonquin Park recreational fishery represents a landscape-scale opportunity for angling with many options for entrance (34 backcountry access points) and travel amongst a diverse set of lakes and rivers. The 2 most sought-after species are lake trout and brook trout — representatives of coldwater fish species that are characteristic of the park's ecology. The use of camping reservation-based information in combination with angler surveys provided insights into the seasonal distribution of angler visitation, the amount of time spent angling, species targeted, and several features of angling parties. Collectively, results from the Algonquin Park Angling Survey provide a unique perspective on a landscape-scale activity. The recreational fishery of Algonquin Park from 2014 to 2018 can be characterized as follows:

- Annually, 3,000 to 4,000 angling parties visit the backcountry of Algonquin Park targeting lake trout and brook trout; 1,000 to 1,500 angling parties targeting the same 2 species base their trips from campgrounds.
- About 50% of all Algonquin Park backcountry parties camping in May indicated they would be angling. By summer, the proportion of parties indicating they would be angling declined to 30%.
- Backcountry and campground angling parties generally consisted of 2 people with party sizes mostly ranging from 1 to 6 individuals.

- Most backcountry angling trips were 2 to 3 days with 12% of angling trips lasting at least 5 days. Campground-based angling trips were also typically 2 to 3 days, but 25% of campground angling party visits were at least 5 days.

- Most backcountry anglers fished for 1 to 4 hours per day with 23% of anglers fishing for more than 4 hours per day. A similar pattern was observed among campground anglers, although 36% of campground anglers fished for more than 4 hours per day.

- Anglers tended to fish 1 lake or river per trip (54% of backcountry angling parties; 70% of campground angling parties). Backcountry angling parties were more likely to fish multiple waterbodies per trip than were campground angling parties.

- Most backcountry trout angling party trips began from a limited number of access points situated along the Highway 60 corridor or the western boundary of Algonquin Park (i.e., Magnetewan, Rain, and Tim lakes).

The CR data set revealed seasonal patterns to the Algonquin Park recreational fishery. In May, anglers represented a large proportion of backcountry camping parties with this proportion declining as the season progressed. This pattern confirms the presence of a culture of spring trout angling that is synonymous with Algonquin Park early in the season followed by a strong influx of non-anglers among backcountry campers in the summer months (June to August). This influx coincides with the onset of more favourable weather, the end of the academic year for grade schools, and likely the increased occurrence of family vacationers. Seasonal changes in fish behaviour likely explain some of the shifts in the fishery. For example, trout are generally more accessible to anglers in spring, before fish behaviour shifts in response to increasing temperatures and lake thermal stratification. Trout thermal preferences drive their habitat selection from shallow water in spring to deeper water in summer (Plumb and Blanchfield 2011). This results in seasonal differences in the angling gear needed to target trout. This shift in gear requirement may contribute to the seasonal changes in recreational fish species targeted during backcountry angling activity.

The number of fish species available for angling opportunities increases in the summer when angling seasons open for recreational species other than trout. The number of backcountry bass angling parties was considerably lower than trout angling parties and showed less year-to-year variability. The distribution of backcountry bass angling party nights was generally concentrated on lakes near roads or historical railway corridors where bass introductions occurred in past decades (Mitchell et al. 2017). Between 2015 and 2018, Lake Opeongo represented the primary destination for bass angling parties in Algonquin Park. This can be partly attributed to the lake's size, easy access, number of campsites, and overall productivity for smallmouth bass spawning and recruitment.

Some anglers did not indicate trout or bass as their target species. All angling parties that indicated a target species other than trout or bass were simply classified as targeting other species. Additional angling parties were unsure of their target species, especially during the summer months. Angling avidity was not assessed via the Algonquin Park Angling Survey, so it is unclear if this group of unsure anglers have similar motivations for angling as the spring trout

anglers. The angling parties unsure of their target species may be visiting Algonquin Park with different expectations of an outdoor experience than spring season anglers targeting lake trout or brook trout. Estimating angler avidity of those targeting/not targeting certain fish species would provide insight into their interests in visiting the park.

Overall, the average angling survey return rate of 11.3% was low relative to reported return rates from other angler diary programs in Ontario (Cooke et al. 2000) and the Federal Department of Fisheries and Oceans 2010 Recreational Fishing Survey (OMNRF 2015). Efforts were made to maximize return rates, including offering prize incentives, but the voluntary nature of the angler survey lends itself to low returns rates. Further consideration for ways to increase return rates is warranted.

