

Distribution and Numbers of Back Country Visitors in Glacier Bay National Park 1996–2003

Mary L. Kralovec^{1,4}, Allison H. Banks^{2,4}, and Hank Lentfer³

Abstract. Most backcountry visitors to Glacier Bay National Park travel by motorized vessel or sea kayak. In the 1990s, we observed a noticeable increase in the number of visitors who chose to experience the backcountry using non-motorized methods. In 1996, we began monitoring the amount and distribution of private motor vessels, private and commercially guided sea kayakers, and backcountry campers using a voluntary survey. Popular destinations, peak travel periods, frequently used campsites and travel routes, anchorages, party size and lengths of stay were identified using a voluntary survey. Visitor use increased in 1995 and slowly declined until 2003. Highest use occurred during June, July and August of each year. Almost all the shoreline of Glacier Bay was used for camping at some point. Areas receiving concentrated use included McBride and Lamplugh Glaciers, Adams, Johns Hopkins, Reid and Hugh Miller Inlets, Ptarmigan Creek, and the Beardslee Islands. Motorized vessels traveled into most areas of the Bay and anchored in popular spots such as Reid Inlet, North Sandy Cove, and Berg Bay.

Introduction

Most of the Glacier Bay National Park backcountry beyond the marine shoreline is rarely visited due to difficult terrain. No surface road connection to the rest of Alaska or Canada currently exists making Glacier Bay accessible only by motorized vessel, sea kayak, floatplane, rowing or sailing craft, or foot. The majority of visitors reach Glacier Bay on large cruise ships and do not actually set foot on the ground of the park. They spend one day touring and viewing several active tidewater glaciers of the park's West Arm as part of a longer cruise. A daily tour vessel is provided by the Glacier Bay Lodge concession. The day tour vessel also provides a drop-off and pick-up service at 3-4 designated points within Glacier Bay for kayakers and hikers.

To protect park resources and provide a diversity of opportunity for visitors, motorized vessel use in Glacier Bay is limited from May through early September using a system of daily and seasonal quotas. In addition, Hugh Miller, Adams, Muir, Wachusett Inlets and the Beardslee Islands are seasonally closed to motorized vessel entry. Johns Hopkins Inlet is also seasonally closed to motorized vessels to protect breeding harbor seals. In 1998 and 1999, a backcountry use limit of no more than 2,200 and 1,870 backcountry visitors, respectively, was initiated for the Glacier Bay backcountry. At that time, all backcountry visitors were required to register and obtain a permit at the Visitor Information Station (VIS)

located in Bartlett Cove. Backcountry use limits were initiated to control the overall increasing number of backcountry visitors until a comprehensive backcountry management plan could be developed. In 2004, the use limit was lifted, although entry registration at the VIS is still required.

In 1996, a voluntary backcountry visitor and motorized vessel survey was initiated in order to document the distribution and number of private and commercially guided backcountry visitors and private motorized vessels using Glacier Bay from May through September. This paper summarizes data gathered from voluntary surveys collected from 1996 through 2003 and data collected from the backcountry permit program. The information will inform the ongoing Backcountry Management Plan process, identify trends in use, areas of potential user group conflict and resource impacts, and help focus management attention where it is most needed.

Methods

All visitors entering Glacier Bay by motor vessel and/or kayaks are required to register at the VIS and receive orientation materials. Because all users must pass through the VIS, it is an effective location to track visitor use and distribute surveys. Surveys are also available on the camper drop/off vessel and interpretive rangers ask campers using the service to complete the form.

Backcountry Use

Backcountry use was tracked and summarized through the backcountry permit database. Each permit issued to a camping group or vessel was entered into an Access database at the VIS. This allows summary of backcountry use on a daily, monthly, or yearly basis. As the permit database

¹ National Park Service, Organ Pipe Cactus National Monument, 10 Organ Pipe Drive, Ajo, AZ 85321

² National Park Service, Glacier Bay National Park and Preserve, P.O. Box 140, Gustavus, AK 99826

³ P.O. Box 162, Gustavus, AK 99826.

