KAATERSKILL CLOVE PROJECT AREA

VISITOR USE MANAGEMENT PILOT PROJECT

FINAL RECOMMENDATIONS REPORT AND MONITORING PLAN

FEBRUARY 2025

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Abbreviations

APSLMP	Adirondack Park State Land Master Plan
CAG	Catskill Advisory Group
CPSLMP	Catskill Park State Land Master Plan
HPAG	High Peaks Advisory Group
IVUMC	Interagency Visitor Use Management Council
IVUMF	Interagency Visitor Use Management Framework
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
PPV	People-per-viewscape
UMP	Unit management plan
VAOT	Vehicles-at-one-time
VUMF	Visitor Use Management Framework

Acknowledgement

This project was funded by the New York State Environmental Protection Fund and conducted in partnership with the New York State Department of Environmental Conservation.

1. Introduction

This report summarizes findings of the Visitor Use Management Pilot Project, initiated by the New York State Department of Environmental Conservation (NYSDEC) for the Kaaterskill Clove Project Area.

The New York State Forest Preserve was established in 1885, making it among the earliest and most-precedent setting examples of landscape conservation in American conservation history. The Forest Preserve has special protections under New York State's constitution and its lands are designated to be protected as "forever wild." Today, the Forest Preserve includes 2.7 million acres of land in the Adirondack Park and 288,00 acres in the Catskill Park. These lands protect significant ecological, historical, and scenic resources and provide world class opportunities for outdoor recreation.

The NYSDEC Division of Lands & Forests has management responsibility for the 3-million-acre Forest Preserve. Management of New York State's Forest Preserve lands is guided by the Adirondack Park State Land Master Plan (APSLMP) and the Catskill Park State Land Master Plan (CPSLMP). Common language in the APSLMP and CPSLMP sets the overarching direction for the state's management of the Forest Preserve through the following statement:

> *If there is a unifying theme to the master plan, it is that the protection and preservation of the natural resources of the state lands within the Park must be paramount. Human use and enjoyment of those lands should be permitted and encouraged, so long as the resources in their physical and biological context as well as their social or psychological aspects are not degraded.*

Additionally, both the APSLMP and the CPSLMP mandate that planning for the Forest Preserve must include "an assessment of the physical, biological and social carrying capacity of the area with particular attention to portions of the area threatened by overuse…"[1]

For the last ten years, visitation to the Forest Preserve has been on an upward trend, culminating in 2020 with a record-setting year in many locations. These trends present opportunities for NYSDEC to engage an increasingly large and diverse share of the public to spend quality time in nature and, in turn, develop an affinity and sense of stewardship for the Forest Preserve. But these trends have also created unprecedented visitor use management challenges in some areas of the Forest Preserve. During peak periods, popular areas within the Forest Preserve experience compounding negative effects of intensive visitation, including parking shortages; unsafe conditions along busy state highways and local roads; crowded trails, summits and other points of interest; impacts to water quality; and physical degradation of trails and other facilities.

In 2019, NYSDEC tasked the Adirondack High Peaks Advisory Group (HPAG) with developing a strategic framework for promoting sustainable recreation in the High Peaks region of the Adirondack Park. A primary recommendation in the HPAG Final Report, released in 2020, was for NYSDEC to utilize the Visitor Use Management Framework (VUMF) developed by the federal Interagency Visitor Use Management Council (IVUMC) to identify and implement adaptive management techniques to

[1] The term "user capacity" is used in this report in place of the term "carrying capacity," except in direct quotations that include the term "carrying capacity." User capacity is defined as the maximum amounts and types of use that an area can accommodate without unacceptable impacts to resource conditions and visitors' experiences.

address impacts related to high visitor use (IVUMC, 2016).[2] These strategies would be developed, according to the HPAG's recommendations and VUMF principles, based on a foundation of research, monitoring, and stakeholder input.

Similarly, in 2020, NYSDEC convened the Catskill Advisory Group (CAG). The CAG issued a report in 2022 with a suite of recommendations for managing recreation use "…amid a surge in visitation in the Catskill Park and communities within it" (CAG, 2022). In their recommendations, the CAG called upon NYSDEC to adopt the VUMF as its core management tool and to use the VUMF process to identify desired visitor experiences, associated user capacities, and management steps necessary to create desired experiences and protect natural resources.

Concurrent with the work of and in response to recommendations from HPAG and CAG, NYSDEC has taken initial steps to address physical and ecological aspects of visitor use management and user capacities in the Forest Preserve. For example, NYSDEC has developed monitoring protocols for trail and campsite conditions and an "ecological scorecard" for measuring and monitoring biological resource conditions.

In addition, NYSDEC commissioned this project to apply the VUMF to address impacts of intensive visitor use on the quality and character of visitors' experiences and on public safety in the Forest Preserve. The purpose of the Visitor Use Management Pilot Project is to promote safe, equitable, and inclusive access to the Forest Preserve, while protecting natural, historical, and scenic resources and the quality and character of visitors' experiences. To achieve this, the project used the VUMF to establish desired conditions, a long-term monitoring plan, adaptive visitor use management strategies, and user capacities for the project area, with a focus on the quality and character of visitors' experiences and public safety. The project was intentionally focused on visitors' experiences and public safety to augment NYSDEC's internal capacity to address resource-related monitoring and management.

To achieve its objectives for this project, NYSDEC selected two highly visited areas of the Forest Preserve as case studies: 1) the Central High Peaks Zone of the Adirondack Park (referred to hereafter as the High Peaks Project Area); and 2) the Kaaterskill Clove/Route 23A corridor of the Catskill Park (referred to hereafter as the Kaaterskill Clove Project Area). The scope of the project in each area includes collecting and analyzing visitor use data, engaging with the public and stakeholders, and developing long-term monitoring protocols and adaptive visitor use management strategies.

The culminating outcome of the project is a recommendations report for each project. The purposes of the recommendations report are to document the project planning process, present the project team's[3] recommendations for adaptive visitor use management strategies, and provide a long-term visitor use monitoring plan to implement and sustain proactive visitor use management into the future.

This report presents the planning process, recommendations for adaptive visitor use, and a long-term monitoring plan for the Kaaterskill Clove Project Area. The next sections of the report describe the

[2] The IVUMC consists of members from the six federal land management agencies. Council members collaborate to increase awareness of and commitment to proactive, professional, and science-based visitor use management on public lands and waters.
[3] The project team consists of professional staff from DJ&A, Ross Strategic, Ruby Mountain Consulting, and VHB.

project area in detail, establish the purpose and need for the project, document the legal and administrative foundation for visitor use management and user capacities in the project area, and present the framework and planning process used to conduct the project. The report then presents results and recommendations, including desired conditions statements, indicators, and thresholds;[4] analysis of current visitor use, impacts, and user capacities; management strategies; and a monitoring plan.

The results and recommendations presented in this report have been prepared by the project team to reflect the management direction and professional judgment of NYSDEC. They are data-driven, informed by robust public and stakeholder engagement, and were developed according to the principles of the VUMF, which is the "gold standard" for addressing visitor use management and user capacities in parks and protected areas globally.

2. Project Area

The Kaaterskill Clove Project Area is approximately three square miles in size and is in the northern portion of the Kaaterskill Wild Forest Management Unit of the Catskill Park, New York (Figure 1). During the summer season, the primary visitor attraction is the iconic Kaaterskill Falls, a two-tiered waterfall that drops about 260 feet and is the highest cascading waterfall in the state. Kaaterskill Falls is formed as Spruce Creek flows west from South Lake and over steep cliffs before dropping into a series of pools and ultimately flowing into Kaaterskill Creek. Visitor use is particularly concentrated in and around the pool at the base of the upper fall (referred to hereafter as the "Middle Pool area").