The Algonquin Park Angling Survey provided information about fish caught by anglers based on self-reporting. The catch of fish by anglers can be characterized as follows:

- Campground-based lake trout and brook trout average catch per unit effort (CUE) was considerably lower than backcountry-based CUE.

- Over the last decade, about 60% of angled lake trout and brook trout were released by backcountry anglers. No trend in release rate is apparent over time, but release rates in 2018 exceeded 60%. Campground angling parties released fewer lake trout and brook trout (about 30% in 2016), but their release rates improved to about 50% in 2018.

- Release rates for the 2 bass species exceeded the release rates for the 2 trout species, ranging from nearly 70% to over 90% depending on species and year. In 2018, release rates for smallmouth bass and largemouth bass were above 80% for both groups of anglers.

# Conclusion

The Algonquin Park Angling Survey provides information about a recreational fishery at landscape scale. Given the park's status as an iconic feature of Ontario, and Canada, and its role in the conservation of many species including lake trout and brook trout, a survey of this kind is a valuable contribution to the sustainable management of the recreational fishery. The combination of information from camping reservations and angler survey results is unique for such a large protected area and will be the basis for further research into spatially explicit fisheries science.

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# Appendix 1: Daily trout and bass harvest limits for Algonquin Provincial Park

**Table A1.1** Daily harvest limits for Fisheries Management Zone (FMZ) 15 as stipulated in the Ontario Fishing Regulations from 2014 to 2018, inclusive. FMZ 15 includes all of Algonquin Provincial Park. These harvest limits have remained consistent since 1989.

| Species | Sport license | Conservation license |
|---|---|---|
| **Lake trout** | 2 | 1 |
| **Brook trout** | 5 | 2 |
| **Aggregate trout** | 5 | 2 |
| **Smallmouth bass** | 6 | 2 |
| **Largemouth bass** | 6 | 2 |
| **Aggregate bass** | 6 | 2 |

# Appendix 2: List of Algonquin Provincial Park backcountry access points

**Table A2.1.** List of Algonquin Provincial Park backcountry access points with corresponding access point numbers. Numbers 30 to 33 are access points for Algonquin Park's backpacking routes. (Shown on park map in Figure 1.)

| Access point number | Access point name |
|---|---|
| **1** | Kawawaymog (Round) Lake |
| **2** | Tim River |
| **3** | Magnetawan Lake |
| **4** | Rain Lake |
| **5** | Canoe Lake |
| **6** | Smoke Lake |
| **7** | Source Lake |
| **8** | Cache Lake |
| **9** | Rock Lake |
| **10** | Sunday Creek |
| **11** | Lake Opeongo |
| **12** | Pinetree Lake |
| **13** | Galeairy Lake - Whitney |
| **14** | Hollow River - Dividing Lake |
| **15** | Kingscote Lake |
| **16** | Hay Lake |
| **17** | Shall Lake |
| **18** | Aylen Lake |
| **19** | Basin Lake |
| **20** | Mallard (Sec) Lake |
| **21** | McManus Lake |
| **22** | Grand Lake - Achray |
| **23** | Lake Travers |

| Access point number | Access point name |
|---|---|
| **24** | Bisset Creek Road |
| **25** | Wendigo Lake |
| **26** | North River |
| **27** | Cedar Lake - Brent |
| **28** | Brain Lake |
| **29** | Kioshkokwi Lake |
| **30** | Western Uplands backpacking trail via Rain Lake |
| **31** | Western Uplands backpacking trail via Highway 60 |
| **32** | Highland Backpacking Trail |
| **33** | Eastern Pines backpacking trail via Sand Lake gate/Achray |
| **34** | Canisbay Lake paddle-in campsites |

# Appendix 3: Historical account of angler surveys in Algonquin Provincial Park (1936 to 2013)

The recreational angler has consistently contributed to fisheries research in Algonquin Park. Since 1936, an access point creel survey has been conducted at Lake Opeongo where anglers are interviewed about their activity, catch, and harvest, and their catches are sampled as they leave the water. Beginning in the same year, fisheries researchers also implemented a broader Algonquin Park Creel Census whereby voluntary creel form cards were distributed to anglers fishing Algonquin Park waters (Fry 1939). This census ran until at least the 1950s as part of a larger trout population study in support of fisheries management in the park, with results summarized in several publications (e.g., Martin and Baldwin 1953, Fry and Chapman 1948). Throughout these early years, onsite creel surveys were also conducted at other lakes including Redrock Lake in support of lake specific studies (Fraser 1963).