⁴ Corresponding authors: Mary_Kralovec@nps.gov, 520-387-7661, Allison_Banks@nps.gov, 907-697-2611

duplicates some of the survey form questions (date of entry and exit, party size, general destinations, length of stay at sites, method of travel) it also provides a way to analyze survey non-response.

Backcountry Survey

Surveys were distributed at the Visitor Contact Station, on the concessionaire operated backcountry drop-off vessel, and through the park's commercially guided sea kayak concessionaire. One survey was given to each vessel or group regardless of the number of persons. The survey asked visitors to record their date of entry and exit, transportation modes, routes of travel, campsites, anchorages, group size, and length of stay at each site, notable wildlife observations, and other groups seen, and asked for any other specific comments about their visit. A reduced photocopy of the nautical chart for Glacier Bay was provided so campers could mark their campsites and other observations. The majority of campers did not carry GPS units along with them, so campsite locations were estimated with landmarks and marked on the chart by hand.

Visitors could take the survey form with them on their trip, wait to fill out the survey on the pick-up vessel, complete it at the VIS, or mail the completed form back to the VIS. Most visitors prefer to fill out the form while on the pick up vessel as there is ample time before they arrive back at Bartlett Cove. Survey form information was entered into an Access database and linked to ArcView geospatial data taken off the nautical chart. There may be error associated with the manual marking of geospatial data by the backcountry visitor on hard copy nautical charts and the manual entry of the same data points to the database. However, this error is negligible for the purpose of documenting overall use in the park.

There is one commercially guided kayaking service operating in Glacier Bay. This concessioner was given a survey for each trip planned at the beginning of the season. Approximately 25 trips were planned each season and we received 25 completed forms each year; a response rate of 100 percent. As these groups tended to be large (up to the group size limit of 12), some of their camping sites were assigned by the park to avoid impacting private groups and sensitive habitats. Some of their camping sites were self determined to respond to a specific group's ability, weather, or sea conditions. The guided trips also had several specific itineraries that were repeated throughout the season so their destinations were basically the same for each trip.

Motorized Vessel Use

We provided surveys to private motor vessel operators from 1996 until 2001 and asked each operator to document their entry and exit date, party size, vessel type, route of travel, and anchorages. All boaters entering the park for the first time each season must attend an orientation at the VIS,

providing a way to distribute survey forms. The survey could either be returned to any park ranger or mailed back to the VIS. However, vessels using Glacier Bay multiple times during the season did not always register at the start of each trip in person at the VIS. Their entry permit could be validated with a radio call and the survey would not reach them. This survey method was more likely to miss local and regional private and charter vessel entries that may make multiple trips into the bay each season. Despite this non response, popular routes and destinations were well defined after the third year of data collection, and as patterns in use were supported by ranger patrol logs, charter use statistics, and other park staff observations this portion of the survey ended in 2002.

Data from the survey forms was entered into 2 linked databases. A Microsoft Access database for numerical or text entries and an ArcView GIS 3.0 database for geospatial data such as travel routes and campsite locations. All locations used as campsites were recorded in one specific data layer in the ArcView database and linked to information on group size, dates of occupancy, frequency of use, etc. Queries were designed to produce statistical information and spatial trends.

Results

Backcountry Use

Using information collected at the VIS we initially observed a gradual increase in non-motorized backcountry visitation from 1992 through 1996. The return rate for the survey ranged from 50 to 65 percent from 1997 until 2002. About 35 percent of backcountry visitors did not complete the survey during this period so our results are probably lower than actual use. The camper survey has continued through 2006 and as VIS and interpretive staff on the pick up vessel have increased their efforts to distribute and collect surveys, the response rate has risen to about 75 percent.