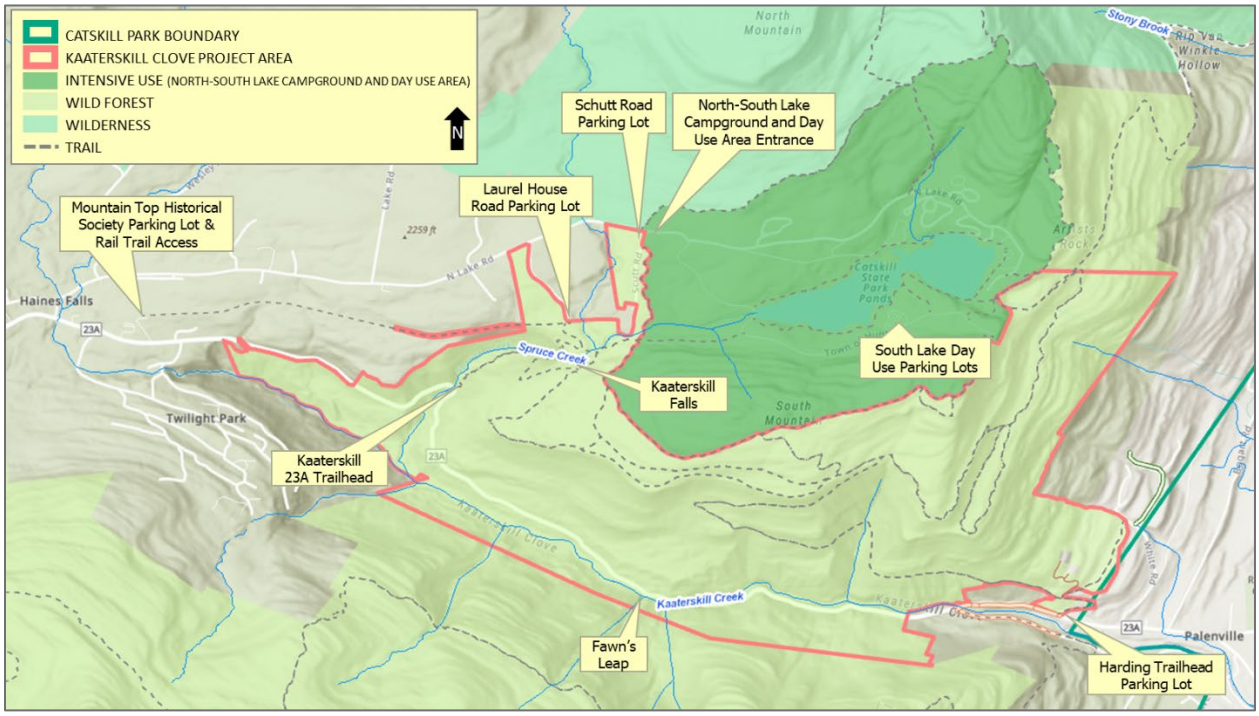

Figure 1. Kaaterskill Clove Project Area.

[4] These are terms for key components of the VUMF and they are defined in *Section 5. Framework and Planning Process.*

There is a parking lot at the end of Laurel House Road that provides the closest point of access to Kaaterskill Falls and includes an informational kiosk, trailhead, toilet, and garbage facilities. The Laurel House Road trailhead connects visitors with a trail network that leads to an accessible observation platform with views of Kaaterskill Falls, to the pools at the base of Kaaterskill Falls, further down Spruce Creek to Route 23A, and to the east along an escarpment. The trail network that continues along Spruce Creek includes many steep sections of stone stairs which were added during a trail expansion project to channelize visitor use onto durable surfaces and protect natural resources. It is about 1.2 miles, roundtrip, to walk from the Laurel House Road parking lot to the Middle Pool area.

When the Laurel House Road parking lot is full, overflow parking occurs in the parking lot on Schutt Road, just east of Laurel House Road along North Lake Road. From there, visitors walk south along a trail that connects the Schutt Road parking lot with the trail network out of Laurel House Road – or they walk along North Lake and Laurel House Roads to access the trail network. Overflow parking for Kaaterskill Falls also occurs in the North-South Lake Campground and Day Use Area at South Lake. From the South Lake Day Use parking lots, visitors walk west along a trail or on the road before taking the Nordic Ski Trail to connect with the trail network to Kaaterskill Falls. From the parking lot on Schutt Road, it is about 2.2 miles roundtrip to walk to the Middle Pool area at Kaaterskill Falls, and it's about 3.1 miles roundtrip from the South Lake Day Use parking lots to the Middle Pool area.

Visitors can also access Kaaterskill Falls by parking at the Mountain Top Historical Society parking lot just off Route 23A. From there, visitors must walk approximately 4.3 miles roundtrip on the Kaaterskill Rail Trail to reach the Middle Pool area at Kaaterskill Falls. Private landowners along North Lake Road in the vicinity of Laurel House Road will also offer paid parking during peak periods as an alternative to formal parking areas. Visitors who pay to park in private lots have a shorter trip to view Kaaterskill Falls than they would if they parked at Schutt Road, South Lake Day Use, or Mountain Top Historical Society parking lots, but they typically walk alongside moving traffic on North Lake Road and Laurel House Road to access the trail network to Kaaterskill Falls.

In recent years, visitors have also been able to ride a privately operated trolley to access Laurel House Road and visit Kaaterskill Falls. These visitors will park at one of two free parking lots and one fee-based parking lot in a nearby town and purchase a ticket to travel on the trolley. The trolley route includes various stops in the Kaaterskill Clove Project Area where visitors can alight to connect with the trail network and ultimately reach Kaaterskill Falls.

In addition to Kaaterskill Falls, the project area includes a trail network that extends east along an escarpment to offer impressive scenic views (Figure 1). A section of the Long Path runs through the eastern edge of the project area and connects Wilderness areas to the north and south. Visitors interested in hiking along this trail network can park at Laurel House Road or Schutt Road parking lots, in the North-South Lake Campground and Day Use Area, or at the Mountain Top Historical Society parking lot along with other visitors seeking to visit Kaaterskill Falls. Alternatively, visitors can park at the small Harding trailhead parking lot located to the east along Route 23A and at a distance from Kaaterskill Falls.

The Kaaterskill Clove Project Area includes a segment of Route 23A, a main travel route connecting the town of Hunter, the village of Tannersville, the hamlet of Haines Falls, and the hamlet of Palenville (Figure 1). The Route 23A corridor follows Kaaterskill Creek and is often referred to as Kaaterskill Clove or *the Clove* due to the surrounding steep slopes cut over time by the creek. There are several popular swimming holes along Kaaterskill Creek, some of which were recently

designated as restricted areas in response to public safety incidents associated with cliff jumping into the creek.

There are a few roadside pullouts and parking areas along the segment of Route 23A in the project area, none of which provide direct access to the creek. Parking has been prohibited in these locations during the summer season in recent years to reduce traffic and pedestrian safety hazards. The pullouts and parking locations on Route 23A have since been designated as trolley stops for visitor access to the creek in the summer. There is a trailhead at the hairpin turn on Route 23A that connects to the trail network that leads to Kaaterskill Falls, but there is no place for parking or pick up and drop off at this trailhead.

3. Purpose and Need

The purpose of the NYSDEC Visitor Use Management Pilot Project in the Kaaterskill Clove Project Area is to promote safe, equitable, and inclusive access to the Forest Preserve, while protecting natural, historical, and scenic resources and the quality and character of visitors' experiences. To achieve this, the project used the VUMF to establish desired conditions, a long-term monitoring plan, adaptive visitor use management strategies, and user capacities for the project area.

The project is needed to address the following persistent issues caused by high levels of visitor use in the Kaaterskill Clove Project Area during the summer season:

- **Parking congestion at access points for Kaaterskill Falls**. High levels of visitor use at Kaaterskill Falls during the peak summer season create intensive parking pressure at points of access to the falls. This includes the parking lots on Laurel House Road and Schutt Road, day use parking areas in North-South Lake Campground and Day Use Area, and the parking lot and adjacent lawn at the Mountain Top Historical Society.
- **Traffic congestion and safety issues in parking areas and on local roads**. Parking pressure from high visitor use at Kaaterskill Falls creates traffic congestion and safety issues. As visitors circulate within and among parking lots looking for a place to park, traffic congestion builds up in parking lots, on the adjacent local roads, and at the entrance to and in North-South Lake Campground and Day Use Area. Many visitors must walk on road shoulders alongside high volumes of moving traffic from where they park to reach Kaaterskill Falls.
- **Crowding on trails and at Kaaterskill Falls**. The amount of visitor use occurring at Kaaterskill Falls during the summer season causes crowding on trails and at the falls. Crowded conditions persist throughout the day on busy weekend days and holidays. Crowding negatively impacts the quality of visitors' experiences and can cause visitors to experience stress. Crowding at Kaaterskill Falls also overwhelms facilities such as toilets and trash receptacles and places undue stress on agency staff and local officials. When it is crowded, some visitors disperse away from trails and other durable surfaces to avoid crowded conditions. This causes trampling impacts to soils and vegetation and causes some visitors to move to locations within Kaaterskill Falls where there are higher risks of an injury or emergency incident occurring.
- **Traffic and pedestrian safety issues on Route 23A**. Until recently, visitors parked in pullouts and on the roadside of Route 23A and walked along the highway's narrow shoulder to access Kaaterskill Creek. The sight lines along the steep, winding highway in this area are limited and the road shoulders do not meet New York State Department of Transportation's (NYSDOT) minimum design standards for pedestrian use of shoulders.