Until the late 1990s, the Opeongo creel survey provided the main insight into long-term angling trends specific to the lake proper. In contrast, limited modern information was available on angling activity across much of Algonquin Park's aquatic landscape. The Algonquin Fisheries Assessment Unit (AFAU) began to address this gap by initiating the Interior Lakes Creel Survey – a voluntary survey conducted from the Lake Opeongo fish check station operated by Harkness Laboratory of Fisheries Research. In addition to Lake Opeongo-specific interviews, Harkness Lab creel attendants interviewed anglers who had been fishing on other waterbodies, gathering information about angling party size, trip length, number of hours spent fishing, and trout harvest and release numbers for each interior lake fished. This information was recorded on paper interview forms that were later provided to the AFAU for analysis.

From 2003 to 2005, the AFAU also ran a Dickson Lake Voluntary Creel Survey. This survey was used to collect information similar to that gathered by the interior lake creel interviews, with the addition of fish length measurements and relevant fish tag information. Survey packages were distributed from the Lake Opeongo permit office to camping parties that indicated plans to fish for trout on Dickson Lake as well as by AFAU staff to anglers they encountered while conducting field work on the lake. Survey packages included a fish handling glove, pencil, measuring tape, and waterproof survey form. Anglers were asked to return completed survey forms to the Lake Opeongo fish check station, an Algonquin Park permit office, or mail them to the AFAU office at Algonquin Park's east gate.

In 2006, the Interior Lakes Creel Survey shifted from in-person interviews to a voluntary mail-in format like the Dickson Lake survey. Survey packages were distributed from the Lake Opeongo permit office to all backcountry camping parties that indicated plans to fish for trout and were returned via the same options as the Dickson Lake survey. In 2007, surveys were also distributed by staff at the Canoe Lake permit office and, by 2008, distribution had expanded to 4 additional permit office locations in and around the park (Table A3.1 and Figure 2). The Interior Lakes Creel Survey was renamed the Algonquin Park Trout Fishing Survey in 2009 and, by 2013, survey distribution had expanded to 16 permit office locations (Table A3.1 and Figure 2).

**Table A3.1.** First year of angling survey distribution at each Algonquin Provincial Park permit office location from 1997 to 2013, inclusive. In 2011 and 2012, surveys were only distributed at the Lake Opeongo access point.

| First year of survey distribution | Permit office |
|---|---|
| **1997** | Lake Opeongo access point office |
| **2007** | Canoe Lake access point office |
| **2008** | Kioshkokwi Lake – Kiosk access point office |
| | Cedar Lake – Brent access point office |
| | Magnetawan Lake/Rain Lake/Tim River access point office |
| | Sand Lake gate |
| **2013** | Bonnechere Provincial Park (Basin Lake access point) |
| | Mattawa Travel Information Centre (Brain Lake access point) |
| | Canisbay Lake campground office |
| | East gate |
| | Kawawaymog (Round) Lake access point office |
| | Pine Grove Point (Kingscote Lake access point) |
| | Mew Lake campground office |
| | Rock Lake campground office |
| | Shall Lake access point office |
| | West gate |

# Appendix 4: 2019 Algonquin Park Angling Survey form

**ALGONQUIN PARK ANGLING SURVEY – 2019**

Example: On May 9th, Doug and Bob fished on Example Lake for 4 hours. They caught 5 brook trout and kept 3. As well they caught 1 lake trout and released it. At the end of the day they enter 2 for the number of people fishing and 4 for the average hours fished per person as a single row on the survey form for the group. They also record their catch, how many fish they kept, and the total lengths of all fish kept on the reverse side of this page. Please refer to the instruction sheet for how to properly fill out the survey.

| Date | Waterbody Name | # of people fishing | Average hours fishing | Brook Trout | | Lake Trout | | Smallmouth Bass | | Largemouth Bass | | Other Species: _____ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Caught | Kept | Caught | Kept | Caught | Kept | Caught | Kept | Caught | Kept |
| 9-May | Example Lake | 2 | 4 | 5 | 3 | 1 | 0 | - | - | - | - | - | - |
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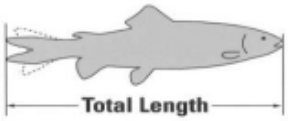
**Figure A4.1.** Front side of the Algonquin Park Angling Survey form distributed to angling parties in 2019.

