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COVID-19 messaging in U.S. state parks: Extensions of the outdoor recreation strategies and practices framework unmasked by the pandemic

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\textbf{ABSTRACT}

U.S. state parks are a considerable part of the nation’s recreation landscape. Understanding their management concerns, including impacts from pandemics, is imperative for sustainably achieving park objectives. Our study aimed to 1) examine park managers’ responses to a novel stressor (COVID-19); 2) aid managers in communicating these strategies to visitors in their pre-visit phase; and 3) test a park management framework’s ability to adapt to this novel stressor in this pre-visit phase. Manning and colleagues’ outdoor recreation strategies and practices framework provides parks with up to 24 response options to an issue: four strategies intersecting with six practices. This framework has been limited to common in-park concerns and visitors. We examined how park systems communicate with potential visitors about COVID-19, to advance the framework toward broader concerns and scales. We analyzed the 50 U.S. state park systems’ official COVID-19 communications at the traditional start of the peak use season (summer 2020). We qualitatively coded these for reference to the framework’s components and mentions of scale. This highlight that while “limit use” and “reduce impact of use” were the only strategies used, different practices and recognitions of beyond-park and beyond-visit scales were acknowledged (e.g., “please recreate close to home”). We suggest the data reveal a seventh practice in use and for framework inclusion: “influence pre-visit decisions.” The pandemic provided an opportunity for parks to communicate their managerial responses with consistency and creativity, as well as an opportunity for researchers and managers to advance the strategies and practices framework.

\textbf{Management implications:} The temporal issue of COVID-19 as a stressor and the spatial nature of its impact across whole social landscapes implores park managers to pay special attention to the critical time in a potential visitor’s visit-cycle: the planning and anticipation stages. It is here that effective messaging about the park’s integration of expert authority data, detailed communication about park-level responses, and awareness of beyond-park contexts can help potential visitors decide how to safely recreate. This examination highlights the importance of pre-visit safety messaging and provides specific examples of how the outdoor recreation strategies and practices framework can assist park managers in targeting visitor use management communications and actions. Given this strategies and practices framework’s usefulness to park managers and ubiquity across parks, we examine ways to expand it to consider broader and emergent contexts.

\textbf{1. Introduction}

“Recreate outdoors and close to home” has been emphasized throughout the COVID-19 pandemic. For many, the stay-at-home orders and closures of other leisure locations meant that local public parks took on outsized importance for pandemic-appropriate recreation and rejuvenation (Volenc et al., 2021). Indeed, the Centers for Disease Control and Prevention (CDC) recognized this power of parks, prioritizing exceptions for outings related to exercise alongside those for groceries and medications (Trust for Public Land [TPL], 2020). Parks were then paradoxically sources of both refuge and risk, as one of the few opportunities for pandemic outings. Managers were correspondingly faced with a dilemma: How to provide recreation experiences for all while promoting COVID-19 preventative practices for all?

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In the U.S., the pressure on parks was ubiquitous. State parks, with their annual pre-pandemic attendance of 800 million visits, bore a large portion of the burden (America’s State Parks, 2020). In spring 2020, state park systems across the 50 U.S. states closed entirely, partially, or sporadically as managers assessed prevailing health guidance and their ability to provide safe recreation opportunities (TPL, 2020). Our work focuses on these locally and regionally-important park systems’ COVID-19 responses.

COVID-19 is a discrete, unexpected, and serious public health stressor to park management. This combination of factors – its sudden emergence affecting social aspects of parks – is a new test for park adaptation strategies. Parks have considered their resilience against threats to resources (i.e., climate change, wildfire, invasive species) and management (i.e., shifts in budgets, values, use types, and user groups). However, the pandemic’s impacts to park strategies and practices is a threat of unique character. Our work examines how state park management communicated about these strategies and practices mid-pandemic.

Adaptive planning to address existing issues tends to focus at the park-level. A common framework asks managers to consider a suite of strategies and practices to arrive at the tactic(s) best suited for the issue and its context (Manning et al., 2017). Typically, these issues are known stressors that are bound within the park’s boundaries and can be adequately mitigated by efforts during a visitor’s trip. As useful as this framework has been with considering a suite of potential management responses to an in-park resource, managerial, or social issue, it has not been examined for an in-park stressor originating from a larger context. COVID-19 presents a unique opportunity to examine how this outdoor recreation strategies and practices framework functions, and where it can be expanded to include a novel stressor that stretches beyond park boundaries and beyond a park visit (i.e., pre-visit mitigation tactics; Clawson & Knetsch, 1966). By considering the COVID-19 pandemic as a case study of a novel park stressor, we followed Eisenhardt’s (2007) approach to expand this framework to be more sensitive to a public health issue and how it could better incorporate beyond-park contexts.