Consequently, parking and pedestrian access on the highway create significant vehicle traffic and pedestrian safety risks.

In recent years, parking on Route 23A has been banned during the peak summer season and this has helped to address traffic and pedestrian safety issues there. However, some visitors still walk on the steep, narrow, and winding road shoulder from the hamlet of Palenville or from trolley stops on Route 23A to access the creek. When this occurs, it creates safety hazards for vehicle passengers and pedestrians alike.

4. Foundation for Visitor Use Management and User Capacities

4.1 Legal and Administrative Foundation

The following legislation, policies, management direction, and planning documents provide the legal and administrative foundation for this project. The approach to address visitor use management and user capacities for the Kaaterskill Clove Project Area was designed to be consistent with the principles, direction, and legal requirements contained within them.

New York State Constitution, Article XIV (1894) establishes constitutional protection of the Forest Preserve as a valuable natural resource that "shall be forever kept as wild forest lands," prohibiting resource extraction and exchange of ownership of these lands. Subsequent amendments to the article have made specific allowances for actions that would otherwise conflict with this article.

Catskill Park State Land Master Plan (1985; updated in 2014) establishes that natural resource protection of the Catskill Forest Preserve is paramount, and that human use and enjoyment of the Forest Preserve should occur to the extent that use does not degrade the physical, biological, social, or psychological aspects of natural resources. The plan defines the land classification system that applies to all Forest Preserve lands in the Catskill Park and provides management guidelines for those lands by establishing geographic management units and related unit management plans (UMPs). This plan requires that each UMP includes an assessment of the physical, biological, and social carrying capacity of an area, particularly for areas threatened by overuse with respect to resource limitations and land use classification.

Kaaterskill Wild Forest Unit Management Plan (1987) and Amendments (2013, 2015) describe the natural resources, facilities, and issues affecting the Kaaterskill Wild Forest Unit in which the Kaaterskill Clove Project Area is located and outline general management objectives and proposed management actions for the unit. This includes managing visitor use in "overused areas" in the vicinity of Kaaterskill Falls. The Kaaterskill Wild Forest UMP also documents visitor safety concerns at Kaaterskill Falls and along Route 23A and describes the negative impacts that visitor behavior can have on natural resources and visitors' experiences.

Catskill Advisory Group Report (2022) provides a long-term, parkwide, strategic framework for the future management of the Catskill Park in response to increased visitor use pressures in the region. The framework was developed by the CAG, which was formed by the State of New York and included representatives with expertise in local government, recreation, resource protection, tourism, and related disciplines. In the report, the CAG recommended NYSDEC take immediate action to adopt the VUMF as its core management tool and to use the VUMF process to identify desired visitor experiences, associated user capacities, and management steps necessary to create desired experiences and protect natural resources. The report specifically mentions the need for visitor use management in the Kaaterskill Clove Project Area.

4.2 Other Related Plans and Management Documents

The project approach was informed by the following planning and management documents prepared by NYSDEC and its partners.

Town of Hunter Comprehensive Plan (2019) provides a vision for the Town of Hunter that guides long-term planning and decision-making. This plan includes reference to Kaaterskill Falls as a valuable resource that drives tourism and must remain protected. It recommends implementing a shuttle system to the Kaaterskill Falls and Kaaterskill Clove areas to reduce roadway congestion.

Palenville, NY Greeneways Plan (2014) examines and provides recommendations for economic development, transportation and parking, trail connections and green space, and streetscapes that connect Palenville with destinations including the Kaaterskill Clove Project Area. This plan also develops a future vision for Palenville. This plan is the product of work conducted by the University at Albany Planning Studio.

Catskill Forest Preserve Public Access Plan (1999) identifies barriers to public use and visual, physical, and informational access on the Catskill Park Forest Preserve and provides recommendations to address these barriers and enhance the public's understanding of, appreciation for, and experiences in the Catskill Park Forest Preserve. This plan emphasizes a forest preserve-wide perspective of resource protection and public use management, and the importance of public/private partnerships and coordination.

Greater Catskill Region Comprehensive Recreation Plan (2020) includes an inventory of recreational assets across the Catskill region, a review of county planning documents, an assessment of outdoor recreation trends, and a summary of feedback from recreation providers and the public. This plan was developed with collaboration from NYSDEC, New York City Department of Environmental Protection, Catskill Center, and the Catskill Watershed Corporation.

Managing Recreation-Related Impacts in the Catskill Park and Building a Culture of Wildlands Stewardship (2021) reports the results of a parkwide assessment conducted by the Leave No Trace Center for Outdoor Ethics. The assessment included key staff consultations to understand recreation-related issues, an online survey of park managers and partners to understand recreation use trends, pressures, impacts, and strategies, and an onsite visit to document current conditions parkwide.

5. Framework and Planning Process

This section presents an overview of the VUMF for addressing visitor use management, including user capacities in parks and protected areas (IVUMC 2016). It also describes and documents the planning process used in this project to implement the VUMF in the Kaaterskill Clove Project Area.

5.1 Framework

Several frameworks have been developed to help provide systematic, transparent, and legally defensible approaches for addressing visitor use management and user capacities in parks and protected areas. Among the better known of these frameworks is the IVUMC's framework (VUMF), which was released in 2016. The VUMF is recognized internationally as a "gold standard" for addressing visitor use management and user capacities. It has been used to guide complex, high-stakes visitor use management plans and programs at the federal, state, and local levels in the U.S. and in parks and protected areas globally.

The IVUMC hosts a website and has developed several products that explain the elements and steps of the VUMF process and provide guidance on how to implement it (IVUMC-Home, n.d.). In essence, the VUMF and other similar visitor use management frameworks are indicator-based, adaptive management frameworks. They all share a common set of core components and principles as outlined in Figure 2 and described below. These components and principles provide the framework for addressing visitor use management and user capacities in this project for the Kaaterskill Clove Project Area.

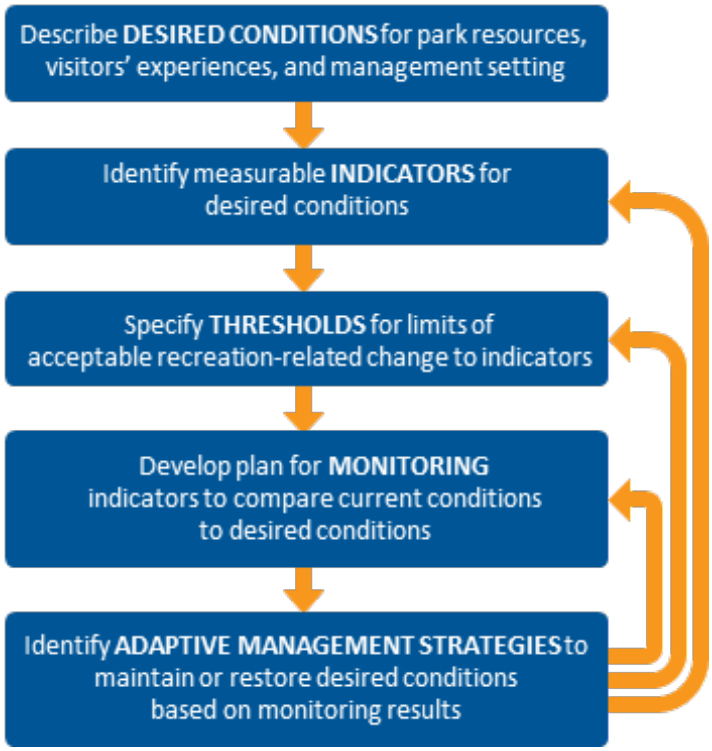

Figure 2. Core components and principles of the VUMF used to guide the NYSDEC visitor use management pilot project in the Kaaterskill Clove Project Area.

5.2 Key Concepts

There are several key concepts that form the basis of the VUMF that warrant further description. Each of these key concepts is described in this section.

Desired conditions: Desired conditions provide an important part of the foundation for addressing visitor use management and user capacities. They are narrative statements that describe the resource conditions, the quality and character of visitors' experiences and opportunities, and the management setting an agency strives to achieve and maintain. Desired conditions statements differ from current conditions statements in that they describe what conditions, outcomes, and opportunities are to be achieved and maintained into the future, not necessarily what exists today. Desired conditions statements differ from management objectives statements in that they focus on *what* to achieve, rather than *how* to achieve it.