Backcountry use in Glacier Bay averaged about 1,600 individuals each season from 1996 through 1998 and began a slow downward trend in 1999. Between 2001 and 2002 visitation dropped from 1,379 to 1,051 (fig. 1). Since 2003 use has remained below 1,200 individuals annually. Commercially guided backcountry visitation is limited by concession permit conditions and the 12 person group size cap. Guided groups were usually near full capacity and remained between 190 and 230 individuals from 1992 to 2003. Peak backcountry use, both commercial and private, occurred in June, July and August.

Park managers have speculated that "shoulder season" (May and September) use is increasing as more visitors attempt to avoid crowding and encounters with cruise ships, tour boats, aircraft and other groups. This study does not bear this out, although use in May has been increasing steadily since 2001. Continued monitoring may identify if this trend continues.

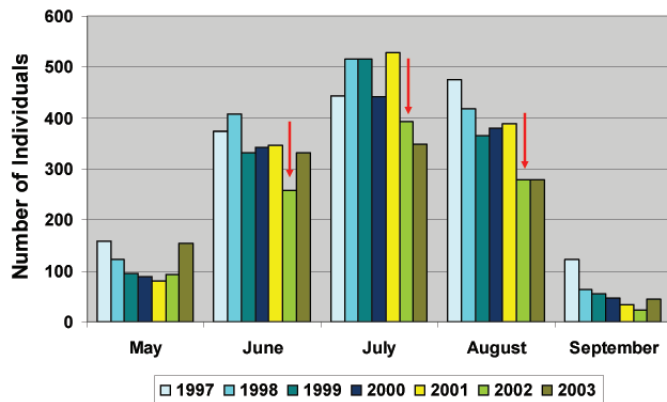


Figure 1. Peak visitation for the Glacier Bay backcountry occurs from June through August each year.

Backcountry Distribution

Almost all of Glacier Bay's shoreline has been used, at some point, for backcountry camping. Areas that received little or no backcountry use are usually associated with steep topography, dense brush, difficult approaches, or they are closed to protect sensitive resources (fig. 2).

Camping areas used consistently every season were close to attractions such as tidewater glaciers, fresh water streams, and within a short paddling distance to a pick-up point. Pick-up points did appear to influence where backcountry visitors spent the first or last nights of their trip. Visitors tended to camp within 1 mile of the pick-up or drop-off location. To avoid bear habituation and accumulating impacts, vessel drop-off and pick-up sites are rotated about every 2 years. When the drop-off and pick-up location was shifted between years or within the same visitor use season, campsite distribution demonstrated a corresponding shift towards the location.

Twenty-nine percent of backcountry camping groups spent at least one night in motorless water areas, with 11% of this use occurring in the Beardslee Island Wilderness complex. Because the Beardslee Islands are close to Bartlett Cove, backcountry visitors can access the area without using the drop-off vessel. As the area contains protected waters and ample shoreline for camping, it is a popular destination for many backcountry visitors.

Although the most common mode of transportation for most of the backcountry visitors in Glacier Bay is a sea kayak, some visitors do walk directly from Bartlett Cove, the drop-off/pick-up location, or their campsite. Most hiking routes follow the shoreline where dense alder or steep terrain prevent all but the hardest from traveling further inland. Glacial outwash plains are popular hikes due to the lack of vegetation, level terrain, and open vistas. Popular hiking areas include Riggs, McBride, Lamplugh and Reid Glaciers, and Geikie Inlet.