Though COVID-19 is the example through which we explore this application, the insight that it offers for the strategies and practices framework transcends this pandemic. Our results have implications for ongoing park management and the continued refinement of theory that informs management approaches to park stressors.

1. U.S. state park systems and hierarchy models

U.S. state parks are well-loved and well-visited. State parks generate about a third of all U.S. nature recreation hours, totaling over 2 billion hours annually (Smith et al., 2019). Annual attendance across the 50 states is about 800 million visits. Though each state manages their parks independently, general knowledge availability and networks of practitioners mean that each state park system knows about and connects with other states’ systems (America’s State Parks, 2020). It is probable that these sources of information and colleagues influence a state’s park management decisions (Siderelis et al., 2012). At the other end of the spatial scale, individual parks within a state’s system can also influence broader management decisions and policies. This range of influences illustrates hierarchy models, where social-ecological systems – including parks – are simultaneously parts of larger and smaller scales (Luzadis et al., 2002; Pelosi et al., 2010; Warren, 2006). State park systems thus operate within the requirements of larger scales like “upstream” nationwide CDC recommendations and state-level policies, while at the same time serving interests of their “downstream” constituents (e.g., visitors, adjacent communities) (CDC 2020, 2021).

1.2. Parks and COVID-19

Research is beginning to document the effects of COVID-19 on park usage and recreation. Two trends are currently apparent. First, the links between parks (particularly green spaces) and human wellbeing continue to be emphasized, as well as the lower risk of COVID-19 in outdoor spaces (Bulfone et al., 2021; Jackson et al., 2021; TPL, 2020). Visiting such parks contributes to the general wellbeing of the population and is associated with higher resilience to the pandemic’s effects and a range of health and social benefits (e.g., Kleinschroth & Kowarik, 2020; Lu et al., 2021; Samuelsson et al., 2020; Slater et al., 2020; Spotswood et al., 2021; Xie et al., 2020). Second, research has mainly focused at the visitor level (i.e., park users). Examples include rural and urban outdoor enthusiasts in the U.S. (Rice et al., 2020), population mobility in general (Jacobsen & Jacobsen, 2020) and in the natural areas (Saladie et al., 2021), frequency of sharing park-based recreation on social media (Volenee et al., 2021), and park access by underrepresented communities (Gonzalez, 2020).

It appears that parks’ management during the pandemic has yet to be a research focus. However, the pandemic and associated response has had profound managerial implications. Managers in these places have had to adaptively create novel safety protocols and visitor regulation techniques and rely on new authoritative sources as main providers of information to visitors (e.g., health professionals, CDC). The COVID-19 pandemic is different from known “usual” emergencies in which there is a separation between victims and rescue personnel, as every member of the public could be in both roles (Sutton et al., 2020). Sutton and colleagues argue that this lack of separation demands that COVID-19 official messaging convey even clearer and more informative statements than seen in other common hazard situation messaging.

This messaging imperative extends to parks, especially as these settings contended with high variability in pandemic visitation numbers. This variability has ranged from record lows during imposed “stay-at-home” periods to record highs when outdoor recreation became allowed (Geng et al., 2020; Google Community Mobility Report, 2020; Rice & Pan, 2020). For example, a study from Vermont on changes in outdoor activities since the start of the pandemic found that Vermonters decreased their camping and relaxing with others but increased all other non-social forms of outdoor recreation (Morse et al., 2020).

1.3. Communicating safety in parks

Parks are recreation settings with inherent risks, and research has correspondingly investigated park visitors’ perceptions about risk (e.g., Gstaetter et al., 2018). The emphasis of safety messages communicated in parks is predominantly on the risks inherent to and occurring within the park visit, such as possible wildlife encounters, extreme weather events, and unsafe water conditions (e.g., Evensen et al., 2012; Carter et al., 2014; Saunders et al., 2019). A recurring finding concerns the overconfidence of visitors and their related, often false, sense of security. Specifically, Girasek et al. (2016) studied hikers in Yosemite National Park who chose to approach the Merced River at locations that experts had identified as dangerous (i.e., high-risk for drowning). Post-visitation interviews with these hikers highlighted that they tended to rate the dangers as significantly (and falsely) lower than did the experts. Combined with visitors’ most commonly consulted information source being friends/family (Girasek et al., 2016), this indicates a potential reliance on presumably non-expert sources on park risks alongside expert sources from the park itself. Reasons for this vary but include pre-existing attitudes toward the issue/staff (Evensen et al., 2012), variations in how visitors attribute risk responsibility (Räikkönen, 2011), and clutered simultaneous messages from park sources (Saunders et al., 2019). It also implies that park communication about risks must be targeted, meaningful, and easily shared to encourage acknowledgement and compliance. Although previous studies highlight the importance and efficiency of personal contacts with uniformed staff in delivering messages (Sisneros-Kidd, 2019), this was not an option during the COVID-19 pandemic due to physical distancing imperatives.