Desired conditions statements serve as the anchor for long-term monitoring and adaptive visitor use management strategies and actions. Desired conditions statements were developed in this project for the Kaaterskill Clove Project Area, and they are reported in *Section 6. Desired Conditions*.

Indicators: Indicators are measurable attributes of park resources, visitors' experiences, and/or the management setting. They are used to assess impacts of recreation use in relation to desired conditions and to track changes in (i.e., monitor) conditions over time and in conjunction with adaptive visitor use management actions. To be applicable for visitor use management, indicators must be directly related to manageable attributes of recreation use, such as:

- Amounts, types, locations, and timing of recreation use.
- Visitors' knowledge, preparedness, and behavior.
- Design, construction, and maintenance of recreational facilities.

For example, the number of encounters with other groups per hour while hiking is an indicator related to the quality and character of visitors' experiences. Similarly, the aggregate areal extent of impact on recreation sites is an indicator related to the protection of natural resource conditions. As noted, the focus of this project is on addressing impacts of intensive visitor use on the quality and character of visitors' experiences and public safety in the Kaaterskill Clove Project Area of the Forest Preserve. Correspondingly, indicators were developed in this project related to visitors' experiences and public safety in the Kaaterskill Clove Project Area. They are reported in *Section 7. Indicators and Thresholds*.

Thresholds: Some amount of change to park resources, visitors' experiences, and even the management setting is inevitable with recreation use. Thresholds define the limits of acceptable recreation-related change to indicators beyond which conditions no longer align with desired conditions. Thresholds should be precise, time-bounded, and outcomes of recreation use rather than types or amounts of recreation use themselves. Thresholds have been specified for each of the indicators selected for the Kaaterskill Clove Project Area, and they are reported in *Section 7. Indicators and Thresholds.*

Monitoring: A systematic monitoring program provides the structure to measure indicators and assess their conditions in relation to thresholds on a recurring basis. Monitoring results provide a data-driven basis to determine if visitor use management strategies are effective and/or if additional strategies are required to achieve desired conditions. The monitoring plan for the Kaaterskill Clove Project Area is presented in *Section 10. Monitoring Plan*.

Adaptive visitor use management strategies: Adaptive visitor use management strategies are applied when on the ground conditions of one or more indicators are approaching, have reached, or have exceeded thresholds. These strategies should progress from those that are indirect and unobtrusive to more direct measures if they are warranted by conditions on the ground. For example, efforts to manage crowding-related impacts to visitors' experiences might include information and education campaigns to inform visitors of "best times" to visit to avoid crowded conditions. The intent of such a strategy is to shift some use away from peak periods and spread it out to reduce crowding. If conditions on the ground suggest information and education alone are not effective at addressing crowding, it may be necessary to implement a permit system or other more direct form of visitor use management.

Regular monitoring to assess the effects of management actions is required for adaptive visitor use management to work. *Section 9. Management Strategies* presents the project team's recommendations for adaptive visitor use management strategies for the Kaaterskill Clove Project Area.

User capacities: User capacities are defined as the maximum amounts and types of recreation use an area can accommodate without unacceptable impacts to resource conditions and visitors' experiences. The VUMF provides a basis to estimate user capacities, where they are necessary as part of an overall visitor use management strategy for an area. User capacities are estimated based on quantifiable relationships between the types and amounts of recreation use and the conditions of use-related indicators ("user capacity indicators").

The best available data are used to estimate the maximum amount of recreation use that can be accommodated without exceeding thresholds for user capacity indicators. For example, trail counter data could be correlated with observations from hiking encounter patrols to estimate the maximum number of people who can hike in an area without exceeding a threshold for the number of encounters hikers have with other groups per hour or day. Crowding- and parking-related user capacities were estimated in this project for the Kaaterskill Clove Project Area.

The methods used to estimate these user capacities, and the results are reported in *Section 8. Current Visitor Use, Impacts, and Capacities*.

5.3 Planning Process

The VUMF was implemented in this project using a robust planning process organized around the following four key components:

- NYSDEC Core Team workshops
- Stakeholder Working Group meetings
- Public meetings and a public-facing project website
- Onsite data collection and analysis, including a survey of current visitors

Each of these components of the planning process is described in this section.

5.3.1 NYSDEC Core Team Workshops

As an initial step in the project, NYSDEC assembled an internal core team of agency staff. The members of the NYSDEC Core Team were selected from the NYSDEC Divisions of Lands and Forests, Forest Protection, Outdoor Recreation; NYSDEC regional administration; and NYSDEC operations group. Members were selected to represent key areas of expertise, experience, and responsibilities related to managing recreation use in the Kaaterskill Clove Project Area.[5] The project team prepared, facilitated, and documented the results of a four-part virtual workshop series with the NYSDEC Core Team.[6] The workshop series was structured according to the Elements and Steps of the VUMF (IVUMC, 2016), as follows:

Workshop #1: Build the Foundation

The purpose of the first workshop was to clarify and establish with the NYSDEC Core Team the purpose and need for the NYSDEC visitor use management pilot project in the Kaaterskill Clove Project Area. Interactive sessions were used to review and discuss guiding legislation, policies, and

[5] A summary of NYSDEC Core Team engagement activities conducted as part of the project is included in Appendix A .

[6] The project team also conducted a project kickoff meeting and regular project check-in meetings with the NYSDEC Core Team. A summary of the project team's engagement with the NYSDEC Core Team is included in Appendix A. All of these engagement activities were conducted virtually.

management direction and to assess and summarize existing information describing current conditions in the project area. A plan for public and stakeholder engagement was also discussed as part of the workshop and an engagement strategy was developed following and as an outcome of the workshop discussions (Appendix B).

In addition, the project team developed the project purpose and need presented in this report based, in part, on the results of this workshop. The project purpose and need were further informed and refined based on the other engagement and data collection components of the project. During the workshop, NYSDEC Core Team members also shared and discussed personally selected photographs of the project area that represent to them special characteristics and values they associate with the Kaaterskill Clove Project Area. This exercise provided a foundation for discussing desired conditions in the second NYSDEC Core Team workshop.

Workshop #2: Define Visitor Use Management Direction

In the second workshop, the project team facilitated discussions with the NYSDEC Core Team to define desired conditions for visitors' experiences, public safety, and related social conditions. A mapping exercise was used to document important activities, destinations, and visitor use conditions in the project area. The workshop also included discussions about potential indicators related to visitors' experiences and public safety. The NYSDEC Core Team was asked to consider and discuss if they could measure just one thing to gauge the quality of visitors' experiences in the project area and just one thing to measure public safety, what those would be. The project team led follow-up guided discussions with the NYSDEC Core Team to assist them in further evaluating and selecting indicators for the Kaaterskill Clove Project Area.

Workshops #3 and #4: Identify Management Strategies

The final two workshops in the series focused on specifying thresholds for indicators, identifying visitor use management strategies, and establishing numeric user capacities, where applicable. The discussion and development of these components of the VUMF involved iteratively evaluating potential thresholds, user capacities, and management strategies in relation to current conditions and desired conditions. Prior to the management strategies workshops, the project team delivered a two-part data results presentation. This helped provide the NYSDEC Core Team with a data-driven basis for evaluating and identifying thresholds, user capacities, and management strategies for the Kaaterskill Clove Project Area.

In addition, the project team led supplemental guided discussions with the NYSDEC Core Team to help them further evaluate and refine thresholds, strategies, and user capacities for the project area.

5.3.2 Stakeholder Working Group Meetings

Stakeholders were engaged in the NYSDEC Visitor Use Management Pilot Project for the Kaaterskill Clove Project Area in two stages.[7] In the first stage, key stakeholders were identified by NYSDEC, with support from the project team, and invited to participate in a virtual group discussion. The purposes of the discussion were to: 1) provide the selected stakeholders with foundational information about the project; 2) invite them to share their questions, thoughts, and concerns about the project; and 3) ask them to share their perspectives about visitor use management issues and opportunities in the project area. Themes that emerged from this discussion with stakeholders were

[7] A summary of stakeholder engagement activities conducted as part of the project is included in Appendix C.

incorporated into the development of desired conditions statements for the project area and used to help inform the project team's onsite data collection and analysis plan.