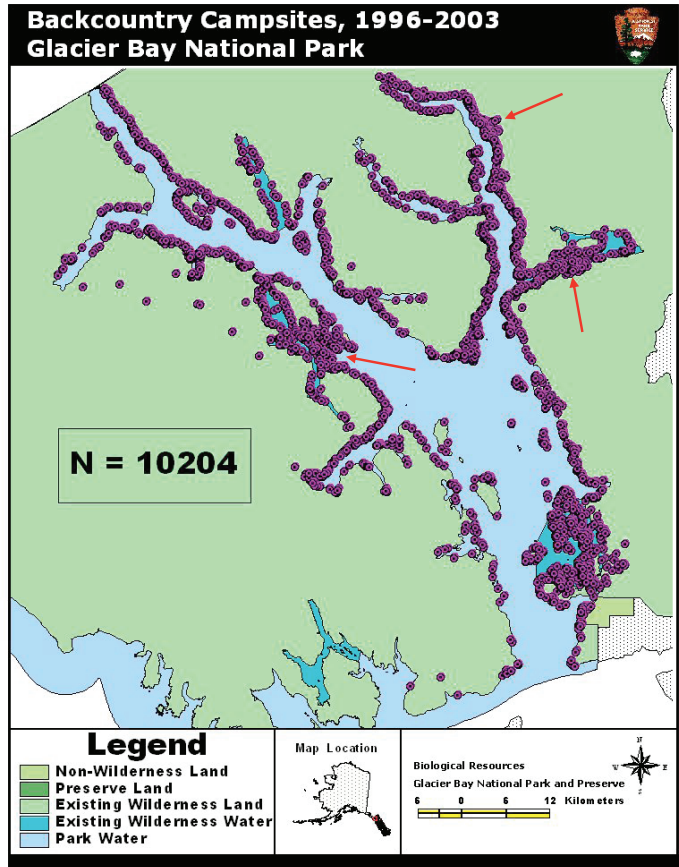


Figure 2. All campsite locations recorded on camper surveys received for May, June, July, August, and September from 1996 through 2003. Almost all of the shoreline of Glacier Bay has been used by kayakers and campers.

Motorized Vessel Use

We experienced a motorized vessel operator survey return rate of 16 percent; probably creating a significant non-response bias. Private vessels traveled into almost all parts of the Bay excluding those areas where motorized vessel access was restricted on a seasonal basis. From 1996-2001, we were unable to identify a specific change in use or trends associated with vessel routes, but were able to identify the more popular anchorages within Glacier Bay such as Reid Inlet, North Sandy Cove, and Berg Bay (fig. 3). Very few motorized vessel passengers set foot on shore other than for short day hikes.

Discussion

The use of a backcountry permit system and voluntary survey to monitor camping visitation patterns in Glacier Bay provided us with useful information on backcountry numbers and distribution. The Visitor Information Station provided park staff with an effective way to distribute and gather survey