There is also a temporal issue in safety communication. Researchers have noted that the tourism industry is “fragmented” in its
communication of safety messages, as information obtained prior to a park visit is usually from non-expert safety sources (e.g., advertisements, tourism marketing professionals) and may not include or emphasize important safety instructions (Reigner & Lawson, 2009; Saunders et al., 2019). Specifically, Reigner and Lawson (2009) examined persuasive messages’ influences on visitors’ swimming behavior at Haleakala National Park. They found that respondents who were presented with pre-visit warning messages focusing on personal health or resource protection were less likely to engage in potentially hazardous swimming behavior than those who were not presented with any pre-visit warning messages. This highlights the importance of pre-visit safety messaging. The COVID-19 pandemic reaffirmed and acutely highlighted the need to provide pre-visit safety information to park visitors.

1.4. Strategies and practices to address safety in parks

Given this imperative on parks to provide pre-visit safety information, the questions turn to the content and delivery of such messages: If there is a park safety issue, how can managers address it and communicate their plan? Although specific tactics (e.g., signage) may be readily available, considering a suite of responses allows managers to approach the issue creatively and expansively. The “strategies and practices” framework for managing park and outdoor recreation issues provides such a suite of approaches (Manning et al., 2017). In this, managers combine four strategies and six practices to consider 24 potential tactics to address a park issue.

In the context of a visitor safety issue, the definitions of each strategy are as follows. “Limit use” - decreasing the quantities, types, locations, and/or timings of visitation to limit risk. “Increase supply” - considering alternative times, locations, and/or activities to dilute the risk in any given period, setting, or recreation pursuit. “Increase the durability of the resource” - protecting the resource’s ability to withstand the risk. Finally, “reduce impact of use,” an integral part of which is modifying visitor behavior - preparing visitors for the risky conditions they will encounter.

Six types of practices can be considered within each overarching strategy: information/education, rationing/allocation, rules/regulations, law enforcement, zoning, and facilities/development. As each name implies, these practices target safety directly and/or indirectly. For example, Kidd et al. (2015) showed the importance of “information/education,” particularly personal contact with a uniformed ranger, in preventing visitors from venturing off-trail in Acadia National Park. “Rationing/allocation” refers to permitting use, which can be done through timed entries and capacity limits to popular features, for example, such as tickets to access the more popular ancient pueblos at Mesa Verde National Park. “Rules/regulations” are policy-focused and can be paired with “law enforcement” to offer information and/or apply sanctions to control behaviors. “Zoning” refers to the spatial or temporal separation of conflicting uses and values, such as closing a certain area of a park when brown bears are using it for important lifecycle functions such as foraging or breeding (Fortin et al., 2015). Finally, “facilities/development” refers to structures that address issues, such as expanding parking lot sizes to reduce unsafe off-road parking or reducing parking lot sizes to limit the number of people at a trailhead at any one time (Hammitt et al., 2015; Manning et al., 2014).

Twenty-four tactics arise from the intersection of the four strategies and six practices, which can each be considered to address park issues. For example, Marion (2016) provides a historic overview on how this framework can be applied to managing visitor impacts on natural resources (i.e., recreation ecology). If resource impacts are rapidly evident on new trails and campsites and their recovery rates are substantially slower, it makes sense to concentrate the bulk of activity on a small number of the most sustainable and professionally managed sites. This tactic would be using the strategy of “limit use” and practice of “facilities/development.” A successful example of this is on the Appalachian Trail, where park managers have limited campsite proliferation and expansion in remote and low-use areas by constraining campsites to “side-hills” and permitting a restricted number of tents.

This strategies and practices framework has assisted park managers in many contexts but is seemingly currently limited in scale. The issues considered are primarily park-based, such as impacts to the resource, social, and managerial functions within a particular park or even a particular feature within a park (e.g., a crowded beach). The research of Ensenat-Sobranis and colleagues (2019) is an exception. These authors applied the framework globally, to 11 highly used protected areas (>1,000,000 annual visitors) with archaeological sites (e.g., Machu Picchu, Giza, La Alhambra). They grouped these sites’ 96 existing visitor management tactics into three framework-complementary categories: restrictive, redistributive, and interpretive (Ensenat-Sobranis et al., 2019; Manning et al., 2017). Expanding on the framework temporally, they suggest that types of visitor use management and particular tactics within these categories can occur before and after park visitation, as well as during the visit. Although they did find evidence of a redistributive strategy pre-visit (i.e., disperse visitors temporarily via an advanced reservation system [strategy: limit use; practice: rationing/allocation]), they did not find evidence of pre-visit restrictive or interpretive strategies.