In the second stage of stakeholder engagement, select stakeholders were invited to voluntarily participate in a formal Stakeholder Working Group.[8] The project team prepared, facilitated, and documented the results of a three-part in-person meeting series with the Stakeholder Working Group. Select members of the NYSDEC Core Team attended the Stakeholder Working Group meetings as observers and to provide responses to questions that were more suitable for them than the project team to address. Like the NYSDEC Core Team workshop meeting series, the Stakeholder Working Group meetings were structured to address the Elements and Steps of the VUMF in sequence. The Stakeholder Working Group meetings were scheduled in step with and to create feedback loops with the NYSDEC Core Team workshop series.

The project team also delivered a two-part data results presentation to the Stakeholder Working Group between the first and second meetings. In addition, the project team conducted 1:1 conversations and virtual meetings with members of the Stakeholder Working Group to supplement and enhance the opportunities for them to engage in the process.

5.3.3 Public Meetings and Project Website

The planning process for the NYSDEC visitor use management pilot project in the Kaaterskill Clove Project Area included multiple opportunities and formats for public engagement.[9] The focus of these engagement opportunities was on informing interested members of the public about the project and consulting with them on desired conditions and potential management strategies for the project area. As part of the public engagement strategy, the project team developed and hosted a project website to provide updates and host documents for public review. The website also contained a feedback and comment form that included a project email contact, an open response field, and specific prompting questions that were updated during the project.

The project team also prepared, facilitated, and documented the outcomes of two public meetings. The public meetings were designed to inform, consult, and involve the public during strategic points in the planning process. The first meeting was conducted in-person and was held in Hunter, New York. The second meeting was conducted virtually to provide an opportunity for members of the public from the broader region to participate more easily. In the first meeting, the project team provided information about the project, generally, and about the VUMF and how it would be applied in the project specifically. In addition, prompting questions were used by the project team to elicit perspectives from meeting participants about visitor use management issues and opportunities in and desired conditions for the project area.

In the second meeting, the project team provided an update on the overall progress on the project and used a series of discussion prompts and meeting exercises to hear from the meeting participants their ideas about potential visitor use management strategies for the Kaaterskill Clove Project Area. Select members of the NYSDEC Core Team attended the public meetings as observers and small group facilitators and provided responses to select questions. Several members of the Stakeholder Working Group also participated in the public meetings.

[8] The Stakeholder Working Group roster is included in Appendix C.
[9] A summary of public engagement opportunities provided as part of the project is included in Appendix D.

5.3.4 Onsite Data Collection and Analysis

The project team worked in collaboration with the NYSDEC Core Team to design and conduct primary data collection onsite in the Kaaterskill Clove Project Area during July 2023. The study plan was informed by themes regarding visitor use management issues and opportunities in the project area that emerged from the project team's review of background information, workshop discussions with the NYSDEC Core Team, and engagement with stakeholders and the public. The study plan was further informed by the project team's experience designing and conducting visitor use management studies in parks and protected areas throughout the U.S.

The purpose of the onsite data collection was to provide a data-driven basis for developing desired conditions, indicators, thresholds, user capacities, and management strategies for the Kaaterskill Clove Project Area. The specific objectives were to collect data that could be summarized and analyzed to:

- Describe current conditions, with respect to vehicle traffic, parking, visitor use volumes and patterns, and crowding.
- Evaluate current conditions from onsite visitors' perspectives.
- Assess onsite visitors' attitudes about visitor use management strategies.
- Identify statistical relationships between visitor use, traffic, parking, and crowding.
- Estimate numeric user capacities.

The onsite data collection methods included automated vehicle traffic counts, trail use counts with infrared trail counters, observation-based parking counts, observation-based counts of the number of people in the Middle Pool area, GPS-based tracking of visitor use patterns, and a visitor survey. A detailed summary of the onsite data collection effort is included in Appendix E. Results of the data collection and analysis are referenced throughout this report and were used to help inform all aspects of the project results and recommendations.

6. Desired Conditions

This section presents desired conditions statements developed by NYSDEC for the Kaaterskill Clove Project Area. The section explains the basis for the desired conditions statements, presents desired conditions for the project area overall and for subregions of the project area, and lists appropriate activities and facilities in each subregion of the project area.

6.1 Basis for Desired Conditions Statements

The desired conditions statements developed for the Kaaterskill Project Area focus on visitors' experiences[10] and public safety and were developed using several sources as described in this section. Foundational legislation, agency policies, and management and planning documents that establish the project area's purpose and management direction were used to form the basis for desired conditions. These include the New York State Constitution Article XIV Section 1, the Catskill Park State Land Master Plan, the Kaaterskill Wild Forest Unit Management Plan and Amendments, and the CAG Final Report.

[10] Visitors include any person who visits the Kaaterskill Clove Project Area for recreational use, including residents of local communities.

Internal planning workshops described in *Section 5. Framework and Planning Process* were conducted with the NYSDEC Core Team to expand on the desired conditions established in the project area's foundational legislation, agency policies, and management documents. The first NYSDEC Core Team workshop was held in February 2023 and used a photo exercise to elicit themes from NYSDEC Core Team members about desired conditions in the project area. During this workshop, NYSDEC Core Team members were asked to submit photos that represented what makes the project area special (i.e., the unique characteristics of the project area) and to describe the photos during the workshop.

The second NYSDEC Core Team workshop was held in May 2023, and used the following open-ended questions to prompt NYSDEC Core Team members to further articulate desired conditions for the Kaaterskill Clove Project Area:

- What should visitors experience when they visit the Kaaterskill Clove Project Area?
- How should people feel and what should they take away from their experiences in the Kaaterskill Clove Project Area?
- What types of opportunities should the public have to experience the Kaaterskill Clove Project Area?
- What benefits should people and local communities experience from recreation in the Kaaterskill Clove Project Area?

Stakeholders and the public were consulted to help develop the desired conditions statements for the Kaaterskill Clove Project Area. As noted, a group discussion with stakeholders was conducted virtually in March 2023, to elicit their perceptions about concerns, needs, and opportunities for visitor use management in the project area.[11] The perceptions shared during this discussion were incorporated into the development of the desired conditions statements for the project area. The public website was launched in May 2023, and the first in-person public meeting was held in Hunter, New York in May 2023 to elicit perspectives from the public about desired conditions for the project area.

Meetings with the Stakeholder Working Group were conducted in person in October 2023 and March 2024 to further elicit perspectives on desired conditions for the project area. The public website, public meeting, and first Stakeholder Working Group meeting used similar open-ended questions to those used during the second NYSDEC Core Team workshop (listed above) to prompt input.[12]

Information and insights from the sources noted were used by NYSDEC to develop desired conditions statements for the Kaaterskill Clove Project Area to reflect its Forest Preserve status and Wild Forest classification. To further reflect the spectrum of resource, visitor use, and management conditions that exist in the project area, desired conditions statements were developed for the project area, overall, as well as for three specific subregions presented in Figure 3: 1) Kaaterskill Falls Subregion; 2) Route 23A Subregion; and 3) Escarpment Subregion.

The concept of these subregions emerged during NYSDEC Core Team workshop discussions based on the resource types, recreation opportunities, and desired experiences for visitors that are unique

[11] The group discussion with stakeholders was summarized in a separate synthesis document delivered to NYSDEC and shared publicly on the project website.
[12] The first question was modified for the public website to read: *What would you like to experience when you visit this area?*

to each subregion. In addition, the desired conditions statements were developed to reflect the fact that robust partnerships with adjacent communities and partner organizations, as well as ongoing coordination of management between the Kaaterskill Wild Forest and the adjacent North-South Lake Campground and Day Use Area, are critical to achieving desired conditions for the Kaaterskill Clove Project Area.

