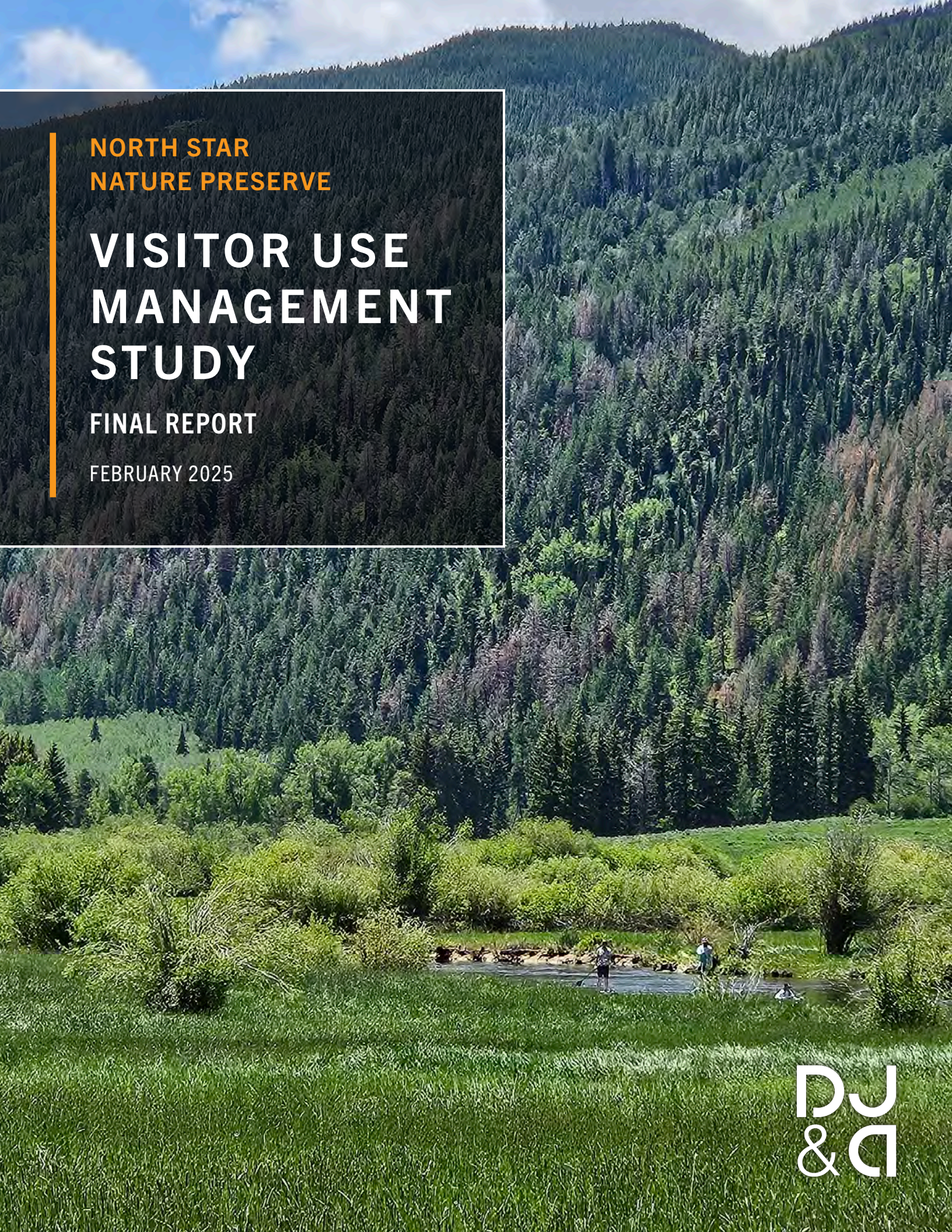


NORTH STAR
NATURE PRESERVE

VISITOR USE MANAGEMENT STUDY

FINAL REPORT

FEBRUARY 2025

DJ&A

Visitor Use Management Study Report – Final

Table of Contents

List of Tables

List of Figures

Appendices

1. Introduction

North Star Nature Preserve is a 245-acre parcel located in the Roaring Fork Valley. It includes the 175-acre parcel referred to as North Star Nature Preserve and the 70-plus-acre James H. Smith Open Space – the two parcels are collectively known as North Star Nature Preserve. Pitkin County Open Space and Trails (OST) manages the Preserve together in partnership with several other entities and according to a management plan that is updated every five years. The 2000, 2015, and 2020 management plans for North Star Nature Preserve established the protection and restoration of the North Star ecosystem as overarching goals, while accommodating recreation that does not result in significant impairment of habitat or interfere with restoration of the Preserve to optimum ecological condition.

In keeping with the management goals for the Preserve, recreation and public access are limited to the Roaring Fork River waterway and to designated corridors on the east side of the river. The river is popular as a destination for paddleboarders and other small-boat users to float through the Preserve. General public use of the river is allowed for float trips through the Preserve and most river use occurs between June and early September. There is a limited number of commercial operators permitted to provide commercial river trips.

Since 2018, OST has systematically recorded river use data for commercial and public recreational river use (Figure 1). During the time series from 2018 through 2024 and excluding the unprecedented global events of 2020, total annual river use has fluctuated between approximately 6,000 and 9,000 river users. Year-over-year changes in annual river use, excluding 2020, have fluctuated from an approximately 40% increase from 2018 to 2019 to an approximately 12% decrease from 2021 to 2022 and again from 2023 to 2024. There are a number of factors that affect total annual river use, and the year-over-year fluctuations in particular. Among the key factors are fluctuating river levels and seasonal and daily weather patterns (refer to the 2020 North Star Management Plan for more information).

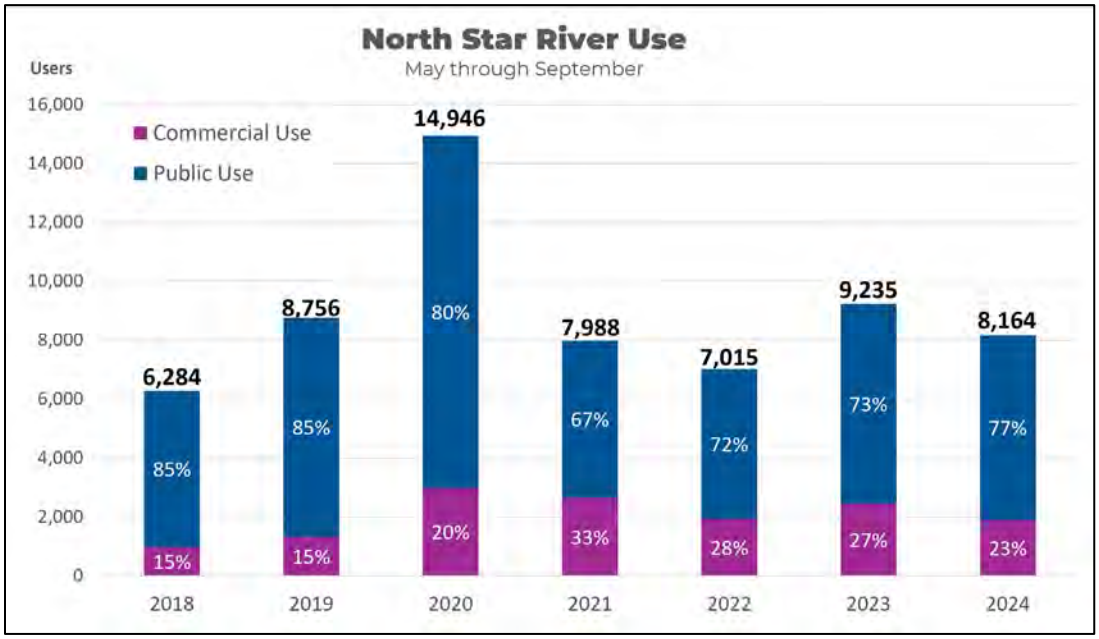


Figure 1. Annual river use, North Star Nature Preserve (2018-2024).

As stewards of the Preserve, OST is responsible for assessing the potential effects of recreational river use on ecological conditions and visitors' experiences in the Preserve, and on related traffic, parking, and safety conditions in and adjacent to the Preserve. Pitkin County OST has adopted an adaptive visitor use management approach to do this according to best practices. As part of this approach and in preparation for an update to the North Star Management Plan in 2025, Pitkin County OST prepared the 2023 North Star Biodiversity and River Use Update Report. The report summarizes management efforts to support a dynamic and healthy ecological community in the Preserve and provides the results from a recreational river use survey conducted from June to September 2023.

As an action item from the 2020 North Star Management Plan, Pitkin County OST commissioned this study, titled the North Star Nature Preserve Visitor Use Management Study. The study builds upon Pitkin County OST's work reported in the 2023 North Star Biodiversity and River Use Report. The primary purposes of the study are to provide a data-driven basis to 1) further understand current recreational river use conditions, 2) evaluate potential impacts of recreational river use on ecological, social, and operational conditions in and adjacent to the Preserve, and 3) identify and evaluate visitor use management strategies to achieve and maintain desired ecological and social conditions in the Preserve.

This report presents the methods and results of the North Star Nature Preserve Visitor Use Management Study. The report includes detailed documentation of the study methods used to conduct the North Star Nature Preserve Visitor Use Management Study and tabular, graphical, and narrative summaries of the data collection and analysis results. The report also includes a set of appendices with more detailed documentation of the study methods and related information.

2. Methods

This section of the report presents the methods used to conduct the North Star Visitor Use Management Study. This includes detailed descriptions of 1) the study area; 2) the types and locations of data collected for the study; and 3) the methods used to collect and analyze the study data.

2.1 Study Area

North Star Nature Preserve is located along Highway 82 south of Aspen and the East of Aspen Trail runs parallel along the Preserve's eastern border. As noted, the Preserve includes two parcels - the James H. Smith Open Space and the North Star Nature Preserve. The Preserve is the core of the study area (Figure 2). The study area also includes sections of the Roaring Fork River that flow through a portion of the White River National Forest, property owned by the Aspen Center for Environmental Studies, and a small number of private properties. All of the parking areas and trails that provide access to the Roaring Fork River and/or the Preserve from the Wildwood Put-in to the North Star Pedestrian Bridge Takeout are included in the study area as well.

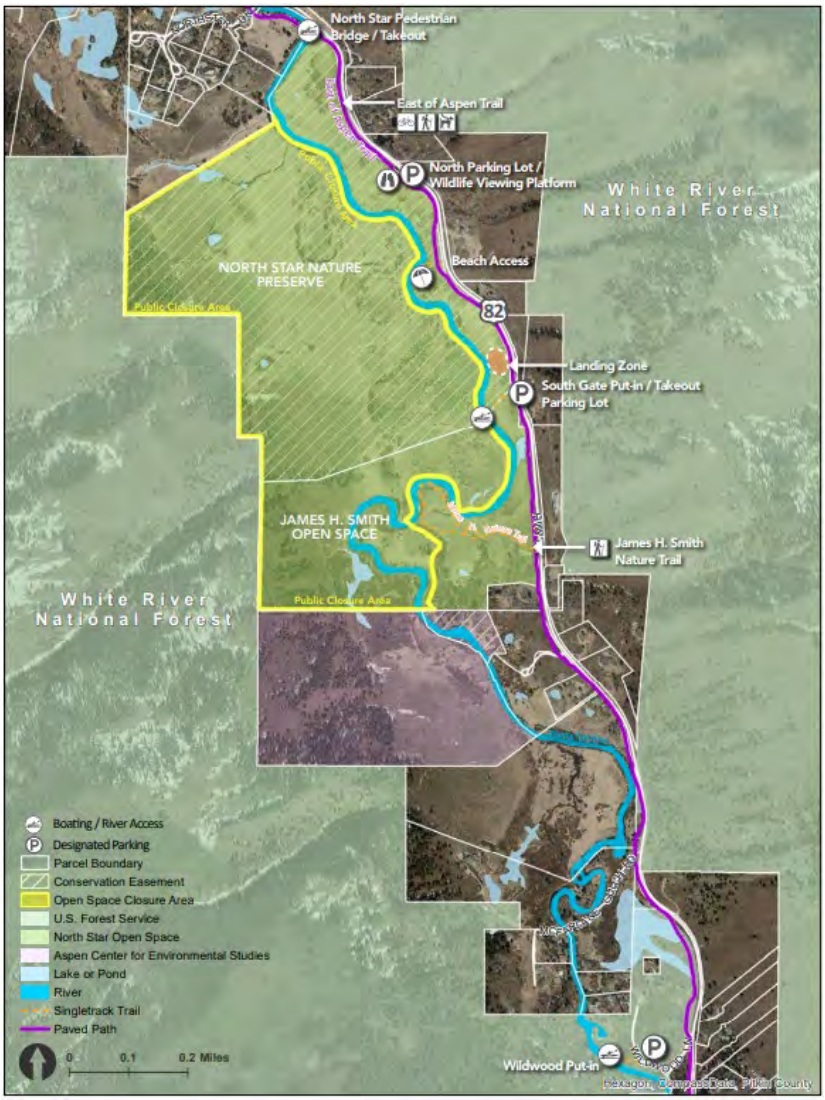


Figure 2. North Star Nature Preserve Visitor Use Management Study Area.

Most public and commercial recreational river users seeking to float through the Preserve launch their paddleboards and other small watercrafts at a put-in on U.S. Forest Service property along Wildwood Lane. There is a small parking area at the Wildwood put-in where a limited number of river users can park their vehicles - there are seven spaces for parking and one space for loading and unloading. During the summer season, an onsite staff person is present to manage parking and traffic circulation and to provide recreational river users with information and education about recreating in the Preserve.

Some recreational river users launch their watercraft at the South Gate access point, particularly when the parking area at the Wildwood put-in is full. The South Gate access point is also used in high water when passage under upstream bridges is problematic, or in very low flows. There is designated parking available at South Gate put-in where river users can park their vehicles - there are 21 spaces for parking and no additional spaces for loading and unloading.

Most recreational river users take out at the pedestrian bridge on the north end of the North Star Nature Preserve. There is a 10-minute loading zone at the takeout with space for three vehicles, but no extended parking is permitted there. The East of Aspen Trail is directly accessible from the North Star Pedestrian Bridge Takeout and there are also bike and paddleboard racks at the takeout where river users can stage bicycles and paddleboards. River users are encouraged to use the trail or a bicycle to shuttle back to their vehicles at the put-in after exiting the river to help reduce parking pressure in the Preserve. There are informal pullouts located on Highway 82 south of the takeout with space for approximately 15 vehicles where river users park their vehicles to shuttle back to their vehicles at the put-in after exiting the river.

In addition to the designated parking areas on Wildwood Lane and at South Gate, there is a formal parking area located at the designated Beach Access and designated parking in the North Parking Lot with parking spaces for 16 and 11 vehicles, respectively, and no additional spaces for loading and unloading. These lots are also used by recreational river users who float the river and are unable to find a place to park closer to their put-in or takeout locations. Short paths from these parking lots also provide public access to the Preserve for wildlife viewing, swimming (only at the designated beach), and other forms of passive recreation.

Recreational river users are not permitted to walk on the river bottom or to beach their watercraft anywhere within the Preserve except at the designated beach located approximately 0.6 miles upstream of the North Star Pedestrian Bridge Takeout. More generally, visitors to the Preserve are required to remain on the designated beach or on designated trails in the Preserve. The Preserve is closed to all recreation use from dusk to dawn.

2.2 Data Collection

Data collection for the North Star Nature Preserve Visitor Use Management Study was conducted in the study area from late June through late July 2024. The study period was selected in consultation with Pitkin County OST and partners to coincide with the summer peak recreational river use season in the Preserve. As such, the data collected in this study and the results presented in this report represent recreational river use conditions during the peak summer season. Data were not collected for this study and the results are not representative of recreational river use conditions during off-peak periods of the season, hours of the day, or days of the week.

The types and locations of data collected for the study are mapped in Figure 3. They include vehicle traffic counts, recreational river use counts, counts of the number of parked vehicles-at-one-time (VAOT), counts of the number of people-per-viewscape (PPV), and a recreational river user survey.

In addition to the data that were collected onsite and mapped in Figure 3, commercial river use records were compiled for analysis and reporting.

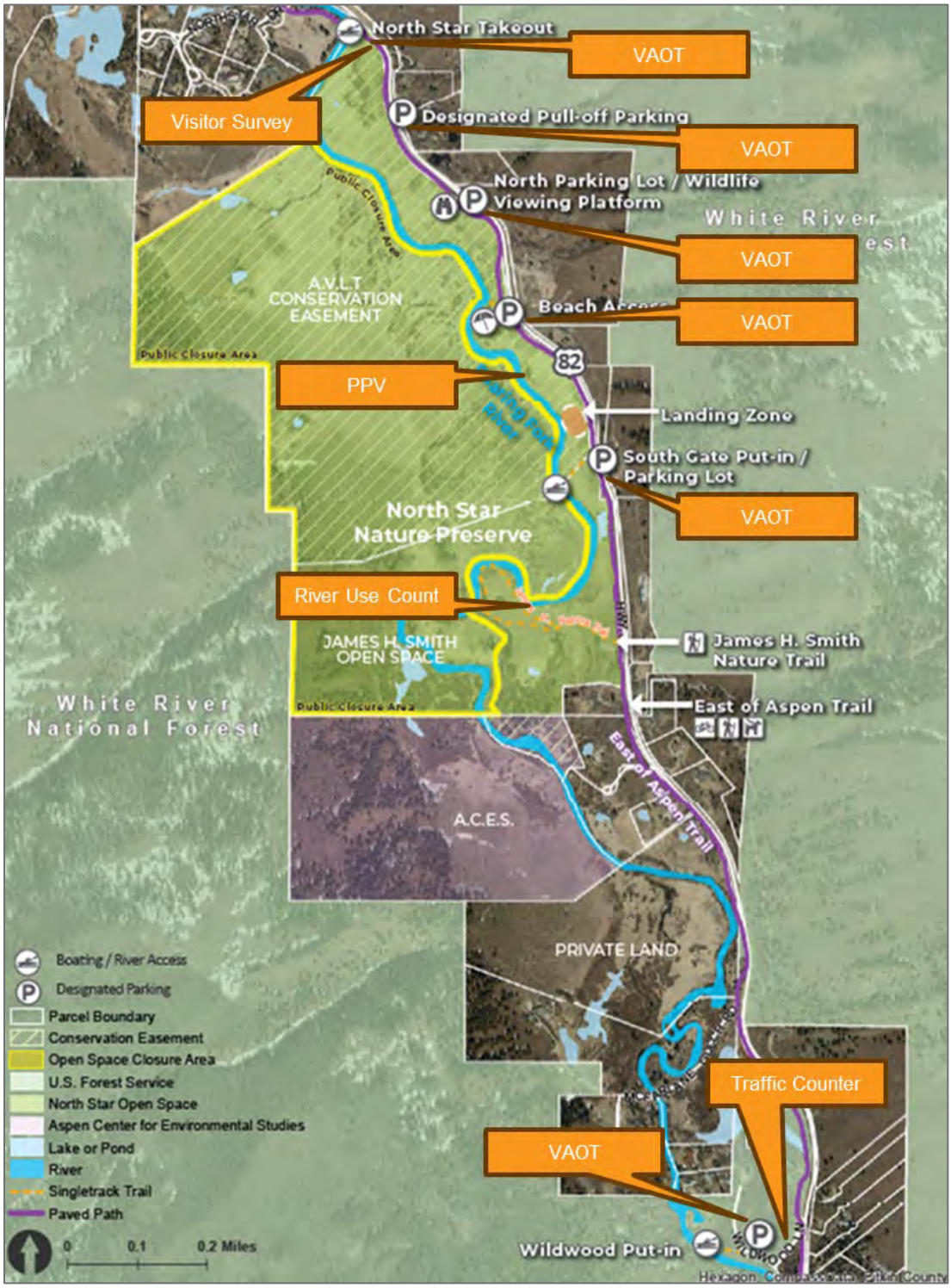


Figure 3. Map of types and locations of data collected for the North Star Nature Preserve Visitor Use Management Study (basemap source: North Star Nature Preserve Biodiversity & River Use Update 2023).

The following subsections report the sampling dates and data collection methods for each data type included in the North Star Visitor Use Management Study. The field team for the study was trained by DJ&A and Pitkin County OST staff, and they were provided with a field manual (included in Appendix A) to help ensure consistency and reliability in the data collection process.

2.2.1 Vehicle Traffic Counts

Pitkin County OST deployed a radar traffic counter on Wildwood Lane to record hourly, directional vehicle traffic volumes 24 hours per day from June 21 through July 29, 2024 (Figure 3, Figure 4). Pitkin County OST staff maintained and periodically downloaded data from the traffic counter during the data collection period. They delivered the vehicle traffic counter data files to DJ&A for data cleaning and analysis of hourly and daily vehicle traffic volumes and patterns on Wildwood Lane. The vehicle traffic data were summarized for all sampling dates without missing data – data were missing on some sampling dates due to counter equipment malfunction.

Figure 4. Traffic counter deployed on Wildwood Lane.

2.2.2 Recreational River Use Counts

Pitkin County OST monitors recreational river use on the Roaring Fork River through the North Star Nature Preserve on an ongoing basis. The river use counts are recorded using a trail camera deployed by Pitkin County OST at a photo point in the James H. Smith Open Space. The trail camera operates 24 hours per day and automatically captures an image each time a passing object is detected in the camera's photo frame. Pitkin County OST staff post-process the trail camera image files to produce daily recreational river use counts. These counts include river users traveling downstream and upstream, vessel type, and comments documenting any visible infractions to the regulations (e.g., nighttime use, dogs, etc.).

For this study, Pitkin County OST staff delivered daily recreational river use count data files to DJ&A for 2021 through 2024 for data cleaning and analysis of daily and annual recreational river use volumes and patterns in the Preserve. However, due to missing data for most of the second half of July 2024 (July 18-31) and for the purposes of focusing on the peak season of recreational river use (i.e., during the month of July), the recreational river use data were summarized for July 2021, July 2022, and July 2023. For the analysis and based on direction from Pitkin County OST, DJ&A assumed 100% of the recreational river use counts recorded outside of Pitkin County OST's voluntary closure period were of downstream river use. DJ&A further assumed for the analysis that

56% of the recreational river use counts during the voluntary closure period were of downstream river users. These assumptions reflect Pitkin County OST's best professional judgement about visitor use patterns outside of and during the voluntary closure periods and the fact that it is known that some users paddle upstream and downstream during the course of a single river trip.

2.2.3 Commercial River Use Reports

Commercial operators are required to record and report to Pitkin County OST the daily number of commercial river users they launch onto the river at the Wildwood and South Gate Put-in locations during the months of May through September. For this study, Pitkin County OST staff delivered the commercial river use reporting records to DJ&A for the years 2015 through 2024 for data cleaning and analysis of annual commercial river use volumes and patterns in the Preserve.

2.2.4 Counts of Parked Vehicles-At-One-Time (VAOT)

Parking data were recorded as observation-based, hourly interval counts of VAOT at each location noted in Figure 3 and Figure 5. Parking data collection occurred every Wednesday through Sunday from June 22 through July 28, 2024[1]. This resulted in a total of 27 sampling days for parking data collection, including 14 weekdays and 13 weekend days and holidays (July 4th holiday). The parking data were recorded manually on a log form following a circuit beginning at the top of each hour from 10:00 a.m. through 5:00 p.m. on each sampling day (see Appendix A for the data collection log form and Appendix B for figures depicting the count area for each of the VAOT counting locations). As such, VAOT was counted once hourly at each location on each sampling day and parking dynamics during the time between hourly VAOT counts are not represented by these data. The VAOT data were entered by Pitkin County OST and cleaned and analyzed by DJ&A to summarize hourly parking conditions in the study area during the sampling period. Pitkin County OST made improvements to parking areas in 2023 and the data collection and analysis results presented in this report capture parking conditions in the first season of use with the parking improvements.

[1] The VAOT counts for the North Star Takeout location included counts of vehicles parked in the 10-minute loading zone and on the opposite side of Highway 82.

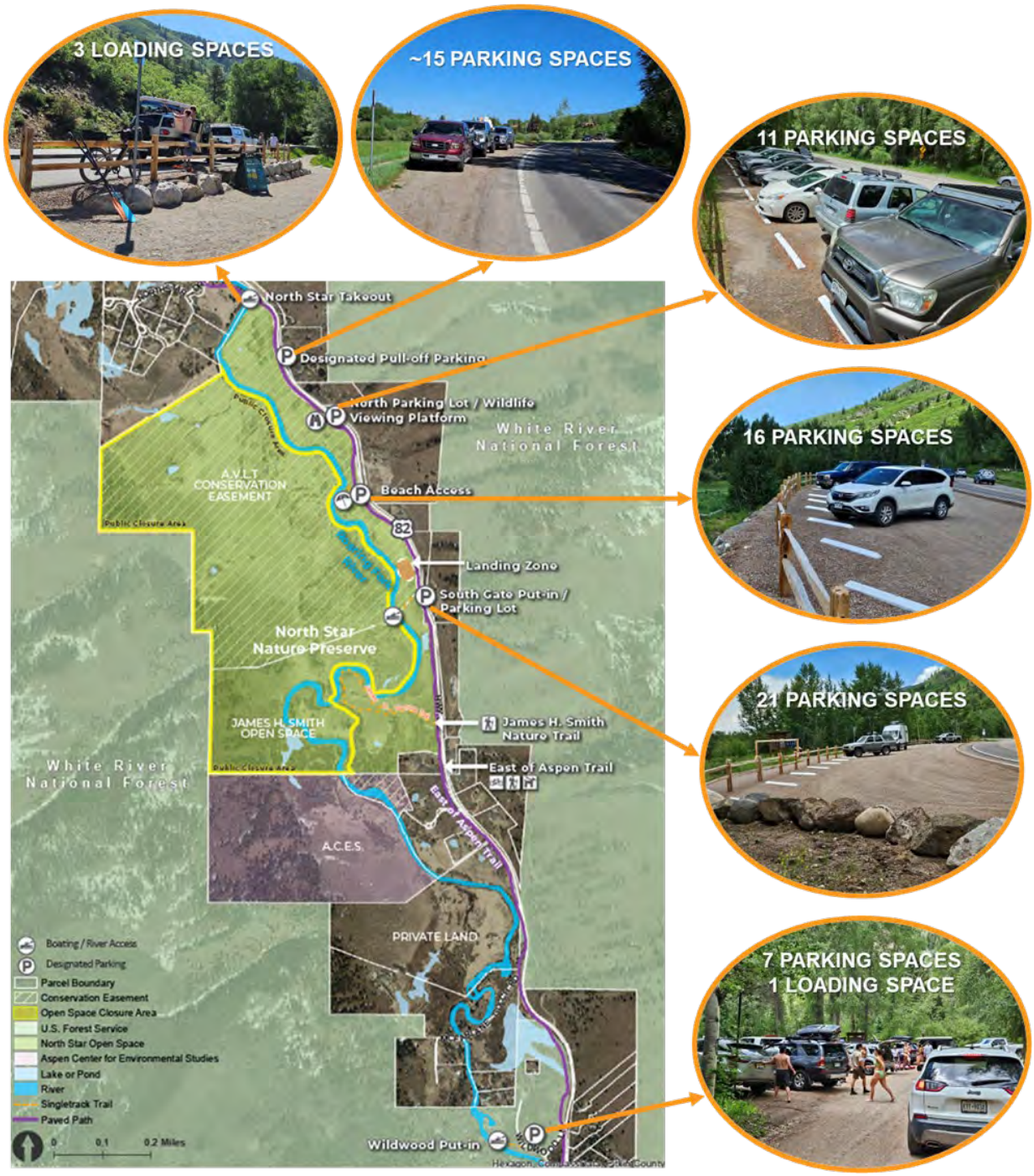


Figure 5. VAOT data collection locations (basemap source: North Star Nature Preserve Biodiversity & River Use Update 2023).

2.2.5 Counts of People-Per-Viewscape (PPV)

A trail camera was deployed by Pitkin County OST from Saturday, June 22 to Sunday, July 28, 2024, to record interval counts of the number of people-per-viewscape (PPV) in a select viewscape on the Roaring Fork River in the Preserve. The location for the camera photo point and corresponding river viewscape was selected in consultation with DJ&A and a professional photographer to depict a representative and open view of the river as it flows through the Preserve (Figure 3, Figure 6). The trail camera was programmed to record an image of the selected river viewscape on a fixed, 10-minute time interval, 24 hours per day (e.g., Figure 7). Pitkin County OST staff post-processed the trail camera images to record a count for each image of the number of people and the number of watercraft visible in the image (including zero counts). Pitkin County OST staff delivered the count data to DJ&A for data cleaning and analysis to summarize the range of visitor use conditions that occur on a representative section of the river under current recreational river use levels. For the purposes of focusing on the peak season of recreational river use (i.e., during the month of July), the PPV count data were summarized for the period from Monday July 8 through Sunday July 28, 2024.

Figure 6. River viewscape and photo point location of the trail camera deployed to record PPV counts.

Figure 7. Sample image from the trail camera deployed to record PPV counts.

2.2.6 Recreational River User Survey

A survey was administered to public and commercial recreational river users exiting the river at the North Star Pedestrian Bridge Takeout every Wednesday through Sunday from June 22 through July 28, 2024. This resulted in a total of 27 survey sampling days, including 14 weekdays and 13 weekend days and holidays (July 4th holiday). The survey was administered to recreational river users from 10:00 a.m. to 6:00 p.m. on each sampling day using the protocols and instruments presented in Appendix A. A total of 582 eligible recreational river users were asked to participate in the survey. Of those, 352 completed the survey, resulting in an overall response rate of 60.5%.

The recreational river user survey was designed to collect information about river users themselves and their river trip planning behaviors, perceptions, and experiences (a copy of the questionnaire is included in Appendix C). A question was included in the survey questionnaire to measure user-based crowding thresholds for visitor use conditions on the river. This question was accompanied by digitally edited photographs, or photo simulations (included in Appendix D), depicting varying numbers of people in the viewscape where PPV counts were recorded for the study (Figure 6 and Figure 7). Each respondent was asked to indicate for a purposefully selected subset of five photo simulations if they would feel crowded if they were on the river with the number of people depicted in the photo.

The survey data were cleaned, analyzed, and summarized by DJ&A to document current recreational river users' characteristics, river trip behaviors, crowding perceptions and tolerances, and attitudes towards potential river use management strategies in the Preserve. A non-response bias analysis was conducted by DJ&A to assess whether the survey data have bias due to systematic differences between survey respondents and non-respondents.

3. Results

This section presents results from the North Star Nature Preserve Visitor Use Management study. Results are presented in tables and/or figures and are paired with in-line text descriptions. Two terms are introduced in this section, as follows: 1) the "visitor use day", which was defined based on hourly vehicle traffic volumes and patterns on Wildwood Lane as 9:00 a.m. to 7:00 p.m.[2]; and 2) "peak day use hours", which were defined based on VAOT volumes and patterns at the primary put-in and takeout parking locations as 2:00 p.m. to 4:00 p.m.[3]

3.1 Wildwood Lane Vehicle Traffic Volumes

Figure 8 presents daily inbound vehicle traffic volumes on Wildwood Lane from 9:00 a.m. to 6:59 p.m. (i.e., during the visitor use day), by date for the period June 21 through July 29, 2024[4]. In the upper right corner of the figure, the median inbound traffic volumes across the date range and corresponding sample sizes, by day of week type (i.e., weekend and weekday), are presented. These data include all vehicle traffic on Wildwood Lane, including that associated with recreational river use as well as non-recreational (i.e., residential, school, other) traffic on the road. The results suggest:

- In July 2024, daily inbound traffic volumes during the visitor use day on Wildwood Lane ranged from approximately 50 to 75 vehicles per day on weekdays, and from approximately 75 to 115 on weekend days. Traffic volumes were substantially lower in June 2024.
- The median daily inbound traffic volume during the sampling period was approximately 50% higher on weekend days compared to weekdays.
- On four days, all of which were weekend days in July, daily inbound traffic volumes on Wildwood Lane reached or exceeded 100 vehicles during the visitor use day.
- Daily inbound traffic volumes during the visitor use day were particularly high on weekends during the second half of July.

[2] On average, 86% of daily vehicle inbound vehicle traffic on Wildwood Lane occurred between the hours of 9:00 a.m. and 7:00 p.m.
[3] Peak parking demand at the Wildwood put-in tended to occur during the 2:00 p.m. hour and peak parking demand downstream at the pullouts along Highway 82 and peak loading activity at the North Star Pedestrian Bridge Takeout tended to occur during the 4:00 p.m. hour.
[4] Dates missing greater than 50% of the hourly inbound counts during the visitor use day were excluded from the figure.

