National Park Service
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Natural Resource Stewardship and Science

Coastal Area Visitation Patterns at Cabrillo National Monument

2011–2020 Visitation Data Summary and Analysis

Natural Resource Report NPS/CABR/NRR—2022/2417

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Abstract

Cabrillo National Monument (San Diego, CA, USA) is a pint-sized unit of the National Park System (0.65 terrestrial km^2) that attracts an average of 850,720 visitors annually (IRMA, SRSS Reports, mean visitation 2011–2020). The coastal area of the park contains well-preserved and sensitive natural resources, including sea cliffs, maritime sage scrub, and rocky intertidal habitat. Understanding small-scale visitor use patterns to this area can guide management decisions such as congestion planning and allocation of recreation fee project money toward staffing the area. Infrared trail counters (TrailMaster™ 1550, USA) were deployed adjacent to two entrances to the Coastal Trail at the Tidepool Parking and Coast View Parking areas to capture visitation patterns 2011–2020. While total visitation to the park has fluctuated over time, visitation to the coastal area has increased steadily during the study period (2011–2020). Visitation on weekend days was 110% higher (i.e., more than double) the number of midweek visitors. Additionally, holidays and some fee-free days attract additional visitors to the area. Despite the tidepools being a popular and desired visitor experience, tide level was not correlated with coastal area visitation. These findings indicate that peak staffing of Volunteers-in-Parks (VIPs) and park staff should occur on weekends and holidays, regardless of tide level. Results of this study can be incorporated into park congestion management planning and staff scheduling funded by recreation fee project money.

Acknowledgments

This project started at Cabrillo National Monument in late 2010. Throughout the decade of data collection, many park staff, Volunteers-in-Parks (VIPs), and partner staff have contributed to the operation and maintenance of the trail counters. We thank everyone who contributed new ideas, methods, and inspiration for this project. We hope to collect another decade of data!

Results

When corrected for missing data and counter calibration (Phillips et al. 2013), we estimate that there were 380,920 visitors to the coastal area of Cabrillo National Monument in 2020 (Table 1). Considering that 523,878 visitors entered the park (IRMA) in 2020, 73% of visitors to the park explored the Coastal Trail area in 2020. Total visitation to the park increased between 2011 and 2016, peaked at nearly 1 million visitors in 2017, and declined 2018 thru 2020 (Figure 2; Appendix 1, Figure S1). Visitation to the Coastal Trail adjacent to the Tidepool Parking and Coast View Parking lots in the coastal area of the park followed a similar trend, peaking around 2016, but remaining relatively high thereafter (Table 1, Figure 2). Visitation to the park in 2020 was lower than 2019. For all years at the Coast View Parking lot, and most years at the Tidepool Parking lot, trail counters collected viable data on over 75% of days (Table 1).

Visitation differed across days of the week, and differences were consistent across lots (Figure 3; Appendix 1, Tables S1-S4). Weekend days (Saturday and Sunday) had the highest visitation, with an average of 1246 visitors per day entering the Coastal Trail from the Tidepool Parking lot and 370 visitors per day from the Coast View Parking lot (Figure 3). Weekend-edge days of Monday and Friday had significantly lower visitation than weekend days, but higher visitation than midweek days, Tuesday thru Thursday (Appendix 1, Tables S2 and S4). The mean number of visitors per day on weekend edge days (Monday and Friday) was 782 at the Tidepool Parking lot and 157 at the Coast View Parking lot. Midweek days (Tuesday thru Thursday) had the lowest average number of visitors per day, with 652 and 118 visitors at Tidepool Parking and Coast View Parking lots, respectively. Overall, visitation on weekends is about twice as high as visitation midweek. Yet, trends in hourly visitation are similar across weekdays (Figure 4). Regardless of the day of week, the highest hourly visitor activity was observed as visitors enter the coastal area of the park when it opens at 9:00 AM, and as visitors leave the coastal area of the park during closing between 4:30 and 5:00 PM (Figure 4).

The magnitude of low tides is not strongly correlated with the number of daily visitors at either the Tidepool Parking (Figure 5, linear regression: $p = 0.92$, $R^2 < 0.01$) or Coast View Parking (linear regression: $p < 0.01$, $R^2 = 0.02$) lots. Similar results were obtained if comparing hourly visitors with tide level (Appendix 1, Figure S2). While there was a significant difference in visitation between low-tide days (with tide levels < 0.7 ft above Mean Lower-Low Water between 7 AM and 7 PM) and seven days following the low-tide day (paired t-test, $t = 3.50$, $df = 1653$, $p < 0.001$), the mean visitation difference was only 25 visitors.