Taking into account the potential expansions opened by Ensenat-Sobranis et al. (2019), we examine how the strategies and practices framework from Manning et al. (2017) stands against the COVID-19 concerns and its imperatives for pre-visit communication. In this context, COVID-19 functions as a novel case that may lend insight for framework extension. This scaling-up temporally (pre-visit) and spatially (beyond-park) is imperative for parks (Perry et al., 2020); extending this framework can help meet the needs this scaling presents. Park managers have had to “think creatively to balance providing access … with managing public safety” during the pandemic (TPL, 2020) and the strategies and practices framework can highlight diverse tactics attending to this balancing act.

Using a dataset of all 50 U.S. state park systems’ COVID-19 statements from the traditional start of the summer recreation season in 2020, we address two fundamental research questions:

1. How are state parks communicating COVID-19 visitor use management tactics to potential visitors (i.e., pre-visit)?
2. How are these tactics aligning with or augmenting the outdoor recreation strategies and practices framework?

2. Materials and methods

Data collection consisted of navigating all 50 U.S. state park websites or state-level sites that housed state park information and harvesting their COVID-19 related information as of Memorial Day weekend (the last weekend in May), 2020. On this date, we harvested (via download or screen capture) information on COVID-19 and any press releases available.

Forty-nine states are represented in this dataset with at least the COVID-19 information for their state parks. California, Delaware, and Wyoming also have at least one associated press release. Many states had their state park COVID-19 information as of Memorial Day weekend (the last weekend in May), 2020. On this date, we harvested (via download or screen capture) information on COVID-19 and any press releases available.

Forty-nine states are represented in this dataset with at least the COVID-19 information for their state parks. California, Delaware, and Wyoming also have at least one associated press release. Many states had their state park COVID-19 information easily accessible (i.e., on the state park system’s landing page), but a few confined it to tabs not as readily apparent or intermingled with other, non-pandemic-related park information. There was also a spectrum of information provided state-by-state. At one end, states such as New York and Washington had relatively large amounts of information regarding their operations and safety procedures for workers and visitors. Near the other end, states such as South Carolina and Louisiana offered relatively limited information regarding their operations to the public, opting to briefly state that COVID-19 had impacted their operations and park visitor capacity. At the furthest end, Illinois offered no information regarding COVID-19 on their state park website in relation to closures, changes, or impacts and thus is the only state not represented in this dataset.
We harvested a second dataset from the same sources and same URLs in mid-summer 2020 – peak season for state park systems. These data represent a pivotal point during the pandemic, where park systems had to adapt their operations quickly with additional focus on pandemic-dependent public safety concerns (e.g., crowding). The data encompassed communication regarding what each state park system was doing to protect visitors and follow health guidelines. Forty-four states offered various extents of updated information. Illinois, Indiana, Maryland, Minnesota, South Carolina, and Wyoming did not have updates to their start-of-summer communications.

A supplemental data file is available with this manuscript, containing all the harvested information described above and used in the analysis described below.

Our goal was to understand broad trends across all U.S. state park systems. To analyze this context, we took a qualitative approach to mixed-methods research by integrating qualitative and quantitative data (Hesse-Biber, 2010). This allowed us to follow Eisenhardt’s (2007) approach to theory extension by examining the strategies and practices frameworks in the context of novel park stressors. Data coding was an iterative, four-phase process, examining and eventually combining the early and mid-season datasets in NVivo12. First, we (the research team) collaboratively developed *a priori* codes based on the existing park management literature, including the specific strategies and practices framework language (Manning et al., 2017) and potential category extensions (Ensenat-Sobranis et al., 2019). We extensively discussed these *a priori* codes. Team members shared examples of excerpts assigned to the *a priori* codes in an effort to ensure the validity of the first round of coding (Glesne, 2016). For example, when messages emerged related to human health, the research team re-examined the framework and discussed the appropriateness of coding that language as “reducing the impact of use.” These discussions continued until we reached consensus about a code, which in this example centered on the reasoning that visiting state parks during a pandemic impacts human health and the intent of the managers is to reduce these impacts by modifying the visitors’ behavior. Second, we identified and discussed the rationale, if any, provided by each state park system regarding new pandemic-related management tactics during summer 2020, resulting in additional codes added to the list for the two datasets. Third, we examined the start-of-summer COVID-19 statements, applying the codes from the first and second phases and noting emergent codes and recurring patterns. A number of themes emerged that did not fit within the existing park management literature, including the specific strategies and practices framework language (Manning et al., 2017) and the remaining 56 (28%) could be ascribed to the pre-visit practices suggested by Ensenat-Sobranis et al. (2019). Qualitative coding shows that all the tactics were concentrated within two overarching strategies: “reduce impact of use” (including modify visitor behavior) or “limit use.” Within these two strategies, each of the six practices were used. Table 2 contains examples of each tactic. We did not find any tactics that fell into the strategies of “increasing supply” or “increasing the durability of the resource.”