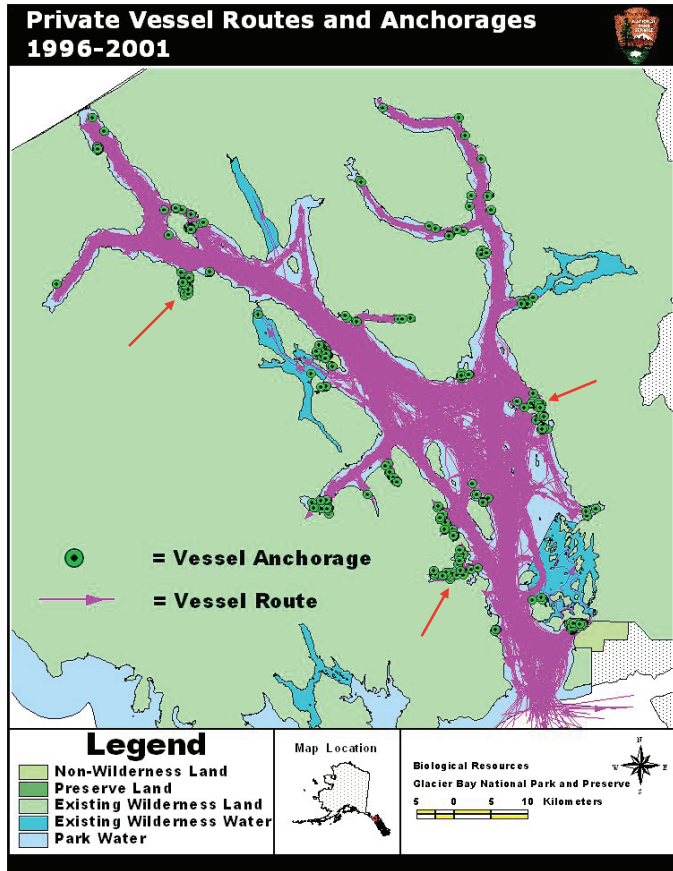


Figure 3. All vessel routes of travel and anchorages recorded on surveys received from 1996 until 2001. Areas not visited were either closed to protect park resources or were hazardous or difficult for vessels to navigate.

data on camping use. Visitors must register at the VIS prior to each trip, so surveys are available there and also on the drop/off vessel. The VIS permit records provide a simple way to document the degree of non-response, as the permitting process asks for a trip itinerary including daily stopovers and camping destinations. The survey would record actual sites used rather than where the group planned to go. Even though the permitting process collects much of the same trip information as the survey, returning visitors do not have to spend time at the VIS verifying just where they went for the permit record. The survey may be taken along on the trip, may be filled out on the pick up vessel, may be given to any park ranger, or mailed back at a later date. Most visitors were willing to complete the survey when asked, and to provide individual comments on the park's various programs, wildlife observations, group encounters and resource impacts.

Here are a few frequent comments from surveys:

"Adams Inlet was the best for wildlife viewing! Great trip!"

"Great trip. Keep up the good work in managing this beautiful park!"

"Small low flying planes over McBride and Riggs Glaciers were obnoxious!"

"We appreciated that the Beardslees were motorless. Pristine and lots of wildlife!"

"Saw many small boats (too many) and two cruise ships at Marjorie Glacier."

"A bear walked through our camp, he just ignored us. It was a thrill!"

"A great experience! The orientation was very long and detailed, but good information."

"Thanks for providing bear canisters."

"The folks on the Spirit of Adventure (camper drop off vessel) were very helpful and friendly."

"Please keep cruise ships out of Glacier Bay."

"We didn't see ANY trash at our campsites!"

Since 1996, non-motorized use in Glacier Bay has leveled off and even declined somewhat. It is possible that non-motorized use has stabilized due to the economy, decline in independent tourist travel in the region, capacity of local outfitter services and transportation options, increasing cost to reach the area, crowding at favored campsites or destinations, and possibly a rise in encounters with motor vessels or other campers.

Even though almost all of the Glacier Bay shoreline has been used for camping at some point there are distinct locations where use impacts are becoming apparent. Sea kayakers and hikers tend to camp on beaches near tidewater glaciers, fresh water streams, dramatic vistas, and sites closer to the season's designated concession drop-off and pick-up points. Changing the drop-off and pick-up points within the park can affect where campers spend part of their trip. However, the concession vessel's inability to reach many beaches in the Bay as well as the time restrictions of a combined day tour and camper drop-off service often prevents park staff from dispersing camper use through the manipulation of drop-off and pick-up locations.

We did not attempt to analyze differences between local resident kayakers and non local visitors in terms of trip destinations or behavior. The Beardslee Island area is popular for short weekend trips as it is so close to Bartlett Cove and does not require using the drop off vessel. Concession employees and other locals often visit the Beardslees, but we did not collect data that defined a trend. Local residents and concession employees also receive a discount for the drop off vessel so some take advantage of this opportunity to visit more remote parts of the bay. We know that many kayakers have visited the park multiple times over the years. Even though the surveys are anonymous, individual comments often refer to previous trips, and we know some local residents take kayak trips throughout the season. Once an individual kayaker has

received an orientation for the season they are not required to complete it again. A new permit is issued to them for each trip and a new survey given out, but the VIS staff can determine a repeat visitor using the permit database. Using the permit database we could analyze the percentage of repeat visits and probably determine a trend in destinations.