Most holidays, or holiday-adjacent days had high visitation (Figure 6). Apart from New Year's Day, Christmas Day and Veterans Day, all holidays and holiday-adjacent days considered had significantly higher visitation than fourteen days after (paired t-test results in Appendix 1, Table S5). While there is some overlap between fee-free days and holidays, there was no strong pattern between fee-free days and visitation trends in the coastal area of Cabrillo National Monument (Appendix 1, Figure S3, Appendix 1, Table S6).

Discussion

Visitation information can provide trend insights, increase operational efficiency of park units, and enrich visitor experiences. Entrance station visitation trends, including increasing visitation 2011–2017 and declining visitation 2018–2020, can likely be explained by changes in park policy and social media presence. The increase and subsequent peak in visitation 2016–2017 are likely explained by the National Park Service Centennial celebration. The campaign was widely publicized on social media and led to increases in visitation across the National Park System. The following decrease in visitation could be attributed to increasing costs of park entry in June of 2018, and the start of the COVID-19 Pandemic in early spring 2020. While visitation to the entrance station fluctuates over time, visitation to the coastal area followed a similar upward trend 2011–2017 and remaining relatively high thereafter (Figure 2). Higher visitor counts at the Tidepool Parking lot area of the Coastal Trail, when compared to the Coast View Parking section, is a consequence of parking lot size and proximity to the tidepool area—the Tidepool Parking lot contains 44 parking spaces and is much closer to the tidepool area, while the Coast View Parking has 13 spaces. Most visitors to the park explore the Coastal Trail area during their visit to Cabrillo National Monument.

Understanding the timing of peak visitation to the coastal area can guide management decisions on project selection and staffing. More specifically, visitation patterns can aid in allocating recreation fee funding—which is collected by the entrance station to fund projects with a direct impact on visitation. The number of weekend visitors to the coastal area is 110% higher (more than double) the number of midweek visitors. On average, holidays and holiday-adjacent days considered in this analysis attract more than 800 additional visitors to the coastal area! Visitation was not correlated with tide level. These findings indicate that, despite the tidepools being a popular and desired visitor experience, it is critical the park maintains high staffing and volunteer docent presence in the coastal area during holidays, weekends, and holiday-adjacent days, regardless of the tide level.

Moving forward, the park continues to monitor coastal area visitation patterns using updated equipment. EcoCounter PYRO trail counters were installed in February 2021. These new counters use thermal differences to detect visitors and can differentiate ingoing and outgoing trail traffic. The sensors on the new counters use passive-infrared, pyroelectric technology to detect two people that are slightly staggered. Testing in the field confirmed that two adult individuals walking next to each other only have to be staggered by a couple inches and that the counter is able to avoid counting dogs, even if they are relatively large, but may not count very small children (personal observation, L. A. Cat). Additionally, the counter installed on the section of the Coastal Trail adjacent to the Tidepool Parking is equipped with an induction loop that can detect bicycles, which are currently not permitted on the Coastal Trail. The new counters address potential limitations of the Phillips et al. (2013) method because the old calibration technique assumes that visitation patterns are identical to the test periods, which has not been observed. The TrailMaster counters used in this analysis were retired in April 2021, with two months of overlap to allow for direct comparison of data between trail counter systems. Moving forward, we recommend a seasonal calibration with the new EcoCounter PYRO trail counters because the sensors require a temperature differential between individuals and the background, which may be masked by thick coats and jackets. The weather at Cabrillo National

Monument is moderate year round, but this may result in undercounting during extremely cold days when visitation will likely be much lower. Cabrillo National Monument is also in the process of completing a Congestion Management Plan that involves several strategies to manage and reduce congestion and visitation in the coastal area that can be guided by the data in this report.

Trail counters are an important monitoring tool to understand visitation at national park units to carry out the NPS mission. “The National Park Service preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations.” Meeting the NPS mission requires balancing access to visitors with preserving the ecosystems they enjoy visiting. This ranges from habitat quality, to staffing sensitive areas like the tidepools with staff or docents that can educate visitors on how to sustainably visit the rocky intertidal.