The most frequently observed combination concerned reducing impact of use by modifying visitor behavior through “information/education,” with a total of 42 tactics (21%). These tactics involved providing the public with information about COVID-19 and translating it into suggested behaviors for recreating in state parks during the pandemic. For example, many state park systems discussed the oft-cited recommendation of maintaining six feet of distance between oneself and other individuals, and asked park visitors to observe this recommendation.

We observed efforts to limit use through the different practices. For example, “rules/regulations” was used 22 times (11%). These rules typically involved closing certain trails where social distancing might be particularly difficult, reducing the places individuals were allowed to park, and reducing the hours of use to limit the total number of individuals congregating at parks. Related, we found 18 (9%) tactics at the nexus of “limit use” and “rationing/allocation.” These tactics similarly attempted to reduce the likelihood of individuals congregating, but did so by allocating resources to specific groups or individuals, such as through a reservation system. We identified 17 tactics (8%) that aimed to reduce impact of use and modify visitor behavior through the creation of rules and regulations, such as requiring individuals to wear masks (as opposed to suggesting their use). Another 16 tactics (8%) were aimed at limiting use through information and education, such as suggesting visitors modify their plans if they arrive at a specific trailhead and find it crowded. The remaining tactics each represented smaller portions of the total tactics.

Based on the substantial outlier tactics data (56%; 28%), we suggest a seventh practice added to the framework: “Influence pre-visit decisions.” In addition to the framework-affirming tactics, we observed two categories of tactics that fell outside of the current framework. Both represent tactics that enlist the broader community as a partner in managing the in-park stressor of COVID-19 by asking them to monitor

### Table 1

| Practice                  | Strategy                  | Limit Use | Reduce Impact of Use |
|---------------------------|----------------------------|-----------|----------------------|
| Information/Ed.           | 8% (n = 16)                | 21% (n = 42) |
| Rationing/Allocation      | 9% (n = 18)                | 6% (n = 12) |
| Rules/Regulations         | 11% (n = 22)               | 8% (n = 17) |
| Law Enforcement           | 1% (n = 2)                 | <1% (n = 1)  |
| Zoning                    | <1% (n = 1)                | 2% (n = 5)  |
| Facilities/Development    | 4.0% (n = 8)               | 1% (n = 3)  |
| *Influence Pre-visit Decisions* | 4% (n = 8) | 24% (n = 48) |

### 3. Results

Results show that during the COVID-19 pandemic, state park systems across the U.S. took action to manage the summer season opening of their parks in the midst of a global health crisis. This translated to specific tactics within the strategies and practices framework, as well as tactics that could be incorporated by a new practice within the framework.

Our analysis revealed that 203 management tactics were used across the 49 state park systems as a result of the pandemic (Table 1). Of those 203 tactics, 147 (72%) fell clearly within the matrix of tactics established by Manning et al. (2017) and the remaining 56 (28%) could be ascribed to the pre-visit practices suggested by Ensenat-Sobranis et al. (2019). Qualitative coding shows that all the tactics were concentrated within two overarching strategies: “reduce impact of use” (including modify visitor behavior) or “limit use.” Within these two strategies, each of the six practices were used. Table 2 contains examples of each tactic. We did not find any tactics that fell into the strategies of “increasing supply” or “increasing the durability of the resource.”

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Delaware encouraged individuals to explore their own neighborhoods and communities. Although this tactic shares some similarities to traditional zoning in two main ways: it is occurring outside of the park boundaries and the area of acceptable use is not discretely defined. The second category – health practices – contained messages imploring community members to engage in recommended health practices (e.g., mask wearing, social distancing, hand hygiene) in their broader lives, in an effort to reduce community spread and thus allow for parks to return to normal operations. These instances were numerous and all centered on typical COVID-19 mitigating health practices.

For any one state park system, we observed a range of tactics. Park managers and state decision-makers selected combinations of tactics to address the stressor of COVID-19. Almost all (48 of 49) articulated three or more tactics. To provide an example of these combinations, we present a sample of the categorization for Delaware’s approach (Fig. 1 and Table 2). Delaware employed a total of 13 tactics, including those aimed at limiting use and reducing impact of use through a combination of each existing practice and the beyond-park proposed practice of influencing pre-visit decisions. A message could also contain multiple tactics. For example, Colorado’s “Get Out – Spread Out” campaign, promoted with partners like the Trails and Open Space Coalition, publicizes less known parks in and out of the state park system. This shows the strategy of “reducing impact of use” with the practices of “information/education” and “influencing pre-visit decisions.”