It does not seem apparent that motor vessel visitation is shifting to the shoulder seasons of May and September even though there is less vessel traffic, fewer aircraft overflights, and less chance of seeing or hearing other people at these times. While use in May has increased slightly, the trend is not clear. Long term monitoring of backcountry use may provide a better indication of this use.

Comments from the backcountry survey frequently include concerns about the number of motor vessels seen and heard, including cruise ships, the amount of low flying aircraft noise, and the number of people encountered in what is considered to be a pristine wilderness. Many kayakers appreciate the five areas where motor vessels are excluded during May 15 through September 30 and comment that they would like the motor restrictions expanded. Occasionally we received a comment asking for increased drop off and pick up vessel services so more remote parts of the bay could be reached during shorter trips.

A voluntary survey distributed from the VIS probably does not reach a significant portion of private vessel operators especially those visiting the bay multiple times per season. Once a particular vessel crew has received an orientation at the VIS for the season and their permits issued, they may call in their arrivals and departures from Glacier Bay by radio. Many vessels apply for and receive entry permits while underway for other ports, so making surveys available on websites or email would not necessarily reach them. We realized a significant number of vessels would not have access to the survey forms even if the surveys were sent out by mail with permits, and as motor vessel use patterns were fairly well defined early in the survey and backed up by other observations, this portion of the project was discontinued. The vessel entry permitting process asks for destination information, ranger patrol logs and other staff field logs also provide corroborative observations on vessel use in the bay. Based on the survey data we did collect in conjunction with other observations, private motor vessel traffic patterns in the park have remained fairly consistent over the past 10 years. Because the number of vessels entering Glacier Bay on a daily basis is currently restricted and the length of their stay limited, vessel numbers will likely remain un-changed for the near future. Vessel distribution, routes, and anchorages will also likely remain consistent due to terrain, popular viewing locations, and resource protection actions.

Boaters commented fairly often about the complicated permit procedure, the number of regulations and limited opportunities to visit the bay, both on surveys and directly to VIS staff. The boater permit database maintained at the VIS could determine if these comments were received from local, regional, or repeat visiting vessels, or single visit vessels

traveling long distances to reach the park. First time motor vessel visitors often commented to the VIS staff that the orientation materials received were thorough and helpful.

Management Implications

This survey has provided essential information on Glacier Bay National Park backcountry visitor and vessel use and distribution patterns. Park staff are now able to identify areas that presently show impacts from human use as well as the type, intensity, and persistence of damage associated with this use. Impacted as well as pristine sites can be monitored over time to determine if limits to use or restoration will be needed to protect them. Survey results can also be used to identify areas where sensitive wildlife such as ground-nesting birds, bears, wolves, and molting waterfowl may be impacted by human activity. The campsite data has focused attention on where and why humans are more likely to encounter bears and has helped us clarify our visitor safety messages. Conflicts between user groups or activities may be addressed before they actually occur.

Survey results also demonstrated how the camper drop off and pick up points affects kayaker destinations and corresponding camp distribution in Glacier Bay. Changes in the vessel service will affect the park's ability to manage camper impacts over time. If the drop off service is discontinued or reduced or the vessel is unable to land at many beaches, the Beardless Islands area could see an increase in use and a corresponding increase in long term impacts to wildlife and beaches.

The survey did not attempt to analyze why visitors did not come to Glacier Bay. The survey only reflects the use of people who were able to reach the park and were prepared for undeveloped wilderness conditions of the backcountry. There are no plans to provide additional facilities in the backcountry such as maintained trails, vehicle access or cabins.

Permit records kept by the VIS will probably be a more efficient way to gather motor vessel use data, as vessels are required to contact the VIS at least by radio when they arrive and depart. Camper permit information collected by the VIS will also provide much of the data gathered by the survey, but may not detect subtle trends in campsite use, user group conflicts, or site impacts over time. In the future the survey can be modified or repeated on a bi-annual basis as management needs change.

Suggested Citation

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