**FISH MEASUREMENTS**

Please measure all fish you keep (not just the big ones) using the method shown here and indicate which unit of measurement you used →




| Date | Waterbody Name | Species | Total Lengths (specify units) |
|---|---|---|---|
| 9 May | Example Lake | Brook Trout | 290mm, 320mm, 450mm |
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**Please return your survey along with your camping permit** to a permit office, the Opeongo creel hut or mail it in the postage paid envelope no later than December 31st. A draw will be held after this date where there are five $100 Algonquin Outfitters Gift Cards to be won! Winners will receive prizes in the mail.

Camping Location: ☐ Backcountry ☐ Campground (Please specify: _____)

What species are you primarily fishing for? ☐ Trout ☐ Bass ☐ Unsure ☐ Other

Name: _____

Address: _____

Email: _____

Your questions and comments are welcome.
Please contact Harkness Senior Technician, Nick Lacombe at nick.lacombe@ontario.ca or 613 637 2103.

**Thank you for participating and good luck!**

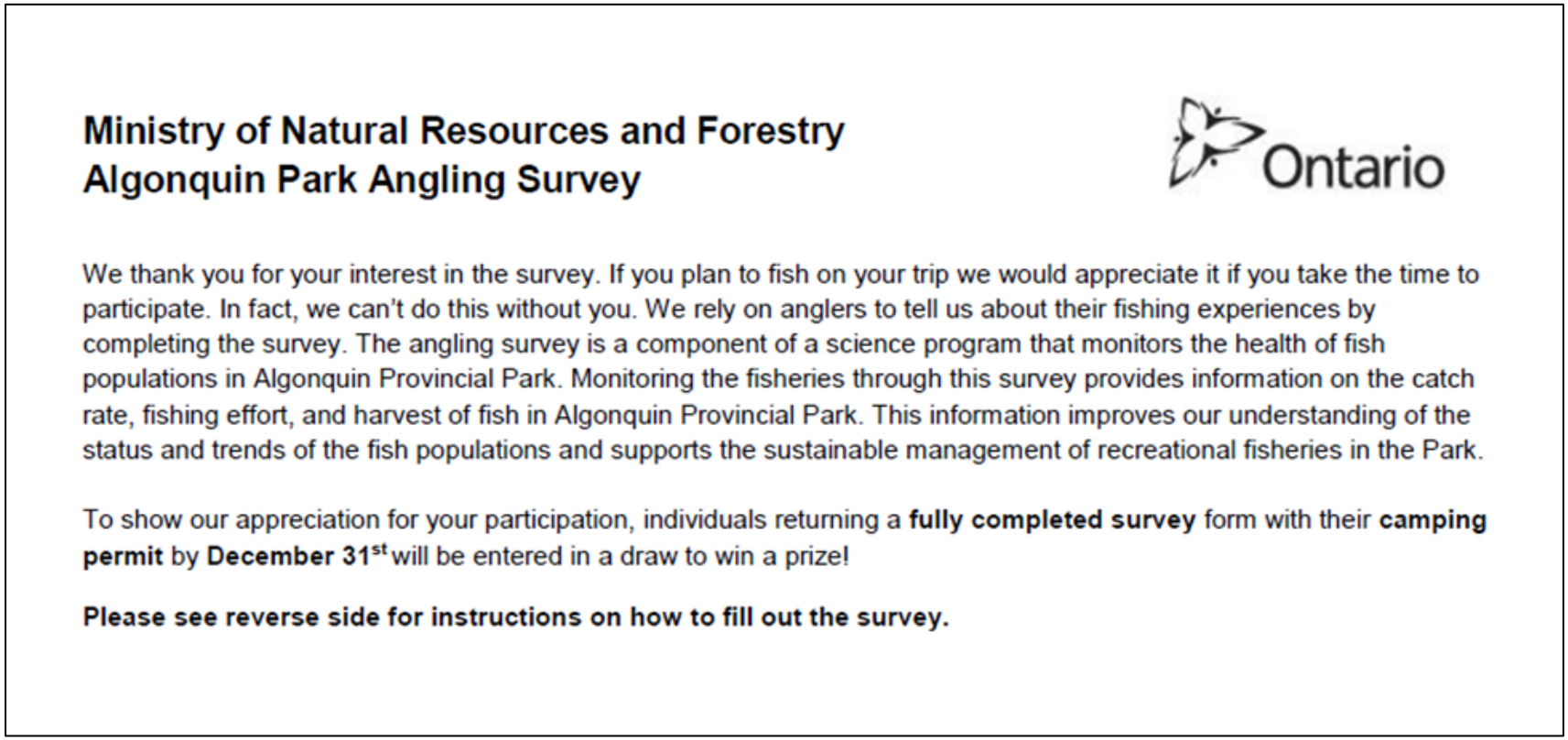
Please record fishing information on the other side of this form.