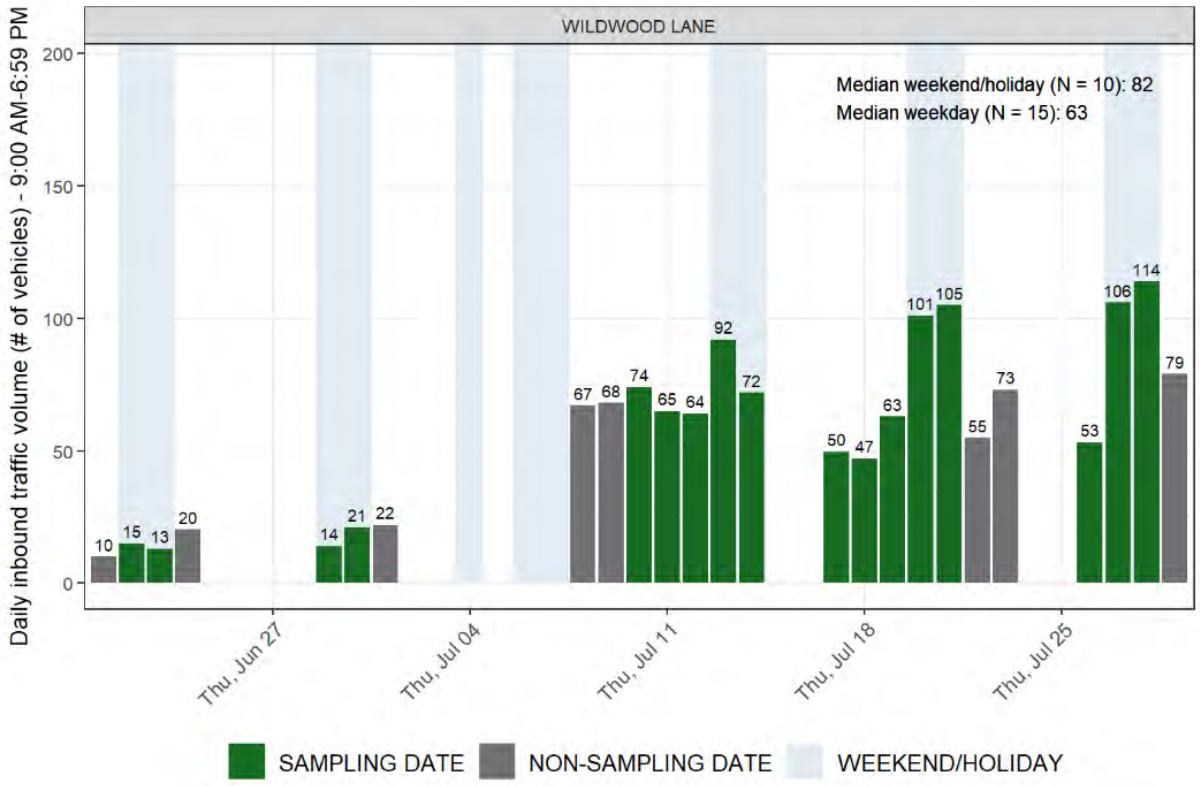


Figure 8. Inbound vehicle traffic volumes during the visitor use day, June 21 through July 29, 2024: Wildwood Lane (light-blue shading indicates weekend days and holidays).

Figure 9 presents median hourly inbound and outbound vehicle traffic volumes on Wildwood Lane during the hours of the visitor use day for the period June 21 through July 29, 2024, by day of week type (i.e., weekend and weekday). In the upper right corner of the figure, the hourly sample size, by day of week type is presented. These data suggest vehicle traffic volumes are generally higher on weekend days than weekdays during the peak summer recreational river use season. They further suggest:

- On weekend days:
  - Median hourly inbound vehicle traffic volumes increased from 9:00 a.m. to 10:00 a.m. and then remained steady from 10:00 a.m. to noon. It then picked up again at noon and reached a peak of approximately 10 inbound vehicles during the 1:00 p.m. hour. Median hourly inbound vehicle traffic declined slightly from 1:00 p.m. to 2:00 p.m. and then declined more sharply after 2:00 p.m.
  - Median hourly outbound vehicle traffic volumes increased steadily from 9:00 a.m. to a peak of approximately 17 vehicles at 2:00 p.m. and then declined steadily from 2:00 p.m. through the end of the day on weekend days.

- On weekdays:
  - Median hourly inbound vehicle volumes increased from 9:00 a.m. to a peak of approximately seven vehicles during the 10:00 a.m. hour. It remained relatively consistent from 10:00 a.m. through 4:00 p.m. and then declined gradually through the end of the day.
  - Median hourly outbound vehicle traffic volumes increased steadily from 9:00 a.m. to a peak of approximately seven vehicles at 3:00 p.m. and then declined gradually from 3:00 p.m. through the end of the day on weekdays.

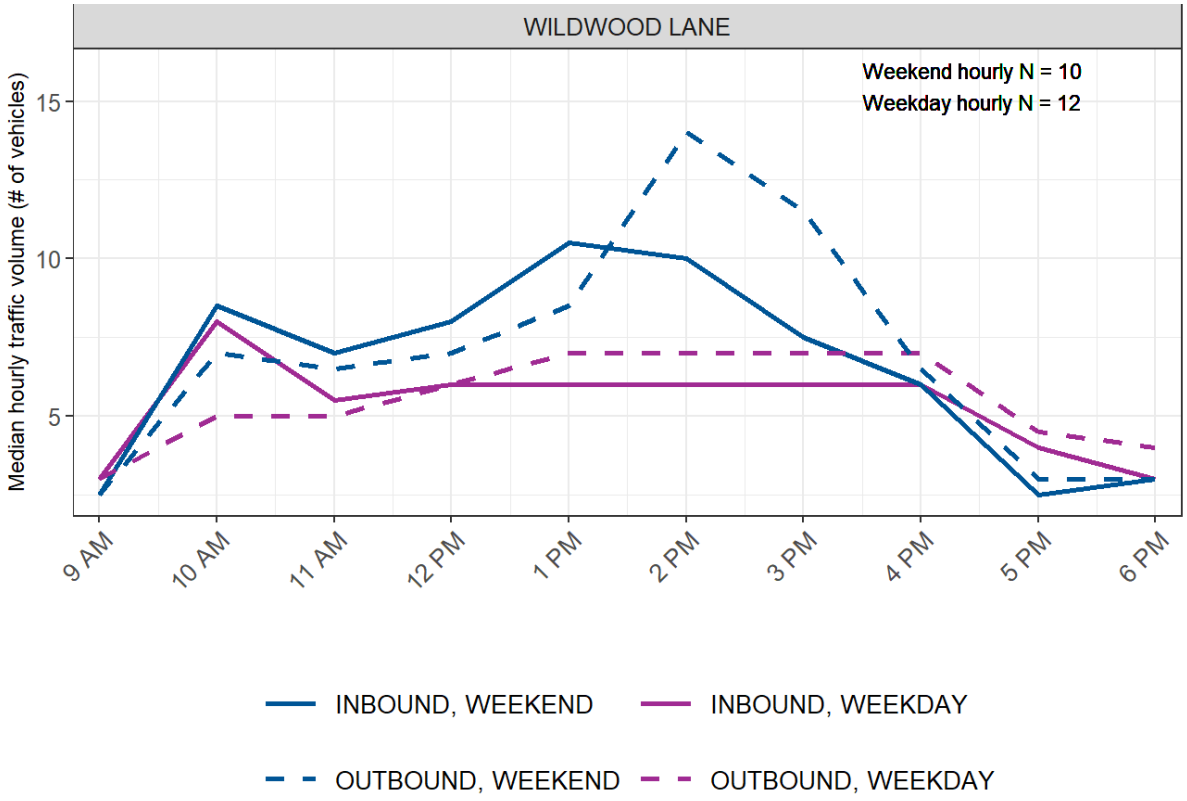


Figure 9. Median hourly traffic volumes, by direction of travel and day of week type (i.e., weekend and weekday), June 21 through July 29, 2024: Wildwood Lane.

3.2 Recreational River Use Counts

As noted, recreational river use count data were missing for a substantial period in July 2024 due to counter equipment malfunction. In lieu of presenting July 2024 data, Figure 10 presents daily recreational river use volumes for July 2023. Though these are the most recent available data for this purpose, it is important to note again that river use is substantively influenced by fluctuations in river levels and seasonal and daily weather patterns. As such, river use patterns in July 2024 may be different than those presented in Figure 10. In the upper right corner of the figure, mean daily recreational river use volumes for July 2023 are presented, along with corresponding sample sizes, by day of week type (i.e., weekend/holiday and weekday)[5]. These data suggest:

- Daily recreational river use volumes in July 2023 ranged from a low of approximately 50 users per day to a maximum of just over 300 users per day. It tended to be higher on weekend days and holidays than on weekdays and was generally lower in the second half of the month.

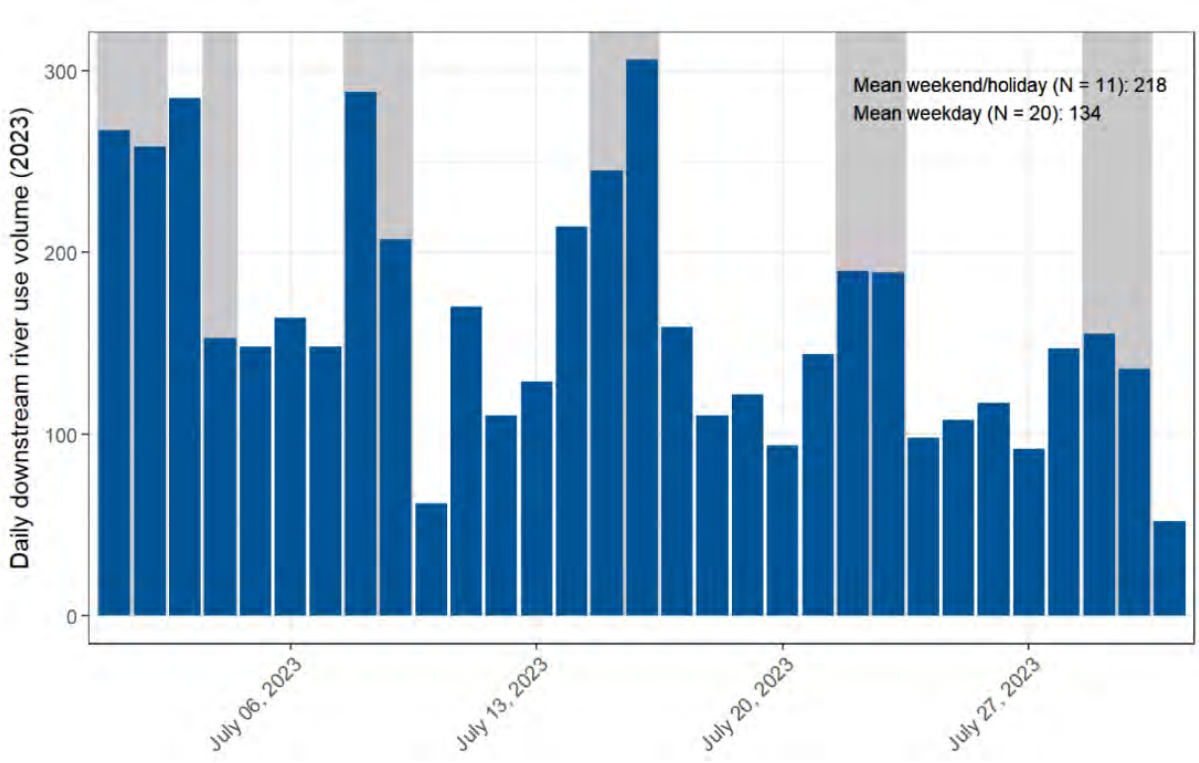


Figure 10. Daily recreational river use volumes for July 2023 (gray shading indicates weekend days and holidays).

[5] While not typical, some users float downstream past the photo point location more than once per day. As such, the river use volumes reported are not necessarily counts of unique river users per day.

For a basis of comparison of July 2023 recreational river use volumes, Figure 11 presents monthly total recreational river use volumes in July, by year for 2021, 2022, and 2023. These data illustrate a similar year-over-year trend from 2021 through 2023 as the total annual recreational river use volumes in Figure 1 and suggest:

- Monthly total recreational river use volumes in July decreased from 2021 to 2022 and then increased from 2022 to 2023. Given the similarity of these trends with the total annual recreational river use volumes in Figure 1, it is likely river use volumes in July 2024 decreased from those in July 2023.

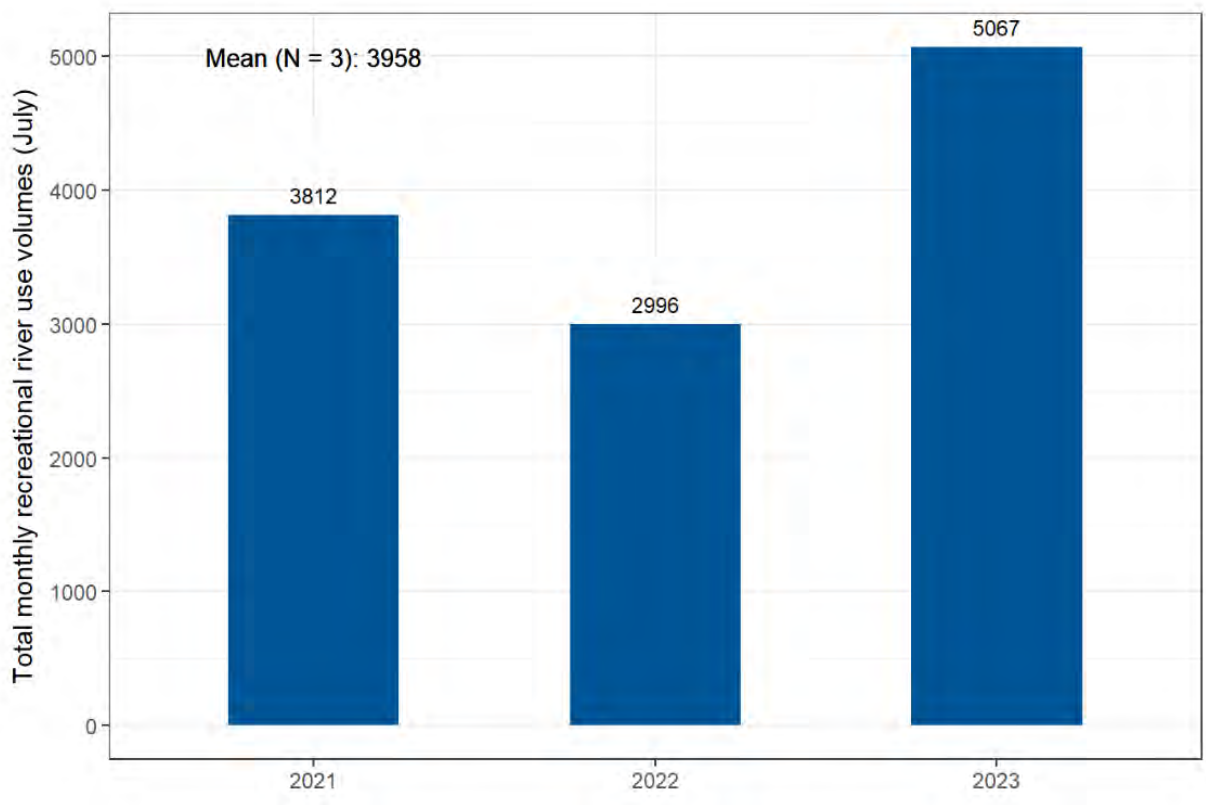


Figure 11. Total monthly recreational river use volumes in July, by year (2021, 2022, 2023).

3.3 Commercial River Use Reports

Figure 12 presents annual recreational river use during the months of May through September reported by commercial operators from 2015 through 2024. These data suggest:

- Commercial river use has increased substantially from the first year data were reported in 2015 (205 annual users) to 2024 (1,898 annual users).
- Within the overall trend for the reported date range, commercial river use increased by more than a factor of five from 2015 to 2019 (from 205 annual users to 1,328 annual users). It then more than doubled again from 2019 to 2020 (from 1,328 annual users to 2,979 annual users).
- From 2020 to 2022, commercial river use declined by about one-third (35.1%). It then increased by more than one-quarter (26.7%) from 2022 to 2023, before declining again by just under one-quarter (22.5%) from 2023 to 2024.

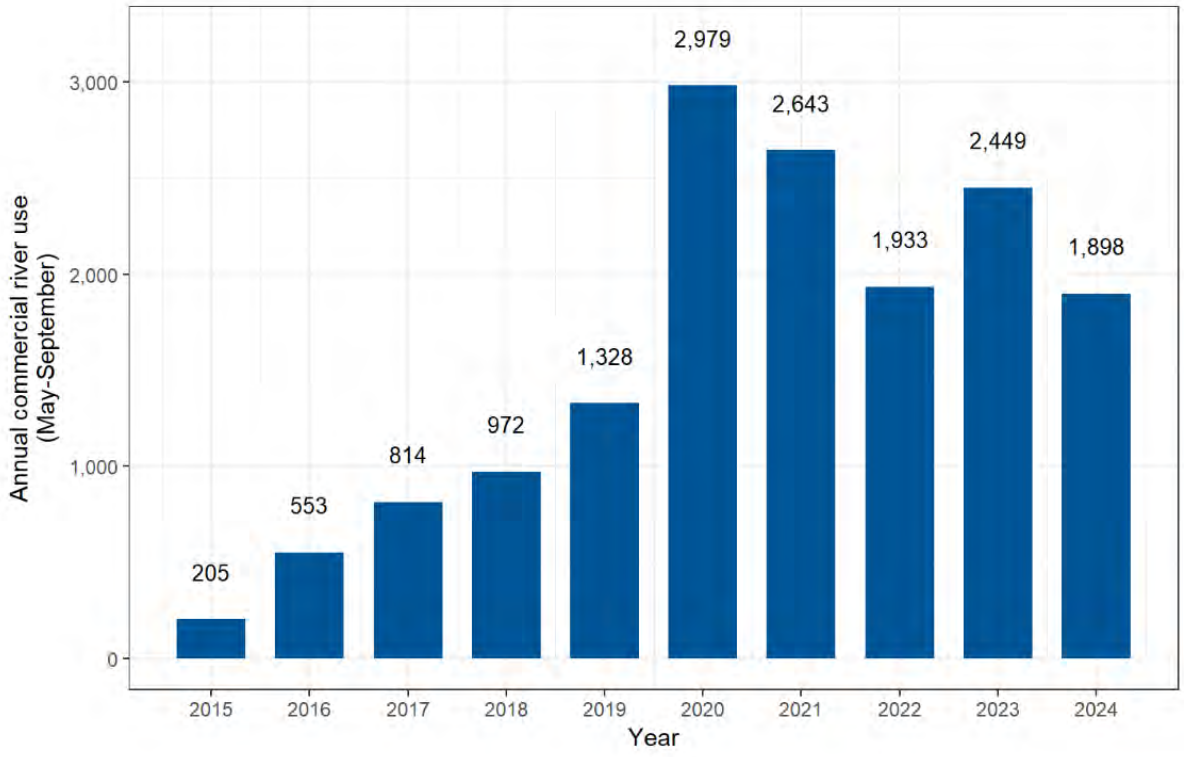


Figure 12. Annual commercial river use, by year (2015-2024)[6].

[6] It should be noted, only one commercial operator was permitted in 2015. As part of implementing the 2015 Management Plan, the number of commercial operators was increased as a strategy to help mitigate vehicle traffic and parking impacts that were occurring at the Preserve. Also as part of implementing the plan, all taxi services, hotels, guide businesses, and similar commercial enterprises have since been required to obtain a permit to deliver guests to the river. These are key factors that help explain the commercial river use trends reported.

3.4 Counts of Parked Vehicles-At-One-Time (VAOT)

3.4.1 Wildwood Put-in Parking Lot

Figure 13 presents mean hourly VAOT in the Wildwood Put-in Parking Lot, by day of week type (i.e., weekend/holiday and weekday), for the period June 22 through July 28, 2024[7]. It also includes observed hourly VAOT, by sampling date, in the background of the figure to illustrate daily variability in hourly VAOT. The sample size used to compute the hourly mean values, by day of week type, is presented in the upper right corner of the figure. The horizontal line in the figure indicates the parking lot's capacity. These data suggest:

- On weekend days and holidays:
  - Average hourly VAOT increased from 10:00 a.m. to a peak of approximately 10 vehicles at 2:00 p.m.[8] It then declined gradually from 2:00 p.m. through the remainder of the day.
  - Average hourly VAOT exceeded the designated parking capacity of the lot from 12:00 p.m. to 3:00 p.m.
  - The maximum observed hourly VAOT during the sampling period was 16 vehicles.
- On weekdays:
  - Average hourly VAOT increased from 10:00 a.m. to a peak of approximately seven vehicles at 2:00 p.m. It then gradually declined from 2:00 p.m. through 4:00 p.m. before increasing slightly at 5:00 p.m.
  - Average hourly VAOT never exceeded the designated parking capacity of the lot. However, observed VAOT exceeded the parking capacity on a few occasions during the sampling period.

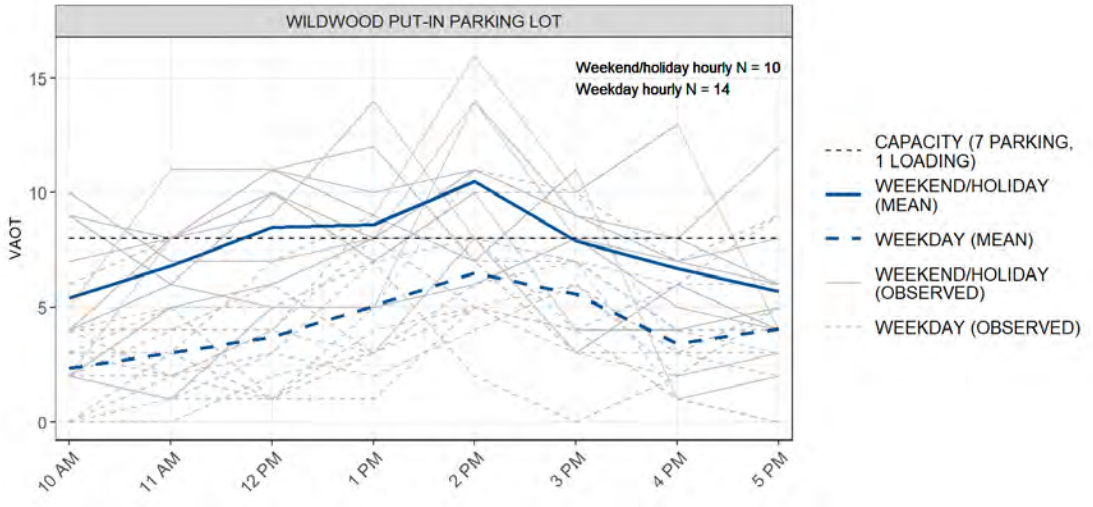


Figure 13. Mean and observed hourly VAOT, by day of week type (i.e., weekend/holiday and weekday), June 22 through July 28, 2024: Wildwood Put-in parking lot.

[7] Rangers provide traffic and parking management during peak use periods at the Wildwood Put-in.
[8] In cases of counts of VAOT that exceed the parking capacity, overflow vehicles were observed orbiting or double-parked in the parking area.

3.4.2 South Gate Put-in Parking Lot

Figure 14 presents mean hourly VAOT in the South Gate Put-in Parking Lot, by day of week type (i.e., weekend/holiday and weekday), for the period June 22 through July 28, 2024. It also includes observed hourly VAOT, by sampling date, in the background of the figure to illustrate daily variability in hourly VAOT. The sample size used to compute the hourly mean values, by day of week type, is presented in the upper right corner of the figure. The horizontal line in the figure indicates the parking lot's capacity. These data suggest:

- Regardless of day of week type, hourly mean VAOT never reached more than approximately five vehicles and was well below the designated parking capacity of the lot all day. It did not fluctuate much during the hours of the day, especially on weekdays.
- The maximum observed hourly VAOT during the sampling period was approximately 17 vehicles. There were only two other occasions during the sampling period when hourly VAOT was observed to exceed 10 vehicles, which is less than half of the designated parking capacity of the lot.

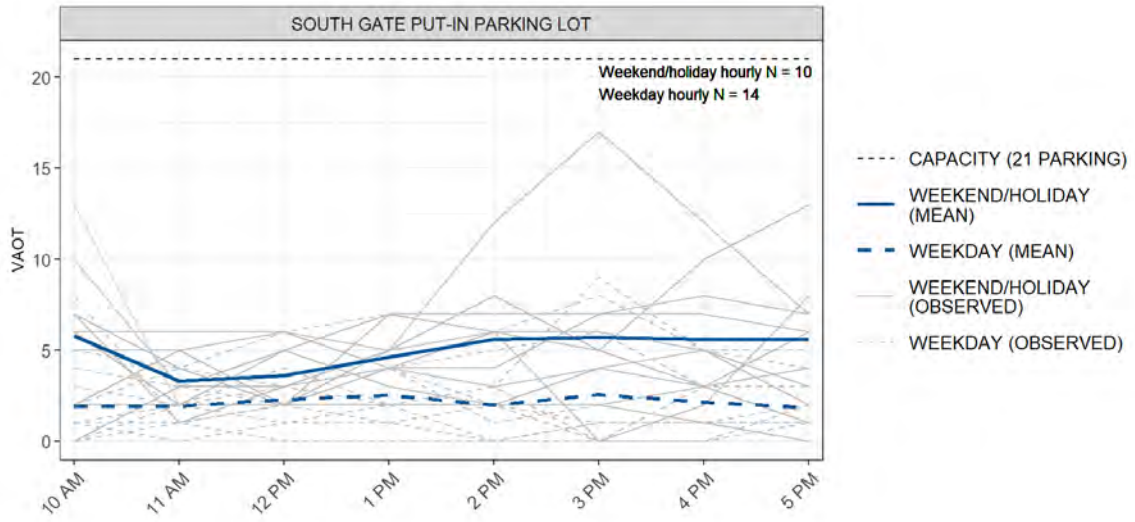


Figure 14. Mean and observed hourly VAOT, by day of week type (i.e., weekend/holiday and weekday), June 22 through July 28, 2024: South Gate Put-in Parking Lot.

3.4.3 Beach Access Parking Lot

Figure 15 presents mean hourly VAOT in the Beach Access Parking Lot, by day of week type (i.e., weekend/holiday and weekday), for the period June 22 through July 28, 2024. It also includes observed hourly VAOT, by sampling date, in the background of the figure to illustrate daily variability in hourly VAOT. The sample size used to compute the hourly mean values, by day of week type, is presented in the upper right corner of the figure. The horizontal line in the figure indicates the parking lot's capacity[9]. These data suggest:

- On weekend days and holidays:
  - Average hourly VAOT increased steadily from 10:00 a.m. to a peak of approximately seven vehicles at 2:00 p.m. It then fluctuated at about five or six vehicles through the remainder of the day.
  - Average hourly VAOT never exceeded the designated parking capacity of the lot. However, hourly VAOT was observed to reach (but not exceed) the lot's designated capacity once during the sampling period and approach the lot's capacity on a few occasions.
- On weekdays:
  - Average hourly VAOT increased gradually from 10:00 a.m. to a peak of approximately three vehicles at 2:00 p.m. It remained steady at about three vehicles through the remainder of the day.
  - At no point in the sampling period was VAOT observed to exceed the designated parking capacity of the lot.

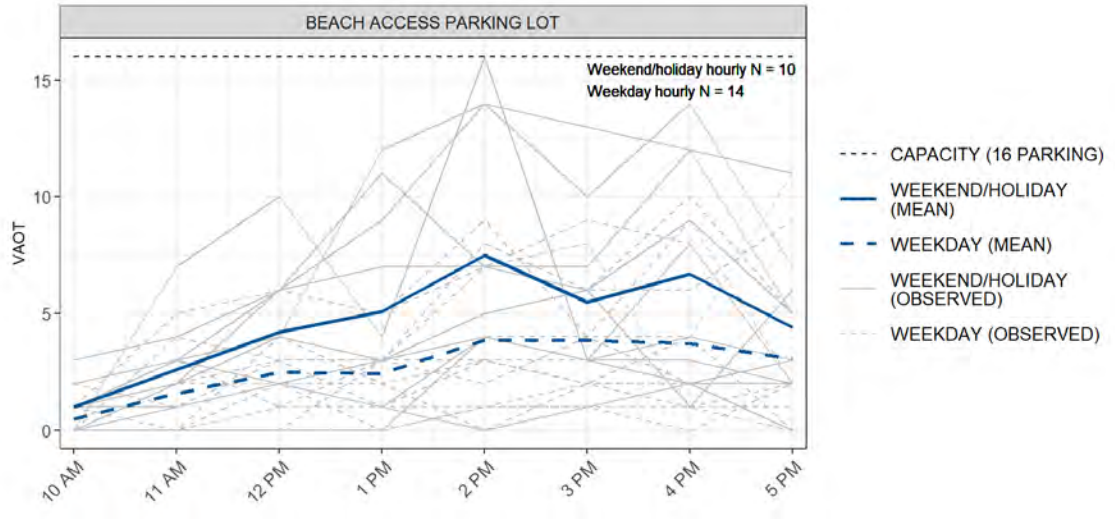


Figure 15. Mean and observed hourly VAOT, by day of week type (i.e., weekend/holiday and weekday), June 22 through July 28, 2024: Beach Access Parking Lot.

[9] In 2024, the Highway 82 shoulder east of the Beach Access Parking Lot was signed "no parking", however it could accommodate 10-15 illegally parked vehicles. On busy days, anecdotal observations indicate there were vehicles parked illegally on the shoulder, and this may have influenced the observed VAOT values in the designated parking areas itself. Cars parked illegally on the shoulder were not included in the VAOT counts. In Fall 2024, Pitkin County OST fenced off this area to effectively eliminate future illegal parking there.

3.4.4 North Parking Lot

Figure 16 presents mean hourly VAOT in the North Parking Lot, by day of week type (i.e., weekend/holiday and weekday), for the period June 22 through July 28, 2024. It also includes observed hourly VAOT, by sampling date, in the background of the figure to illustrate daily variability in hourly VAOT. The sample size used to compute the hourly mean values, by day of week type, is presented in the upper right corner of the figure. The horizontal line in the figure indicates the parking lot's capacity. These data suggest:

- On weekend days and holidays:
  - Average hourly VAOT increased steadily from 10:00 a.m. to a peak of approximately six vehicles from 3:00 p.m. to 4:00 p.m. It then declined to approximately three vehicles at 5:00 p.m.
  - Average hourly VAOT never exceeded the designated parking capacity of the lot. However, hourly VAOT did exceed the designated parking capacity of the lot from 2:00 to 4:00 p.m. on one weekend sampling day and it reached or nearly reached capacity on two other weekend sampling days.
- On weekdays:
  - Average hourly VAOT was highest at 10:00 a.m. at approximately five vehicles and declined slightly to about three vehicles through the remainder of the day.
  - At no point in the sampling period was VAOT observed to exceed the designated parking capacity of the lot, although it did approach the capacity for one hour on one weekday during the sampling period.

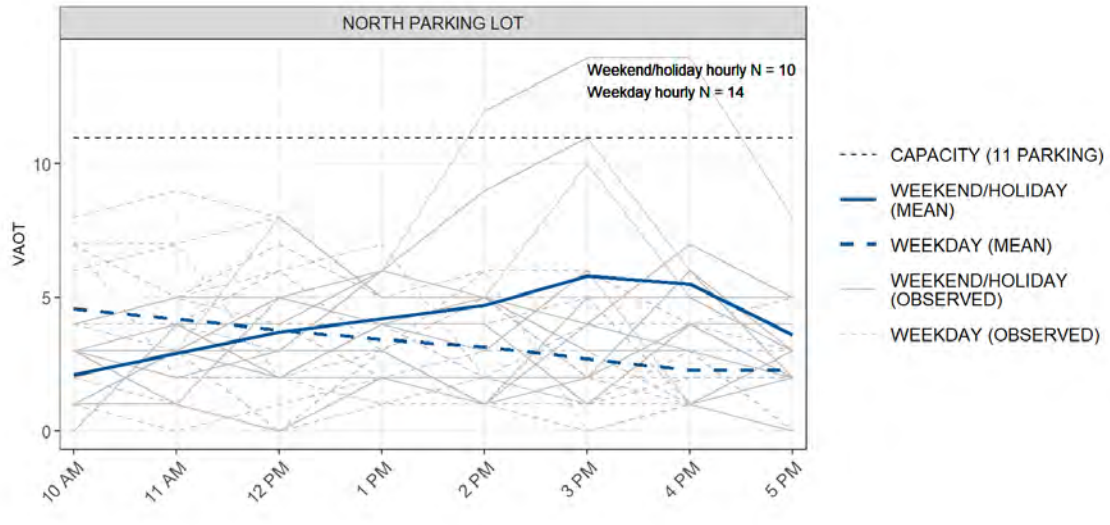


Figure 16. Mean and observed hourly VAOT, by day of week type (i.e., weekend/holiday and weekday), June 22 through July 28, 2024: North Parking Lot.

3.4.5 Informal Parking Area Pullout Along Highway 82

Figure 17 presents mean hourly VAOT in the informal parking area pullout along Highway 82, by day of week type (i.e., weekend/holiday and weekday), for the period June 22 through July 28, 2024. It also includes observed hourly VAOT, by sampling date, in the background of the figure to illustrate daily variability in hourly VAOT. The sample size used to compute the hourly mean values, by day of week type, is presented in the upper right corner of the figure. The horizontal line in the figure indicates the informal parking area's approximate capacity. These data suggest:

- On weekend days and holidays:
  - Average hourly VAOT increased steadily from 10:00 a.m. to a peak of approximately 12 vehicles from 3:00 p.m. to 4:00 p.m. It then declined to approximately seven vehicles at 5:00 p.m.
  - Average hourly VAOT never exceeded the approximate capacity of the pull-off parking area of 15 spaces. However, hourly VAOT did exceed the approximate capacity of the area from 1:00 p.m. through 5:00 p.m. on one sampling day. It also reached or exceeded the approximate capacity at one or more points between 2:00 p.m. and 4:00 p.m. on five other sampling days.
- On weekdays:
  - Average hourly VAOT increased steadily from 10:00 a.m. to a peak of approximately six or seven vehicles from 2:00 p.m. to 3:00 p.m. It then declined through the remainder of the day.
  - Average hourly VAOT never exceeded the designated parking capacity of the pull-off parking area. However, hourly VAOT did exceed the designated parking capacity of the lot from 2:00 p.m. through 5:00 p.m. on one sampling day. It also slightly exceeded the capacity at 3:00 p.m. on one other sampling day.