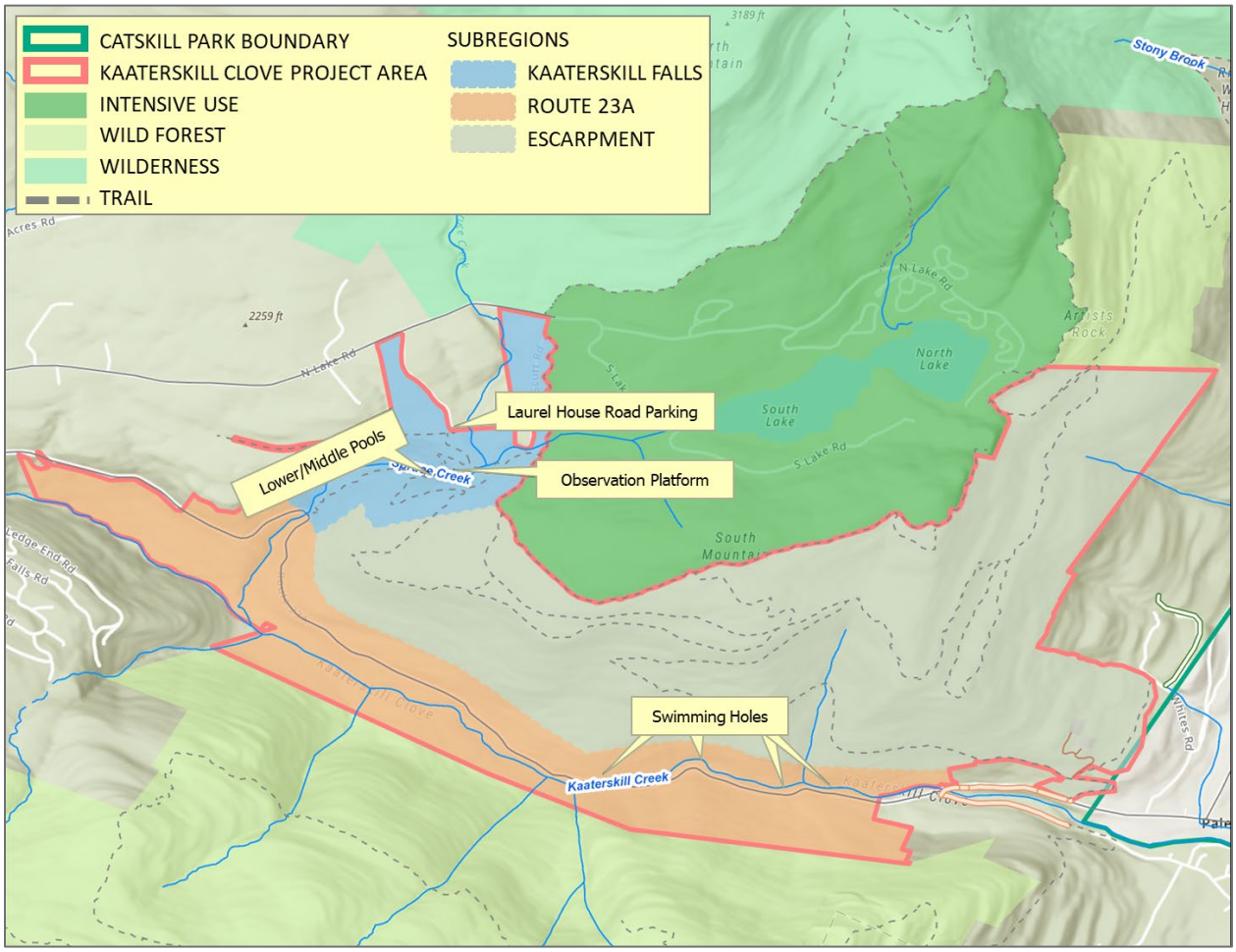

Figure 3. Kaaterskill Clove Project Area Subregions.

6.2 Desired Conditions Statements

6.2.1 Overall Kaaterskill Clove Project Area

The Kaaterskill Clove Project Area provides positive and high-quality visitor experiences to safely access outstanding scenic views and feel connected to nature with relative ease. Visitors have opportunities to realize physical and mental health benefits from spending time in nature. They are able to recharge and refresh through sensory, emotional, and spiritual connections to the plants, animals, and water. The sights and sounds of nature dominate and allow visitors to immerse themselves in a Wild Forest setting. The wild character and natural resources in Kaaterskill Clove are protected and maintained for current and future generations.

Previously impacted areas in Kaaterskill Clove are restored. Visitor activities, facilities, and services are in harmony with the natural surroundings and with the enjoyment and safety of the visiting public. The opportunities the area offers for public use promote representation, inclusion, and access for all. All people feel welcome, which fosters in them a sense of place for the project area, an appreciation for the unique qualities and wild setting of the Forest Preserve, and a desire to return with their family and friends to share special experiences.

Visitors can participate in a spectrum of dispersed and responsible public uses and low impact activities. Frequent encounters with other visitors are expected in parking areas, on popular trails, and at primary destinations, but visitors can move freely along the trail network and among scenic destinations. When encounters with other visitors occur, these interactions are positive and create a sense of shared appreciation for the project area. Visitors also have opportunities to hike on less-traveled trails and to enjoy a sense of calm and tranquility in the natural surroundings.

The Clove's natural scenic beauty predominates visitors' experiences, whether they are driving through the Clove or spending time along the creek. Travel on the roadway is uncongested and drivers do not experience traffic safety risks from pedestrians or parked vehicles in or along the shoulder of the highway. Visitors experience a sense of arrival when they enter the Clove. Visitors can find safe and convenient places to park their vehicles with modes of access from where they park to safely reach their destinations in the project area. They can access the area without impacting the flow of traffic on local roads, causing congestion that restricts local residents' ability to go about their daily routines, or creating potential traffic safety hazards for themselves or others.

Information and services are available and promoted to help visitors feel prepared for their visit and to make informed decisions about how to safely access and enjoy the area at their own pace and skill level. Education and information about points of access, recreation opportunities, the popularity of the area, the area's history and significance, responsible use of public lands, and the importance of planning ahead are provided by NYSDEC and partners. This information is made available for advanced trip planning and onsite. All information is designed to communicate clearly and effectively with the diverse public that visits this area.

Facilities, trails, signage, and wayfinding are provided to encourage safe and sustainable visitor use, and to minimize impacts to natural resources and the quality of visitors' experiences. They are strategically located to provide optimal utility within the smallest footprint necessary. They are designed to be unobtrusive and to integrate with the rustic, natural, wild, and scenic character of the area, and to be welcoming for all visitors.

Visitors are connected and engaged with local communities and businesses that work collaboratively with NYSDEC, NYSDOT, and other partner organizations and agencies. Strong and enduring partnerships support safe, memorable, and high-quality visitor experiences.

6.2.2 Kaaterskill Falls Subregion

Opportunities for visitors in Kaaterskill Falls Subregion are diverse. They include short visits to scenic vistas, hikes along the official trail network that follows Spruce Creek, and enjoyment of the pools that form at the base of the falls along the creek. Visitors to this area can expect other people to be present along trails, at vistas, and in and around the pools at the base of the falls. Yet, iconic views of Kaaterskill Falls and the surrounding landscape predominate visitors' experiences and visitors do not feel crowded. Infrastructure and facilities in this area support accessibility for all people. They are designed to help direct visitor use, provide safe and enjoyable visitor experiences, minimize impacts to natural resources, and promote the restoration of previously impacted areas.

Visitor information is readily accessible to all visitors for wayfinding, interpretation, and education about low-impact practices. Administrative personnel are present during busy periods to support safe and sustainable visitor use in this area. The levels of infrastructure, facilities, and staffing are more prominent here compared to the other subregions in the Kaaterskill Clove Project Area.

6.2.3 Route 23A Subregion

The Clove's natural scenic beauty predominates visitors' experiences in the Route 23A Subregion, whether they are driving through the Clove on the scenic byway or spending time along the creek. Travel on the roadway is uncongested, travel speeds are safe, and drivers do not experience traffic safety risks from pedestrians or parked vehicles in or along the shoulder of the highway. Visitors can safely access the creek, without having to walk in or along the roadway. Visitors spending time along the creek can appreciate the rush of the cool creek waters that cut the scenic landscape of the narrow Clove, and the self-guided experiences afforded by the lack of trails. Visitors to this area can expect other people to be present at the pools formed by the creek and along the creek bed, but visitors do not experience crowding. Visitors' activities are in harmony with the natural surroundings and with the enjoyment and safety of the visiting public.

Recreational facilities are kept to a minimum to balance with the Wild Forest character of the area. Strategically placed signage reminds visitors of the area's unique natural features and encourages visitors to recreate safely and sustainably. Administrative personnel are periodically present to support safe and sustainable visitor use in this area, and they are reachable in an emergency.

6.2.4 Escarpment Subregion

Visitors to the Escarpment Subregion can experience the surrounding forested landscape along an expansive, less-traveled trail network with dramatic scenic vistas that stretch across and down into the Clove. Visitors engage with the landscape through a broad range of public uses that include hiking, camping, skiing, hunting, ice climbing, and more. Those who hike can enjoy a range of experiences from family-friendly short hikes to long-distance traverses that include historic monuments and outstanding scenic overlooks along the way. Those who prefer unconfined and self-sufficient activities such as hunting and ice climbing can also appreciate this area and can expect high-quality experiences.

