



Katmai National Park

Bridge Traffic Monitoring 2011

Natural Resource Data Series NPS/KATM/NRDS—2013/590



ON THE COVER

People waiting to cross the bridge at Brooks Camp.
Photograph by: Katmai National Park Photo

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All manuscripts in the series receive the appropriate level of peer review to ensure that the information is scientifically credible, technically accurate, appropriately written for the intended audience, and designed and published in a professional manner.

This report received informal peer review by subject-matter experts who were not directly involved in the collection, analysis, or reporting of the data

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Abstract

From May through October approximately 255 people a day come to watch one of the highest concentrations of brown bears (*Ursus arctos*) feed on sockeye salmon (*Oncorhynchus nerka*). The peak periods of concomitant bear and human activity occur in July and the first two weeks in September when salmon availability is highest and the lodge and other facilities are open to the public. Visitors coming from the lodge or visitor center must cross a floating bridge to reach viewing platforms on the south side of Brooks River. The park closes access across the river when bears are active near the bridge. This study documented the frequency and duration of these bridge closures and the number of visitors affected. During sampled hours in July, the bridge was open a total of 4,630 minutes (66%) and closed 2,390 minutes (34%). In September, comparable sampling showed 676 minutes open (18%) and 3,014 closed (82%). Most closures were less than 10 minutes and there were more closures per day in September than July. While the closures were shorter than previous staff reports and experience suggested, we documented that the bridge was closed during a substantial portion of the total time sampled.

Acknowledgments

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Introduction

Over 10,000 visitors from around the globe come to Brooks River each year to see one of the highest concentrations of brown bears (R. W. Wood, National Park Service, personal communication). From May through September, up to 255 people a day will come to watch bears fish, feed, and swim in the river. Visitor numbers peak in July and September coinciding with when bears are feeding on seasonal salmon runs. There are three elevated viewing platforms available for bear viewing, including the Falls and Riffles Platforms, which are accessed by interconnected elevated boardwalks. Overnight facilities including a lodge and campground, a visitor Center and an auditorium are located in Brooks Camp just south of the river mouth (Figure 1). A floating bridge provides access across the lower river, including by small NPS and lodge motorized utility vehicles.

Visitors to Brooks River arrive by boat or floatplane. Most visitors arrive on the beach of Brooks Camp on Naknek Lake. When weather makes Naknek Lake inaccessible to floatplanes, they can usually land on Brooks Lake. Cargo and people that land on Brooks Lake, are typically shuttled by regular vehicle north to the floating bridge and then transferred across the bridge to camp in smaller utility vehicles.

After arriving at Brooks Camp, visitors are required to attend a bear orientation at the visitor center. To maintain a safe and predictable viewing environment, visitors may not approach within 50m of a bear, including bears in the river near the bridge. During peak use hours in June through mid-September, a NPS interpreter stationed on the lower platform manages traffic flow across the bridge. When bears are within 50m of the bridge, the bridge is closed until this interpreter deems it safe. During most of these hours an interpreter is also stationed on the south side of the river. This interpreter assists with management of traffic movement at the bridge. Because bears regularly fish, sleep and travel within 50m of the bridge, visitor travel across the bridge is often delayed. This study was designed to document the frequency and duration of bridge closure, the number of visitors affected by these closures and the patterns of bear activity associated with these closures.

Methods

Survey sessions were conducted on the lower river platform. Before the sampling start time, general weather information was recorded. There were two components to the sampling work: 10-minute scans and bridge closure logs.

10-minute scans

The 10-minute scan was a 'snapshot' of activity in the lower river. The scans were conducted throughout the day, starting and ending with the arrival and departure of the interpretive rangers stationed on the lower platform, respectively. At the start of the sampling session, and every ten minutes thereafter, the bridge status (open or closed) was recorded. The number of people on the lower platform, satellite platform, corner and bridge, the number of people fishing in the river, people below the platforms and people on the ground below the corner to the gravel bar were recorded.