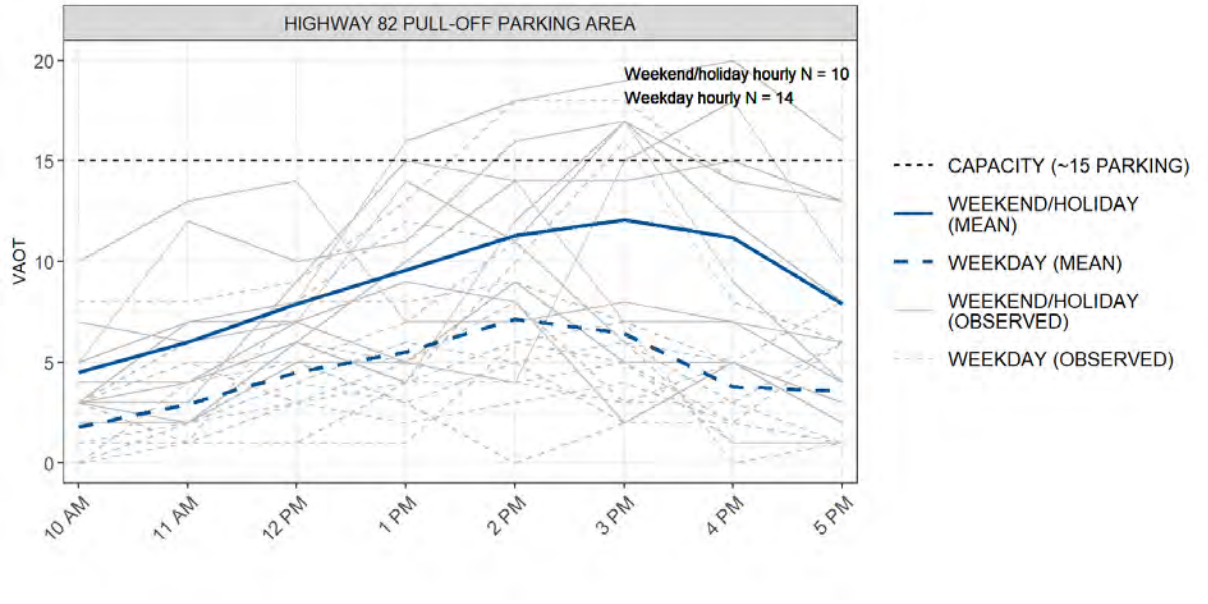


Figure 17. Mean and observed hourly VAOT, by day of week type (i.e., weekend/holiday and weekday), June 22 through July 28, 2024: Highway 82 Pull-off Parking Area.

3.4.6 North Star Pedestrian Bridge Loading Zone

Figure 18 presents mean hourly VAOT in the North Star Pedestrian Bridge Loading Zone and illegal parking along the Highway 82 shoulder, by day of week type (i.e., weekend/holiday and weekday), for the period June 22 through July 28, 2024[10]. It also includes observed hourly VAOT, by sampling date, in the background of the figure to illustrate daily variability in hourly VAOT. The sample size used to compute the hourly mean values, by day of week type, is presented in the upper right corner of the figure. The horizontal line in the figure indicates the capacity of the 10-minute loading zone. These data suggest:

- Regardless of day of week type, average hourly VAOT fluctuated between one and two vehicles from 10:00 a.m. through 2:00 p.m. and it fluctuated between two and three vehicles from 3:00 p.m. to 5:00 p.m.
- As noted, average hourly VAOT reached, but did not exceed the designated capacity of the 10-minute loading zone. However, hourly VAOT was observed to exceed the designated capacity of the 10-minute loading zone on multiple weekdays and multiple weekend days during the sample period.

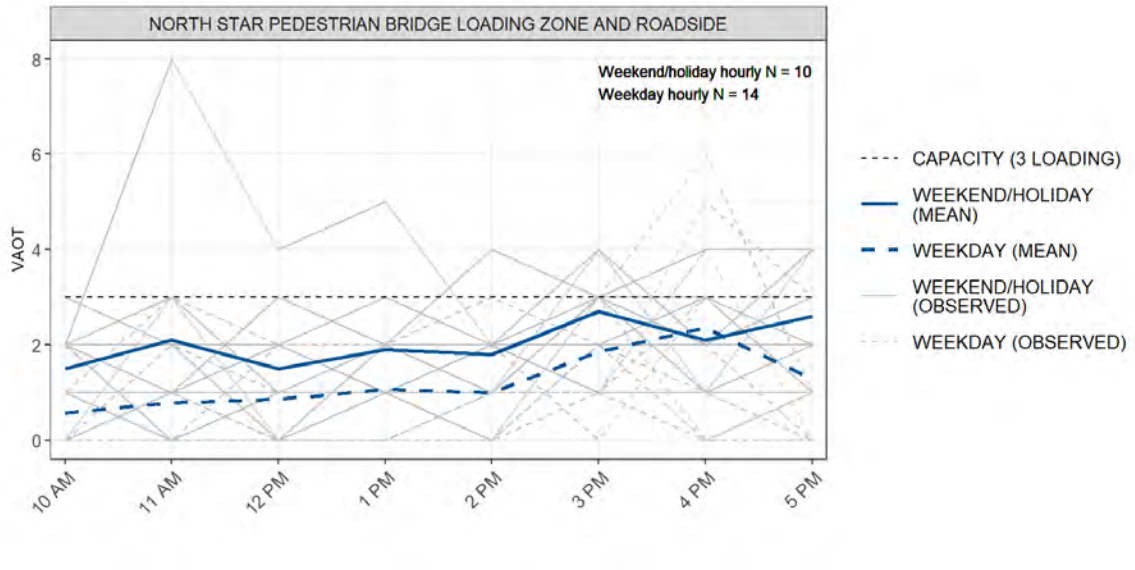


Figure 18. Mean and observed hourly VAOT, by day of week type (i.e., weekend/holiday and weekday), for the period June 22 through July 28, 2024: North Star Pedestrian Bridge Takeout location.

[10] The three spaces here are designated and signed for loading only. Rangers provide traffic and parking management during peak use periods at the North Star Pedestrian Bridge Takeout. At times, vehicles loading here may have been blocking the entrance to the loading area, preventing river users from using all three loading spaces simultaneously.

3.5 Counts of People-Per-Viewscape (PPV)

Figure 19 and Figure 20 show the distributions of PPV counts during the visitor use day (9:00 a.m.-6:59 p.m.) and during peak day use hours (2:00 p.m.-3:59 p.m.), by day of week type (i.e., weekend and weekday) for the period July 8 through July 28, 2024[11]. Sample sizes, by day of week type, are presented next to corresponding legend items. These data suggest:

- On weekend days
  - The majority (71%) of the instantaneous PPV counts recorded ***during the visitor use day*** were of 0 PPV. About one-fifth (18%) of the counts were of 1 or 2 PPV and 8% were of 3 or 4 PPV. There were 5 or more PPV in 3% of the counts.
  - About half (56%) of the counts ***during the peak day use hours*** were of 0 PPV. More than one-quarter (29%) of the counts were of 1-2 PPV and 10% were of 3 or 4 PPV. There were 5 or more PPV in 6% of the counts.
- On weekdays
  - The majority (84%) of the instantaneous PPV counts recorded ***during the visitor use day*** were of 0 PPV. Ten percent of the counts were of 1 or 2 PPV and 4% were of 3 or 4 PPV. There were 5 or more PPV in 2% of the counts.
  - About three-quarters (74%) of the counts ***during the peak day use hours*** were of 0 PPV. More than one-tenth (16%) were of 1-2 PPV and 6% were of 3 or 4 PPV. There were 5 or more PPV in 4% of the counts.

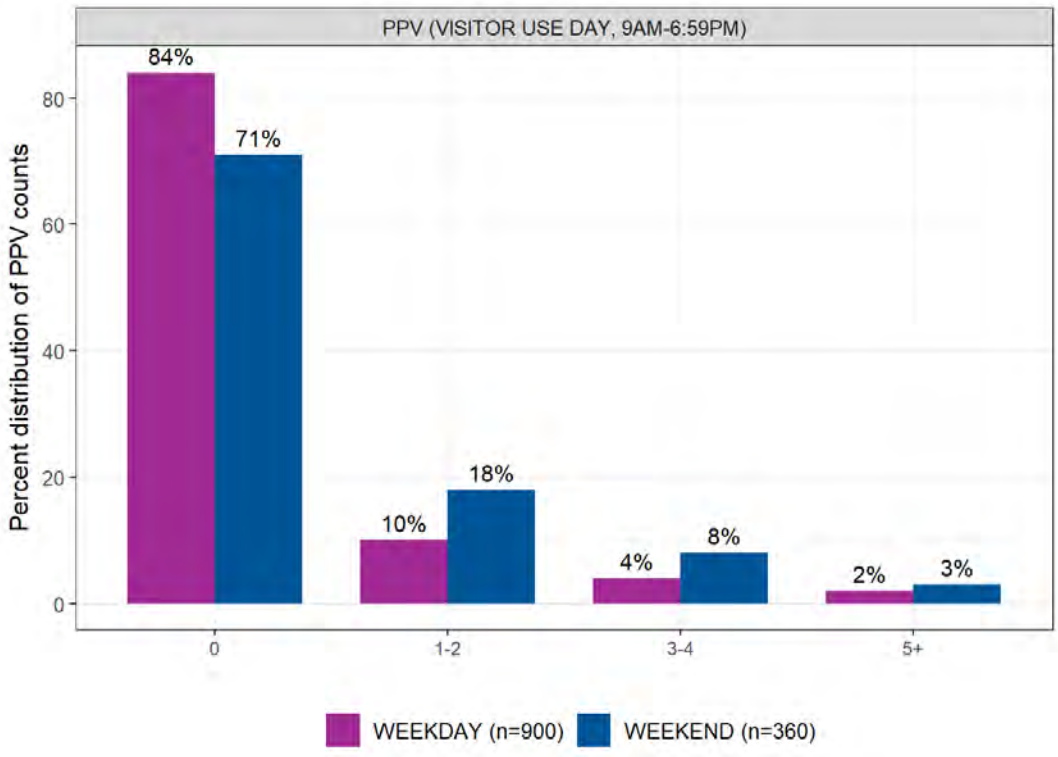


Figure 19. Distribution of PPV counts during the visitor use day, by day of week type (i.e., weekend and weekday), July 8 through July 28, 2024.

[11] The average number of people per watercraft was approximately 1.2.

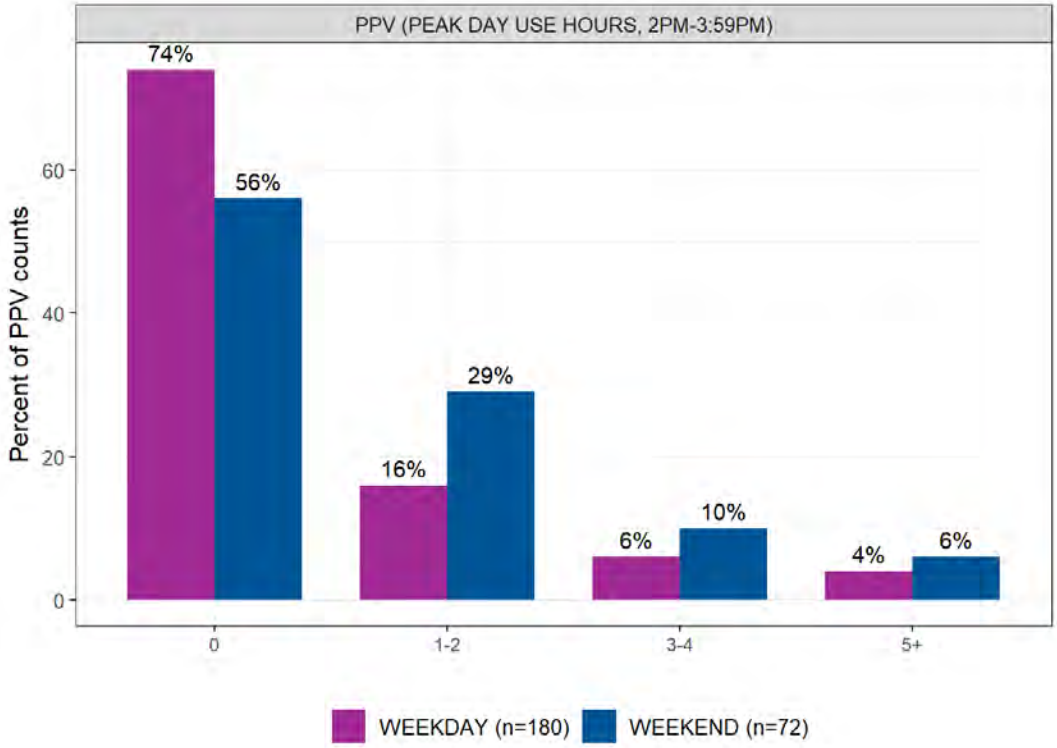


Figure 20. Distribution of PPV counts during the peak day use hours, by day of week type (i.e., weekend and weekday), July 8 through July 28, 2024.

Table 1 reports the percentage of the instantaneous PPV counts that were higher than hypothetical PPV thresholds ***during the visitor use day***[12]. Similarly, Table 2 reports the percentage of the PPV counts recorded ***during the peak day use hours*** that were higher than hypothetical PPV thresholds. These data suggest:

- The vast majority of counts during the visitor use day on weekend days (97%) and on weekdays (98%) included four or fewer PPV. Regardless of the day of week type, an even greater majority of counts (99% or more) included six or fewer PPV.
- The vast majority of counts during peak day use hours on weekend days (94%) and on weekdays (96%) included four or fewer PPV. Regardless of the day of week type, an even greater majority of counts (97% or more) included six or fewer PPV.

[12] The hypothetical thresholds used in this analysis were selected based on the survey results presented on pages 41-44. They represent a range from a PPV level that elicited a "crowding response" from very few respondents to a PPV level that elicited a "crowding response" from just under a majority of respondents.

Table 1. Percentage of PPV counts during the visitor use day that exceeded hypothetical PPV thresholds, by day of week type (i.e., weekend and weekday), July 8 through July 28, 2024.

Day of week type	Total counts	Percentage of counts > 2 PPV	Percentage of counts > 4 PPV	Percentage of counts > 6 PPV
Weekend	360	11%	3%	1%
Weekday	900	6%	2%	<1%

Table 2. Percentage of PPV counts during peak day use hours that exceeded hypothetical PPV thresholds, by day of week type (i.e., weekend and weekday), July 8 through July 28, 2024.

Day of week type	Total counts	Percentage of counts >2 PPV	Percentage of counts > 4 PPV	Percentage of counts > 6 PPV
Weekend	72	15%	6%	3%
Weekday	180	9%	4%	1%

3.6 Recreational River User Survey

This section of the report presents the results of the survey that was administered to public and commercial recreational river users exiting the Roaring Fork River at the North Star Pedestrian Bridge Takeout. The results are presented in questionnaire order and include the question number, the question text, bulleted summaries, and data figures and tables. For select results, responses were summarized by recreational river user type (i.e., public user and commercial user), day of week type (i.e., weekend/holiday and weekday), and/or perceptions of crowding (i.e., did/did not report feeling crowded during float trip). For all open-ended questions and questions with open-ended response options, verbatim responses are reported. Where applicable, mean values are reported in the bulleted text. Descriptive statistics (mean, median, standard deviation) are presented in Appendix E for those variables for which measures of central tendency can be computed. Crosstabs comparing survey results for respondents with a primary residence in the Roaring Fork Valley, a secondary residence in the Roaring Fork Valley, and for respondents that are not residents of the Roaring Fork Valley are presented in Appendix F.

It should be noted, due to rounding, the percentages summarized in the bulleted information may not exactly match summation of the percentages presented in the tables. The percentages in the tables may not sum to 100% due to rounding (indicated by "*" at the top of the figure), or in cases where survey respondents were instructed to select all response options that apply (indicated by "**" at the top of the figure). It should also be noted that sample size varies by question due to item non-response (i.e., one or more questions left blank by a respondent) and/or skip patterns. Therefore, it is important to reference both the percentage and sample size values when interpreting results.

Group and visit characteristics

Question 1: Group type

Which of the following best describes your group that you floated the river with today?

Results (Figure 21)

- A majority of respondents (56%) floated the river with family.
- Nearly half of respondents (46%) floated the river with friends.
- Few (7%) respondents floated the river alone, and fewer still (2%) reported that they floated the river with an organized group.
- Table 3 reports the other group types specified by respondents.

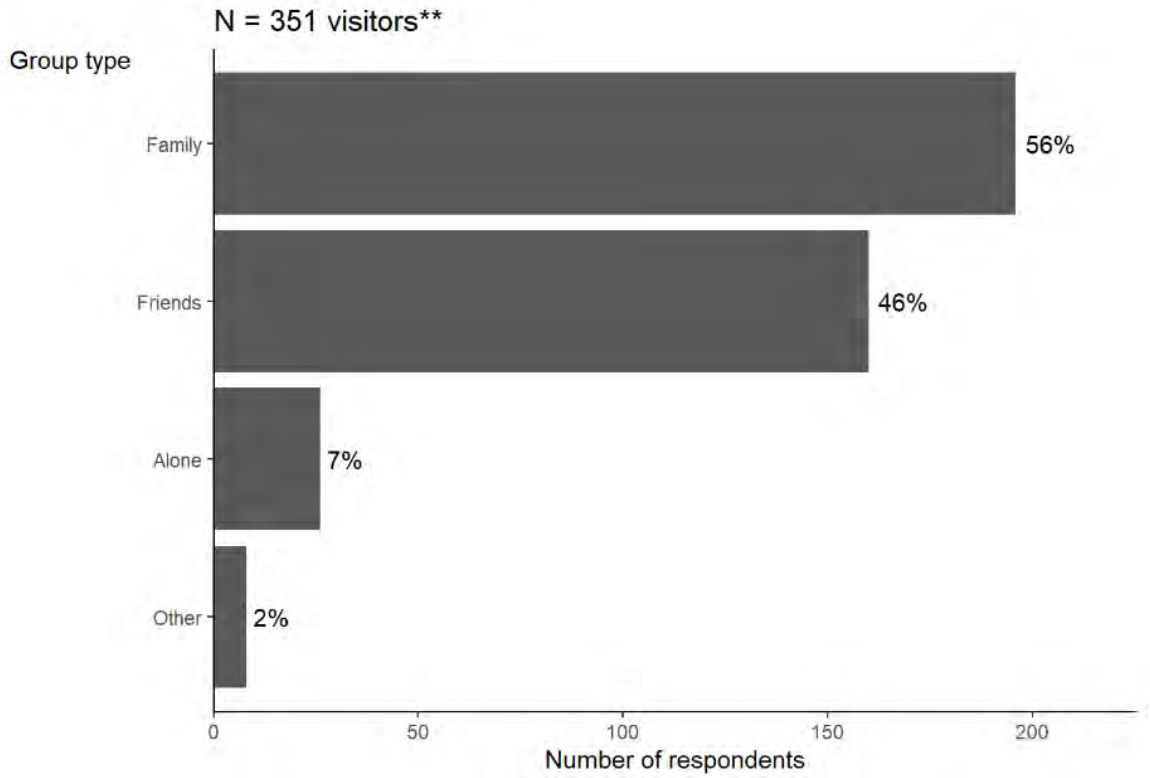


Figure 21. Group type.

Table 3. Other group types specified.

Other group type	N
BOTH FAMILY AND FRIENDS	1
BOYFRIEND	1
BOYFRIEND/GIRLFRIEND	1
GUIDED	1
H.A	1
SPOUSE	1
UP RIVER/DOWN RIVER	1
WE ARE A COUPLE.	1
WELL EXPERIENCED FAMILY, PADDLE BOARDING THIS RIVER FOR 16 + YEARS.	1

Question 2A: Number of adults in group

Including yourself, how many adults (18 years or older) are in your group?

Results (Figure 22)

- Forty-one percent of respondents were in groups with two adults.
- Almost half (48%) of respondents were in groups with three or more adults.
- On average, there were approximately three adults per group.

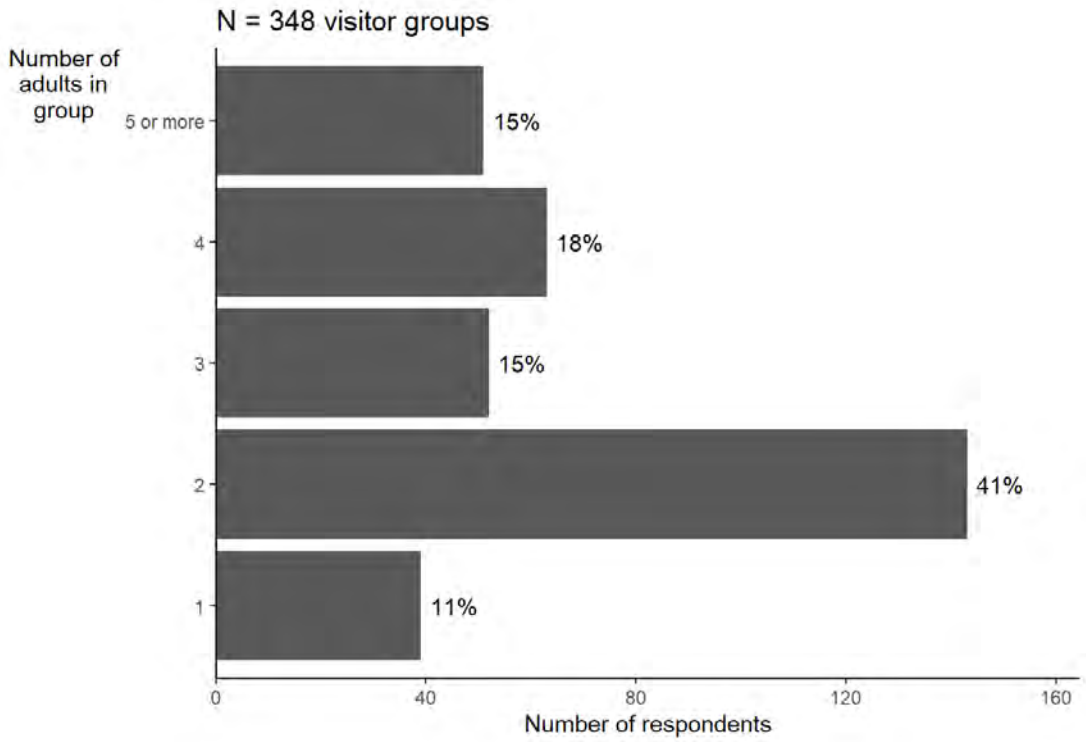


Figure 22. Number of adults in group.

Question 2B: Number of children in group

Including yourself, how many children (under 18 years) are in your group?

Results (Figure 23)

- The majority (53%) of respondents were in groups with no children.
- About one-third (36%) of respondents were in groups with one or two children.

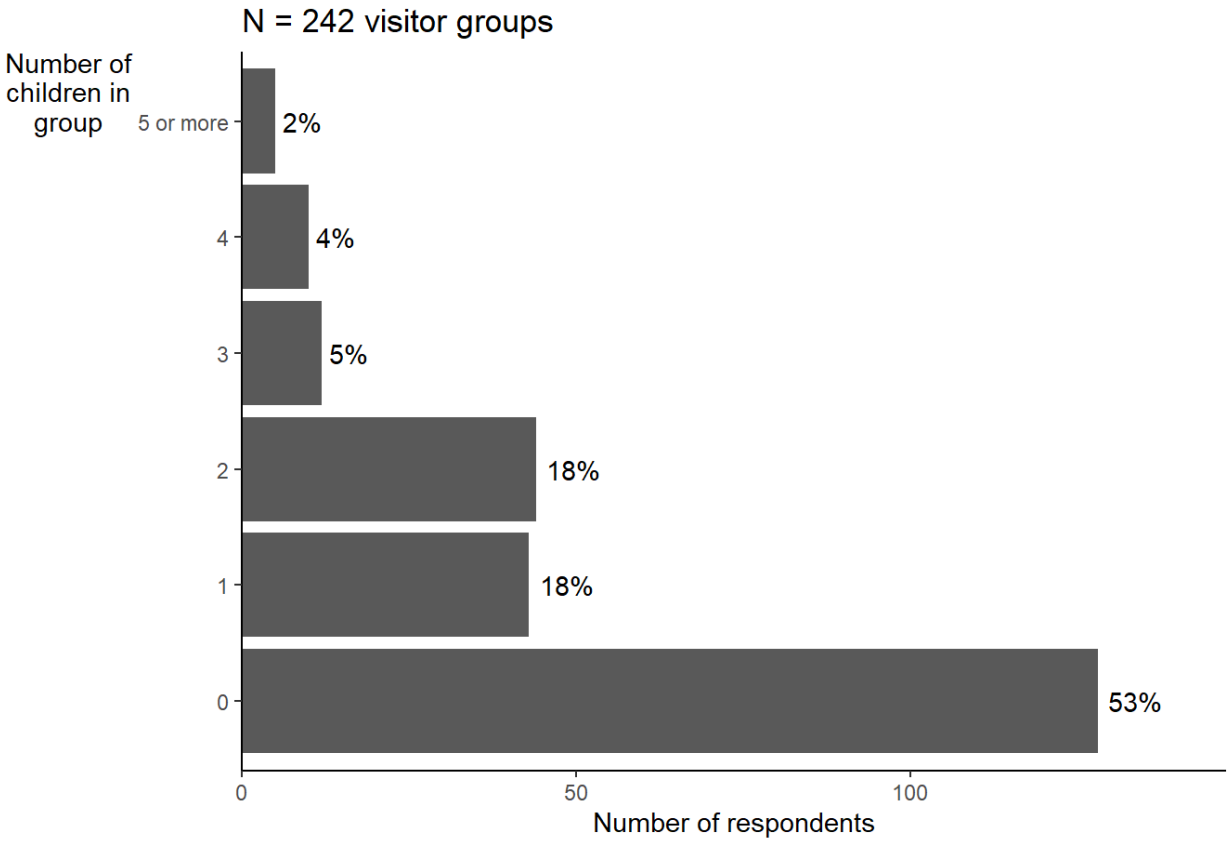


Figure 23. Number of children in group.

Question 3: Transportation used to access the river

What type of transportation did you and your group use to access the river today?

Results (Figure 24)

- The majority of respondents (79%) used their personal vehicles to access the river.
- About one-fifth of respondents (18%) used a commercial group shuttle to access the river.
- Table 4 reports the other types of transportation specified by respondents.

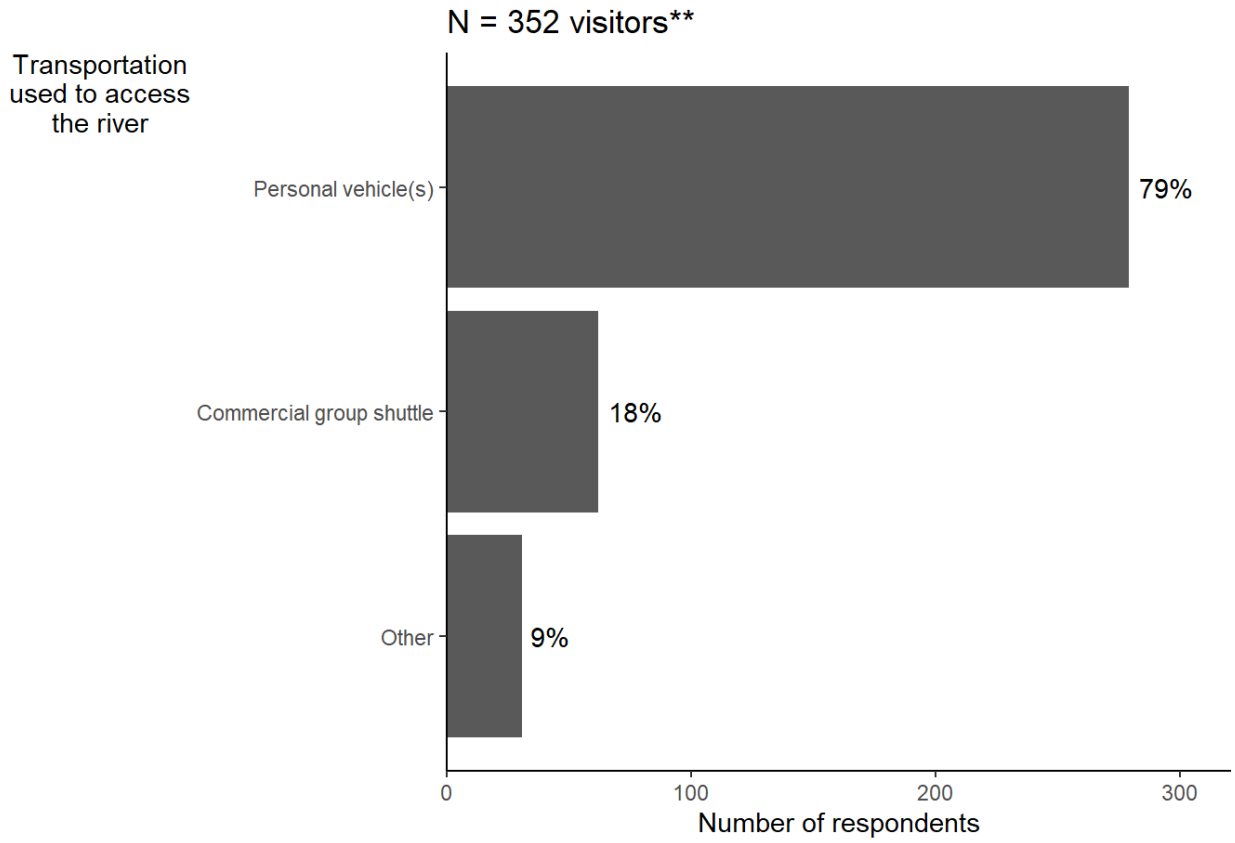


Figure 24. Transportation used to access the river.

Table 4. Other transportation types specified.

Other transportation type	N
• BIKE	1
+1 BIKE	1
1 BIKE	1
1 CAR 1 BIKE	1
1 PADDLEBOARD	1
1 SCOOTER	1
AND A BIKE	1
ASPEN WHITE WATER RAFTING	1
BIKE	14
BIKE WITH RACK	1
DROP OFF	1
E-BIKE	7
LIMELIGHT	1
ONE WHEEL	1
RENTED KAYAKS	1
SCOOTER	2
VESPA MOTORCYCLE	1
WITH BIKE SHUTTLE	1

Question 4: Launch location

At which of the following locations did you launch onto the river today?

Results (Figure 25)

- Three-quarters of respondents (75%) used the Wildwood launch location to access the river.
- A smaller share of respondents (14%) used the South Gate launch location to access the river.
- Table 5 reports the other launch locations specified by respondents, which were reclassified from verbatim responses into three distinct categories selected in consultation with Pitkin County Open Space and Trails staff.

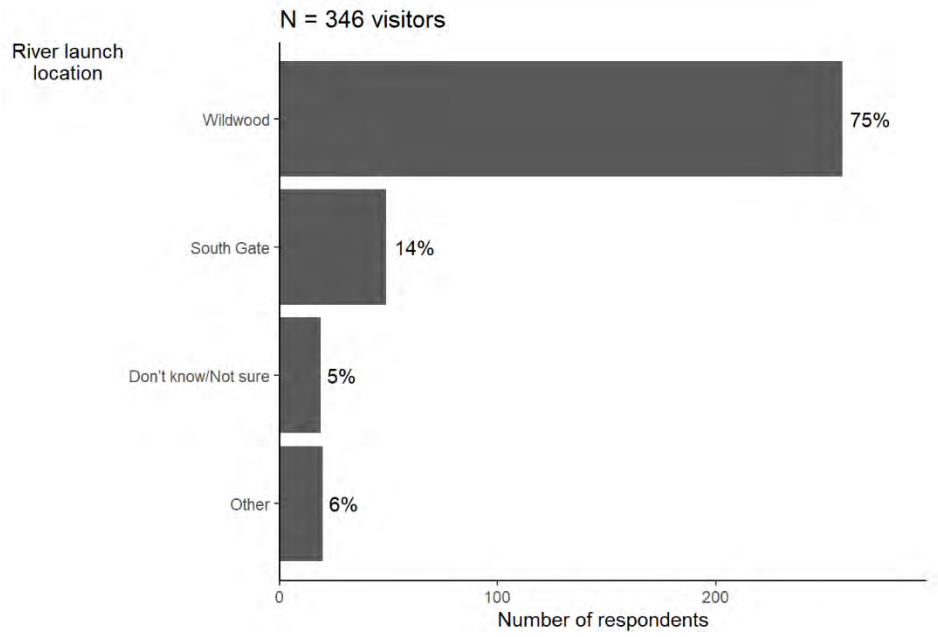


Figure 25. Launch location used to access the river.

Table 5. Other launch locations specified (reclassified from verbatim responses).

Other launch locations	N
TAKE OUT/PEDESTRAIN BRIDGE	20
PRIVATE PROPERTY	4
BEACH	2

Question 5: River float duration

At approximately what time did you launch onto the river today?

Analysis note: The respondents' reported launch times were subtracted from the river user exit survey contact times to estimate river float durations[13].

Results (Figure 26)

- Nearly two-thirds of respondents (64%) had a river float duration of one to two hours.
- About one-fifth of respondents (21%) had a river float duration of two to four hours.
- A smaller share of respondents (15%) had a river float duration of less than one hour.
- The average river float duration was approximately an hour and a half for both public river users and commercial river users.