### 4. Discussion and recommendations

The heightened importance of parks during the COVID-19 pandemic exemplifies the value of these places and their need for sound management strategies at all times. The outdoor recreation strategies and practices framework is a crucial tool in examining managerial options available to parks. Results from our investigation across U.S. state park systems demonstrate this framework’s enduring utility as well as an emergent opportunity for its extension. In particular, we highlight two areas for further discussion and recommendation: extending the framework temporally and spatially and considering a diversity of strategies and practices.

#### 4.1. Extending the strategies and practices framework temporally and spatially

First, the COVID-19 pandemic has illustrated that the strategies and practices framework requires scaling, especially to address other external, highly impactful park stressors (e.g., climate change, budget and modify their behavior before their visit. For both, park systems requested that prospective visitors recreate locally (8; 4%) and maintain health practices (48; 24%). Both are more general changes to visitors’ daily lives than just when visiting state parks, and both occur in advance of park entry. The first category – recreate locally – contained messages encouraging prospective visitors to forgo their visits to state parks and to instead recreate closer to home. Some of these messages contained specific distances, such as Vermont’s request that individuals only recreate in places they could reach without driving, while others like Delaware encouraged individuals to explore their own neighborhoods and municipal parks rather than visit state parks outside of their home communities. Although this tactic shares some similarities to “zoning,”

![Image](https://example.com/image.png)

Fig. 1. Example infographic of tactics communicated by the Delaware state park system on their website, which can be categorized into multiple strategies and practices (Delaware State Parks, 2020).

| Practice          | Strategy                                                                 | Reduce Impact of Use          |
|-------------------|--------------------------------------------------------------------------|-------------------------------|
| Information/      | Encouraging individuals to change plans if they arrived at a crowded park. | Providing up to date information and encouraging individuals to follow health and safety guidelines. |
| Education         |                                                                           | Rationing the number of campsites available to ensure social distancing. |
| Rationing/        | Providing cavern tours by reservation only.                              | Operating at reduced capacity. |
| Allocation        |                                                                           | Informing that park staff may require visitors without masks to leave. |
| Rules/            | Isuing fines (by park rangers) for use of restricted areas.              | Asking individuals to only congregate in camping areas with members of their own households. |
| Regulations       |                                                                           | Equipping all welcome areas and bathrooms with hand sanitizer and disposable masks. |
| Law               | Closing backcountry to limit the need for emergency resources.           | Closing communal spaces, such as amphitheaters and picnic areas. |
| Zoning            | Closing communal spaces, such as amphitheaters and picnic areas.         | Encouraging visitors to recreate close to home, if safe and possible. |
| Facilities/       |                                                                           | Providing cavern tours by reservation only. |
| Development       |                                                                           | Providing up to date information and encouraging individuals to follow health and safety guidelines. |
| Influence         |                                                                           | Rationing the number of campsites available to ensure social distancing. |
| Pre-visit         |                                                                           | Operating at reduced capacity. |
| Decisions         |                                                                           | Informing that park staff may require visitors without masks to leave. |
|                   |                                                                           | Asking individuals to only congregate in camping areas with members of their own households. |
|                   |                                                                           | Equipping all welcome areas and bathrooms with hand sanitizer and disposable masks. |
|                   |                                                                           | Encouraging visitors to recreate close to home, if safe and possible. |

Table 2: Examples of tactics that fit within the coding framework. The strategies of “Increase Supply” or “Increase the Durability of the Resource” were not represented in the tactics and thus are omitted here.

and modify their behavior before their visit. For both, park systems requested that prospective visitors recreate locally (8; 4%) and maintain health practices (48; 24%). Both are more general changes to visitors’ daily lives than just when visiting state parks, and both occur in advance of park entry. The first category – recreate locally – contained messages encouraging prospective visitors to forgo their visits to state parks and to instead recreate closer to home. Some of these messages contained specific distances, such as Vermont’s request that individuals only recreate in places they could reach without driving, while others like Delaware encouraged individuals to explore their own neighborhoods and municipal parks rather than visit state parks outside of their home communities. Although this tactic shares some similarities to “zoning,”

![Image](https://example.com/image.png)