Visitors have opportunities to feel close connections to nature and to experience tranquility. Signs are kept to a minimum in this area to harmonize with the Wild Forest setting and to help visitors navigate the trail network, while allowing for a sense of adventure in the forest. There is little or no presence of administrative personnel here, allowing visitors to practice self-reliance as they experience the area.

6.3 Activities and Facilities

In conjunction with the process to develop desired conditions statements, NYSDEC identified recreation activities and facilities that are appropriate in each subregion of the Kaaterskill Clove Project Area. These are listed in Table 1.

Table 1. Appropriate activities and facilities, by subregion of the Kaaterskill Clove Project Area.

Subregion	Activities	Facilities

Kaaterskill Falls	• Cross-country skiing
	• Day hiking
	• Horseback riding in select areas
	• Ice climbing
	• Nature study
	• Picnicking
	• Sightseeing along the creek
	• Waterfall viewing
		• Accessible primitive campsites
		• Garbage facilities
		• Horse mounting platform
		• Informational and directional signage
		• Kiosks with trail registers and signage
		• Observation platform
		• Parking areas
		  ○ Laurel House Road parking lot
		  ○ Scutt Road parking lot
		• Pedestrian bridge
		• Toilet facilities
		• Trail network (including hardened stairways and accessible trails

Route 23A	• Fishing • Ice climbing • Nature study • Sightseeing along the creek • Waterfall viewing	• Informational signage • Parking areas (Route 23A roadside)[13]

Escarpment	• Backpacking
	• Camping in designated campsites
	• Cross-country skiing
	• Day hiking
	• Dispersed camping
	• Horseback riding
	• Hunting
	• Ice climbing
	• Mountain biking
	• Nature study
	• Picnicking
	• Snowmobiling on designated trails
	• Trapping
		• Informational and directional signage
		• Kiosks with trail registers and signage
		• Parking areas
		  ○ Harding Road parking lot
		  ○ Whites Road parking lot
		• Primitive campsites
		• Trail network

[13] Parking in roadside lots and pullouts along Route 23A was temporarily restricted during the 2023 and 2024 summer seasons. This action may be permanently implemented in the future, which would effectively restrict parking in the Route 23A subregion.

7. Indicators and Thresholds

This section presents the indicators and thresholds selected by NYSDEC to monitor and adaptively manage visitor use in the Kaaterskill Clove Project Area according to desired conditions. The section explains the basis for the selected indicators and thresholds, presents the selected indicators and thresholds, and provides a summary table of them for quick reference. The monitoring plan for the Kaaterskill Clove Project Area presents guidance and tools for long-term monitoring of the selected indicators (see *Section 10. Monitoring Plan*).

7.1 Basis for Indicators and Thresholds

Several sources were used to develop the indicators and thresholds selected by NYSDEC for long-term monitoring and adaptive management of visitor use in the Kaaterskill Clove Project Area. These sources include foundational legislation, agency policies, and management documents for Kaaterskill Clove; results from internal planning workshops conducted with the NYSDEC Core Team; insights from the Stakeholder Working Group; results from an onsite survey of visitors to the project area; input from the public; and guidance documents from the IVUMC. In the process to evaluate and ultimately select indicators for the Kaaterskill Clove Project Area, NYSDEC considered the following questions based on the IVUMC's definition of and criteria for indicators:

- Is the indicator a valid and measurable proxy for a key component(s) of the desired conditions expressed for visitors' experiences and/or public safety in the project area?
- Would the indicator be effective at tracking changes in key characteristics of visitors' experiences and/or public safety that are specifically associated with recreation use?
- Does the indicator provide a systematic basis to assess progress towards achieving and maintaining desired conditions for visitors' experiences and/or public safety in the project area?
- Is the indicator relatively easy to measure reliably? Related, is it administratively and financially feasible for NYSDEC to commit to monitoring this indicator on an ongoing basis?
- Is the condition of the indicator likely to be responsive to/change as a function of visitor use management actions?
- Is the indicator directly related to the amounts of recreation use in the project area (not necessary for a good indicator, but required for an indicator used as a basis to estimate numeric user capacities)?

Thresholds were specified by NYSDEC for each selected indicator to reflect the limits of acceptable recreation use-related change beyond which desired conditions for the project area are not being met. The thresholds are ultimately management judgments made by NYSDEC. These judgments were informed by input from the public, meetings with the Stakeholder Working Group, results of the onsite data collection conducted as part of this project, and relevant laws, policies, and management guidance.

Ultimately, NYSDEC judged that the thresholds specified for each indicator strike the best balance possible among several critical factors, including the quality and character of visitors' experiences, the practical feasibility of managing use to achieve desired conditions, and a commitment to provide safe, equitable, and inclusive access to the Kaaterskill Clove Project Area.

7.2 Selected Indicators and Thresholds

Using the criteria and considering the sources of input noted, NYSDEC selected the following indicators for long-term monitoring and adaptive management of visitor use in the Kaaterskill Clove Project Area:[14]

- People-per-viewscape (PPV) in the Middle Pool area
- Vehicles-at-one-time (VAOT) in select parking lots and adjacent overflow areas
- Vehicle traffic queue length on North Lake Road
- Intergroup encounters on a section of trail in the Escarpment Subregion

This section provides a description of each indicator, specifies thresholds for each indicator, and explains the basis and rationale for the indicators and thresholds selected by NYSDEC. As noted, the monitoring plan for the Kaaterskill Clove Project Area provides guidance and tools for long-term monitoring of the selected indicators (see *Section 10. Monitoring Plan*).

7.2.1 Indicator: People-Per-Viewscape in the Middle Pool Area

Description: The PPV indicator will be used to measure and monitor the number of people present in a select and representative viewscape in the Middle Pool area. The indicator provides a basis to assess crowding at Kaaterskill Falls, and corresponding impacts to the quality of visitors' experiences and crowding-related risks to public safety. The viewscape depicted in Figure 4 was used for PPV counts and crowding-related questions in the visitor survey administered onsite during the summer 2023 data collection. This viewscape will be used by NYSDEC to monitor PPV in the Middle Pool area. It is important to note that this viewscape does not include all people who may be present in the Middle Pool area, just those people in the specific area depicted in the photo in Figure 4.

Figure 4. Viewscape for monitoring PPV in the Middle Pool area.

[14] Appendix F reports ideas that were mentioned as potential indicators during meetings with the NYSDEC Core Team, the Stakeholder Working Group, and/or the public but not selected for adoption by NYSDEC.

Threshold: The threshold for PPV in the Middle Pool area is as follows:

There will be fewer than 24 PPV in the Middle Pool area viewscape 90% of sampled time.

Rationale: Crowding is a negative reaction to the number of people in a space that can cause people to experience stress (Stokols, 1972; Lepore, 2012). Crowding has been documented to adversely affect the quality of visitors' experiences in public lands recreation areas and to cause visitors to adopt crowding avoidance behaviors that can cause resource impacts and potential public safety issues (e.g., off-trail travel, per National Park Service, 2023).

A history of concern about intensive visitor use levels and crowding impacts in the Kaaterskill Clove Project Area has been recorded in official planning and management reports, stakeholder advisory reports, and popular media. In addition, crowding was identified as a primary issue of concern in the Kaaterskill Clove Project Area by members of the public, the Stakeholder Working Group, and the NYSDEC Core Team.

Findings from the onsite visitor survey during summer 2023 further reinforce the significance of crowding at Kaaterskill Falls, as follows:

- A majority of visitors surveyed reported that they enjoy the social atmosphere when visiting a place like Kaaterskill Falls (62%), but that seeing a lot of other people on trails or paths like the ones at Kaaterskill Falls can make them feel crowded (72%) and that views of the natural scenery aren't as good when it's crowded (67%).
- A majority of visitors surveyed also said that crowding can make their visit to a place like Kaaterskill Falls less enjoyable (58%) and that it's important to them to be able to find an uncrowded spot to enjoy when they visit areas like Kaaterskill Falls (71%).
- Visitors who were surveyed were asked to look at a series of photo simulations with varying numbers of people in the viewscape depicted in Figure 4. About half (53%) of all visitors surveyed said they would feel crowded when there are 18 people in the viewscape and about two-thirds (64%) said they would feel crowded when there were 24 people in the viewscape (Figure 5). An increasing majority of surveyed visitors said they would feel crowded when there were 27 or more people in the viewscape (70% to 100%; Figure 5). Members of the Stakeholder Working Group were even more likely to report feeling crowded by these conditions than visitors who completed the survey onsite (Figure 6). These results suggest too many people (PPV) in the Middle Pool area makes visitors feel crowded.