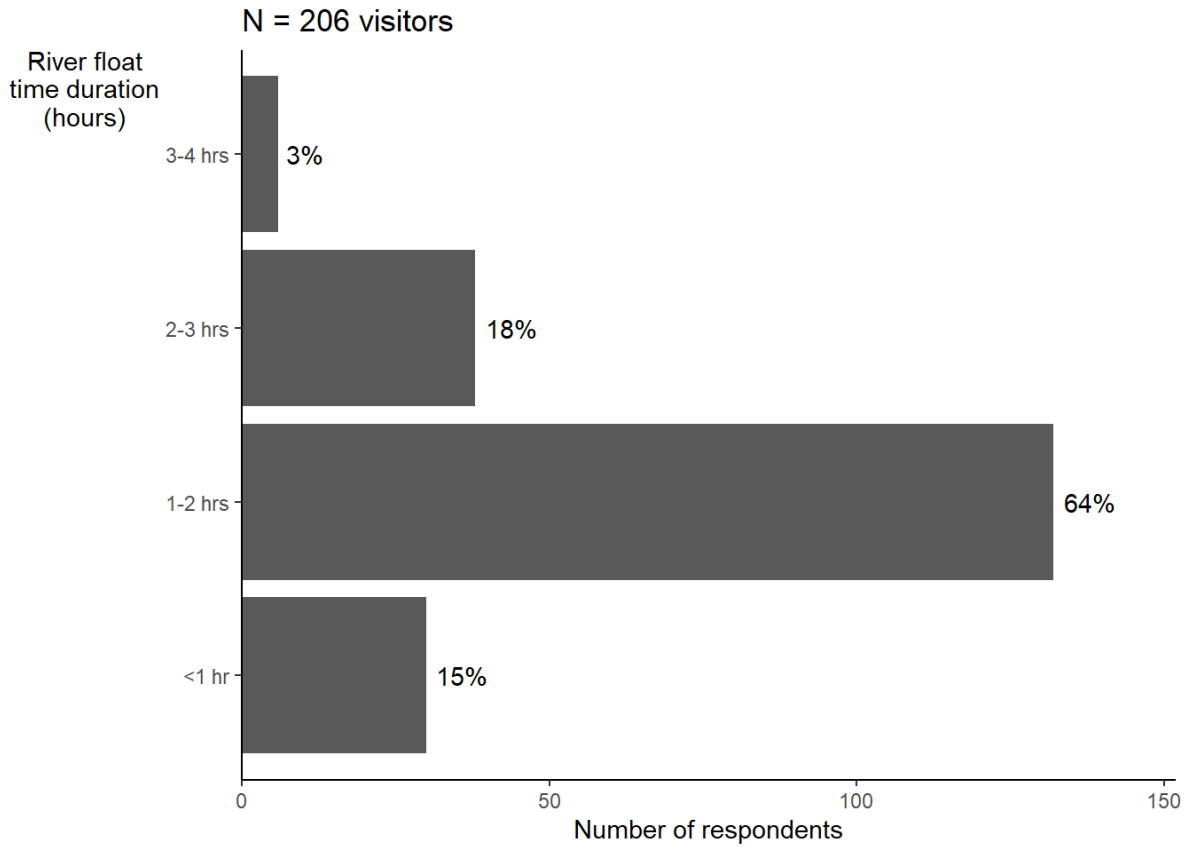


Figure 26. Estimated river float duration.

[13] Note, some respondents may have floated the river more than once between the time they reported launching onto the river and when they were contacted for the survey.

Question 6: Previous river floats in the last 12 months

Including your float on the river today, approximately how many times have you floated this river in the last 12 months?

Results (Figure 27)

- Some respondents (10%) reported no river floats on the river in the last twelve months. This suggests that some respondents misinterpreted the question asking them to report the number of river floats in the last 12 months *including today's float*. As a result, some respondents underreported their river float count by one (i.e., the river float on the day they completed the survey). Despite the misinterpretation, these results show general patterns about the number of floats on the river.

- About one-third of respondents (36%) reported that they floated the river only once in the last twelve months.

- About one-fifth of respondents (19%) reported that they floated the river twice in the last twelve months.

- One-quarter of respondents (25%) reported that they floated the river multiple (three to nine) times in the last twelve months, and 11% reported that they floated the river 10 or more in the last twelve months.

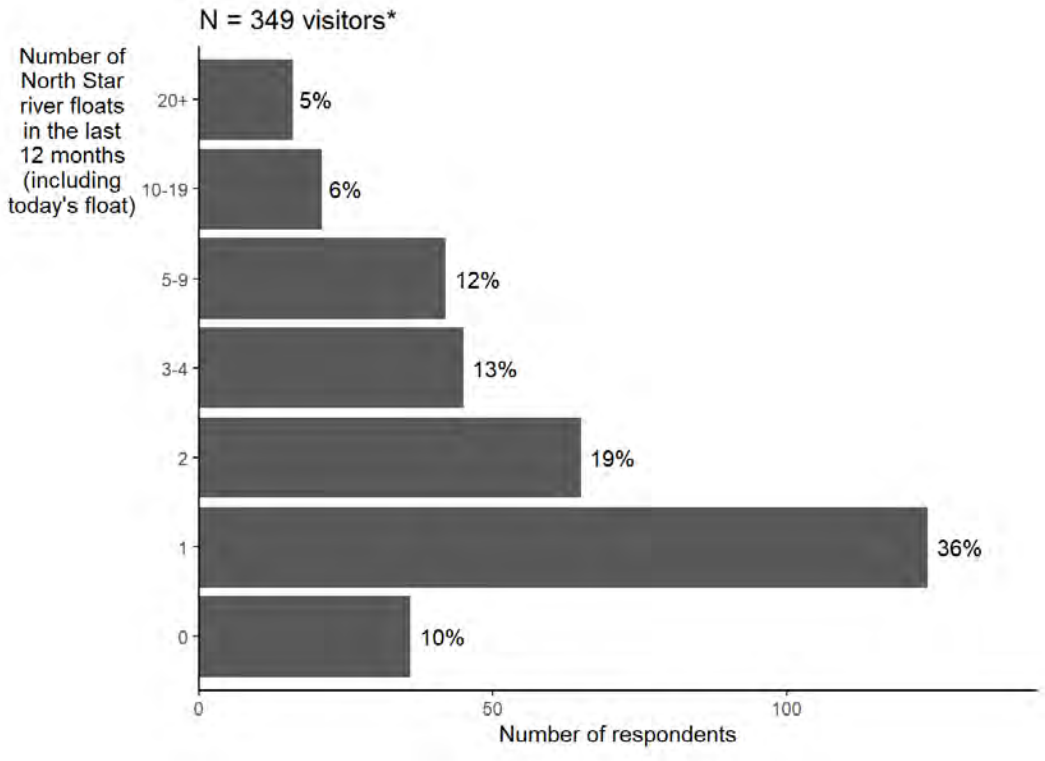


Figure 27. Reported number of times floating the river in the last 12 months.

Planning and motivations

Question 7: Reasons for floating this section of the Roaring Fork River

People have many different reasons for floating this section of the Roaring Fork River. How important to you was each of the following reasons for floating the river today?

Results (Table 6)

- Most respondents indicated that enjoying natural scenery (98%), doing something they enjoy with friends and/or family (96%), and immersing themselves in the river environment (84%) were "extremely important" or "very important" reasons for floating this section of the Roaring Fork River.

- About half of respondents (52%) reported that exploring a new area was an "extremely important" or "very important" reason for floating this section of the Roaring Fork River.

- Just under one-third of respondents (29%) reported that getting physical exercise was an "extremely important" or "very important" reason for floating this section of the Roaring Fork River.

Table 6. Importance of reasons for floating this section of the Roaring Fork River.

	N	Extremely important	Very important	Moderately important	Slightly important	Not at all important	Total
To get physical exercise	343	15%	14%	39%	18%	13%	100%
To enjoy natural scenery	346	77%	21%	1%	0%	0%	100%
To do something I enjoy with friends and/or family	342	76%	20%	3%	1%	<1%	100%
To explore a new area	333	31%	21%	20%	15%	14%	100%
To immerse myself in the river environment	345	53%	31%	13%	3%	1%	100%

Question 8: Timing of decision to float the river

When did you decide you would float the river today?

Results (Figure 28)

- About half of respondents (52%) made their decision to float the river within the last week, but before the day that they floated the river.
- About one-third of respondents (30%) made their decision to float the river on the same day that they floated the river.
- Relatively few respondents made their decision to float the river more than a week in advance but in the last month (11%), or more than a month in advance (6%).

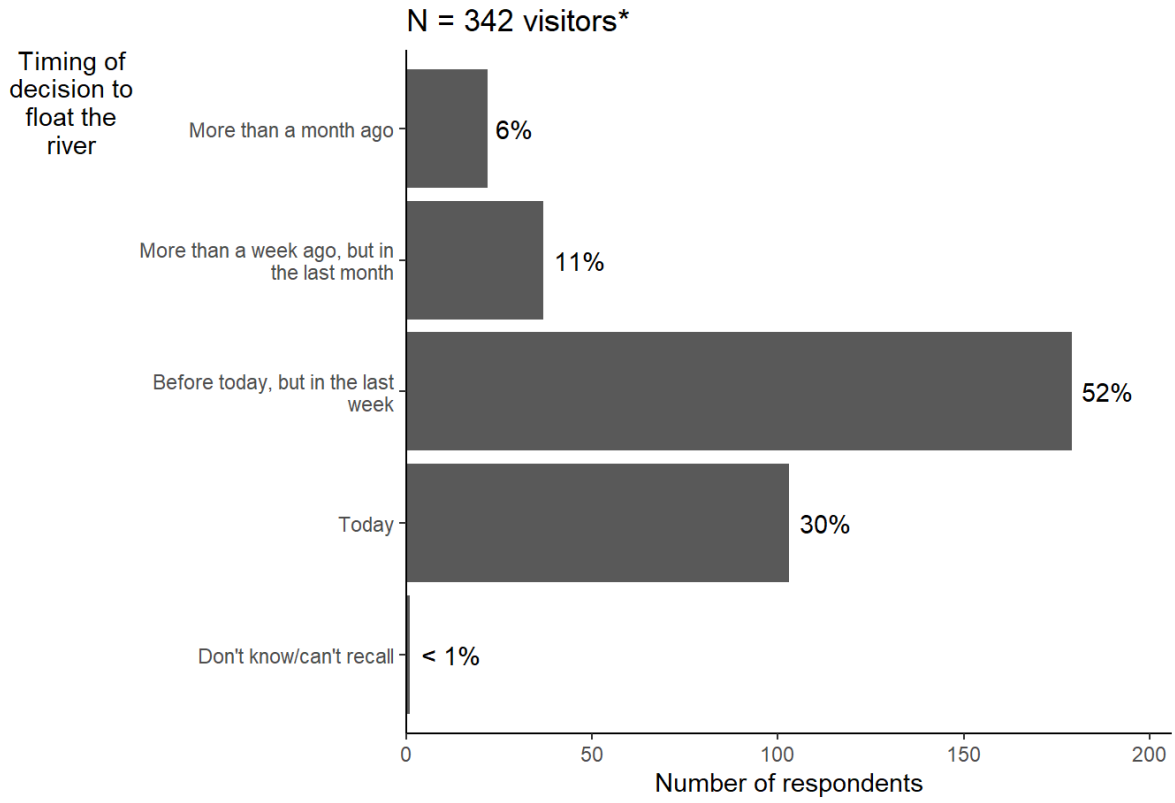


Figure 28. Timing of decision to float the river.

Question 9: Information sources

Did you use any of the following sources of information to plan and/or prepare for your float on the river today?

Results (Figure 29)

- A majority of respondents used personal knowledge from previous visits (73%), other people who had previously floated the river (61%), and/or a weather forecast (59%) to plan and/or prepare for their float on the river.
- Just over one-quarter of respondents (27%) used a river level forecast to plan and/or prepare for their float on the river.
- Relatively few respondents used a website (8%), group, club, or organization (3%), Instagram (3%), TikTok (1%), or Facebook (1%) to plan and/or prepare for their float on the river.
- Table 7 reports the specified group, club, or organizations used as sources of information by respondents, and Table 8 reports the specified websites used as sources of information by respondents.
- Table 9 reports other sources of information specified by respondents.

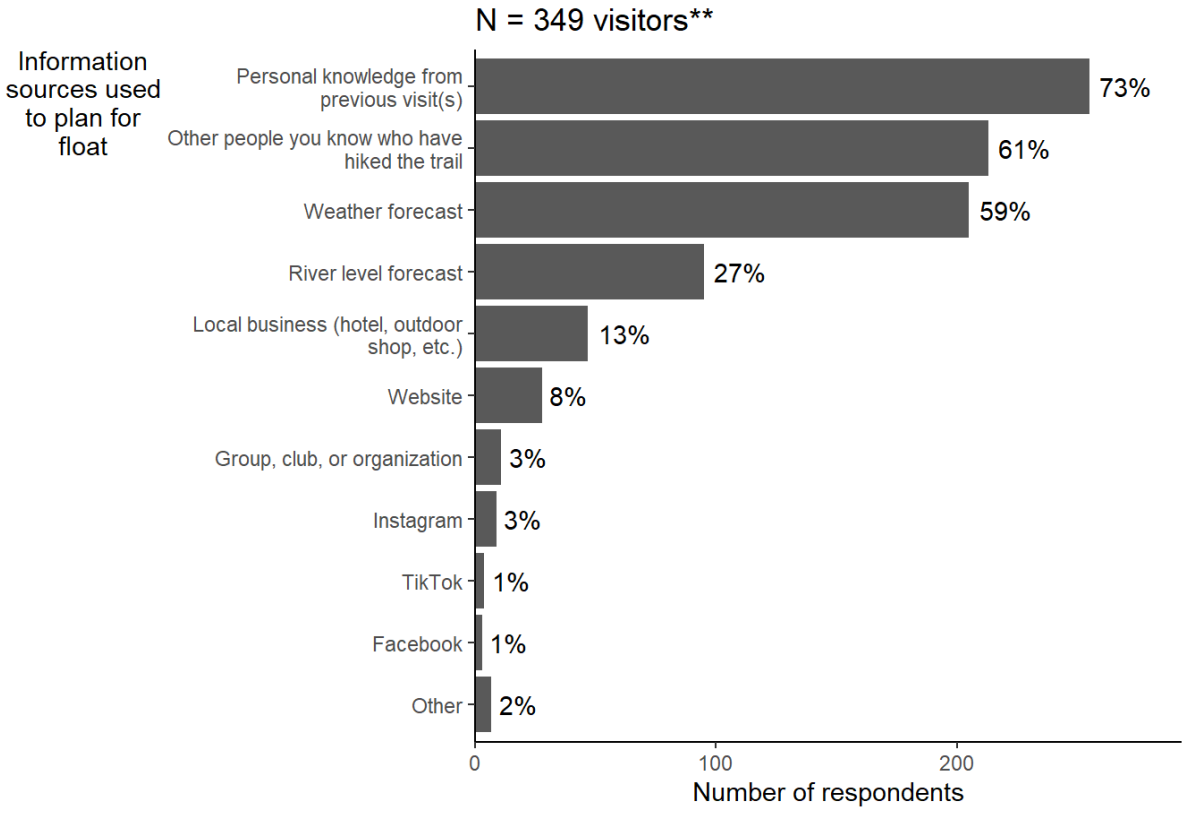


Figure 29. Information sources used to plan for river float.

Table 7. Group, club, or organization specified.

Group, club, or organization	N
ASPEN	1
EME	1
TIMBERS CLUB	1

Table 8. Website specified.

Website	N
CITY WEBSITE W/MAP	1
ELK MOUNTAIN	1
ELK RIVER	1
ELKMOUNTAINEXPEDITIONS.COM	2
EME	1
GOOGLE	3
OUTFITTERS TO SEE IF RUNNING AND TIMES TO AVOID CROWDS	1
PITKIN CO	1
PITKIN COUNTY	1
PITKINCOUNTY.ORG	2
PITKINCOUNTY.ORG - NORTHSTAR PRESERVE	1

Table 9. Other sources of information specified.

Other sources of information	N
ELK MOUNTAIN EXPEDITIONS	1
FAMILY THAT LIVES HERE	1
FORGOT OUR PADDLES AND HAD TO USE A RENTAL SHOP	1
GOOGLE SEARCH	1
GOOGLE.COM	1
ITS MY SANCTUARY	1
LOCAL CARBONDALE	1
RAN INTO RANGER YESTERDAY	1
WORD OF MOUTH.	1

Question 10: Had information needed

Did you feel that you had the information you needed to properly plan and prepare for your float on the river through the North Star Nature Preserve today?

Results (Figure 30)

- The vast majority of respondents (97%) reported that they had the information they needed to properly plan and prepare for their float.
- Only 3% of respondents reported that they did not have the information they needed to properly plan and prepare for their float.
- For respondents who did not feel they had the information they needed, Table 10 reports the types of information they reported that they felt they needed but were not able to find.

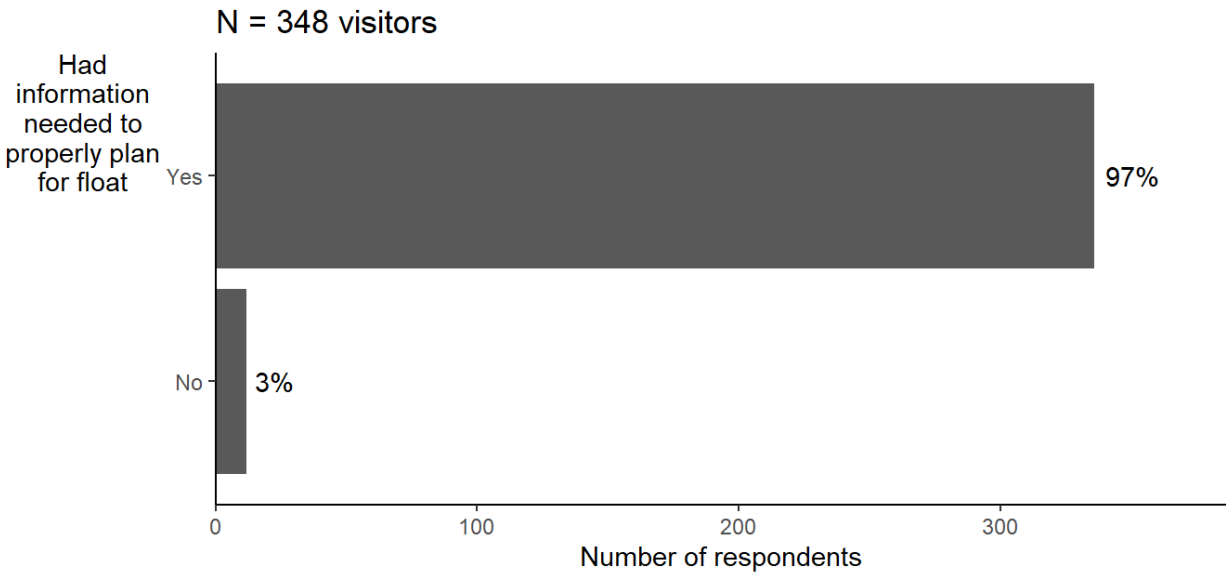


Figure 30. Had information needed to properly plan for float on the river.

Table 10. Information that respondents specified they felt they needed but were not able to find.

Information needed	N
A LITTLE BETTER IDEA OF THE PARKING SITUATION	1
BETTER MAP W/GOOGLE MAP PINS	1
BUT I HAVE FLOATED ALONE AND W/FRIENDS HERE FOR YEARS THIS SECTION OF RIVER. I WOULD HAVE NO IDEA WHERE TO GATHER INFORMATION IF I NEEDED IT.	1
COULD NOT SEE THE SIGN TO GET OFF THE RIVER.	1
EXCEPT FORGOT ABOUT MOSQUITOS	1
FINDING WHERE TO START	1
FRIEND KNEW THE RIVER	1
HOW TO SUPPORT NSNP?	1
I HAD NO INFO AND DON'T KNOW WHERE TO SOURCE FLOAT INFO.	1
I WOULD HAVE WORN A SWIMSUIT AND RIVER SHOES.	1
IM LOCAL	1
ITS GOOD	1
MOSTLY USED FRIEND WHO FLOATED BEFORE	1
NOT SURE HOW TO ACCESS ANY INFO	1
POOR SIGNAGE ABOUT RULES/NO SPEAKERS I.E.	1
RESEARCH & 16 + YEARS EXPERIENCE ON THIS RIVER.	1
WE CAME A LOCAL FRIEND.	1
WE DIDN'T KNOW WHERE TO ACCESS.	1
WEBSITE? W/INFO	1

Visitor experience

Question 11: Would feel crowded in the PPV viewscape area given the number of people depicted in the photo simulations

We would like to know how many other people you could see while you are floating on the river without feeling crowded. To help judge this, we have a series of photographs that show different numbers of people floating on the river. Please ask the survey administrator to show you these photos to answer the following question.

For each photograph, please tell us if you would feel crowded if you were floating on the river and saw the number of people depicted in the photograph.

Results, by River User Type (Public Users and Commercial Users; Figure 31)

- In general, public recreational river users were slightly more sensitive to crowding than commercial recreational river users, but the crowding tolerances of the two river user groups were similar across the range of PPV values depicted in the photo simulations.

- Few public river users (4% to 7%) and no (0%) commercial river users reported they would feel crowded with three or fewer PPV in the river viewscape area depicted in the photo simulations.

- Approximately one-third (35%) of public river users and one-fifth (20%) of commercial river users reported that they would feel crowded with four PPV in the river viewscape area, and just under half reported that they would feel crowded with six PPV in the river viewscape area (44% of public users and 43% of commercial users).

- A majority of public river users and commercial river users (57% and 53%, respectively) reported that they would feel crowded with eight PPV in the river viewscape. Nearly two-thirds (61%) of public river users reported that they would feel crowded with 10 PPV in the river viewscape, while about half (52%) of commercial users reported that they would feel crowded.

- The vast majority of public river users (91% or more) and commercial river users (85% or more) reported that they would feel crowded with 12 or more PPV in the viewscape.

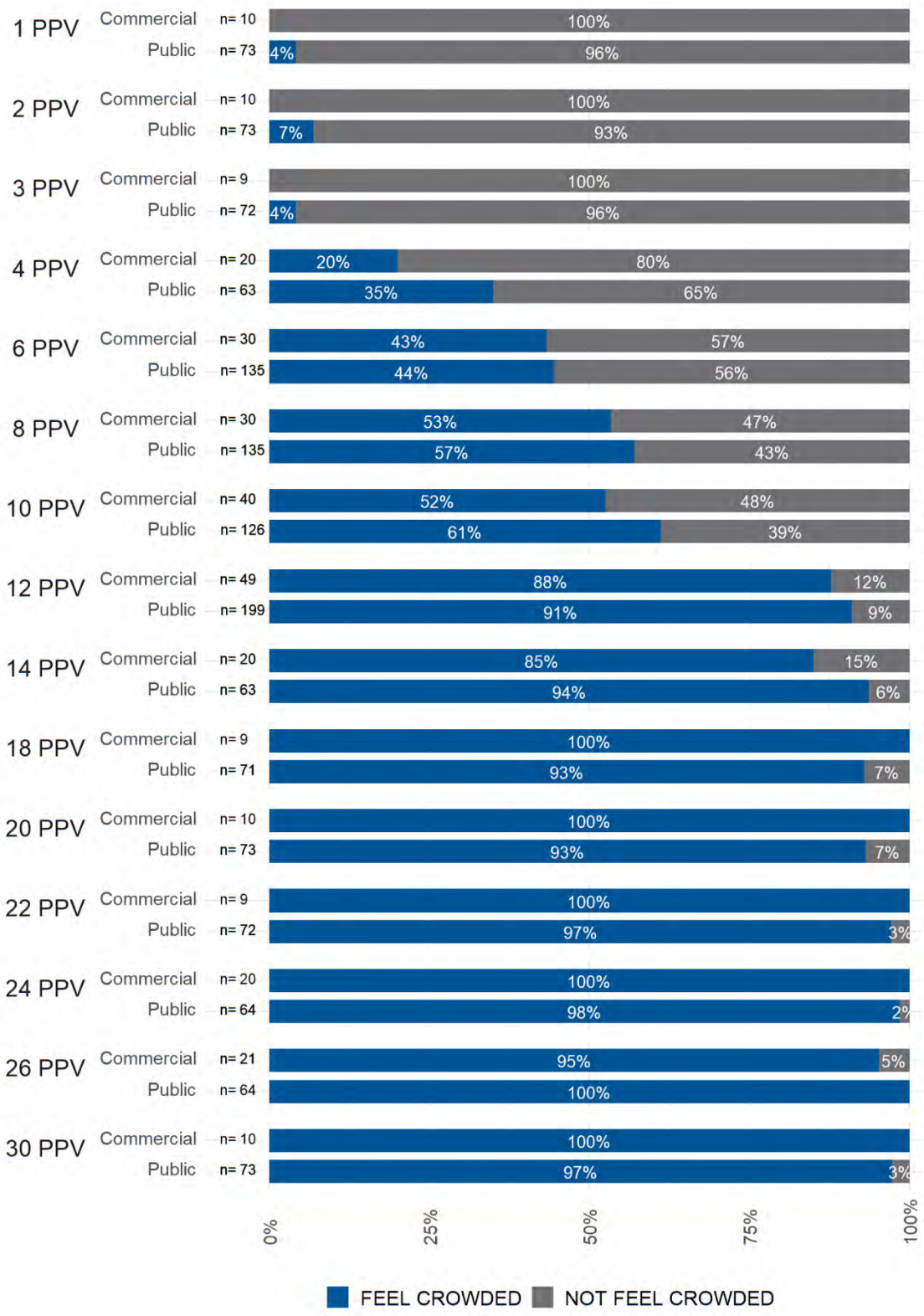


Figure 31. Percentage of respondents who would feel crowded, by PPV in photo simulations and river user type.

Results, by Perceptions of Crowding During River Trip (Figure 32)

- In general, those respondents who reported feeling crowding at some point during their float trip the day they were contacted for the survey were slightly more crowding sensitive than those who did not report feeling crowded. That said, the crowding tolerances of the two respondent groups were similar across the range of PPV values depicted in the photo simulations.

- Few respondents, regardless of their crowding perceptions during their float trip that day reported they would feel crowded with three or fewer PPV in the river viewscape area depicted in the photo simulations (3% to 9% of those who felt crowded that day and 3% to 4% of those who did not feel crowded that day).

- Approximately one-third of respondents, regardless of whether they felt crowded during their float trip that day (36%) or not (31%) reported that they would feel crowded with four PPV in the river viewscape area.

- About half (51%) of respondents who felt crowded during their float trip that day reported that they would feel crowded with six PPV in the river viewscape, compared to less than half (42%) of those who did not feel crowded that day.

- Similarly, about two-thirds of those who felt crowded during their float trip that day reported that they would feel crowding with eight to 10 PPV in the river viewscape (66% and 68%, respectively), compared to about half of those who did not feel crowded that day (50% and 56%, respectively).

- The vast majority of respondents (89% to 100%), regardless of their crowding perceptions during their float trip that day reported that they would feel crowded with 12 or more PPV in the river viewscape.

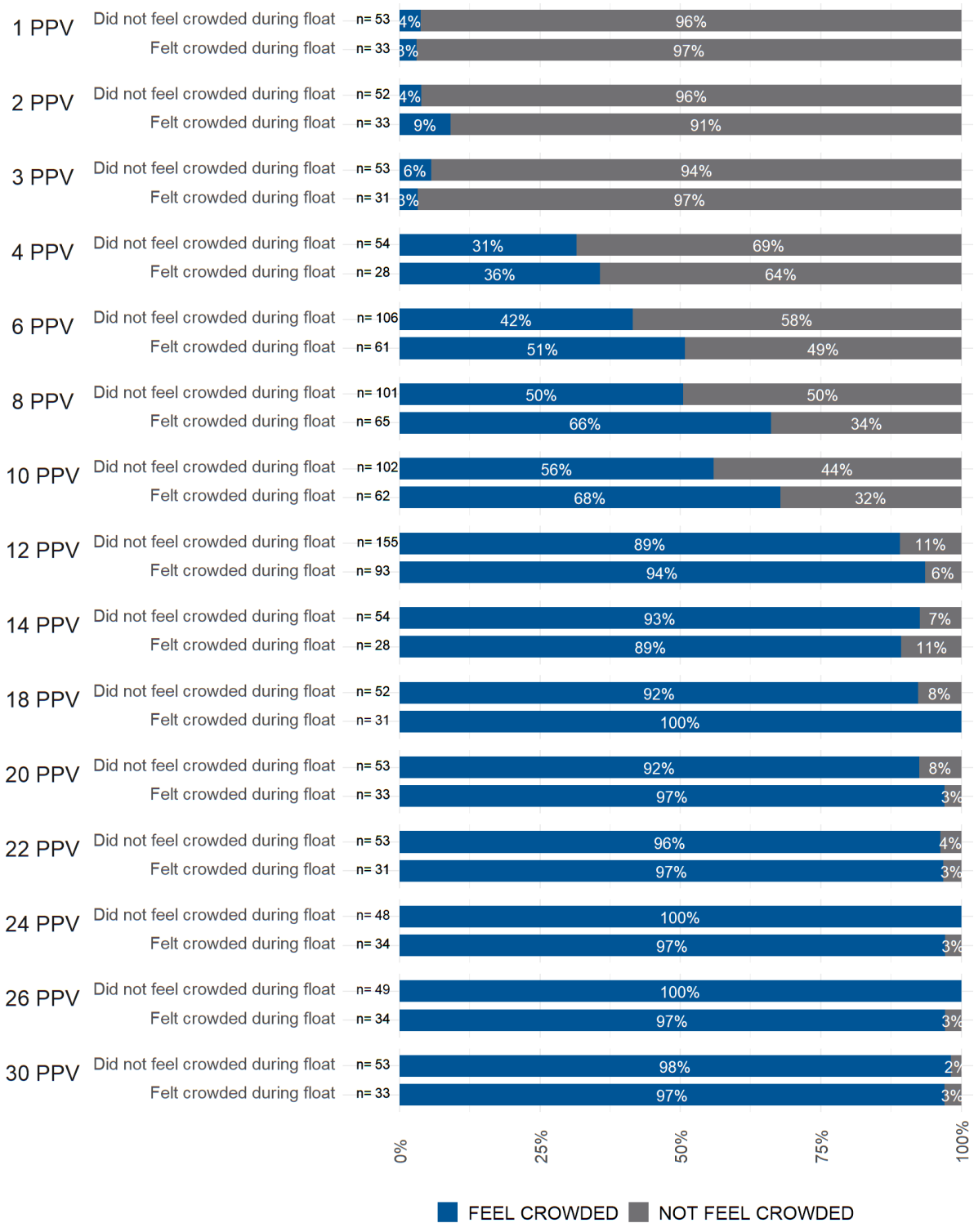


Figure 32. Percentage of respondents who would feel crowded, by PPV in photo simulations and survey respondents' perceptions of crowding during their river trips.

Question 12: Felt crowded during float

Did you feel crowded at any point during your float trip today?

Results, by River User Type (Public Users and Commercial Users; Table 11)

- About one-quarter (24%) of public river users reported feeling crowded while parking and/or unloading in the parking lot where they launched, compared to 12% of commercial river users.
- Similarly, public users were more likely than commercial users to report feeling crowded at the put-in itself while launching onto the river (15% of public users versus 7% of commercial users) and at the takeout (18% of public users versus 12% of commercial users).
- Few public (8%) and commercial (7%) river users reported feeling crowded while floating on the river.

Table 11. Felt crowded at any point during float trip, by river user type.

I felt crowded today…	River user type	N	Yes	No	Total	Test statistic
Parking and/or unloading in the parking lot	Commercial	59	12%	88%	100%	$X^2 = 3.631$ $p = 0.057$
	Public	268	24%	76%	100%	
At the put-in while launching onto the river	Commercial	59	7%	93%	100%	$X^2 = 2.1$ $p = 0.147$
	Public	268	15%	85%	100%	
While floating on the river	Commercial	59	7%	93%	100%	$X^2 = 0.022$ $p = 0.883$
	Public	262	8%	92%	100%	
At the takeout where I finished floating the river	Commercial	59	12%	88%	100%	$X^2 = 1.032$ $p = 0.31$
	Public	266	18%	82%	100%	

Results, by Day of Week Type (Weekend/Holiday and Weekday; Table 12)

- River users on weekends and holidays were more likely than those on weekdays to report feeling crowded while parking and/or unloading in the parking lot where they launched (24% versus 18%, respectively), while floating on the river (13% versus 3%, respectively), and at the takeout (21% versus 13%, respectively).

- River users were similar in their perceptions of crowding at the put-in while launching onto the river, regardless of the day of week type of their river float (14% of weekend/holiday river users versus 13% of weekday river users).

Table 12. Felt crowded at any point during float trip, by day of week type (i.e., weekend/holiday and weekday).

I felt crowded today…	River user type	N	Yes	No	Total
Parking and/or unloading in the parking lot	Weekend/holiday	189	24%	76%	100%
	Weekday	151	18%	82%	100%
At the put-in while launching onto the river	Weekend/holiday	189	14%	86%	100%
	Weekday	151	13%	87%	100%
While floating on the river	Weekend/holiday	189	13%	87%	100%
	Weekday	146	3%	97%	100%
At the takeout where I finished floating the river	Weekend/holiday	187	21%	79%	100%
	Weekday	151	13%	87%	100%

Question 13: Support for current visitor use management strategies

To what extent do you support or oppose each of the following visitor use management strategies currently being used?