Fig. 1. Example infographic of tactics communicated by the Delaware state park system on their website, which can be categorized into multiple strategies and practices (Delaware State Parks, 2020).
shortfalls, relevance). Throughout its iterations, it has remained primarily park-based and park visit-based. However, recreation experiences, decisions, and behaviors encompass a visit cycle and geographic reach beyond the actual visit. Indeed, it is often a hope of conservation agencies that the actual visit will spur changes in visitors’ daily lives (e.g., a sense of stewardship, carbon footprint reductions). Considering the pre and post-visit behaviors, both inside the park systems and in surrounding communities, is crucial to this goal. The pandemic-appropriate recreation phrase “recreate outdoors, close to home” embodies this need for scale and was present throughout our dataset. In the spirit of the framework, this could be considered a form of zoning, though outside of the park’s traditional area of management. We suggest that a new practice – influence pre-visit behavior – is warranted. This practice confirms and concentrates the recommendations of Ensenat-Sobranis et al. (2019) to expand the framework temporally. Specifically, our data confirm the tactics of redistributive strategies pre-visit through limiting use and further highlight this important time in the visit cycle (Clawson & Kretsch, 1966). Our data also expand our knowledge about pre-visit safety communications at an earlier time point in the visit cycle. For example, while Reigner and Lawson (2009) explored pre-visit safety communications, they still focused on visitors at the park entrance, which is the latest time point possible in the pre-visit phase (i.e., immediately impending visitation). Our focus on web messaging that can be accessed at any time prior to visitation extends the window of “pre-visit.” Lastly, the data also provide evidence of pre-visit restrictive and interpretive tactics within limiting use and reducing impact of use, asking potential visitors to recreate elsewhere and engage in socially-conscious health practices.

The scales of the management considerations (hierarchy models) should correspond to the scale of the stressor, to align resources with needs. In the case of COVID-19 and state parks, data suggest that there are at least three scales external to the park system that they were communicating: local recreation (the closest state park(s) to where a person lives), statewide recreation (visitation to the system of parks), and domestic visitors from other states (dissuading from visiting). Communications also emphasized recreation beyond state parks (e.g., “your neighborhood”), illustrating regional recreation systems beyond a single conservation agency’s management. In all these cases, having a clear and scalable framework to base management tactics may assist in communicating with these multiple audiences before they visit a state park in the system or other recreation site. Similarly, applying the framework to specific types of parks in a system (e.g., those with water bodies, those with substantial built infrastructure) could help identify tactics to communicate with these multiple audiences not just for parks in a geographic area but also parks that could be similarly categorized.

Providing a virtual experience might be considered as increasing the supply of the resource, but at a scale greater than a park or a park system, and thus may be a tactic to consider. Miller-Rushing et al. (2021) list how COVID-19 disrupted parks’ fundamental operations, conservation research and management, and public engagement. However, they highlight that this crisis and its impacts have also brought new priorities and opportunities, such as a chance to increase parks’ online public engagement. Virtual visitation may be both a tactic to consider and a spatial-temporal means of expanding management strategies.

Other creative tactics may also become apparent, if scholars and managers think of the framework at multiple scales. Although the data in our study speak to aspects of this, we have found few examples of other instances beyond the notable work of Ensenat-Sobranis et al. (2019). As an example from our data, Colorado state parks working with partners to advertise lesser-known state and other parks is also a way of reducing the impact of use through information/education and influencing pre-visit behaviors. In this, potential visitors are encouraged to consider parks beyond their usual or the most visited ones. This could be a means of advertising the fuller range of parks available and also have benefits of people getting to know their local areas through a greater range of park experiences. Through this, visitors could potentially solidify their connections, revisit favorite parks from their past, make intergenerational memories, promote parks in an equitable way, and many other benefits of people getting to know their local areas through a greater range of park experiences.

In May 2020, the U.S. Census Bureau ranked the outdoor recreation industry as the second most impacted industry from COVID-19 (behind food systems), due to supply chain disruptions, closed parks, and furloughed employees (TPL, 2020). However, this time was also marked by enhanced interest in outdoor park and recreation experiences, with 81% of Americans saying they recreated outside during the pandemic (compared to 50% pre-pandemic), and a greater diversity of Americans doing so (Outdoor Recreation Roundtable, 2020a). Given the pandemic-related concerns for parks overall, and with this increase of new use mid-pandemic, information/education will continue to be a key tactic to manage visitor use and assess risks to particular recreation activities. The ability of parks to consider pre-visit and beyond-park contexts in framing these messages is important, and planning efforts increasingly focus on these contexts beyond a park visit (Outdoor Recreation Roundtable, 2020b). A parallel crowd-sourced effort across social media, #RecreateResponsibly, also emphasizes tips to protect individual, community, and resource well-being, and many of these tips center on decisions pre-visit or that overlap across visit stages (Recreate Responsibly, 2021). We believe that these efforts further demonstrate the necessity of expanding the strategies and practices framework to pre-visit and beyond-park contexts that are still within a park manager’s sphere of engagement.
4.2. Modifying behavior through information/education is ubiquitous but incomplete