At any given time, both the number of bears associated with a bridge closure and the total number of visible bears were also recorded. Some closures were due to bears not visible from the lower platform, but whose locations were known from staff reports or had recently moved through the observation area. These bear numbers were also recorded.

Bridge closures

During each scan, the start time and end time of each closure was documented. If the bridge was closed, but visitors were still escorted across by a guide, the time of the escort was noted. For each event, the number of people crossing the bridge and their destination were recorded.

Data analysis

Data was entered using Microsoft Excel spreadsheet and analyzed using Sysat.

Schedule

Bridge surveys were conducted when an interpretive ranger was stationed on the lower platform. Sampling sessions began on July 2, 2011 and were conducted every three days throughout the month. Fall sampling sessions began on September 2nd, and were conducted on the 4th then every three days until the September 16, the day before the lodge closed.

Results

10-minute scans

The 10-minute scans were predicted to show how many individuals were using the Brooks River throughout the day and where. Once data was entered into the spreadsheet and analyzed, no valuable statistical information could be referenced to the opening and closing of the bridge and where people were located.

During July, the bridge was open more than closed during the observation times (Figure 1). When closed, it was most commonly the result of only one bear. There were 3 days (July 11, 14, 17) when closures were caused by six bears in the area. On average 2 bears are seen in the area during a closure. By contrast, in September, the bridge was closed more often than it was open during the observation times. Bridge closures were usually associated with 1 or 2 bears and the greatest number of bears associated with a closure during a scan in September was 4. On the average in September the number of bears seen during a closure in the area is 6 and up to 11 bears have been sighted at the time of a closure. It was unexpected to find a bridge closure in July caused by six bears since normally there are not that many bears in the area when the bridge is closed.

Bridge closures

There were more bridge closures recorded per day during our sampling session in September than July (Figure 3). This corresponded with the typical pattern in September of more bears utilizing the lower river as dying salmon wash downriver and aggregate in slower water near the river mouth.

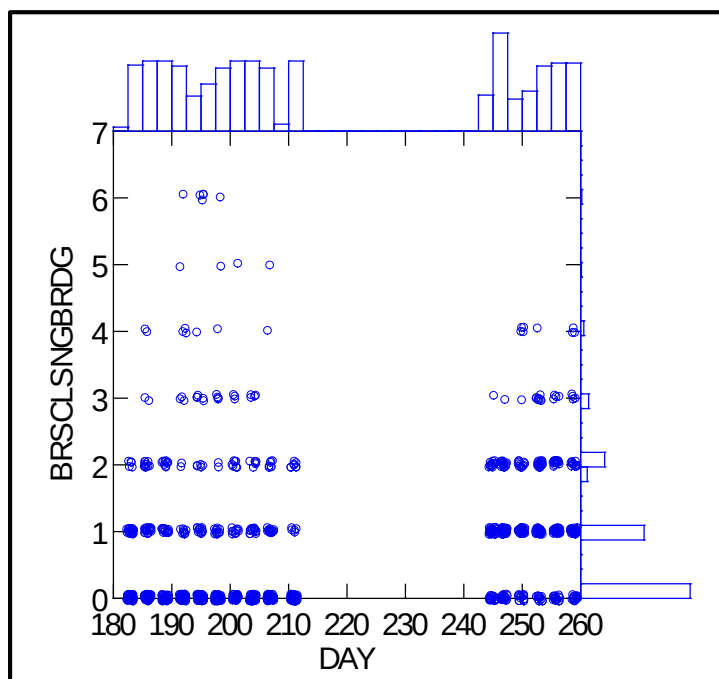


Figure 1. The number of bears associated with each bridge closure (BRSCLSNGBRDG) per 10 minute scan sampling date (Julian date: DAY) at Brooks River, Katmai National Park, Alaska, 2011.