Results (Table 13)

- Substantial majorities of public river users and commercial river users indicated that they ("somewhat" or "strongly") support:
    - Managing the number of commercial group arrivals who float the river per hour (82% and 79%, respectively)
    - Managing the size of commercial groups who float the river (84% and 82%, respectively).
    - Providing mandatory low impact education to all commercial groups before they float the river (70% and 69%, respectively).
- Just over half (51%) of public river users and close to two-thirds (62%) of commercial river users support managing use through limited availability of parking.

Table 13. Support or opposition for current visitor use management strategies, by river user type.

	River user type	N	Strongly support	Somewhat support	Neither support nor oppose	Somewhat oppose	Strongly oppose	Total	Test statistic
Managing the number of commercial group arrivals who float the river per hour	Commercial	59	54%	25%	10%	7%	3%	100%	X^2 = 4.776 p = 0.444
	Public	268	57%	25%	12%	2%	4%	100%	
Managing the size of commercial groups who float the river	Commercial	59	46%	36%	10%	5%	3%	100%	X^2 = 8.529 p = 0.074
	Public	269	62%	22%	11%	1%	3%	100%	
Managing use through limited availability of parking	Commercial	58	33%	29%	19%	10%	9%	100%	X^2 = 2.935 p = 0.71
	Public	266	24%	27%	23%	14%	12%	100%	
Providing mandatory low impact education to all commercial groups before they float the river	Commercial	59	42%	27%	19%	8%	3%	100%	X^2 = 3.98 p = 0.409
	Public	268	50%	20%	21%	4%	5%	100%	

Question 14: Support for potential visitor use management strategies

To what extent would you support or oppose each of the following potential visitor use management strategies?

Results (Table 14)

- Commercial river users were statistically significantly and substantively more likely than public river users to ("somewhat" or "strongly") support:
  - Implementing a permit system to manage the number of people allowed to float the river per hour (54% of commercial users versus 24% of public users).
  - Managing the size of personal groups who float the river (72% of commercial users versus 39% of public users).
  - Allowing access to float the river only by commercial operator or alternative transportation (shuttle/walk/bike; 25% of commercial users and 10% of public users).
  - Closing the Preserve to floating use during the morning and evening for the benefit of wildlife (47% of commercial users versus 18% of public users).
- Public users had relatively low levels of support for all of the visitor use management strategies included in the question. The strategies that received the highest levels (though not a majority) of support from public users were:
  - Providing mandatory low impact education to personal groups before they float the river (45%).
  - Managing the size of personal groups who float the river (39%).
  - Implementing a permit system to manage the number of people allowed to float the river per hour (24%).
- The strategies that were supported by a majority or near-majority of commercial river users were:
  - Managing the size of personal groups who float the river (72%).
  - Implementing a permit system to manage the number of people allowed to float the river per hour (57%).
  - Providing mandatory low impact education to personal groups before they float the river (55%).
  - Closing the Preserve to floating use during the morning and evening for the benefit of wildlife (47%).

Table 14. Support or opposition for potential visitor use management strategies, by river user type.

	River user type	N	Strongly support	Somewhat support	Neither support nor oppose	Somewhat oppose	Strongly oppose	Total	Test statistic
A permit system to manage the number of people allowed to float the river per hour	Commercial	54	35%	22%	15%	15%	13%	100%	$X^2 = 33.527$ $p < 0.001$
	Public	267	9%	15%	16%	26%	34%	100%	
Manage the size of personal groups/individuals who float the river	Commercial	54	41%	31%	13%	4%	11%	100%	$X^2 = 31.208$ $p < 0.001$
	Public	266	12%	27%	18%	17%	26%	100%	
Provide mandatory low impact education to personal groups/individuals before they float the river	Commercial	54	33%	20%	24%	11%	11%	100%	$X^2 = 5.574$ $p = 0.233$
	Public	267	19%	26%	26%	14%	15%	100%	
Allow access to float the river only by commercial operator or alternative transportation (shuttle/walk/bike)	Commercial	52	19%	6%	33%	19%	23%	100%	$X^2 = 43.236$ $p < 0.001$
	Public	267	3%	7%	12%	14%	63%	100%	
Close the nature preserve to floating use during the morning and evening for the benefit of wildlife	Commercial	53	21%	26%	23%	13%	17%	100%	$X^2 = 23.902$ $p < 0.001$
	Public	264	6%	12%	28%	20%	34%	100%	
Close the nature preserve to all floating use for the benefit of wildlife	Commercial	53	9%	6%	19%	17%	49%	100%	$X^2 = 9.012$ $p = 0.061$
	Public	267	3%	3%	13%	15%	66%	100%	

Visitor characteristics

Question 15: Age

What is your age?

Results (Figure 33)

- Almost half of respondents (47%) were between the ages of 30 and 49.
- Approximately one-quarter of respondents were between the ages of 18 and 29 (28%) and approximately one-quarter were between the ages of 50 and 69 (23%).
- Very few but some respondents (1%) were 70 years of age or older.

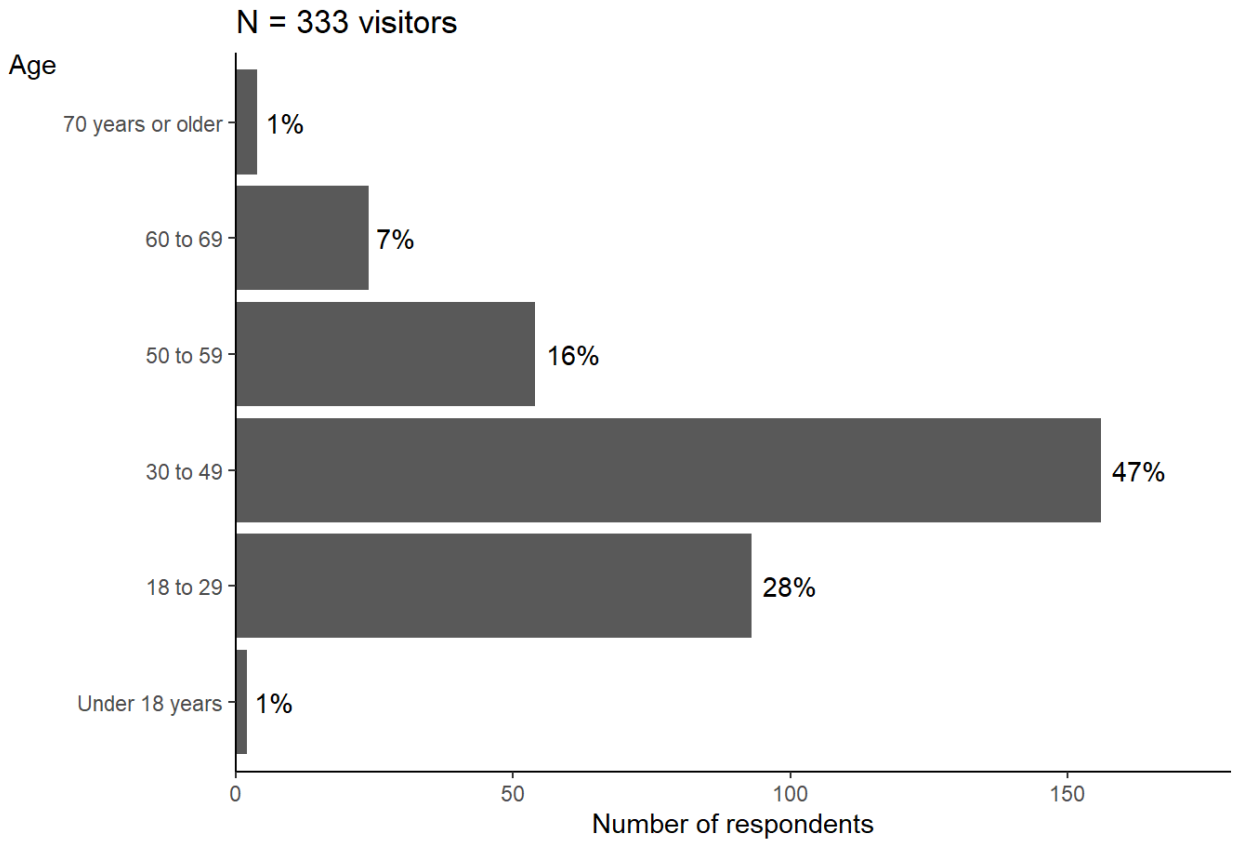


Figure 33. Age of respondents[14].

[14] A screening question was used to recruit respondents who were 18 years of age or older, yet a small number of respondents indicated they were under 18 years of age.

Question 16: Roaring Fork Valley residency

Are you a resident of Roaring Fork Valley?

Results (Figure 34)

- Public river users were substantially more likely than commercial river users to indicate that they have a primary residence in the Roaring Fork Valley (54% of public users versus 2% of commercial users).
- Commercial users, however, were more likely than public users to indicate that they have a secondary residence in the Roaring Fork Valley (33% of commercial users versus 11% of public users).
- Overall, public river users were more likely than commercial rivers users to indicate that they had a residence the Roaring Fork Valley (65% of public users versus 35% of commercial users).

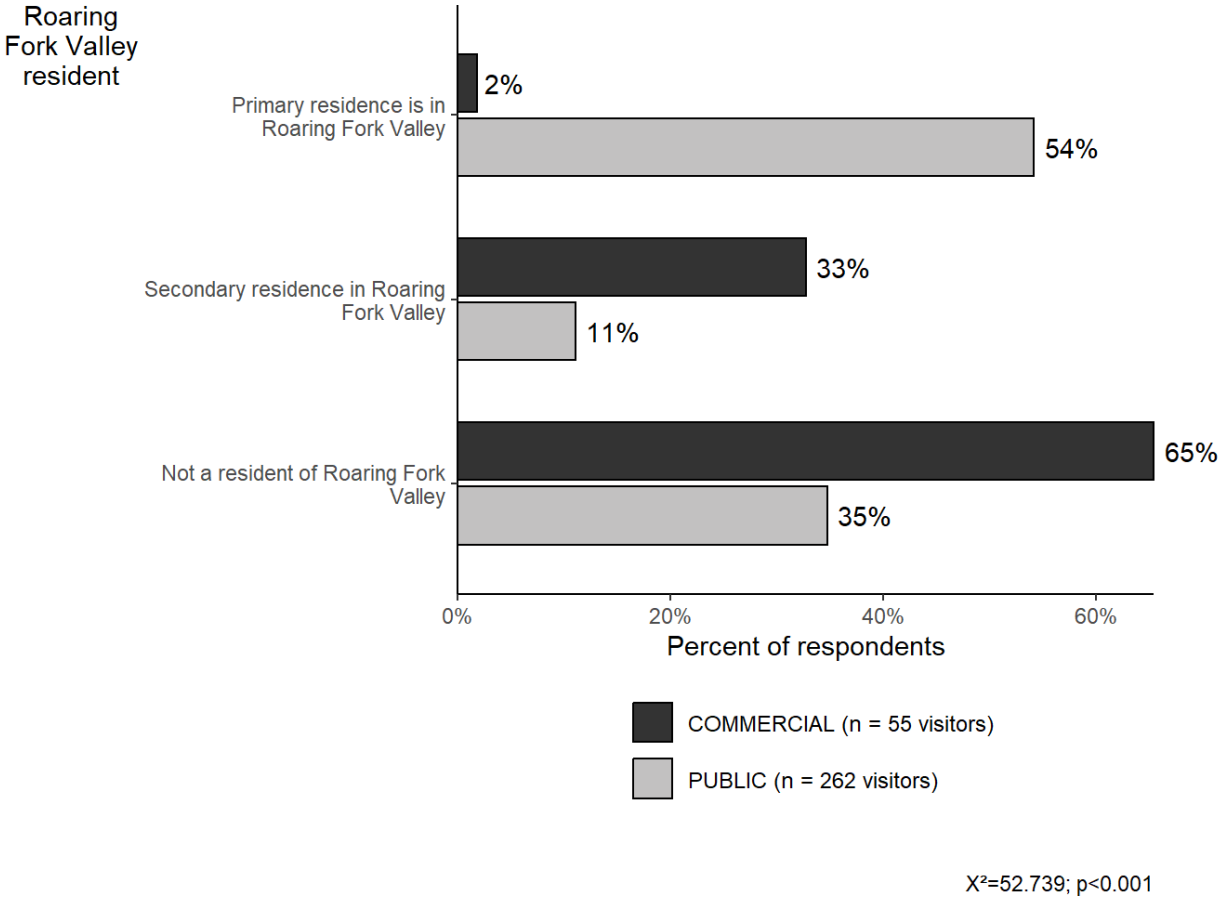


Figure 34. Roaring Fork Valley residency, by river user type.

Question 17: U.S. postal code or country of residence

Whas is your U.S. ZIP code or country (if not U.S.)?

Results

- The vast majority of respondents (99%) were U.S. residents (Figure 35).
- Overall, respondents from 28 different U.S. states are represented in the survey sample (Table 15).
- The most common state of residence for U.S. respondents was, by far, Colorado (65% of U.S. respondents; Table 15).
- Public river users were more likely to reside in Colorado (74%) compared to commercial river users (13%; Figure 36).
- Of the three international respondents (1%), one was from Australia, one was from Mexico, and one was from the United Kingdom (Table 16).

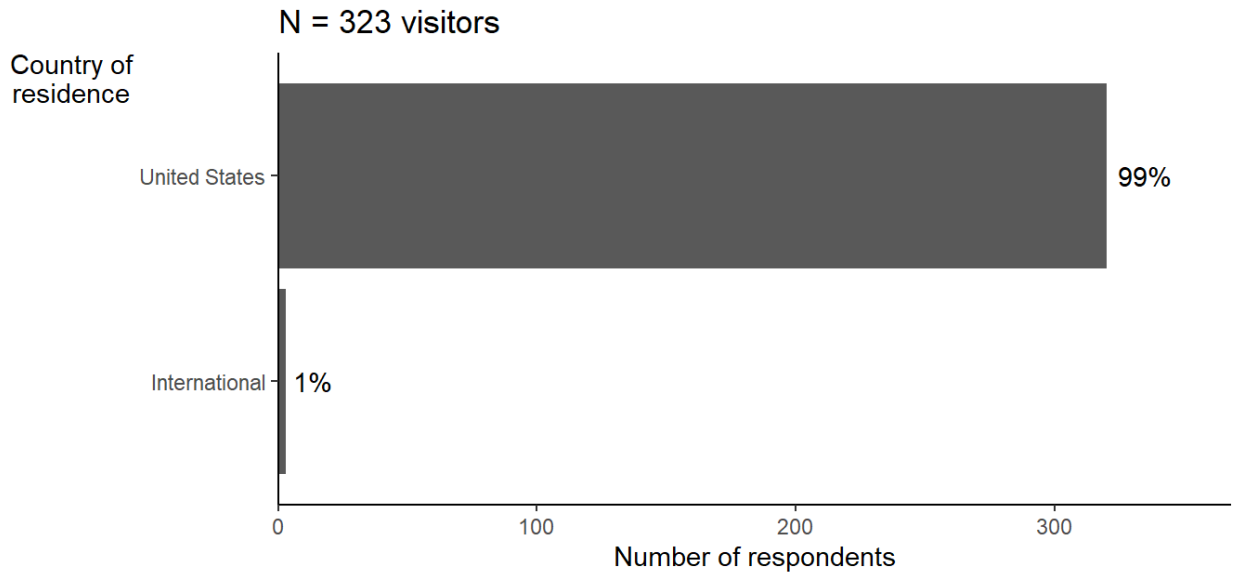


Figure 35. Percentage of U.S. and international residents.

Table 15. U.S. state of residence.

State	Number of visitors	Percent of U.S. visitors*	Percent of all visitors*
Colorado	206	65%	64%
Texas	25	8%	8%
California	21	7%	7%
Florida	14	4%	4%
New York	7	2%	2%
Illinois	6	2%	2%
North Carolina	5	2%	2%
Georgia	3	1%	1%
Maryland	3	1%	1%
Tennessee	3	1%	1%
Wisconsin	3	1%	1%
Arkansas	2	1%	1%
Massachusetts	2	1%	1%
Michigan	2	1%	1%
New Jersey	2	1%	1%
13 other states	13	4%	4%
Total	317	102%	101%

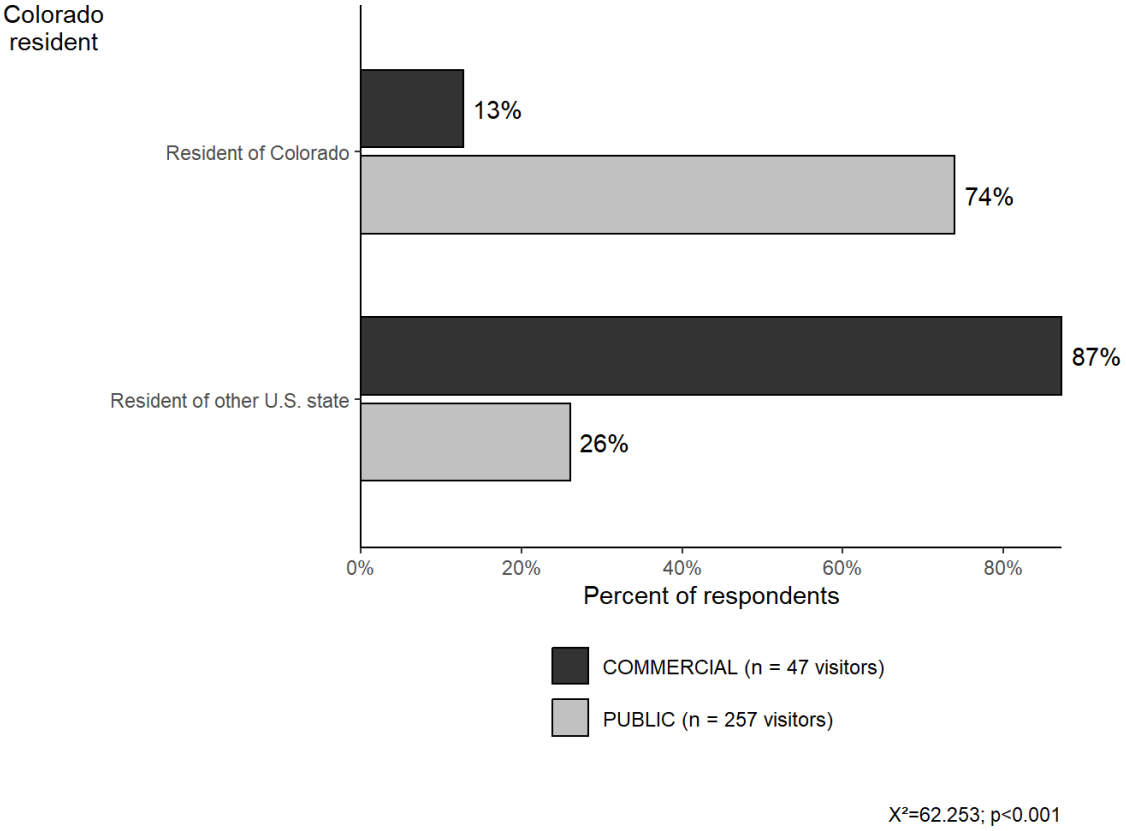


Figure 36. Percentage of U.S. residents who are residents of Colorado, by river user type.

Table 16. Country of residence of international residents.

Country	Number of visitors
AUSTRALIA	1
MEXICO	1
UNITED KINGDOM	1

Question 18: Ethnicity/racial groups

What ethnic and/or racial groups do you belong to?

Results (Figure 37)

- The majority of respondents (87%) identified as White or Caucasian.
- Few respondents identified as belonging to other ethnic and/or racial groups, with the most common being Hispanic, Latino, or Spanish origin (10%) and Asian (4%).
- Respondents who self-described their ethnicity/racial group specified “EUROPEAN” and “ME.”

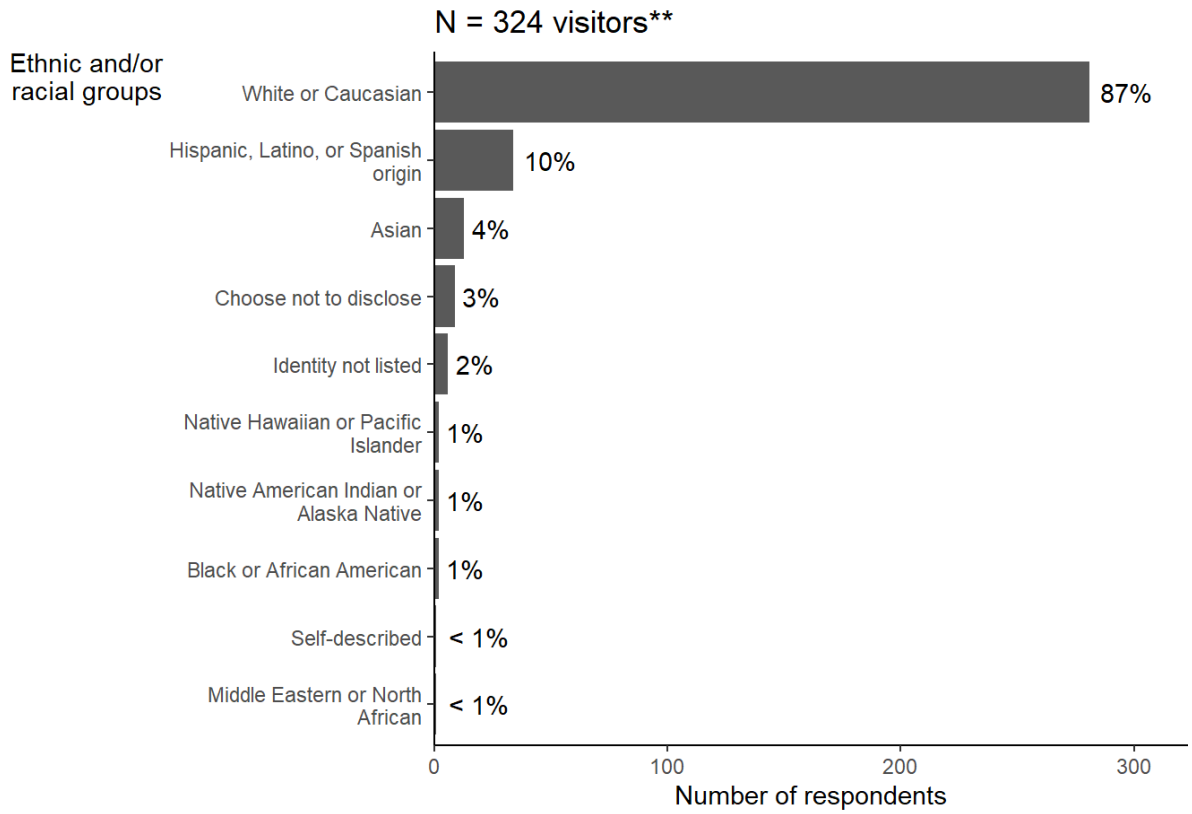


Figure 37. Ethnicity/racial groups of respondents.

Question 19: Annual household income

Which of these categories best represents your annual household income?

Results (Figure 38)

- About half (48%) of all respondents reported an annual household income of less than $200,000.
- About one-third of respondents (30%) reported an annual household income of $200,000 or more.
- One-fifth of respondents (20%) preferred not to respond to the question about their annual household income.

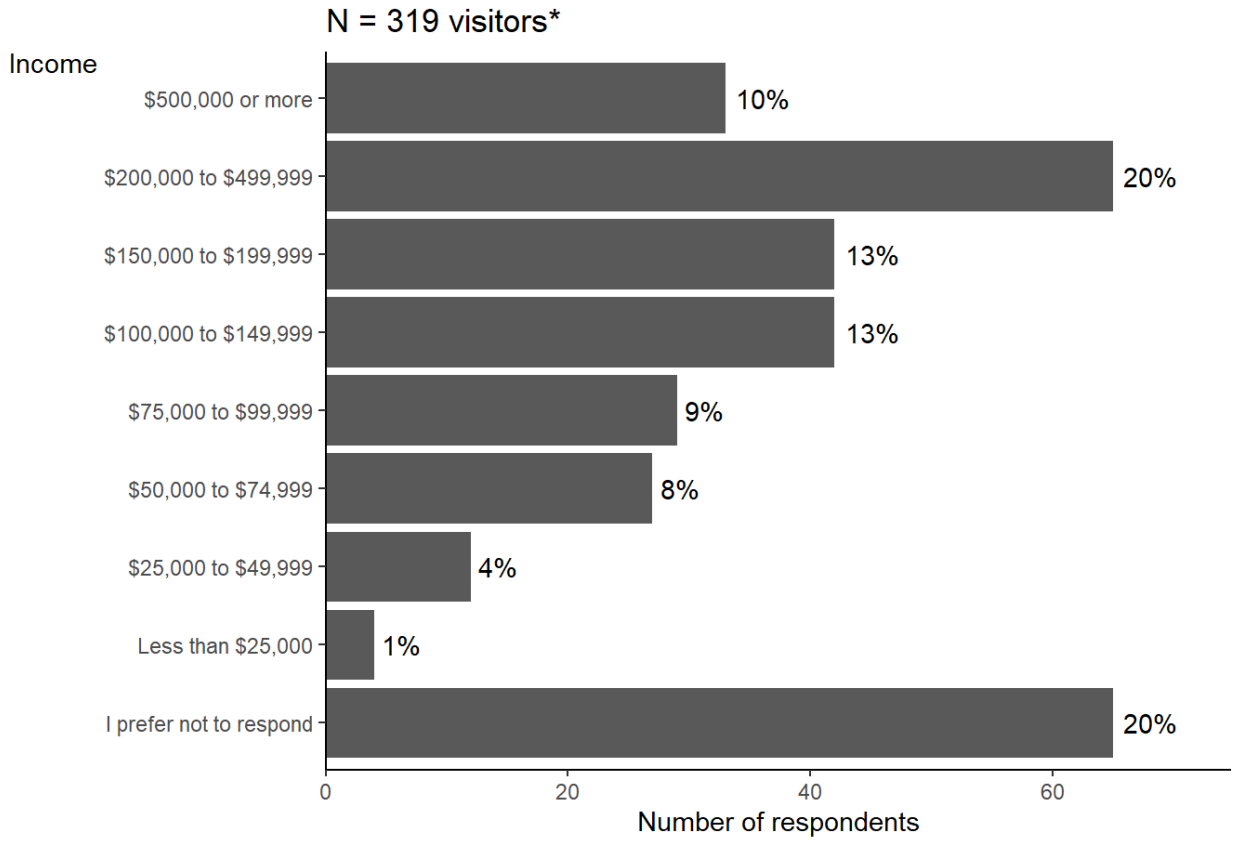


Figure 38. Annual household income of respondents.

Non-Response Bias

Non-response bias is the bias that results when respondents differ in meaningful ways from non-respondents. To check for non-response bias in the Recreational River User Survey data, this study used responses to four non-response bias questions. The non-response bias questions were administered via a short interview with all eligible contacted visitor groups who refused to participate in the river user exit survey[15]. The non-response bias questions exactly matched questions in the survey to provide a reliable basis to compare respondents and non-respondents with respect to several key characteristics. The non-response bias questions included:

1. Did you feel crowded while you were floating the river today?
2. Did you float the river with a commercial group today?
3. Are you a resident of Roaring Fork Valley?
4. Did you float the river alone today?

Chi-square tests of independence were used to test for differences between respondents and non-respondents. A Bonferroni correction was applied to account for the fact that four simultaneous statistical tests were conducted with the same dataset. The Bonferroni correction minimizes the likelihood of concluding from the results of the statistical tests that there are differences between respondents and non-respondents, when there actually are no differences (i.e., minimizes the probability of making a Type I error). With the Bonferroni correction applied in this analysis, statistical test results with p-values of less than 0.01 are assumed to be statistically significant. The results of the non-response bias analysis are presented in the following subsections.

Felt Crowded While Floating the River

The results of the chi-square test in Table 17 suggest that survey respondents and non-respondents differed significantly with respect to whether they felt crowded while floating on the river ($p < 0.001$). Non-respondents were more likely than respondents to report feeling crowded while floating on the river (26% of non-respondents versus 8% of respondents). Therefore, respondents who felt crowded while floating on the river may not be as well represented in the survey data as desired.

Table 17. Percentage of respondents and non-respondents who felt crowded while floating on the river.

Response	Respondents (N)	Respondents (%)	Non-respondents (N)	Non-respondents (%)
Felt crowded while floating on the river	28	8%	32	26%
Did not feel crowded while floating on the river	308	92%	92	74%
Total	336	100%	124	100%

$X^2 = 22.865$; p-value < 0.001
$\alpha = 0.05$, $p \leq 0.01$ indicates significant result following Bonferroni correction to account for multiple non-response bias statistical tests

[15] Approximately 54% of non-respondents answered one or more of the non-response bias questions.

Floated the River with a Commercial Group

The results of the chi-square test in Table 18 suggest that survey respondents and non-respondents differed significantly with respect to whether they floated the river with a commercial group ($p < 0.001$). Non-respondents were more likely than respondents to be commercial river users (37% of non-respondents versus 18% of respondents). Therefore, respondents who floated the river with a commercial group may not be as well represented in the survey data as desired.

Table 18. Percentage of respondents and non-respondents who floated the river with a commercial group.

Response	Respondents (N)	Respondents (%)	Non-respondents (N)	Non-respondents (%)
Floated the river with a commercial group	62	18%	47	37%
Did not float the river with a commercial group	289	82%	80	63%
Total	351	100%	127	100%

$X^2 = 18.74$; p-value < 0.001
$\alpha = 0.05$, $p \leq 0.01$ indicates significant result following Bonferroni correction to account for multiple non-response bias statistical tests

Resident of the Roaring Fork Valley

The results of the chi-square tests in Table 19 suggest that survey respondents and non-respondents did not differ significantly with respect to residency in the Roaring Fork Valley ($p = 0.04$). These results suggest the survey data are not biased, with respect to differences between respondents' and non-respondents' residency status in the Roaring Fork Valley.

Table 19. Percentage of respondents and non-respondents with a primary or secondary residence in the Roaring Fork Valley.

Response	Respondents (N)	Respondents (%)	Non-respondents (N)	Non-respondents (%)
Primary or secondary residence in the Roaring Fork Valley	200	60%	61	49%
Not a resident of the Roaring Fork Valley	131	40%	63	51%
Total	331	100%	124	100%

$X^2 = 4.203$; p-value = 0.04
$\alpha = 0.05$, $p \leq 0.01$ indicates significant result following Bonferroni correction to account for multiple non-response bias statistical tests

Floated the River Alone

The results of the chi-square test in Table 20 suggest that survey respondents and non-respondents did not differ significantly with respect to whether or not they floated the river alone (p = 0.582). These results suggest the survey data are not biased, with respect to differences between respondents' and non-respondents' likelihood of floating the river alone.

Table 20. Percentage of respondents and non-respondents who floated the river alone.

Response	Respondents (N)	Respondents (%)	Non-respondents (N)	Non-respondents (%)
Floated the river alone	26	7%	7	5%
Did not float the river alone	326	93%	122	95%
Total	352	100%	129	100%

X^2 = 0.302; p-value = 0.582
α = 0.05, p ≤ 0.01 indicates significant result following Bonferroni correction to account for multiple non-response bias statistical tests

The results of the non-response bias analysis suggest there are statistically significant differences between respondents and non-respondents, with respect to whether or not they felt crowded while floating on the river and with respect to whether or not they floated the river with a commercial group. Respondents were less likely than non-respondents to feel crowded while floating on the river and to float the river with a commercial group. The study results should be interpreted with these points in mind. Results regarding perceptions of crowding and support for visitor use management strategies included in the questionnaire may be understated in the survey data, and crowding tolerances for PPV on the river may be overstated.

Appendix A—Field Manual

PITKIN COUNTY OPEN SPACE AND TRAILS

NORTH STAR NATURE PRESERVE FIELD MONITORING MANUAL

Prepared by:
Steve Lawson
Abbie Larkin
Annie Engen

June 20, 2024

Traffic counter deployment protocols

Deploy an automated vehicle traffic counter along Wildwood Lane to record hourly, directional class counts of vehicles traveling on the roadway.

Deploying and maintaining the counter

1. If possible, select a counter deployment location after the road forks to the Wildwood put-in and before the parking area itself.
2. Deploy the traffic counter according to Pitkin County OST standards and protocols.
3. Complete the Traffic Counter Setup Log Form, making sure to record the date and time of the installation, the installation location, and photos of the setup.
4. Maintain and download data from the traffic counter weekly, if possible, and every two weeks at a minimum.
    a. Check counter functionality and battery life.
    b. Download data from the counter to a laptop/computer.
    c. Backup data files to a cloud-based server.

Traffic Counter Set Up Log

Location: _____ **Initials:** _____

Date: _____/_____/_____ (mm/dd/yy)

1. **Time of setup:** _____ (use 24-hr clock hh:mm:ss)
2. **Counter serial number:** _____
3. **GPS coordinates of counter location:**
   _____
4. **Written description of counter location:**
   _____
   _____

In the box below, please draw a bird's-eye diagram of the counter setup, including:

- The road and side roads
- Location of the traffic counter
- Location or direction of any major attractions

Please take pictures of the counter setup

- Take **close-up** pictures to document the counter setup
- Take pictures of the counter setup from a **distance**

Trail camera-based PPV and WCPV count data collection protocol

Deploy a game camera to record images of people floating on the river in the people-per-viewscape (PPV) photo simulations photo frame area. Post-process the image data to digitally enter camera-based counts of PPV and watercraft-per-viewscape (WCPV) in the photo frame area.