A substantial number of tactics observed (21%) fell at the nexus of “reduce impact of use” through information/education, or modifying visitor behavior through outreach and education. In short, managers are providing information to the public and relying on those individuals to do the right thing. We see at least two potential challenges with this approach. First, information alone is rarely sufficient to engender behavior change (Heimlich & Ardoin, 2008; Kollmuss & Agyeman, 2002). Instead, research suggests that programs aimed at promoting behavior change should pair information with attempts to create social conditions conducive to desired behaviors (e.g., social norms and infrastructure), tap into core values, and develop relevant skills (Heimlich & Ardoin, 2008). In the context of COVID-19 or similar crises, it may be difficult for park managers to create the type of programming that needs to be paired with information to change behaviors. Though consistent messaging is key (Slater et al., 2020), mode of delivery, program timing, and location are critical. We encourage other scholars and practitioners to explore ways to accomplish this remotely. In the meantime, we suggest that managers consider other approaches—such as rules and regulations, law enforcement, and zoning—before or alongside relying on education and outreach to change behavior.

5. Limitations and future work

Our goal in this work was to broadly examine the tactics employed across all U.S. state park systems to address the COVID-19 pandemic. We did not attempt to look in-depth at how those tactics were implemented. This has several implications. First, one potential limitation concerns discrepancies in advertised versus enacted management tactics. We analyzed the former: pre-visit web messages and press releases. We consider it unlikely, however, that there were systematic and substantial on-the-ground deviations from the tactics published on state websites, particularly given the imperative to provide accurate and up-to-date information to the public during the pandemic. Thus, we feel that the websites offer a reasonable proxy for park responses to visitor use conditions during this time.

Second, we recognize that place specifics shape park management approaches. In this spirit, there may be park-level, on-the-ground policies and communications that exemplify different strategies and practices or different ratios of them. However, at the park systems-level, we thoroughly examined the information readily available to potential visitors via official agency websites. Further research can inquire about how these messages are presented and interpreted by various audiences, as this was beyond the scope of our study. For example, these inquiries could include expanding depth of focus within a particular state’s park system or incorporating park managers’ perspectives into the analysis.

Third, we recognize that COVID-19 is a unique stressor and may present strategies and practices that are not routinely employed. These tactics do align with the existing framework and an additional practice, suggesting that types of tactics used with this stressor are similar to those used with other stressors although managers must consider larger scales in their responses. The lack of the strategies “increase supply” and “increase the durability of the resource” do speak to the tailored ways in which the framework applies to each park issue. More research through empirical park examples is necessary to examine these two strategies and whether scaled efforts within them also fit within the proposed practice of “influence pre-visit behavior.” Furthermore, it would seem beneficial for future research to interview visitors who did not abide by pandemic-responsive park tactics. Understanding their motivation and decision-making processes may help managers better target the subsequent messaging overall to include those with particular attitudes, expectations, behaviors, and perceptions of park communications’ trustworthiness.

Though stressors the magnitude of the COVID-19 pandemic may be rare, its extreme nature allowed for us to test the strategies and practices framework in ways not encountered before. Beyond the park-based research suggestions above, we believe that the framework can be further examined for extension or nuance in destinations that are undergoing drastic changes in their visitation planning and management. For example, today’s swimming pools and museums operate routinely, sometimes solely, via pre-booked and timed entries. Similarly, places impacted by climate change (with threatened resource integrity and/or visitor safety) may benefit from the same. Studies in these contexts can help situate the relative uniqueness or commonality of pandemic-related park management. Finally, researchers should examine visitor perceptions about these strategies and practices. For example, surveying park visitors to elicit their preferences for managerial responses to a range of issues and park stressors, as well as factors influencing such preferences, could assist in knowing the transferability of COVID-19 lessons and approaches to other contexts.

6. Conclusions

In sum, this work examined the strategies and practices framework in response to state park systems’ COVID-19 messaging and found that the framework is both useful and needing extension spatially (considering broader park and recreation geographies) and temporally (considering the entire visit cycle, particularly pre-visit). We expect that further tests, extensions, and refinements of this framework will continue to improve its utility as parks contend with more novel and broader stressors.

CRediT authorship contribution statement

Elizabeth E. Perry: Investigation. Kimberly J. Coleman: Investigation. Tatiana A. Iretskaia: Contributed to all aspects of this manuscript. Jordan M. Baer: Compiled the dataset and contributed to, Methodology, Validation, Formal analysis, Writing – review & editing. Liesl F. Magnus: Methodology, Validation, Formal analysis, Writing – review & editing. Peter R. Pettengill: Methodology, Validation, Formal analysis, Writing – review & editing.

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We acknowledge the settler-colonial legacies of violence and land expropriation that continue to shape U.S. state parks. Parks occupy the ancestral, traditional, and contemporary places of Indigenous people. We honor their Elders past and present, and future generations who continue to steward these places since time immemorial. We encourage all to learn about the histories of the places in which they recreate.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jort.2021.100449.

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