

EXPLORING VISITOR ATTITUDES, VALUES, AND BEHAVIORS REGARDING WASTE IN NATIONAL PARKS



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Executive Summary

For most park and protected area managers, balancing resource protection with the provision of recreational opportunities is an ongoing challenge. With the recent substantial increase in national park visitation in the United States, impacts on visitor experience and ecological conditions have correspondingly increased. One specific concern for many park and protected area managers is waste management and/or waste generation by visitors, park operations, and concessionaires, and the impact it has on both protected areas and adjacent communities. Each year, over 100 million pounds of waste are generated in national parks through a variety of means, including park operations, by visitors to parks, and other sources (Pierno, 2017). This is not entirely representative of all waste generating activities in parks, and does not completely account for waste generated in gateway communities or by park concessions. Although the NPS promotes visitation and enjoyment of parks, the agency must provide sustainable parks now and for future generations.

The primary goal of this study was to explore visitor attitudes and behaviors toward waste disposal and recycling in select national parks. This was carried out through direct visitor observations paired with visitor surveys at Grand Teton National Park (GRTE), Yosemite National Park (YOSE), and Denali National Park and Preserve (DENA) to better understand how park managers can achieve waste management goals through effective educational and management strategies.

In order to explore visitor attitudes and behaviors, researchers stratified sampling across the selected park units over a three-month period in summer of 2017. Approximately 20-25 days of sampling were allotted for data collection in each park. A total of $N = 2790$ surveys (including paired and non-paired) were administered to visitors, and $N = 7558$ observations were obtained.

Perhaps the most salient finding from this research is that the attitudes, norms, and behaviors of park visitors included in this sample are largely aligned with proper disposal of waste and recyclable material in national parks. Despite very low visitor awareness of the Zero Landfill Initiative (ZLI), the data suggest that visitors are predisposed to engage in environmentally responsible behaviors that benefit and protect national parks. Furthermore, the data reveal that moral norms are important constructs for park visitors, and that moral norms could be targeted in future ZLI messaging in parks and surrounding communities, online, on signage, and in other printed materials. Such messages could reinforce visitors' latent sense of "the right thing to do" in national parks and surrounding areas.

Although ZLI messages, infrastructure, and programmatic efforts varied in 2017 among the pilot parks, there were increased diversion rates for each park. DENA increased from 18 to 23%, GRTE increased from 20 to 33%, and YOSE increased from 24 to 30% (D. Coogan, personal communication, January 9, 2018). This increased diversion suggests that initial ZLI efforts have been effective. Continued enhancements to the ZLI may increase diversion rates in the future. Given the overall alignment of visitors with ZLI goals, the results indicate that if the necessary support structure (heightened awareness, robust education, enhanced messaging, well-labeled and located infrastructure) were in place in the parks, visitors would willingly participate in ZLI efforts.

Key Findings

Survey Results

- Approximately 66% of respondents brought items into the park that they later disposed of within the park.
- Roughly 74% of the sample reported disposing of waste items in a trash container in the park.
- Over half of the sample (55%) reported disposing of recyclable material in a recycling container in the park.
- Approximately 30% of respondents purchased an item in the park that they later disposed of in the park.
- Just over 75% of respondents reported that they brought a reusable water bottle to use while in the park.
- ***Avoid the purchase of items in the park that cannot be reused or recycled*** was considered to be the most difficult of the behaviors listed. This result holds for the overall sample, and for each park individually.
- The item ***Sort my waste items between recycling and trash while in the park*** was found to be the easiest of the behaviors to perform. This result holds for the overall sample, and for each park individually.
- Overall, respondents strongly disagreed with the notion that recycling in national parks is useless, and with the notion that recycling in national parks takes too much time.
- Respondents strongly disagreed with the notion that recycling and trash disposal are inconvenient, nor do they consider trash disposal and recycling to be confusing.

Observation Results

- Trash units were the items most frequently used, with approximately 64% of the sample having used a trash-only unit.
- Nearly 25% of the sample used recycle-only units.
- Nearly three fourths (approximately 74%) of visitors properly disposed of their waste and recycling.
- Plastic wrappers were the most frequently discarded item (32%), with over one third of visitors disposing of a non-recyclable plastic wrapper.

- Recyclable plastic was the second most frequently discarded item (31%), followed by paper (28%).
- Visitors who did not actively sort their waste/recycling were significantly less likely (18%) to dispose of waste/recycling properly than those who actively sorted (53%).

Paired Results

- Results indicate that if park visitors **sought information regarding waste management (prior to their visit)**, they were statistically more likely to dispose of waste/recycling appropriately in the park.
- The data reveal that park **visitors who looked at/or saw signage regarding waste management** were statistically more likely to dispose of waste/recycling appropriately.
- There was no relationship between place of residence (US or abroad) and proper disposal of waste/recyclables – international visitors are no more or less likely than domestic visitors to dispose of their waste/recyclables properly.

Principal Components Analysis Results

- Multiple correlation regression path analysis suggests that only **perceived difficulty** (e.g., *actively sorting waste, minimizing amount of waste generated in the park, etc.*) ($b=.335$), **moral norms** (*sense of responsibility, feelings of guilt, etc.*) ($b=.459$), and **ZLI awareness** ($b=.049$) had a significant influence on visitor behavioral intention.

Implications

- Having the right messages in place, accessed prior to a visit and/or seen by visitors on-site, can lead to greater compliance and appropriate waste disposal and recycling.
- These findings could potentially be more relevant for campground visitors, because they generally have to book sites in advance of their stay, which means that they could receive information on waste/recycling *prior* to their visit.
- Such messages could be reinforced by signage/messaging on-site; this may hold true for park visitors who stay in concession-run lodging as well.
- Results suggest that messages focusing on *the ease* of proper waste disposal/recycling may be effective at aligning visitor behavior with ZLI goals.
- *Moral norms* are an important construct, and could be leveraged for effective messaging to park visitors (eliciting a sense of responsibility, feelings of guilt, etc.).

- Vendors/concessions can play a more active role in educating visitors (e.g., at point of purchase) about which items can be recycled versus those items which must go to landfill.
- Based on high levels of reported support for proper waste disposal/recycling, such positive attitudes should be leveraged in all ZLI messaging (e.g., “By properly recycling in Denali, you are helping to preserve this park”).
- Simply ensuring that park visitors are aware of the location of recycling/trash infrastructure will encourage proper disposal.
- Given the currently low visitor awareness of ZLI, programmatic changes to the initiative could likely be undertaken with minimal visitor confusion.
- Results indicate that when visitors are less engaged with waste/recycling infrastructure, they are less likely to properly dispose of materials. More visually engaging signage is likely warranted on and around the infrastructure, both to capture visitor attention and to influence proper disposal.