Deploying and maintaining the camera

1. Deploy the game camera according to Pitkin County OST standards and protocols. Ensure that:
    a. The camera lens is focused on the PPV photo simulations photo frame (Figure 1).

Figure 1. North Star Nature Preserve PPV viewscape area

    b. The camera is set to capture a photo once every 10 minutes. Start the interval at the top of the hour, if possible (e.g., such that images are recorded at 10:00, 10:10, 10:20, etc.).
2. Maintain and download data from the camera daily, if possible, and every few days at a minimum.
    a. Check camera battery life.
    b. Swap memory cards.
    c. Save image files from memory cards to computer.
    d. Backup image files to a cloud-based server

Data entry for photo data

1. Complete virtual data entry training session with DJ&A prior to start of data entry.

2. Use the PPV and WCPV data entry form provided by DJ&A to digitally enter PPV and WCPV counts into an Excel-based datasheet.
3. Count only people and watercraft in the PPV photo frame itself.
4. Complete data entry on a weekly basis, if possible, with a target of completing all data entry within a week after the end of the sampling period (i.e., by early August).

Parking data collection protocol

Conduct hourly parking counts to span pre-peak, peak, and post-peak parking conditions.

Equipment and supplies

The following equipment and supplies are required to complete parking count data collection:

1. OST-provided bicycle or vehicle
2. Parking data collection form and protocol
3. Writing utensil (pen or pencil and pencil sharpener, with backups)
4. One-gallon Ziploc bag
5. Hand-held tally counter
6. Clipboard
7. Watch or cell phone
8. Traffic safety vest
9. Personal items (e.g., clothing layers, sunglasses, sunscreen, water, food, etc.)

Before starting data collection

1. Arrive at the Wildwood put-in parking area at least 10 minutes prior to the start of the data collection period.
2. Complete the header information on the parking data collection log form.
3. Read the instructions below.

Collecting parking count data

1. Parking data collection will be conducted from 10:00 a.m. to 6:00 p.m. on each sampling day.
2. Start each hourly count at the top of the designated hour.
3. The starting location for each hourly count will alternate between Wildwood put-in and North Star pedestrian bridge takeout.
4. At the start of each hour, set the tally counter to zero and record the hour of the count in the "Hour" column of the data collection log form.
5. Conduct a roving count of the number of vehicles parked in the first location, including on the adjacent roadside, and record the count in the cell corresponding to the location and hour of the count.

6. Record comments in the "Comments" column of the data collection form, if applicable.
7. Travel to the next parking location, set the tally counter to zero, and repeat Steps 5 and 6.
8. Repeat Step 7 for each of the rest of the parking locations (there are a total of six parking locations; Figure 2).

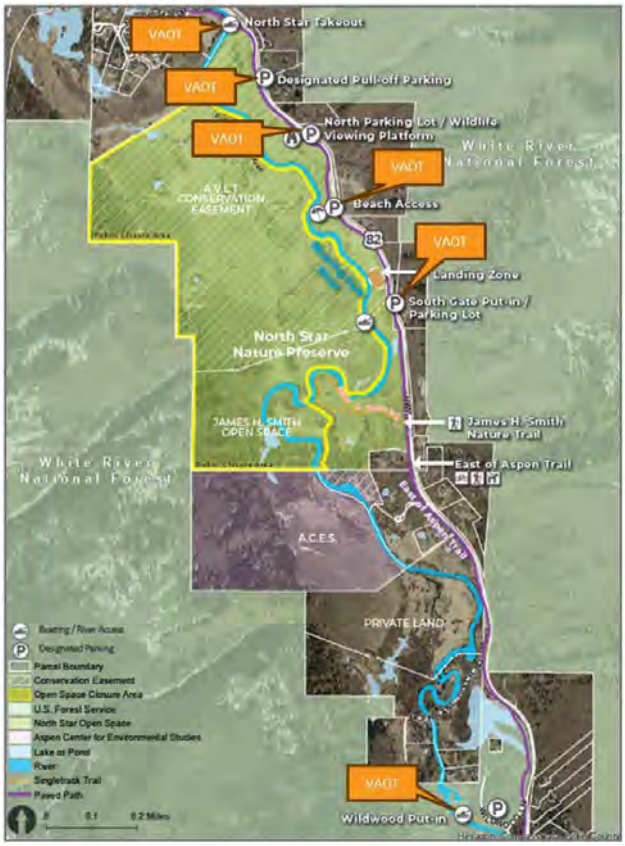


Figure 2. Parking count locations

Additional considerations

1. If you park a vehicle within the parking data collection area, do not include your vehicle in the counts of parked vehicles.
2. Think of each hourly count as an "instantaneous count". Do not adjust your count for vehicles counted within an hourly count that leave before you finish the hourly count.

Similarly, do not adjust your count for vehicles that arrive and park after you started your hourly count.

3. Include all vehicle types in the counts of parked vehicles. Use the "Comments" column on the data collection log form to record information about any unusual circumstances.

Data entry for parking count data

1. Complete virtual data entry training session with DJ&A prior to start of data entry.
2. Use the VAOT data entry form provided by DJ&A to digitally enter hourly parking counts into an Excel-based datasheet.
3. Complete data entry on a weekly basis, if possible, with a target of completing all data entry within a week after the end of the sampling period (i.e., by early August).

North Star Nature Preserve Parking Count Data Collection Log Form

Initials: _____ **Date:** ____/____/____(mm/dd/yy)

Special Event: No / Yes: _____ **Arrival Time:** ____:____ (use 24-hr clock *hh:mm*)

Weather: Sunny / Overcast / Rainy / Stormy / Smoky *(circle one)*

Row ID	**Hour** (24-hour clock)	**Count of parked vehicles**						**Comments**
		North Star ped. Bridge takeout	Shoulder	North lot	Beach access	South Gate put-in/takeout	Wildwood put-in	
1	____:00							
2	____:00							
3	____:00							
4	____:00							
5	____:00							
6	____:00							
7	____:00							
8	____:00							

Enter the hour value for each count interval using 24-hr clock (e.g., record "14:00" for the interval starting at 2:00 PM).

Enter a ZERO (0) count if there were no parked vehicles during an hourly count period – **do not leave any cells blank.**

Draw a line through any rows that are not used – **do not leave any rows blank.**

Visitor survey administration protocol

Administer the visitor survey to people exiting the river at the North Star pedestrian bridge takeout after floating the river.

Equipment and supplies

The following equipment and supplies are required to complete survey administration:

1. Survey recruitment script
2. Survey contact log form
3. Survey questionnaire
4. Clipboards (4)
5. Photo simulation binders (4)
6. Writing utensil (pen or pencil and pencil sharpener, with backups)
7. One-gallon Ziploc bag
8. Watch or cell phone
9. Personal items (e.g., clothing layers, sunglasses, sunscreen, water, food, etc.)

Before administering visitor surveys (with photo simulation binders)

1. Arrive at the survey administration location at least 15 minutes prior to the scheduled sampling start time (Figure 3).
2. Complete the header information on the survey administration contact log form.
3. Prepare the survey recruitment script, questionnaires, and binders for survey administration.
4. Refer to the completed contact log forms for the last survey ID# and binder ID # values assigned on the previous sampling day to determine starting values for each on the current sampling day.

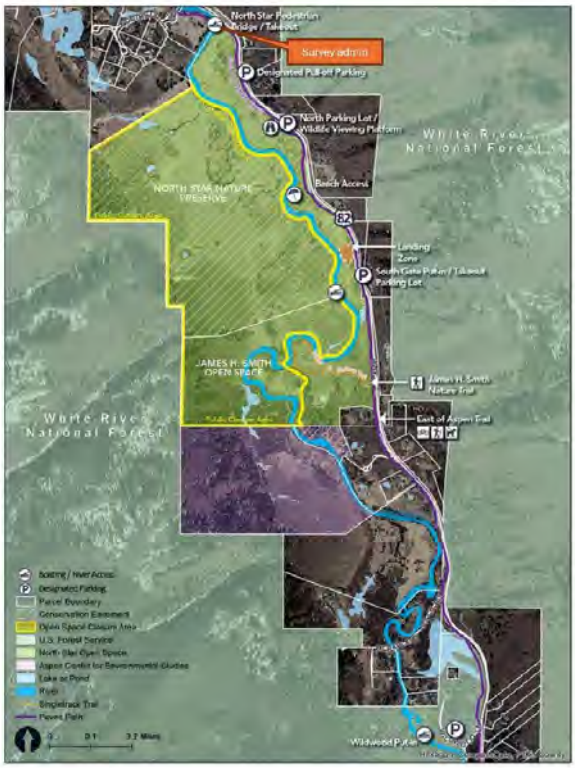


Figure 3. Survey administration location

Administering visitor surveys (with photo simulation binders)

1. Survey administration will be conducted from 10:00 a.m. to 6:00 p.m. on each sampling day.
2. At the start of the sampling period, contact a member of the first group to land at the takeout after floating the river using the method in the survey recruitment script.
3. Complete the survey contact log form for each group you contact, whether they agree to participate in the survey or not.
4. Administer the questionnaire to a selected member of each group that agrees to participate using the method in the survey recruitment script.
5. Record the date, survey ID #, and binder ID # on the cover of the questionnaire before handing it to the respondent.
6. When respondents notify you that they are at the photo simulations questions (Question 11), select the correct binder to help them complete the photo simulations questions, as follows:

a. Show the respondent each of the photo simulations in the binder, one at a time, in the order they appear in the binder.

b. When showing each photo simulation to the respondent, verbally indicate which photo they are looking at ("I am showing you Photo #1").

c. For each photo simulation, prompt the respondent to answer the photo simulation-specific question in the survey.

7. After the respondent completes the photo simulations questions:

   a. Instruct the respondent to complete the remainder of the questionnaire and return it to you when they are done.

   b. Place the used photo simulations binder at the bottom of the ordered pile so that the next binder in the sequence is at the top for the next visitor group.

8. While the respondent is completing the remaining portion of the questionnaire, contact the next group to land at the takeout after floating the river and complete Steps 3 through 7.

Data entry for visitor survey data

1. Complete virtual data entry training session with DJ&A prior to start of data entry.
2. Use the survey data entry form provided by DJ&A to digitally enter survey day into an Excel-based datasheet.
3. Complete data entry on a weekly basis, if possible, with a target of completing all data entry within a week after the end of the sampling period (i.e., by early August).

Survey Recruitment Script

Pitkin County Open Space and Trails

North Star Preserve River Use Survey

1. **"Hi, we are conducting a survey for Pitkin County Open Space and Trails, do you have a few minutes to help?"**
   --> If the visitor says YES, go to Q2

   --> If the visitor says NO, thank them for their consideration. If they appear to be 18 years of age or older, ask them the following non-response bias questions if they are willing to respond to them, and then release them from response burden:

   1. Did you feel crowded while you were floating the river today? Yes/No
   2. Did you float the river with a commercial group today? Yes/No
   3. Are you a resident of Roaring Fork Valley? Yes/No
   4. Did you float the river alone today? Yes/No (SKIP if Q2 = Yes)

2. **"Are you 18 years of age or older?"**
   --> If the visitor says YES, go to Q3

   --> If the visitor says NO, thank them for their time and release them from response burden

3. **"Have you previously participated in this survey?"**
   --> If the visitor says YES, thank them for their time and release them from response burden

   --> If the visitor says NO, go to Q4

4. **"Okay, great, thanks! Here is a copy of the questionnaire. Please fill out the first two sections of the questionnaire and then let me know when you get to Question 11 about the photos of people floating the river."**
   --> Record the date, survey ID #, and binder # on the cover of the questionnaire and hand them the questionnaire.

Survey Administration Contact Log Page ___ of ____

Date: ____/____/____(mm/dd/yy) **Location:**_____ **Initials:** _____

Arrival Time at Sampling Location: _____:_____ (*hh:mm*) **Departure Time from Sampling Location:** _____:_____ (*hh:mm*)

Weather: Sunny / Overcast / Rain / Storm (circle one) **Special Event:** No / Yes (Describe): _____

Row ID	Contact Time (hh:mm)	*If Yes*		*If No*	*If*	*If Refused* **Non-response bias questions**				Comments
		Survey ID #	***Binder ID #***	Refusal Reason[1]	***Ineligible*** Reason[2]	Felt Crowded? *Y/N*	Commercial group? *Y/N*	Roaring Fork resident? *Y/N*	Alone? *Y/N*	
1										
2										
3										
4										
5										
6										
7										
8										
9										

[1] **Refusal Reasons**: DB drive/walk-by; W weather; NT no time/hurry; NR no reason given; OR other reason (explain in comments)

[2] **Ineligible Reasons**: LB language barrier; PP previously participated; U underage; OR other reason (explain in comments)

DO NOT LEAVE ANY CELLS BLANK. Draw lines through unused cells

Appendix B—Vehicles-At-One-Time (VAOT) Counting Location Schematics

This appendix presents figures depicting the approximate count area of each of the VAOT counting locations included in the 2024 North Star Visitor Use Management Study (Figures B1 through B6).

Figure B1 depicts the approximate count area for the Wildwood Put-in Parking Lot, which includes seven parking spaces, one loading space, and the roadside of Wildwood Lane from the end of the bike path to the parking lot and loading area.

Figure B1: VAOT counting location schematic for the Wildwood Put-in Parking Lot.

Figure B2 depicts the approximate count area for the South Gate Put-in Parking Lot, which includes 21 parking spaces. There were no loading spaces at this location at the time of the study and no roadsides were included in the VAOT counts at this location.

Figure B2: VAOT counting location schematic for the South Gate Put-in Parking Lot.

Figure B3 depicts the approximate count area for the Beach Access Parking Lot, which includes 16 parking spaces. There were no loading spaces at this location at the time of the study and no roadsides were included in the VAOT counts at this location.

Figure B3: VAOT counting location schematic for the Beach Access Parking Lot.

Figure B4 depicts the approximate count area for the North Parking Lot, which includes 11 parking spaces. There were no loading spaces at this location at the time of the study and no roadsides were included in the VAOT counts at this location.

Figure B4: VAOT counting location schematic for the North Parking Lot.

Figure B5 depicts the approximate count area for the informal parking area pullout along Highway 82 between the North Lot and the North Star Pedestrian Bridge Loading Zone. The count area includes approximately 15 informal roadside parking spaces.

Figure B5: VAOT counting location schematic for the informal parking area pullout along Highway 82.

Figure B6 depicts the approximate count area for the North Star Pedestrian Bridge Loading Zone, which includes three 10-minute loading spaces, and the roadside of Highway 82 across from the loading zone.

Figure B6: VAOT counting location schematic for the North Star Pedestrian Bridge Loading Zone.

Appendix C—River User Exit Survey Questionnaire

North Star Nature Preserve River Use Survey

Date: _____ (mm/dd/yyyy)

Survey ID #: _____

Photo Sim Binder #: _____

1

Section 1. Group and Visit Characteristics

1. **Which of the following best describes your group that you floated the river with today? (Please mark all that apply.)**

   O Solo
   O Family
   O Friends
   O Other (please specify: _____)

2. **Including yourself, how many people are in your group? (Please enter one number for adults and one number for children.)**

   _____ Number of adults (18 years or older)
   _____ Number of children (under 18 years)

3. **What type of transportation did you and your group use to access the river today? (Please mark all that apply.)**

   O Commercial group shuttle
   O Personal vehicle(s):_____(please enter number of vehicles used by your group)
   O Other (please specify: _____)

4. **At which of the following locations did you launch onto the river today? (Please mark one.)** *Refer to the map as needed to help answer this question.*

   O Wildwood
   O South Gate
   O Other (please specify: _____)
   O Don't know/Not sure

5. **At approximately what time did you launch onto the river today? (Please enter your launch time today and circle AM or PM.)**

   _____:_____ AM/PM

6. **Including your float on the river today, approximately how many times have you floated this river in the last 12 months? (Please enter one number.)**

   _____ # of times floating the river in the last 12 months

Section 2. Planning and Motivations

7. **People have many different reasons for floating this section of the Roaring Fork River. How important to you was each of the following reasons for floating the river today? (Please mark one for each row.)**

	Extremely Important	Very Important	Moderately Important	Slightly Important	Not at All Important
To get physical exercise	O	O	O	O	O
To enjoy natural scenery	O	O	O	O	O
To do something I enjoy with friends and/or family	O	O	O	O	O
To explore a new area	O	O	O	O	O
To immerse myself in the river environment	O	O	O	O	O

8. **When did you decide you would float the river today? (Please mark one.)**

- O Today
- O Before today, but in the last week
- O More than a week ago, but in the last month
- O More than a month ago
- O Don't know/can't recall

3

9. **Did you use any of the following sources of information to plan and/or prepare for your float on the river today? (Please mark all that apply.)**

	Yes	No
Personal knowledge from previous visit(s)	O	O
Other people you know who have floated the river	O	O
Weather forecast	O	O
River level forecast	O	O
Local business (hotel, outdoor shop, etc.)	O	O
Group, club, or organization (please specify: _____)	O	O
Website (please specify: _____)	O	O
TikTok	O	O
Instagram	O	O
Facebook	O	O
Other (please specify: _____)	O	O

10. **Did you feel that you had the information you needed to properly plan and prepare for your float on the river through the North Star Nature Preserve today? (Please mark one.)**

O Yes

O No (Please specify what information you feel you needed but were not able to find.)

_____

_____

4

Section 3. Visitor Experience

11. We would like to know how many other people you could see while you are floating on the river without feeling crowded. To help judge this, we have a series of photographs that show different numbers of people floating on the river. Please ask the survey administrator to show you these photos to answer the following question.

    For each photograph, please tell us if you would feel crowded if you were floating on the river and saw the number of people depicted in the photograph. (Please mark one for each photograph.)

	I would feel crowded...	
	Yes	No
Photo 1	○	○
Photo 2	○	○
Photo 3	○	○
Photo 4	○	○
Photo 5	○	○

5

12. **Did you feel crowded at any point during your float trip today? (Please mark one for each row.)**

I felt crowded today...	Yes	No
Parking and/or unloading in the parking lot	○	○
At the put-in while launching onto the river	○	○
While floating on the river	○	○
At the takeout where I finished floating the river	○	○

13. **To what extent do you support or oppose each of the following visitor use management strategies currently being used? (Please mark one for each row.)**

	Strongly support	Somewhat support	Neither support nor oppose	Somewhat oppose	Strongly oppose
Managing the number of commercial group arrivals who float the river per hour	○	○	○	○	○
Managing the size of commercial groups who float the river	○	○	○	○	○
Managing use through limited availability of parking	○	○	○	○	○
Providing mandatory low impact education to all commercial groups before they float the river	○	○	○	○	○

14. To what extent would you support or oppose each of the following potential visitor use management strategies? (Please mark one for each row.)

	Strongly support	Somewhat support	Neither support nor oppose	Somewhat oppose	Strongly oppose
A permit system to manage the number of people allowed to float the river per hour	O	O	O	O	O
Manage the size of personal groups/individuals who float the river	O	O	O	O	O
Provide mandatory low impact education to personal groups/individuals before they float the river	O	O	O	O	O
Allow access to float the river only by commercial operator or alternative transportation (shuttle/walk/bike)	O	O	O	O	O
Close the nature preserve to floating use during the morning and evening for the benefit of wildlife	O	O	O	O	O
Close the nature preserve to all floating use for the benefit of wildlife	O	O	O	O	O

7

Section 4. Visitor Characteristics

15. What is your age? (Please mark one.)

- O Under 18 years
- O 18 to 29 years
- O 30 to 49 years
- O 50 to 59 years
- O 60 to 69 years
- O 70 years or older
- O Prefer not to answer

16. Are you a resident of Roaring Fork Valley? (Please mark one.)

- O Yes, my primary residence is in Roaring Fork Valley
- O Yes, I have a secondary residence in Roaring Fork Valley
- O No, I am not a resident of Roaring Fork Valley

17. Where do you live?

U.S. ZIP Code _____

OR

Country (if not U.S) _____

18. What ethnic and/or racial groups do you belong to? (Please mark all that apply.)

- O Asian
- O Black or African American
- O Hispanic, Latino, or Spanish origin
- O Middle Eastern or North African
- O Native American Indian or Alaska Native
- O Native Hawaiian or Pacific Islander
- O White or Caucasian
- O Choose not to disclose
- O Identity not listed
- O I self-describe as (please describe): _____

8

19. Which of these categories best represents your annual household income? (Please mark one.)

- O Less than $25,000
- O $25,000 to $49,999
- O $50,000 to $74,999
- O $75,000 to $99,999
- O $100,000 to $149,999
- O $150,000 to $199,999
- O $200,000 to $499,999
- O $500,000 or more
- O I prefer not to respond

Thank you for completing this survey.

Appendix D—Photo Simulations

1 PPV:

2 PPV:

3 PPV:

4 PPV:

6 PPV:

8 PPV:

10 PPV:

12 PPV:

14 PPV:

16 PPV:

18 PPV:

20 PPV:

22 PPV:

24 PPV:

26 PPV:

30 PPV:

Appendix E—River User Exit Survey Descriptive Statistics

This appendix reports the sample size, mean, median, and standard deviation for those variables for which measures of central tendency can be computed on the river user exit survey. Measures of central tendency with and without outliers are presented. Outliers were defined as values that were greater than three times the interquartile range of the values for the variable.

Table D1. Mean, median, standard deviation of applicable variables.

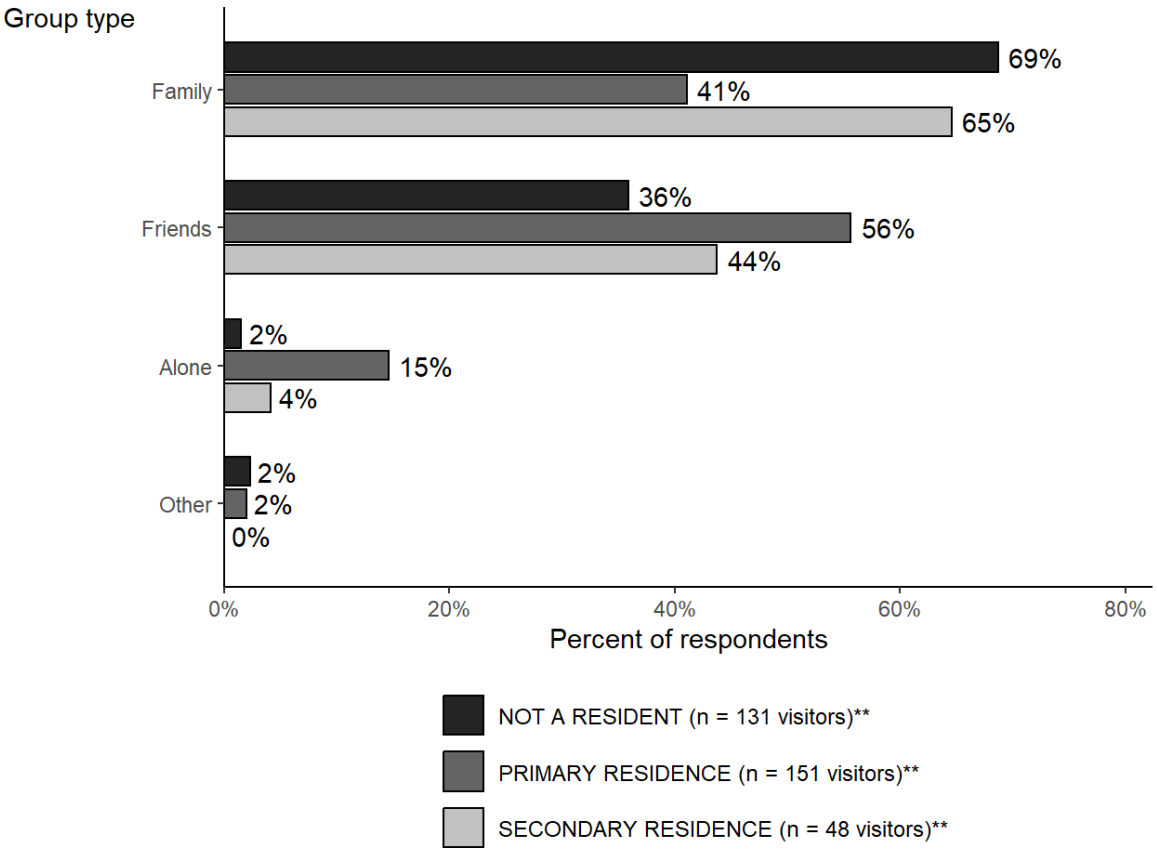
Question	N (all)	N (no outliers)	Mean (all)	Mean (no outliers)	Median (all)	Median (no outliers)	St. dev (all)	St. dev (no outliers)
Q02: Number of adults	348	347	2.99	2.96	2.0	2.0	1.63	1.57
Q02: Number of children	242	242	0.97	0.97	0.0	0.0	1.30	1.30
Q03: Number of personal vehicles used by group to access the river	292	291	1.22	1.19	1.0	1.0	0.80	0.70
Q05: Float duration (hours)	206	206	1.57	1.57	1.5	1.5	0.63	0.63

Appendix F—Crosstabs Comparing Survey Results Based on Respondent's Residency

Group and visit characteristics

Question 1: Group type

Which of the following best describes your group that you floated the river with today?

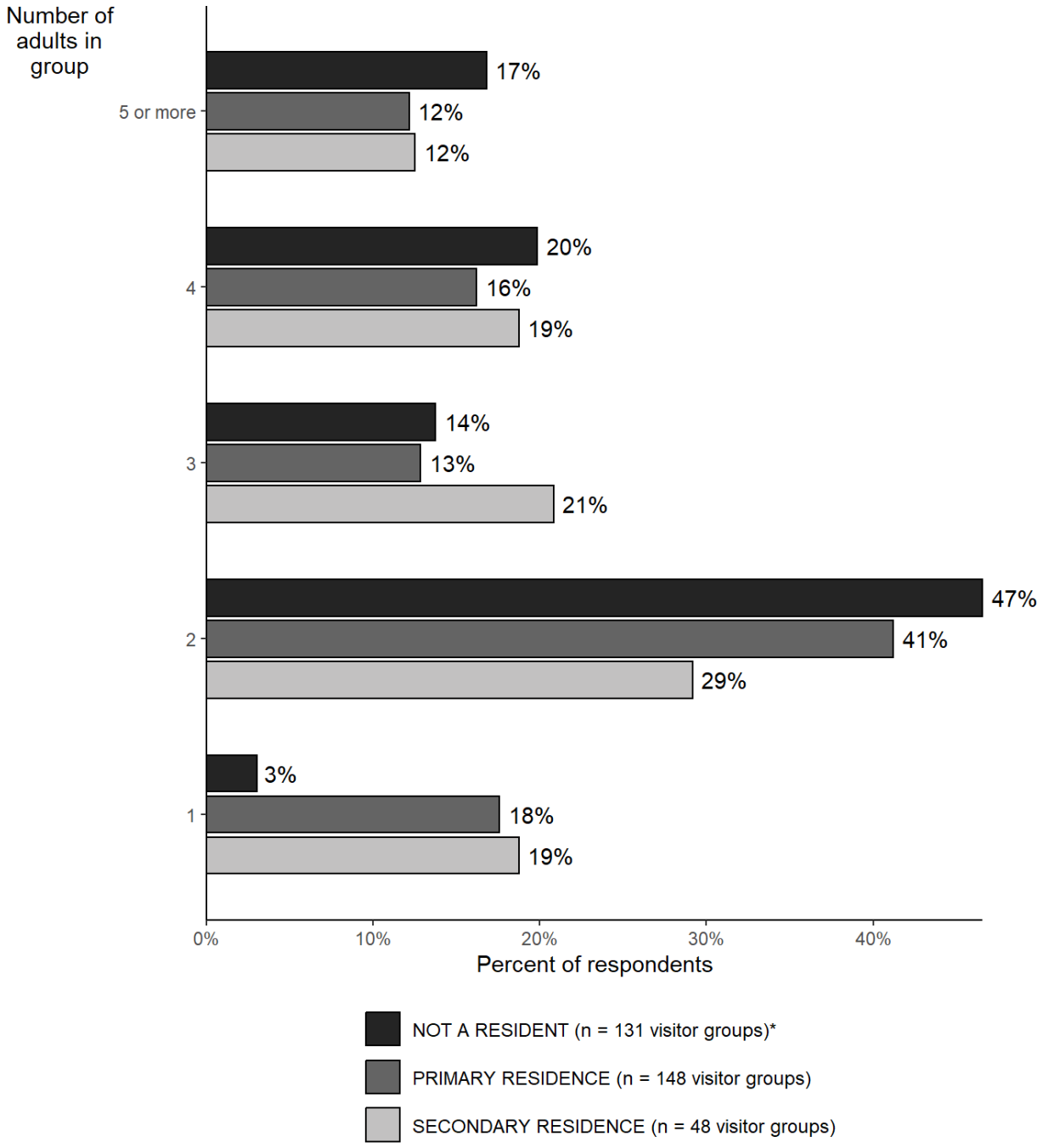


Other group type – not a resident	N
GUIDED	1
SPOUSE	1
WE ARE A COUPLE.	1

Other group type – primary residence	N
BOYFRIEND	1
BOYFRIEND/GIRLFRIEND	1
UP RIVER/DOWN RIVER	1
WELL EXPERIENCED FAMILY, PADDLE BOARDING THIS RIVER FOR 16 + YEARS.	1

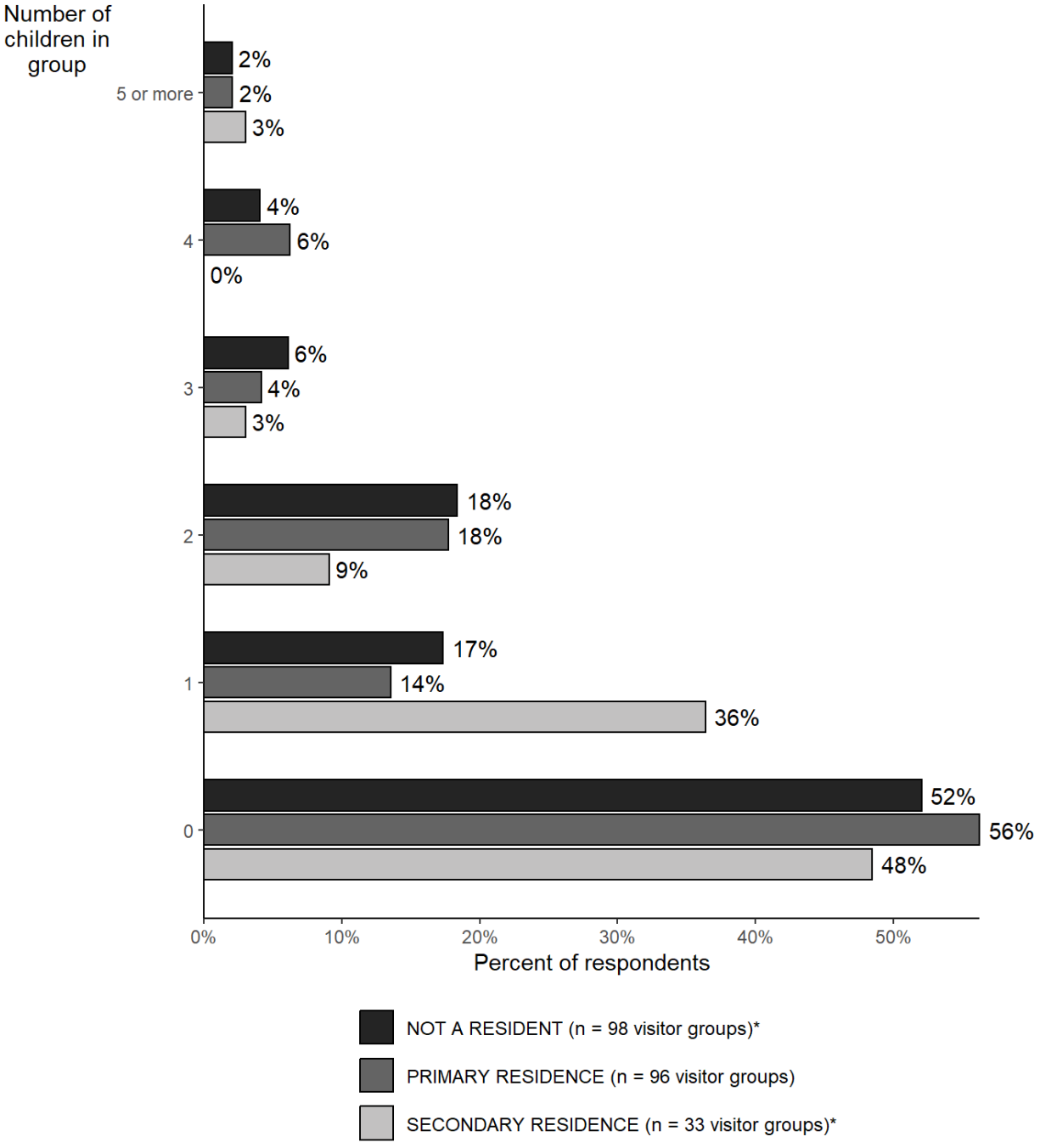
Question 2A: Number of adults in group

Including yourself, how many adults (18 years or older) are in your group?