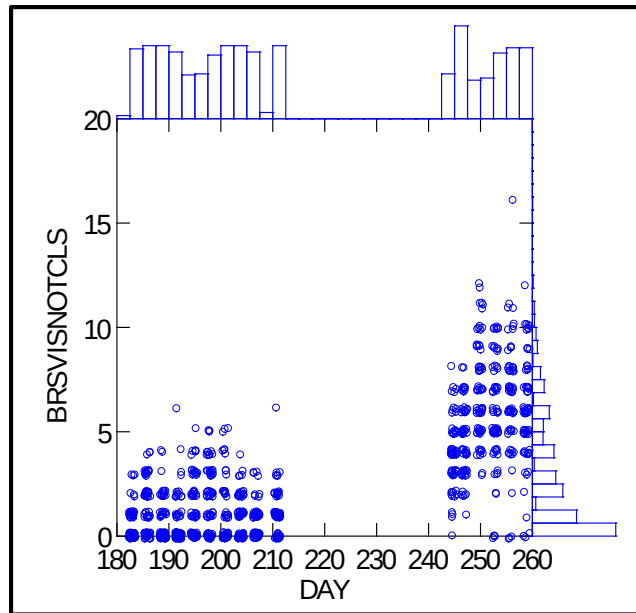


Figure 2. The number of bears visible not associated with a bridge closure per 10 minute scan (BRSVISNOTCLS) by sampling date (Julian date; DAY), Brooks River, Katmai National Park, Alaska, 2011.

Most closures documented were less than 10 minutes long, especially during July (Figure 4). Generally, September had longer closures than July which was as to be expected given the increased bear use in the fall (Figure 2). The average number of minutes the bridge was closed in July was 10, the longest closure was 94 minutes long and the shortest was 1 minute. During the July sampling sessions, the bridge was open 4,630 minutes (66%) and closed 2,390 minutes (34%); whereas, in September the bridge was open 676 minutes (18%) and closed 3,014 minutes (82%). The longest documented closure occurred on September 10th at 9 am and lasted 98 minutes. The average number of minutes the bridge was closed in September was 15.

According to staff anecdotes, closures before the bridge was moved to its current location could easily last 3 – 5 hours, especially in September. More people utilize the bridge during lunchtime and in the late afternoon hours to catch flights home, so the bridge needs to be accessible more continuously. When looking at the pattern of closures data does show that for the most part closure length appears to be fairly constant throughout the day. Unfortunately the data also shows that the longest closures fall in the late afternoon and evening when large numbers of visitors are trying to cross the river. Park management is currently considering a range of solutions for this problem.

During the sampling sessions, 302 people were escorted across the bridge during 25 separate escort events. The time saved by an escort was determined by calculating the number of minutes between when the escort occurred and the time the bridge was again opened. The number of minutes saved per escort was then multiplied by the number of visitors that were escorted to determine the number of people minutes. The amount of time saved was 13 hours, with the total people minutes being 8,067 minutes saved. There were times when people started across the bridge and then were turned back due to changing safety conditions. The number of people observed during the study who were turned back during an attempted crossing was 72.

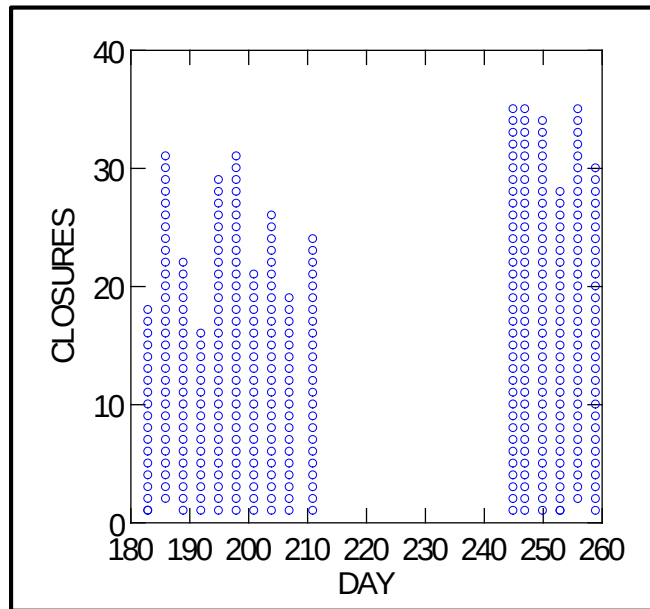


Figure 3. The number of bridge closures per sampling day (Julian date: DAY), Brooks River, Katmai National Park, Alaska 2011