Ontario

ALGONQUIN OUTFITTERS

**Figure A4.2.** Back side of the Algonquin Park Angling Survey form distributed to angling parties in 2019.

# Appendix 5: 2019 Algonquin Park Angling Survey instruction sheet



**Ministry of Natural Resources and Forestry**
**Algonquin Park Angling Survey**

Ontario

We thank you for your interest in the survey. If you plan to fish on your trip we would appreciate it if you take the time to participate. In fact, we can't do this without you. We rely on anglers to tell us about their fishing experiences by completing the survey. The angling survey is a component of a science program that monitors the health of fish populations in Algonquin Provincial Park. Monitoring the fisheries through this survey provides information on the catch rate, fishing effort, and harvest of fish in Algonquin Provincial Park. This information improves our understanding of the status and trends of the fish populations and supports the sustainable management of recreational fisheries in the Park.

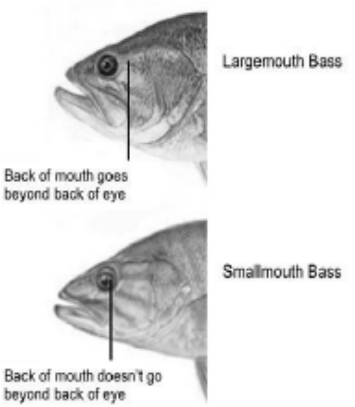
To show our appreciation for your participation, individuals returning a **fully completed survey** form with their **camping permit** by **December 31st** will be entered in a draw to win a prize!

**Please see reverse side for instructions on how to fill out the survey.**

**Figure A5.1.** Front side of the Algonquin Park Angling Survey instruction sheet distributed to angling parties in 2019.

**Completing the survey**

This will only take a few minutes a day. First identify your camping location by checking either backcountry or campground (please specify which). Then identify what species you are primarily fishing for by checking trout, bass, unsure or other (please check only one). At the end of each day fished please have one person complete the survey on behalf of the group, **even if no one caught a fish**. Please be sure to record all the time fished on all lakes/rivers each day. We ask that you **return the survey along with one of your camping permits**, allowing us to determine your transaction number. The "transaction" number allows us to determine the relationship between camping and fishing activities. This relationship will be used to estimate fishing catch, effort and harvest for all registered camping groups that plan to fish. Please note we are primarily interested in obtaining information related to brook trout, lake trout, smallmouth bass and largemouth bass (see diagram at right to distinguish between the two bass species); however, we ask that you record information for other fish species as well.




Ensure to close the fish's mouth when determining if a bass is either a largemouth or smallmouth.

***Measuring fish***

If you catch and keep a fish we'd like to know how big it was as this information will allow us to estimate the total mass of fish harvested in the park in a season. Please use the measuring tape to measure the total length of the fish. Measure from the tip of the mouth with the jaws closed to the tip of the tail, with the tail fin lobes compressed to give the maximum possible length (see diagram on the survey form). You can use any measuring unit you are comfortable with but please record the units you used (e.g. mm, cm, inches) on the form. Ideally, we'd like you to measure all fish kept on your trip or all fish kept on a day of fishing (not just the big ones).

**Figure A5.2.** Back side of the Algonquin Park Angling Survey instruction sheet distributed to angling parties in 2019.

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