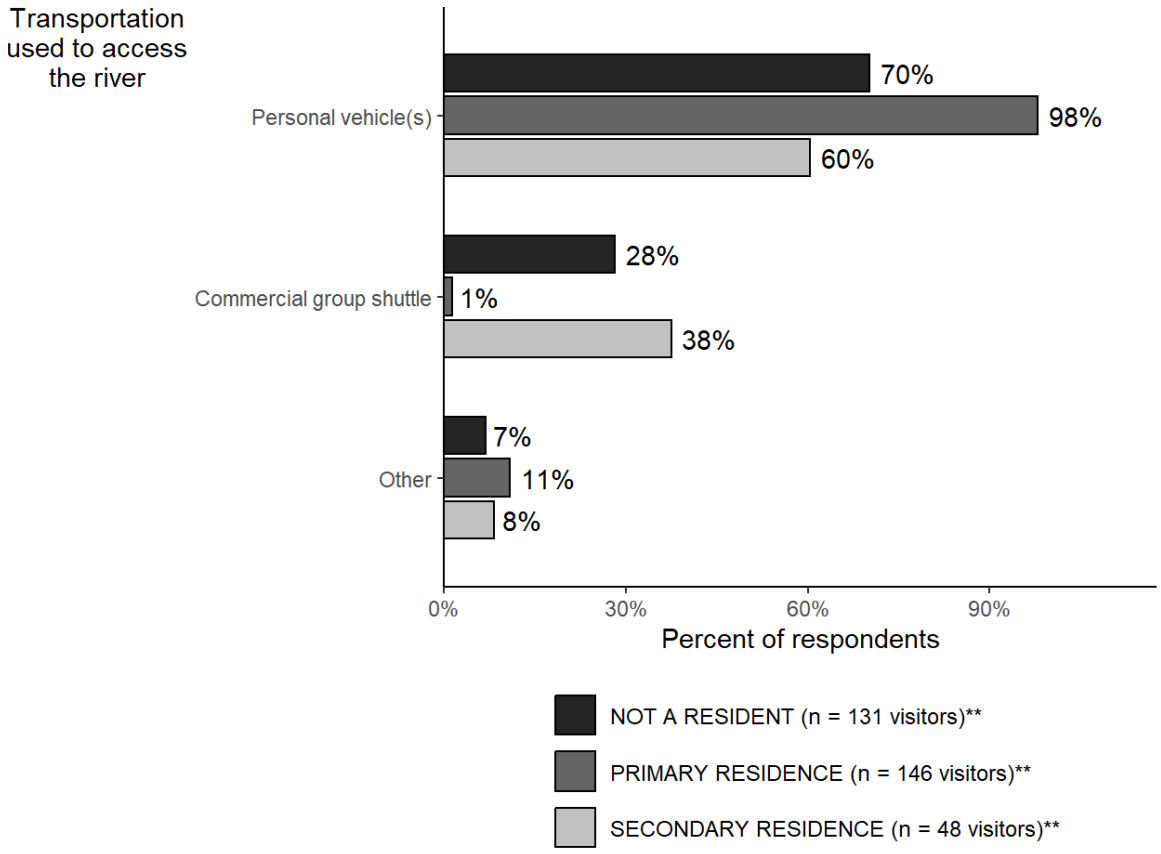
Question 2B: Number of children in group

Including yourself, how many children (under 18 years) are in your group?



Question 3: Transportation used to access the river

What type of transportation did you and your group use to access the river today?



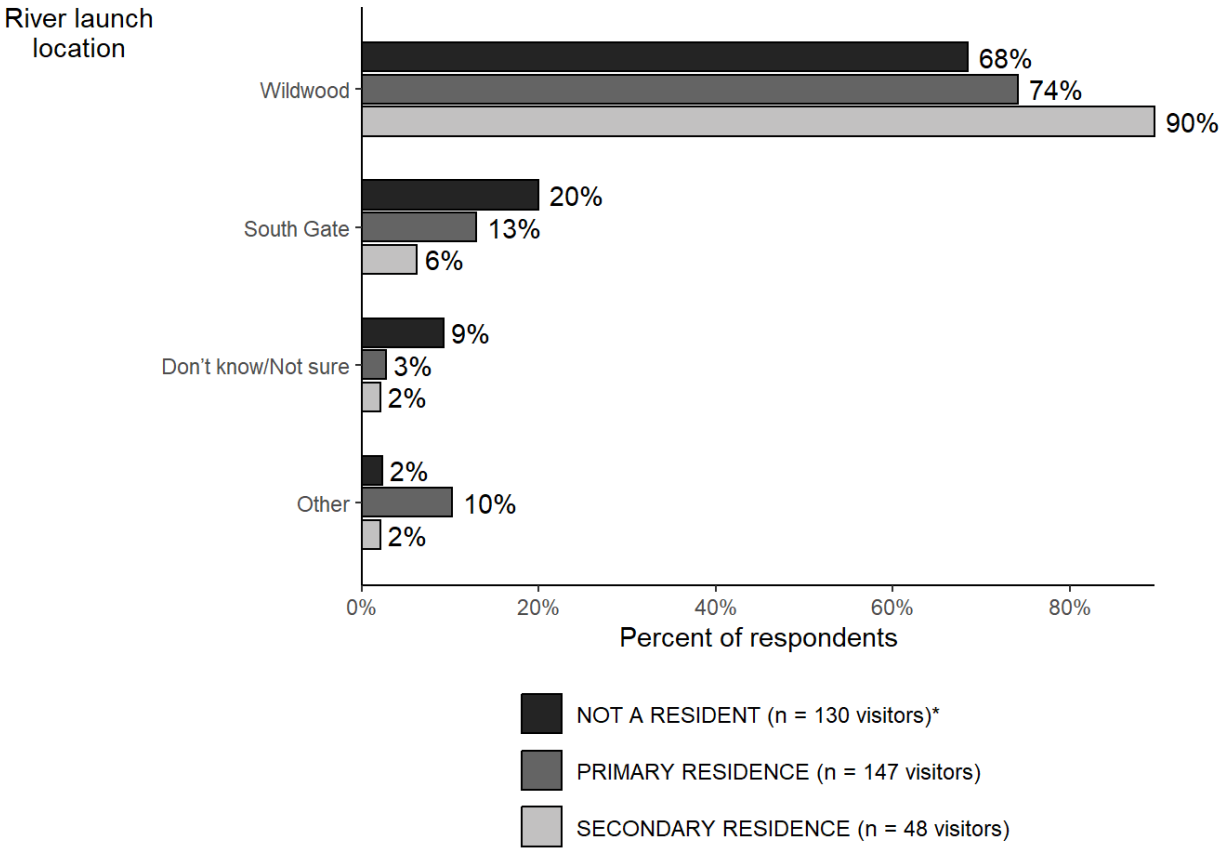
Other transportation type – not a resident	N
1 CAR 1 BIKE	1
BIKE	4
DROP OFF	1
E-BIKE	7
LIMELIGHT	1
ONE WHEEL	1
RENTED KAYAKS	1

Other transportation type – primary residence	N
BIKE	1
+1 BIKE	1
1 BIKE	1
1 PADDLEBOARD	1
1 SCOOTER	1
AND A BIKE	1
BIKE	6
BIKE WITH RACK	1
E-BIKE	3
SCOOTER	1
WITH BIKE SHUTTLE	1

Other transportation type – secondary residence	N
ASPEN WHITE WATER RAFTING	1
BIKE	1
E-BIKE	1
VESPA MOTORCYCLE	1

Question 4: Launch location

At which of the following locations did you launch onto the river today?



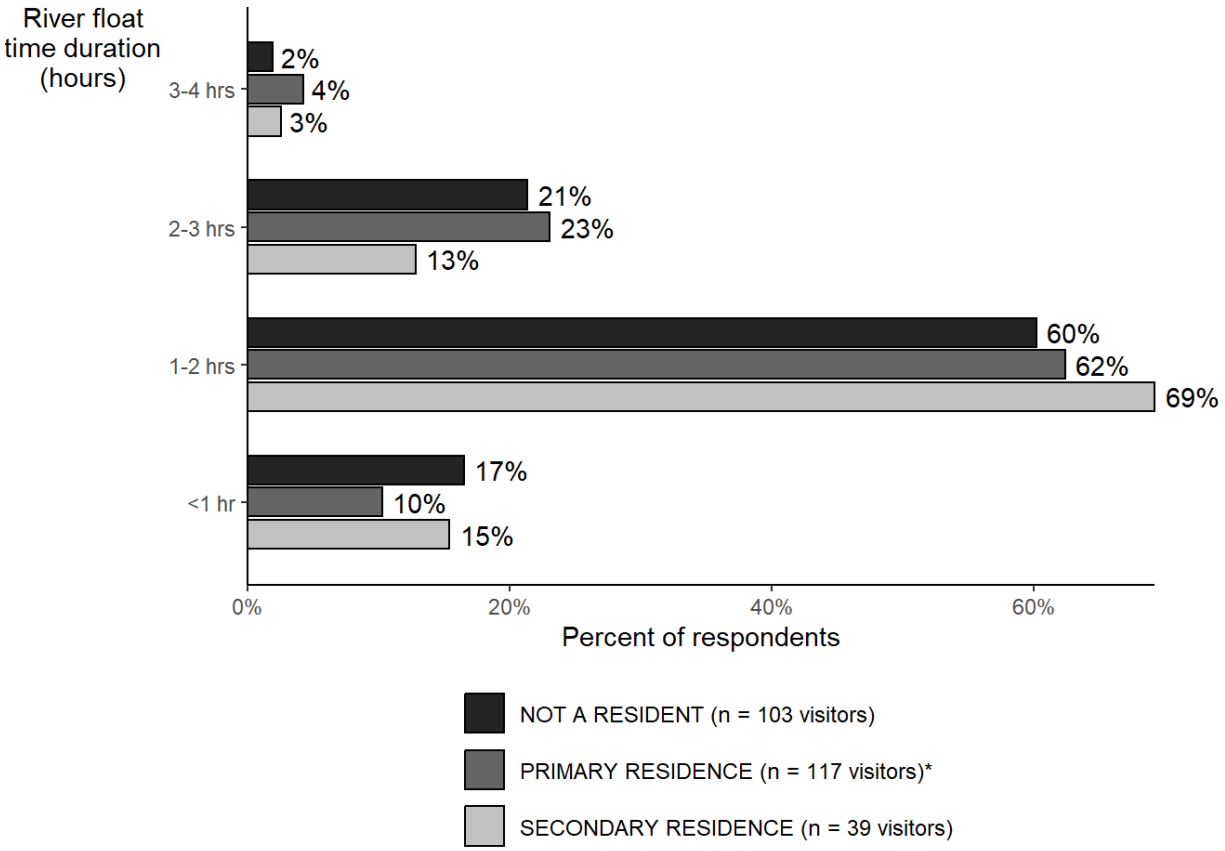
Other launch locations – not a resident	N
NORTH STAR	3
THE BEACH	1

Other launch locations – primary residence	N
BRIDGE	1
BRIDGE-GOTTA GET UP TO GET DOWN	1
FAMILY HOUSE ALONG RIVER	1
FAMILY PRIVATE HOUSE	1
FRIENDS PROPERTY	1
NORTH STAR PEDESTRIAN BRIDGE TAKE OUT	1
NORTH STAR TAKE OUT	1
NORTH STAR TAKEOUT	1
PED BRIDGE	1
PEDESTRIAN BRIDGE - RIVER TAKE OUT	1
RIVER TAKE OUT	4
TAKE OUT	1
TAKE-OUT	1
TAKEOUT	3

Other launch locations – secondary residence	N
STILLWATER BRIDGE	1

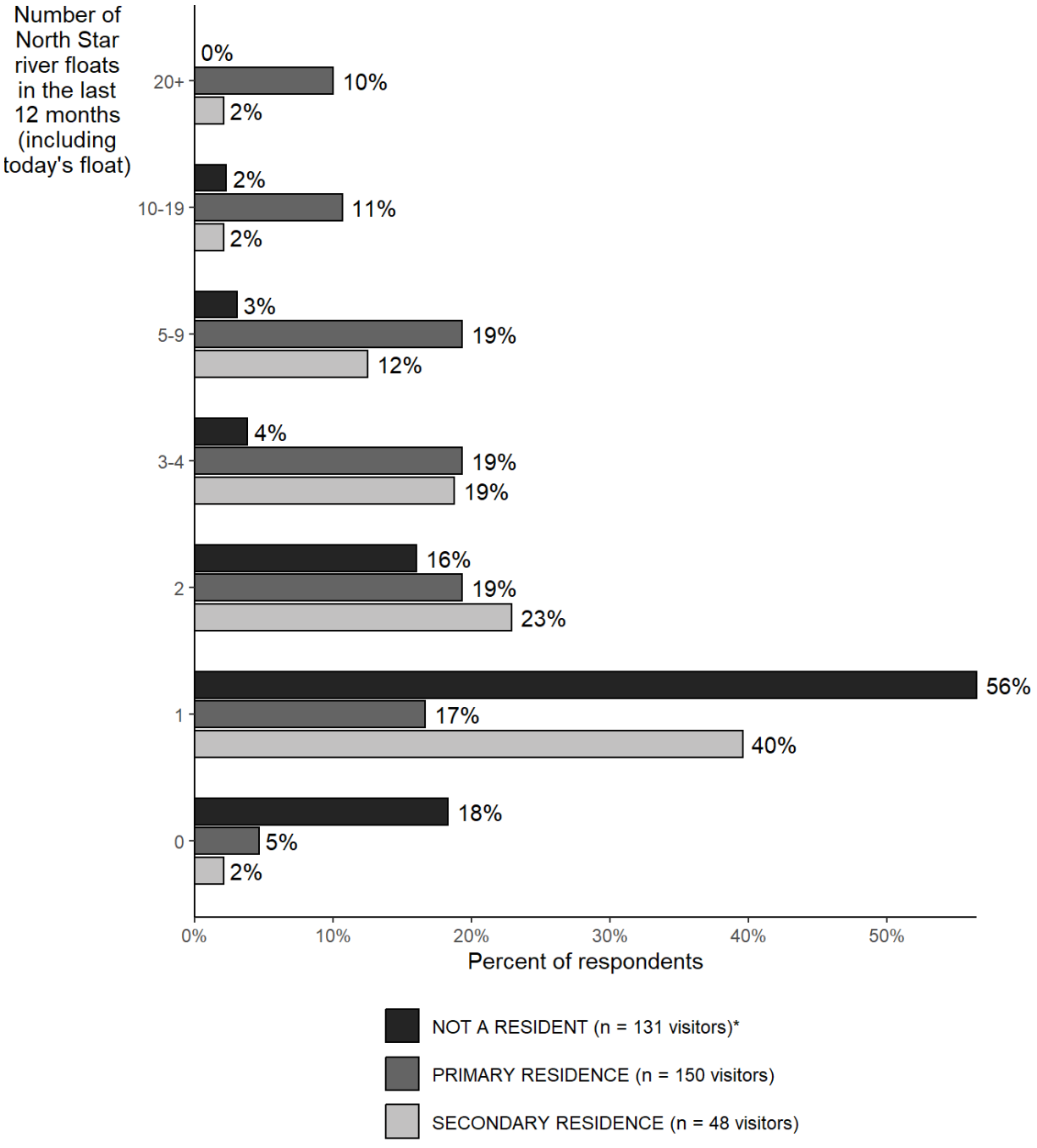
Question 5: River float duration

At approximately what time did you launch onto the river today?



Question 6: Previous river floats in the last 12 months

Including your float on the river today, approximately how many times have you floated this river in the last 12 months?



Planning and motivations

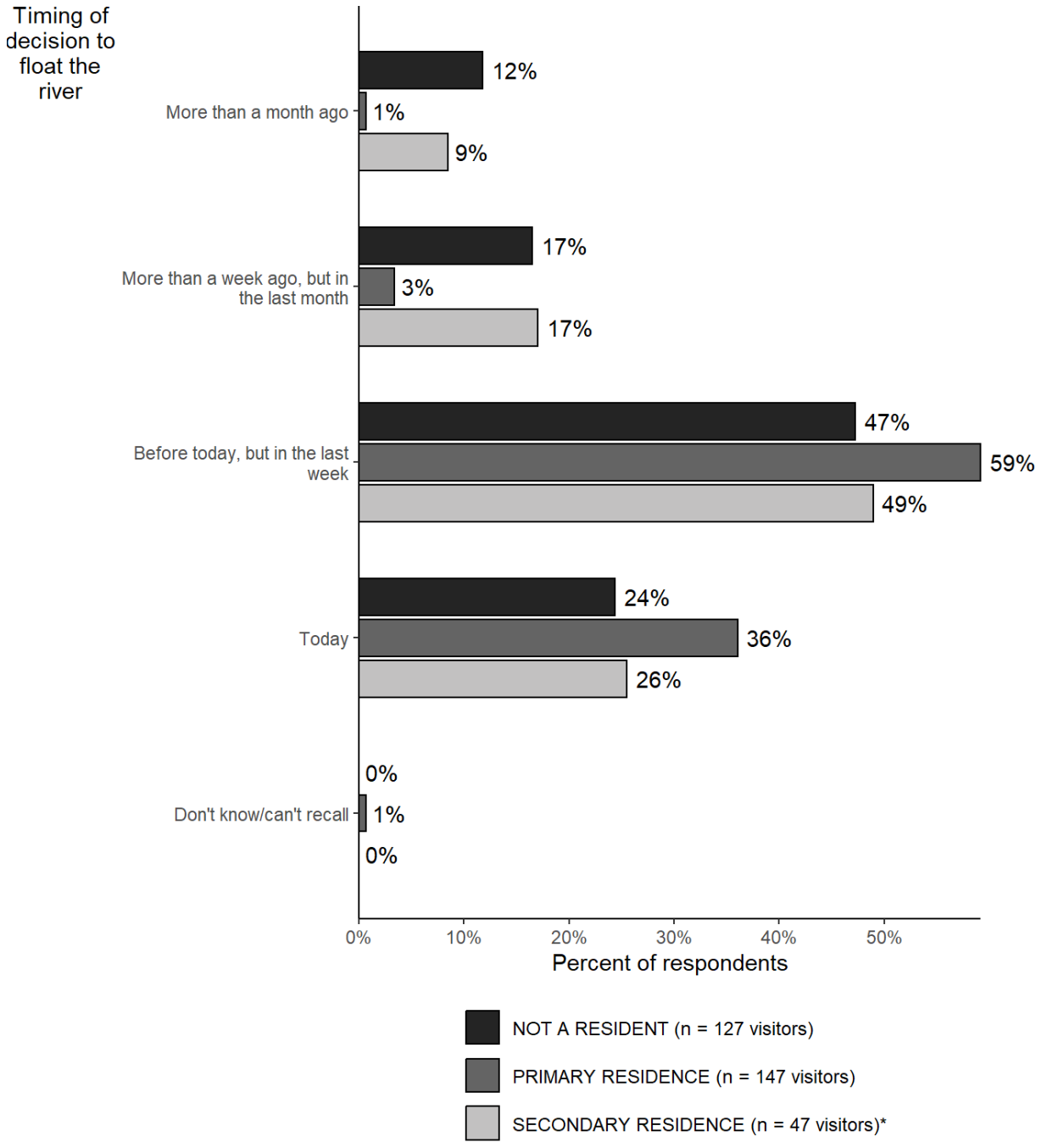
Question 7: Reasons for floating this section of the Roaring Fork River

People have many different reasons for floating this section of the Roaring Fork River. How important to you was each of the following reasons for floating the river today?

	Residence type	N	Extremely important	Very important	Moderately important	Slightly important	Not at all important	Total
To get physical exercise	Not a resident	127	9%	15%	47%	17%	12%	100%
	Primary residence	149	21%	14%	27%	22%	15%	100%
	Secondary residence	47	13%	9%	55%	13%	11%	100%
To enjoy natural scenery	Not a resident	129	72%	26%	2%	0%	0%	100%
	Primary residence	149	84%	15%	1%	0%	0%	100%
	Secondary residence	47	70%	28%	2%	0%	0%	100%
To do something I enjoy with friends and/or family	Not a resident	128	75%	22%	2%	1%	1%	100%
	Primary residence	146	75%	19%	4%	1%	0%	100%
	Secondary residence	47	81%	17%	2%	0%	0%	100%
To explore a new area	Not a resident	127	44%	28%	18%	6%	4%	100%
	Primary residence	139	21%	14%	19%	22%	24%	100%
	Secondary residence	46	26%	22%	24%	20%	9%	100%
To immerse myself in the river environment	Not a resident	129	47%	35%	16%	2%	0%	100%
	Primary residence	148	62%	28%	7%	3%	1%	100%
	Secondary residence	47	36%	32%	21%	9%	2%	100%

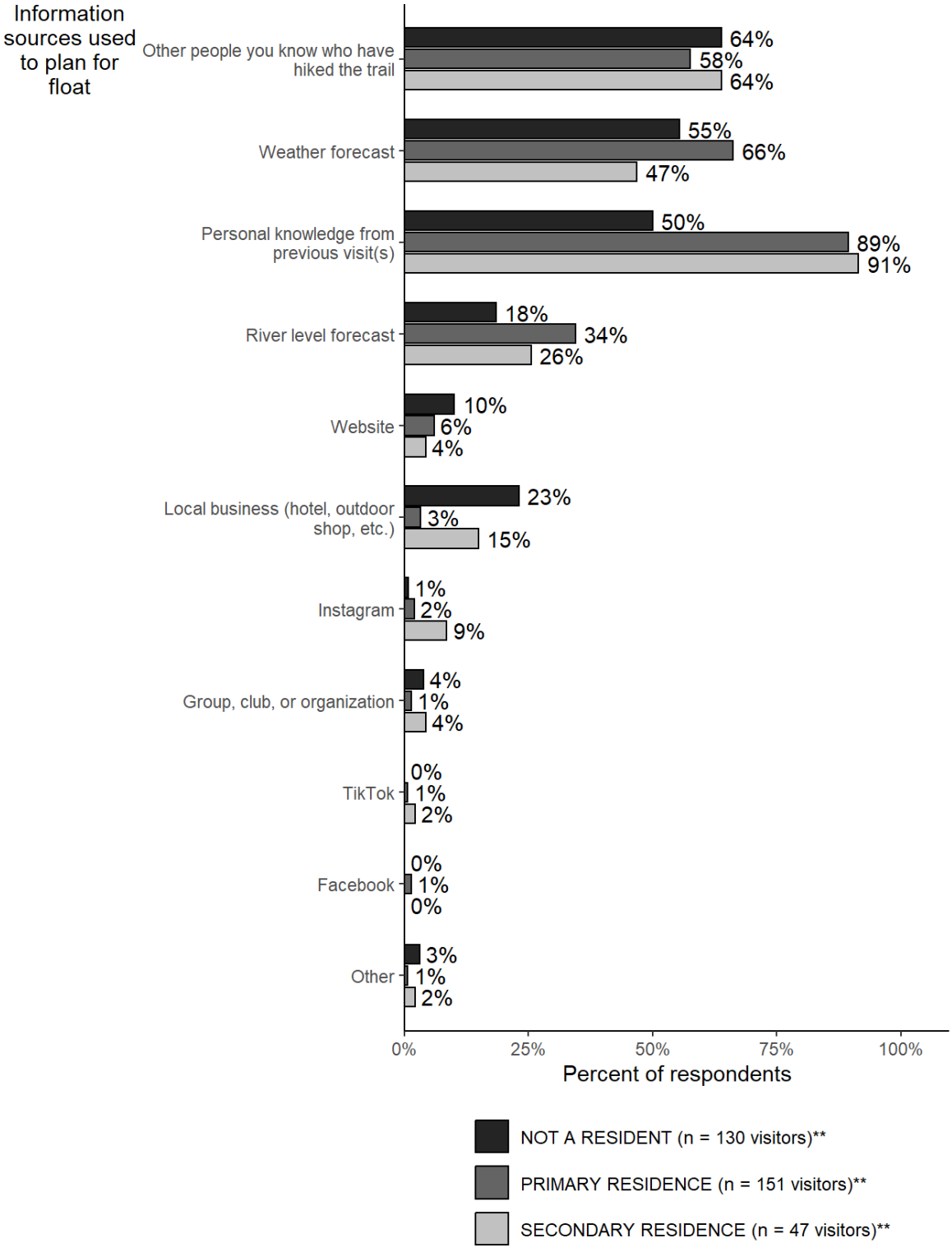
Question 8: Timing of decision to float the river

When did you decide you would float the river today?



Question 9: Information sources

Did you use any of the following sources of information to plan and/or prepare for your float on the river today?



Group, club, or organization – not a resident	N
TIMBERS CLUB	1

Group, club, or organization – secondary residence	N
EME	1

Website – not a resident	N
CITY WEBSITE W/MAP	1
ELK MOUNTAIN	1
ELK RIVER	1
ELKMOUNTAINEXPEDITIONS.COM	2
PITKINCOUNTY.ORG	1

Website – primary residence	N
GOOGLE	2
OUTFITTERS TO SEE IF RUNNING AND TIMES TO AVOID CROWDS	1
PITKIN CO	1
PITKIN COUNTY	1
PITKINCOUNTY.ORG	1
PITKINCOUNTY.ORG - NORTHSTAR PRESERVE	1

Website – secondary residence	N
EME	1

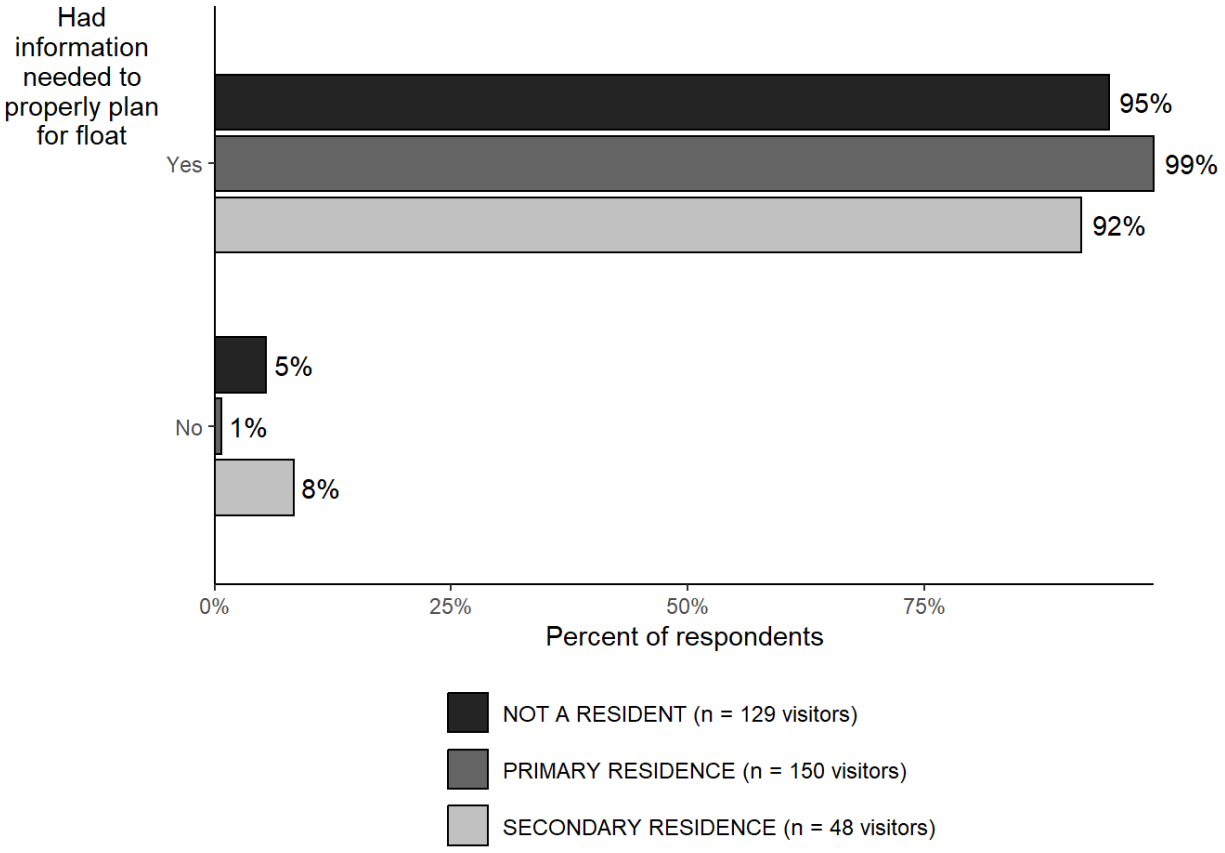
Other sources of information – not a resident	N
FAMILY THAT LIVES HERE	1
FORGOT OUR PADDLES AND HAD TO USE A RENTAL SHOP	1
GOOGLE SEARCH	1
GOOGLE.COM	1
RAN INTO RANGER YESTERDAY	1
WORD OF MOUTH.	1

Other sources of information – primary residence	N
ITS MY SANCTUARY	1
LOCAL CARBONDALE	1

Other sources of information – secondary residence	N
ELK MOUNTAIN EXPEDITIONS	1

Question 10: Had information needed

Did you feel that you had the information you needed to properly plan and prepare for your float on the river through the North Star Nature Preserve today?