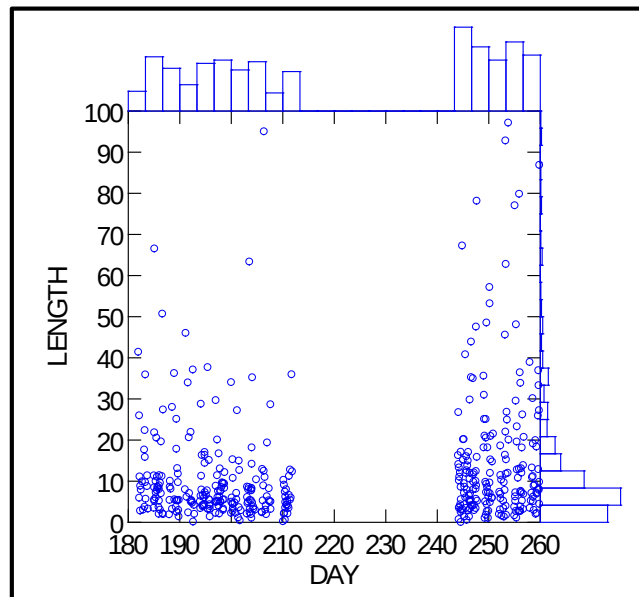


Figure 4 The duration of each bridge closure by sampling day (Julian date: DAY), Brook River, Katmai National Park, Alaska, 2011

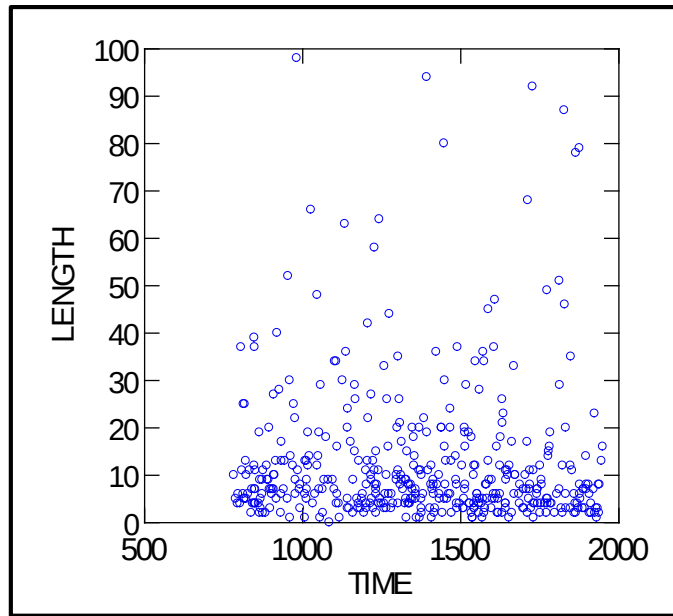


Figure 5 The duration of each bridge closure by time of day, Brooks River, Katmai national Park, Alaska, 2011

Discussion

The objectives of this one-year study were to document (a) the frequency and duration of bridge closures, and (b) the number of people affected by the closures. The length of time the bridge was closed was less than anticipated compared to staff experience and anecdotal records. NPS escorts of visitors improved access during times when the bridge would have normally been closed. While individual closures were shorter than previous staff experience suggested, the total closure time was significant, justifying why staff work is so concentrated around the bridge.

Even though this was a one year study, the information is valuable, and more data is needed to draw more thorough conclusions. There are several options for continuing with limited additional funding. Surveys could be conducted opportunistically as resource staff are available at Brooks Camp. Resource staff time could be used in conjunction with the ongoing Student Conservation Association Japanese Exchange Interpretation program to conduct surveys and give the Japanese staff member a chance to learn about data collection and resource management. A third option would be to perform the survey every other or every third year, and work to obtain funding during the intervening years.