Information needed – not a resident	N
A LITTLE BETTER IDEA OF THE PARKING SITUATION	1
BETTER MAP W/GOOGLE MAP PINS	1
COULD NOT SEE THE SIGN TO GET OFF THE RIVER.	1
FINDING WHERE TO START	1
FRIEND KNEW THE RIVER	1
I WOULD HAVE WORN A SWIMSUIT AND RIVER SHOES.	1
NOT SURE HOW TO ACCESS ANY INFO	1
WE CAME A LOCAL FRIEND.	1
WEBSITE? W/INFO	1

Information needed – primary residence	N
BUT I HAVE FLOATED ALONE AND W/FRIENDS HERE FOR YEARS THIS SECTION OF RIVER. I WOULD HAVE NO IDEA WHERE TO GATHER INFORMATION IF I NEEDED IT.	1
EXCEPT FORGOT ABOUT MOSQUITOS	1
IM LOCAL	1
ITS GOOD	1
MOSTLY USED FRIEND WHO FLOATED BEFORE	1
POOR SIGNAGE ABOUT RULES/NO SPEAKERS I.E.	1
RESEARCH & 16 + YEARS EXPERIENCE ON THIS RIVER.	1

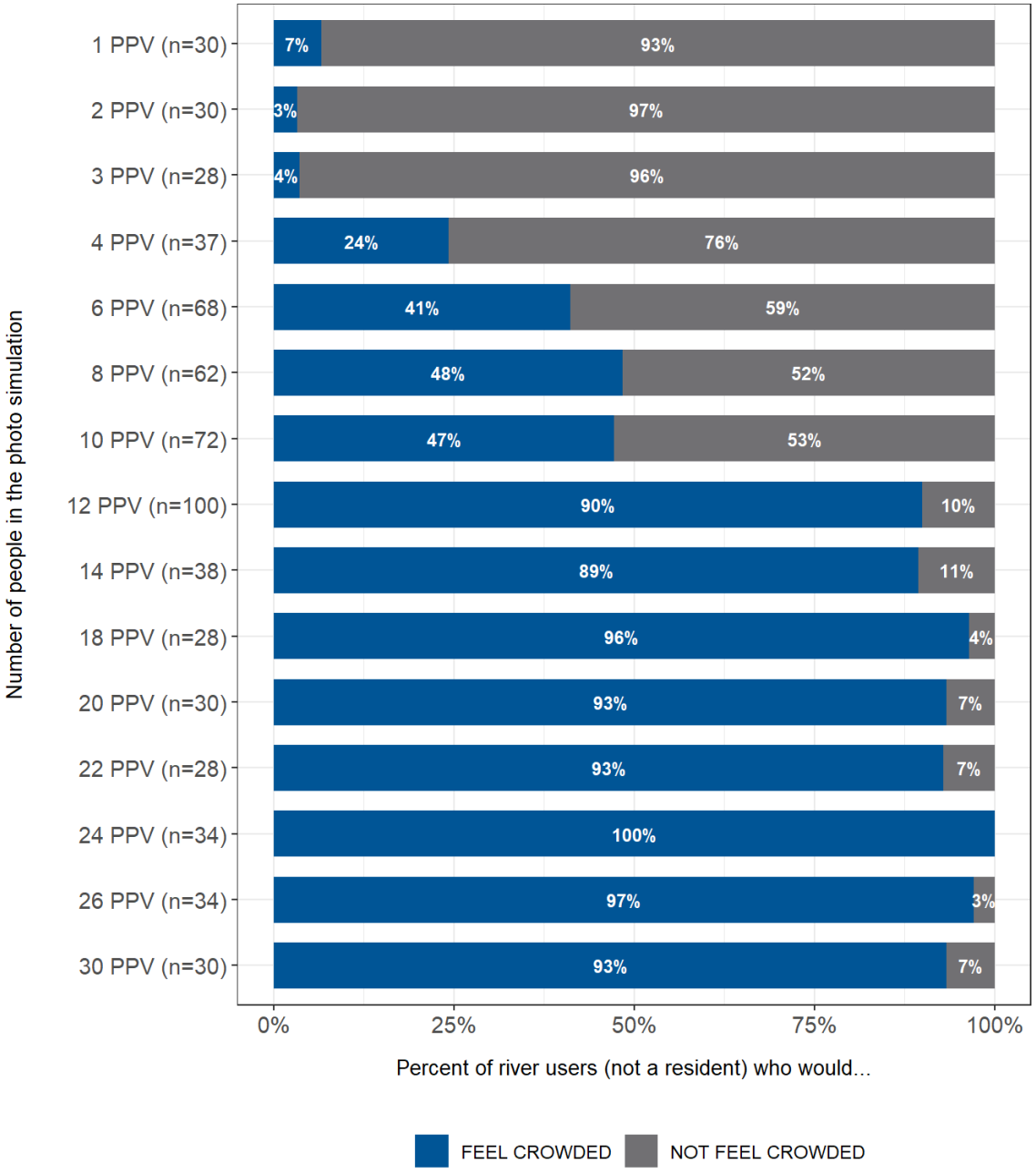
Information needed – secondary residence	N
HOW TO SUPPORT NSNP?	1
I HAD NO INFO AND DON'T KNOW WHERE TO SOURCE FLOAT INFO.	1
WE DIDN'T KNOW WHERE TO ACCESS.	1

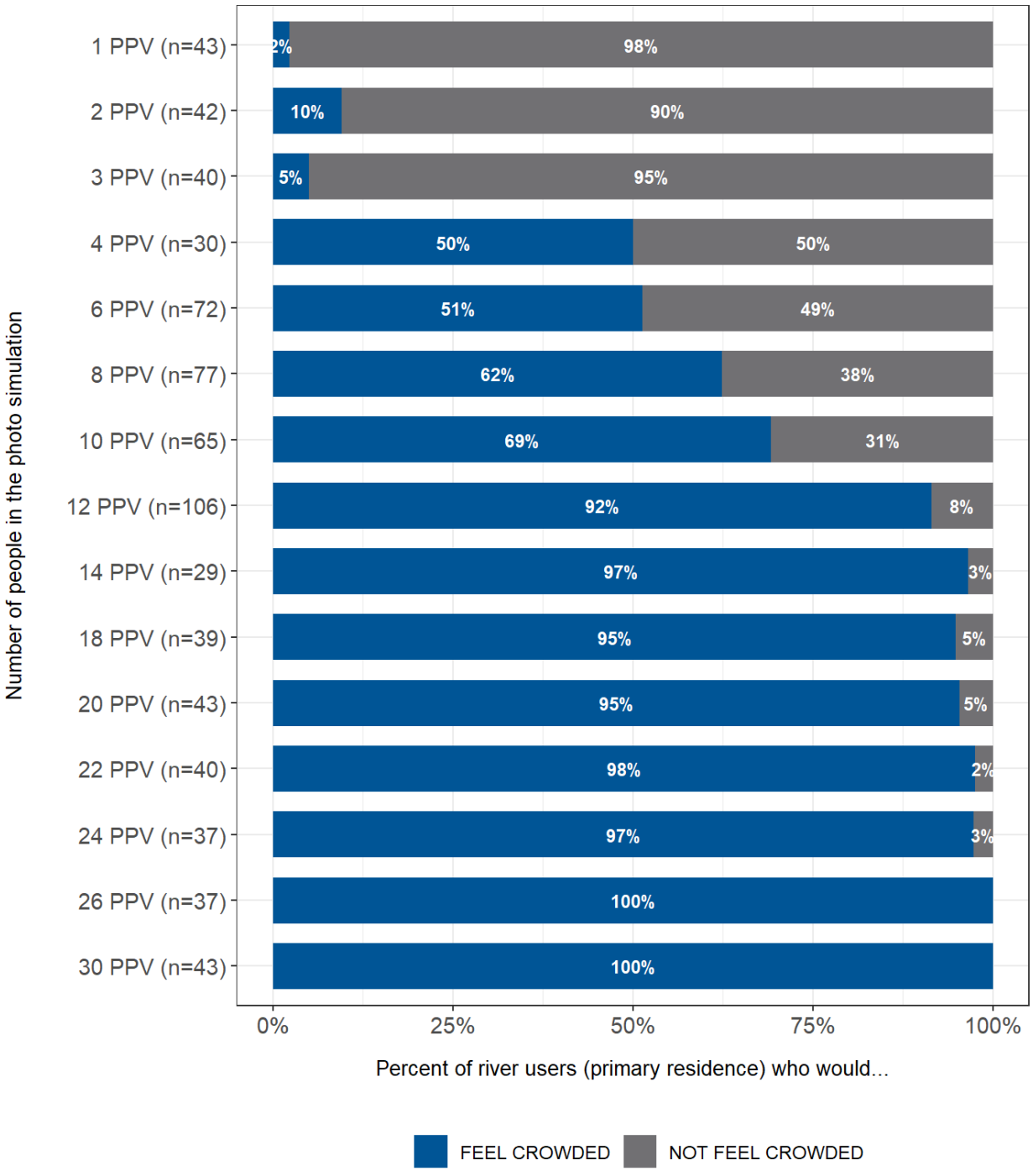
Visitor experience

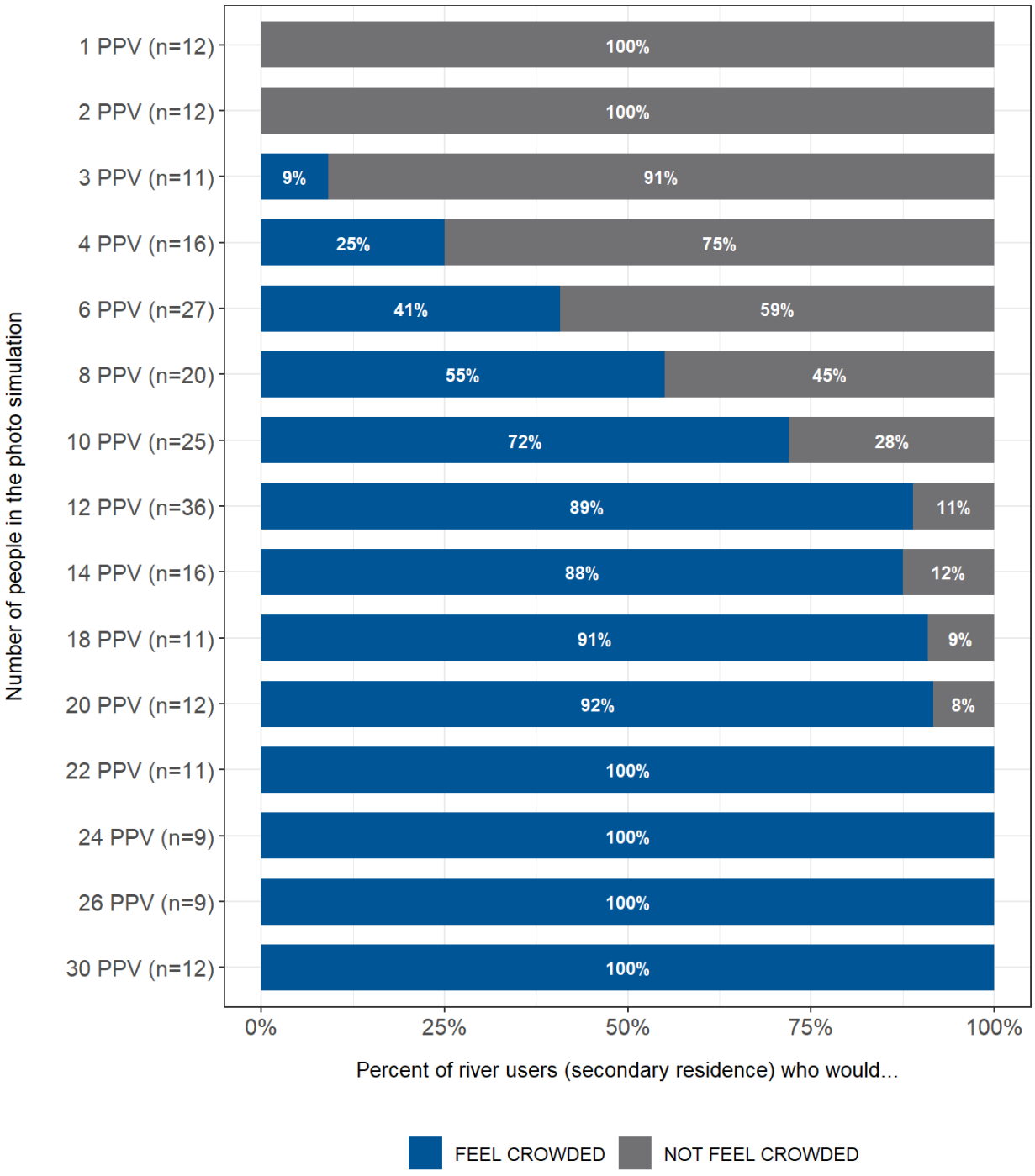
Question 11: Would feel crowded in the PPV viewscape area given the number of people depicted in the photo simulations

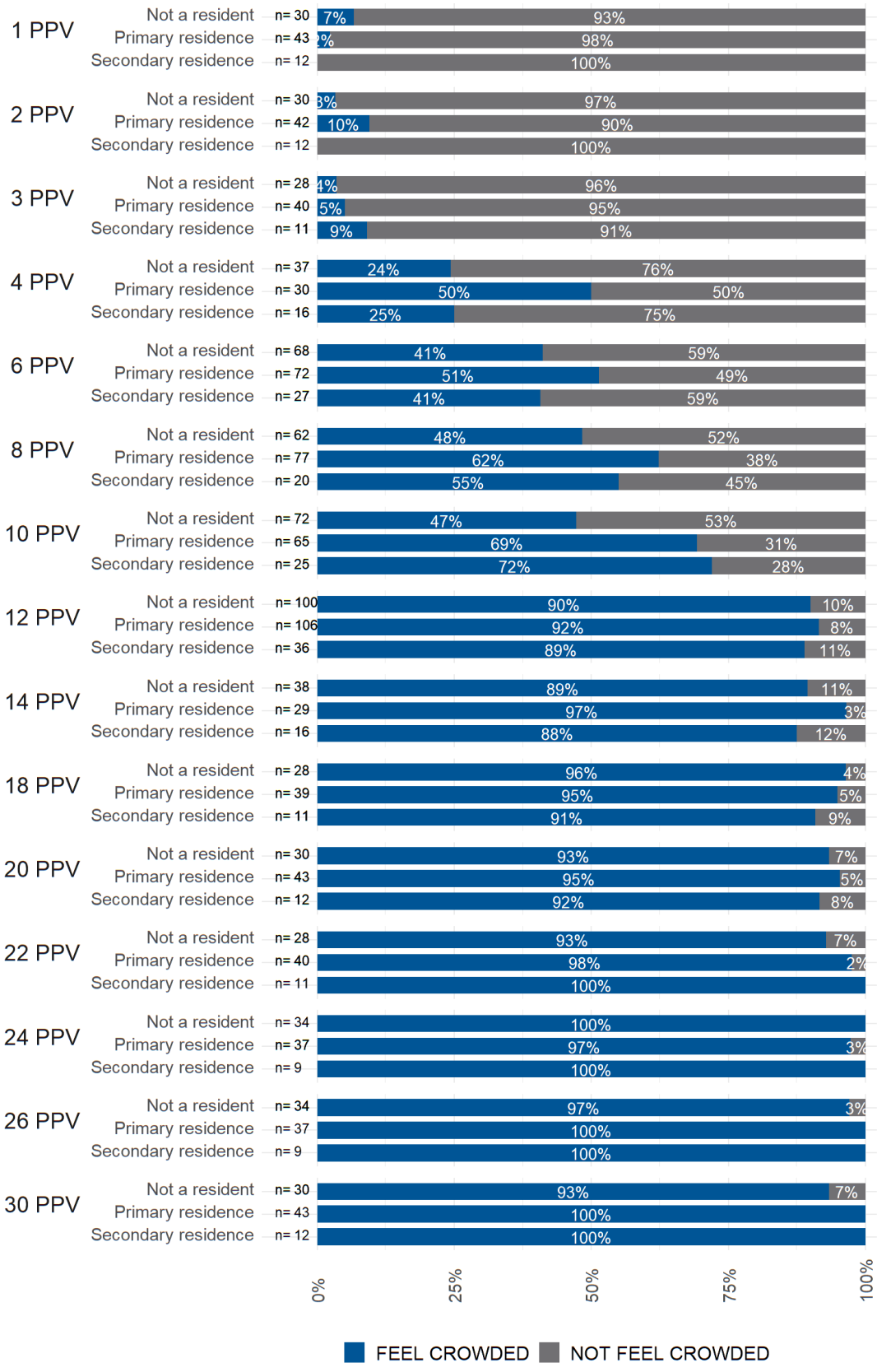
We would like to know how many other people you could see while you are floating on the river without feeling crowded. To help judge this, we have a series of photographs that show different numbers of people floating on the river. Please ask the survey administrator to show you these photos to answer the following question.

For each photograph, please tell us if you would feel crowded if you were floating on the river and saw the number of people depicted in the photograph.




Number of people in the photo simulation
1 PPV (n=43)
2 PPV (n=42)
3 PPV (n=40)
4 PPV (n=30)
6 PPV (n=72)
8 PPV (n=77)
10 PPV (n=65)
12 PPV (n=106)
14 PPV (n=29)
18 PPV (n=39)
20 PPV (n=43)
22 PPV (n=40)
24 PPV (n=37)
26 PPV (n=37)
30 PPV (n=43)
2%
98%
10%
90%
5%
95%
50%
50%
51%
49%
62%
38%
69%
31%
92%
8%
97%
3%
95%
5%
95%
5%
98%
2%
97%
3%
100%
100%
0%
25%
50%
75%
100%
Percent of river users (primary residence) who would...
FEEL CROWDED
NOT FEEL CROWDED


Number of people in the photo simulation
1 PPV (n=12)
2 PPV (n=12)
3 PPV (n=11)
4 PPV (n=16)
6 PPV (n=27)
8 PPV (n=20)
10 PPV (n=25)
12 PPV (n=36)
14 PPV (n=16)
18 PPV (n=11)
20 PPV (n=12)
22 PPV (n=11)
24 PPV (n=9)
26 PPV (n=9)
30 PPV (n=12)
100%
100%
9%
91%
25%
75%
41%
59%
55%
45%
72%
28%
89%
11%
88%
12%
91%
9%
92%
8%
100%
100%
100%
100%
0%
25%
50%
75%
100%
Percent of river users (secondary residence) who would...
FEEL CROWDED
NOT FEEL CROWDED


1 PPV
Not a resident n= 30 7% 93%
Primary residence n= 43 2% 98%
Secondary residence n= 12 100%
2 PPV
Not a resident n= 30 3% 97%
Primary residence n= 42 10% 90%
Secondary residence n= 12 100%
3 PPV
Not a resident n= 28 4% 96%
Primary residence n= 40 5% 95%
Secondary residence n= 11 9% 91%
4 PPV
Not a resident n= 37 24% 76%
Primary residence n= 30 50% 50%
Secondary residence n= 16 25% 75%
6 PPV
Not a resident n= 68 41% 59%
Primary residence n= 72 51% 49%
Secondary residence n= 27 41% 59%
8 PPV
Not a resident n= 62 48% 52%
Primary residence n= 77 62% 38%
Secondary residence n= 20 55% 45%
10 PPV
Not a resident n= 72 47% 53%
Primary residence n= 65 69% 31%
Secondary residence n= 25 72% 28%
12 PPV
Not a resident n= 100 90% 10%
Primary residence n= 106 92% 8%
Secondary residence n= 36 89% 11%
14 PPV
Not a resident n= 38 89% 11%
Primary residence n= 29 97% 3%
Secondary residence n= 16 88% 12%
18 PPV
Not a resident n= 28 96% 4%
Primary residence n= 39 95% 5%
Secondary residence n= 11 91% 9%
20 PPV
Not a resident n= 30 93% 7%
Primary residence n= 43 95% 5%
Secondary residence n= 12 92% 8%
22 PPV
Not a resident n= 28 93% 7%
Primary residence n= 40 98% 2%
Secondary residence n= 11 100%
24 PPV
Not a resident n= 34 100%
Primary residence n= 37 97% 3%
Secondary residence n= 9 100%
26 PPV
Not a resident n= 34 97% 3%
Primary residence n= 37 100%
Secondary residence n= 9 100%
30 PPV
Not a resident n= 30 93% 7%
Primary residence n= 43 100%
Secondary residence n= 12 100%
0%
25%
50%
75%
100%
FEEL CROWDED
NOT FEEL CROWDED

Question 12: Felt crowded during float

Did you feel crowded at any point during your float trip today?

I felt crowded today…	Residence type	N	Yes	No	Total
Parking and/or unloading in the parking lot	Not a resident	130	23%	77%	100%
	Primary residence	149	23%	77%	100%
	Secondary residence	47	11%	89%	100%
At the put-in while launching onto the river	Not a resident	129	11%	89%	100%
	Primary residence	149	16%	84%	100%
	Secondary residence	47	13%	87%	100%
While floating on the river	Not a resident	127	7%	93%	100%
	Primary residence	148	10%	90%	100%
	Secondary residence	46	7%	93%	100%
At the takeout where I finished floating the river	Not a resident	129	12%	88%	100%
	Primary residence	148	23%	77%	100%
	Secondary residence	47	17%	83%	100%

Question 13: Support for current visitor use management strategies

To what extent do you support or oppose each of the following visitor use management strategies currently being used?

	Residence type	N	Strongly support	Somewhat support	Neither support nor oppose	Somewhat oppose	Strongly oppose	Total
Managing the number of commercial group arrivals who float the river per hour	Not a resident	129	53%	27%	14%	2%	3%	100%
	Primary residence	151	63%	20%	10%	3%	5%	100%
	Secondary residence	47	53%	34%	9%	2%	2%	100%
Managing the size of commercial groups who float the river	Not a resident	130	51%	32%	15%	2%	2%	100%
	Primary residence	151	70%	15%	9%	1%	5%	100%
	Secondary residence	47	55%	30%	9%	2%	4%	100%
Managing use through limited availability of parking	Not a resident	128	27%	34%	19%	13%	6%	100%
	Primary residence	149	29%	22%	21%	13%	15%	100%
	Secondary residence	47	19%	30%	28%	11%	13%	100%
Providing mandatory low impact education to all commercial groups before they float the river	Not a resident	130	42%	25%	26%	5%	2%	100%
	Primary residence	150	59%	15%	16%	4%	5%	100%
	Secondary residence	47	36%	34%	13%	6%	11%	100%

Question 14: Support for potential visitor use management strategies

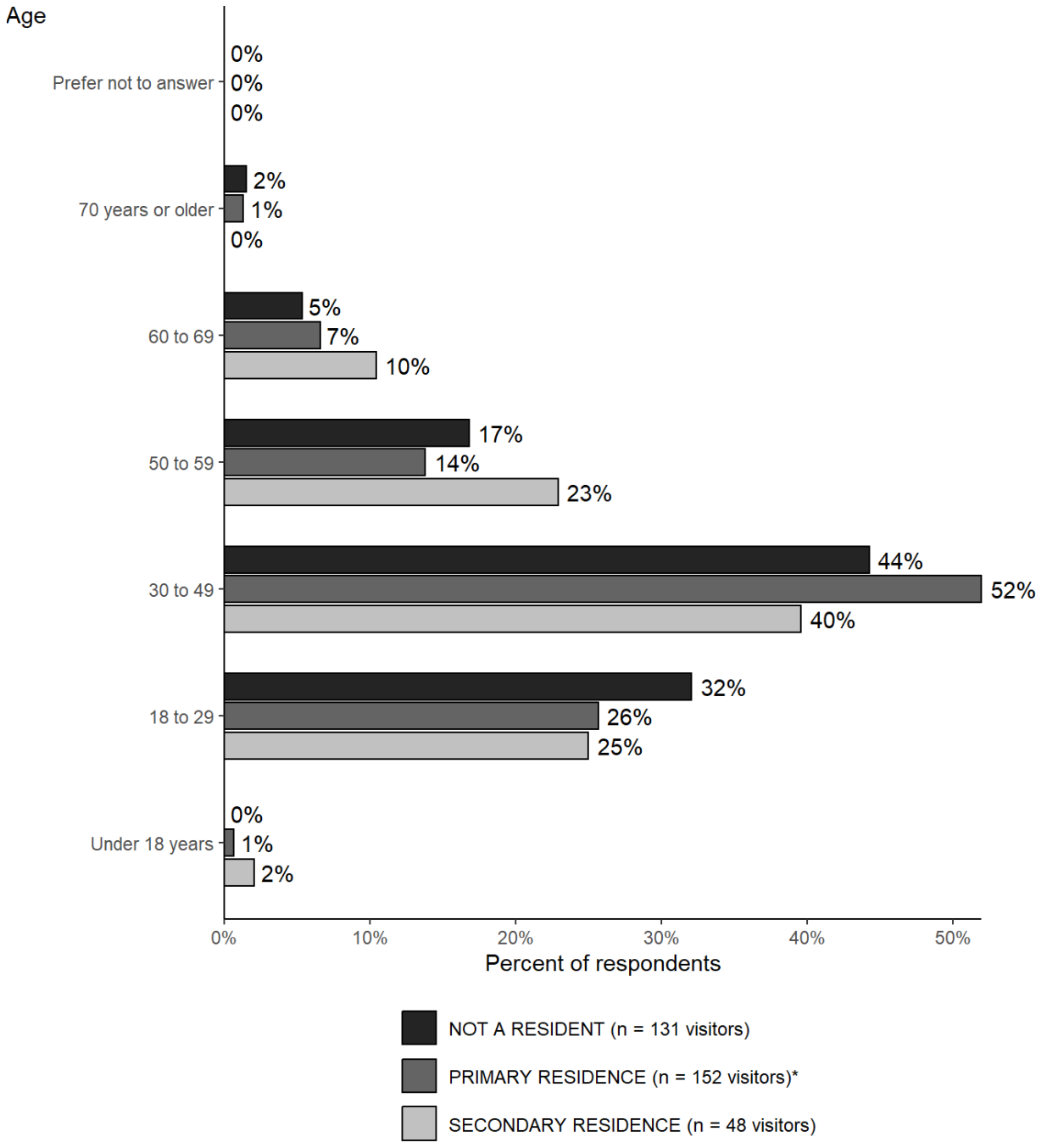
To what extent would you support or oppose each of the following potential visitor use management strategies?

	Residence type	N	Strongly support	Somewhat support	Neither support nor	Somewhat oppose	Strongly oppose	Total
A permit system to manage the number of people allowed to float the river per hour	Not a resident	130	16%	19%	26%	21%	18%	100%
	Primary residence	148	9%	14%	12%	26%	39%	100%
	Secondary residence	45	24%	16%	11%	18%	31%	100%
Manage the size of personal groups/individuals who float the river	Not a resident	129	20%	31%	19%	16%	14%	100%
	Primary residence	148	15%	24%	20%	14%	28%	100%
	Secondary residence	45	22%	36%	4%	13%	24%	100%
Provide mandatory low impact education to personal groups/individuals before they float the river	Not a resident	130	19%	24%	31%	15%	12%	100%
	Primary residence	148	25%	26%	23%	13%	13%	100%
	Secondary residence	45	20%	24%	24%	11%	20%	100%
Allow access to float the river only by commercial operator or alternative transportation (shuttle/walk/bike)	Not a resident	128	7%	10%	22%	18%	43%	100%
	Primary residence	149	4%	5%	12%	12%	67%	100%
	Secondary residence	44	11%	5%	11%	16%	57%	100%
Close the nature preserve to floating use during the morning and evening for the benefit of wildlife	Not a resident	128	11%	19%	34%	18%	19%	100%
	Primary residence	147	5%	11%	25%	19%	40%	100%
	Secondary residence	44	11%	23%	20%	16%	30%	100%
Close the nature preserve to all floating use for the benefit of wildlife	Not a resident	129	4%	5%	22%	17%	53%	100%
	Primary residence	148	3%	4%	12%	16%	65%	100%
	Secondary residence	45	7%	0%	7%	16%	71%	100%

Visitor characteristics

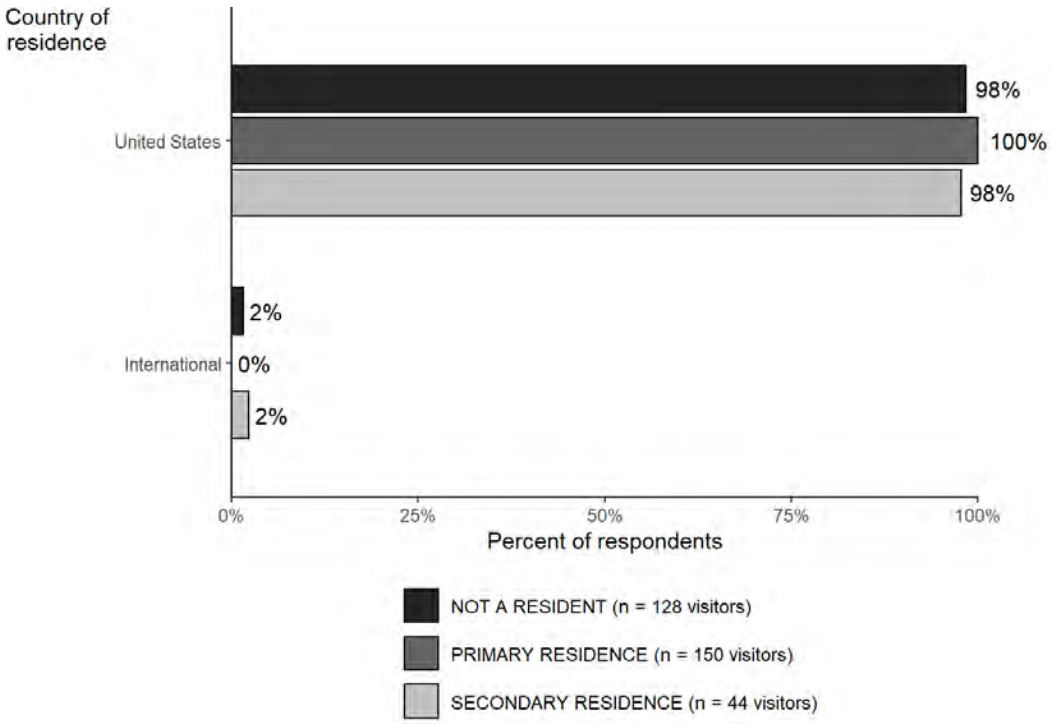
Question 15: Age

What is your age?



Question 17: U.S. postal code or country of residence

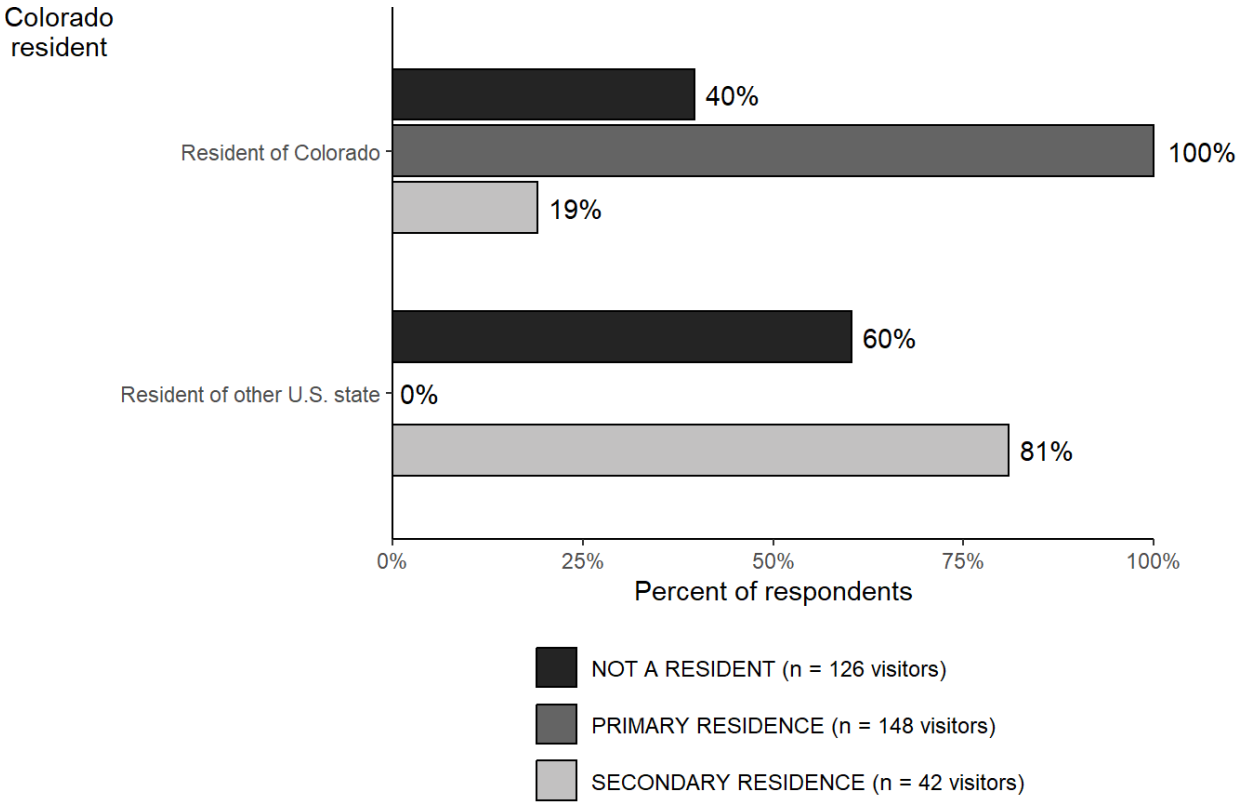
Whas is your U.S. ZIP code or country (if not U.S.)?



State – not a resident	Number of visitors	Percent of visitors that were not a resident*
Colorado	50	40%
California	16	13%
Texas	14	11%
Florida	9	7%
Illinois	6	5%
New York	4	3%
Georgia	3	2%
North Carolina	3	2%
Wisconsin	3	2%
Arkansas	2	2%
Maryland	2	2%
Michigan	2	2%
12 other states	12	10%
Total	126	101%

State – primary residence	Number of visitors	Percent of visitors with a primary residence
Colorado	148	100%
Total	148	100%

State – secondary residence	Number of visitors	Percent of visitors with a secondary residence*
Texas	10	24%
Colorado	8	19%
California	5	12%
Florida	5	12%
New York	3	7%
North Carolina	2	5%
Tennessee	2	5%
7 other states	7	17%
Total	42	101%

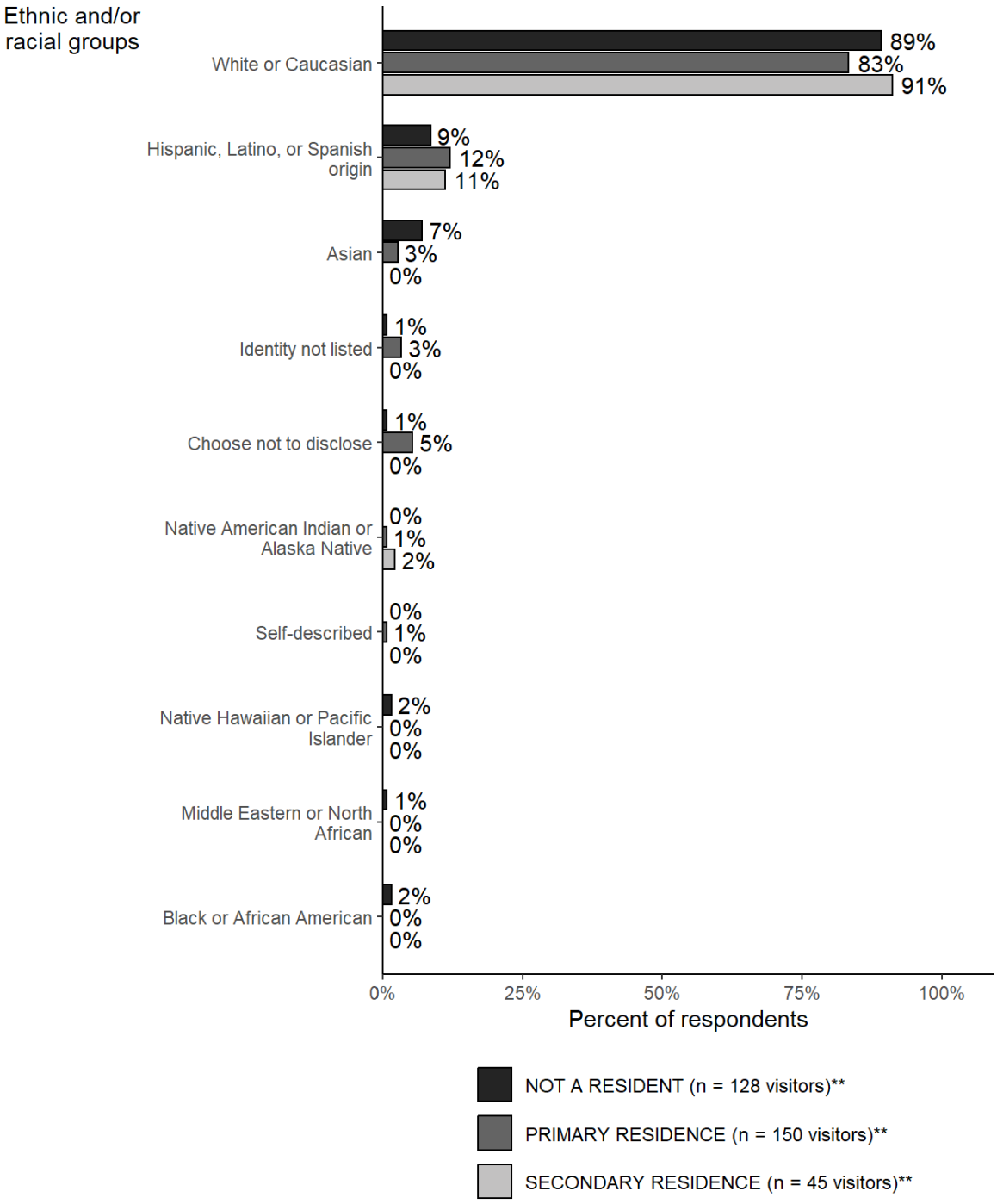


Country – not a resident	Number of visitors
MEXICO	1
UNITED KINGDOM	1

Country – secondary residence	Number of visitors
AUSTRALIA	1

Question 18: Ethnicity/racial groups

What ethnic and/or racial groups do you belong to?



Question 19: Annual household income

Which of these categories best represents your annual household income?