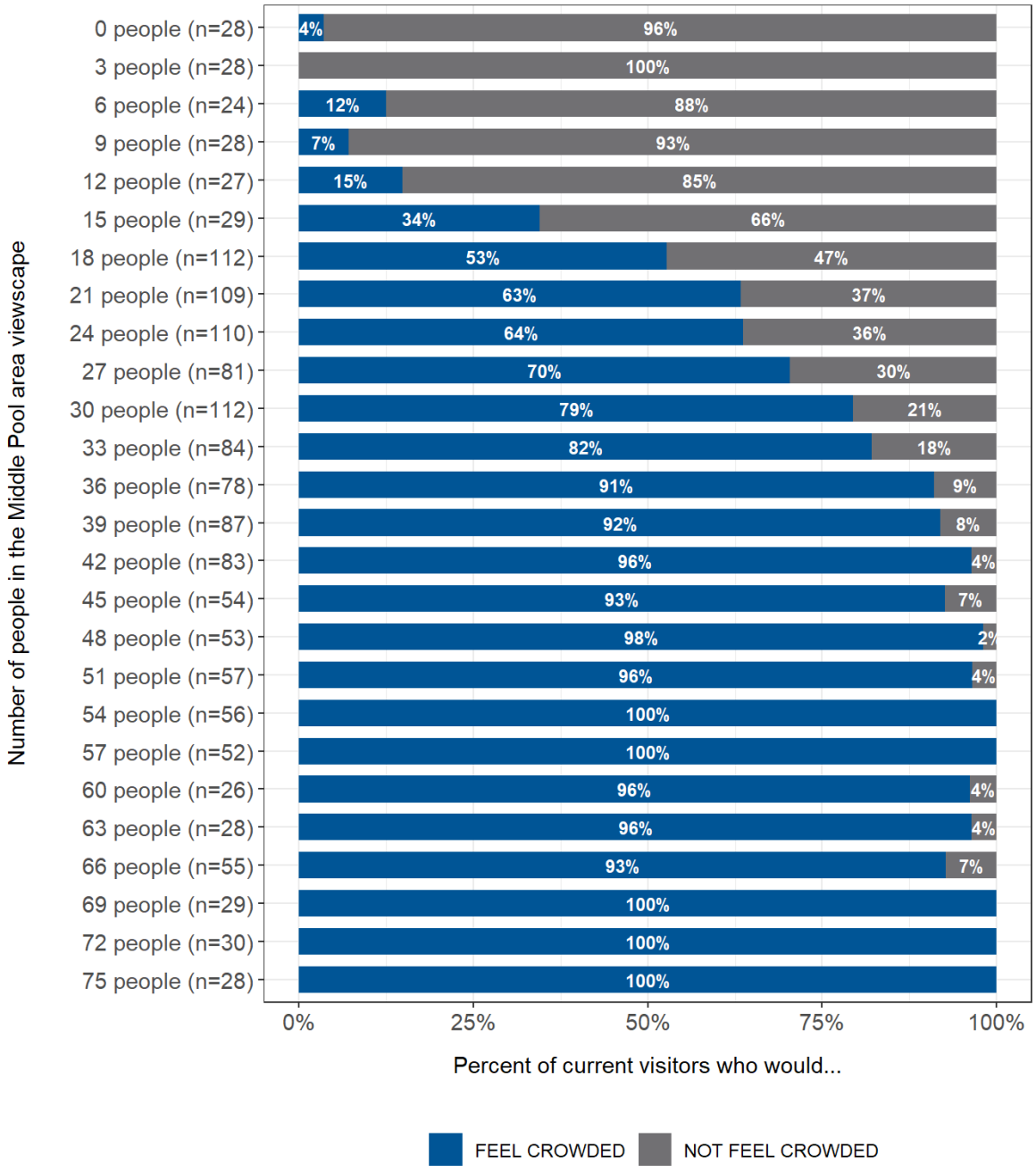

Figure 5. Summary of crowding responses of visitors to photo simulations of PPV in the Middle Pool area, by the number of people depicted in the viewscape.

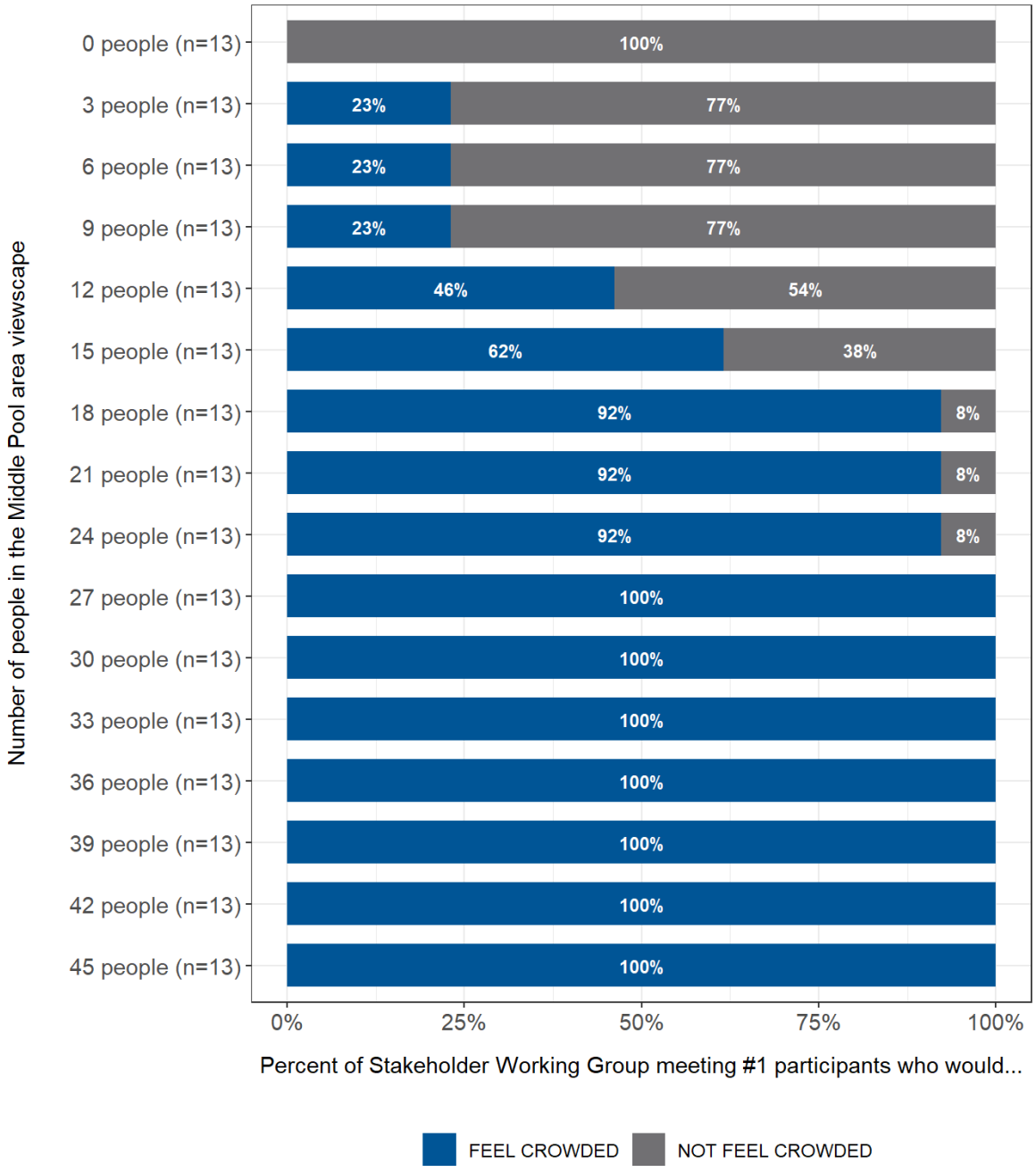

Figure 6. Summary of crowding responses of members of the Stakeholder Working Group to photo simulations of PPV in the Middle Pool area, by the number of people depicted in the viewscape.

7.2.2 Indicator: Vehicles-At-One-Time in Select Parking Lots and Adjacent Overflow Areas

Description: The VAOT indicator will be used to measure and monitor the number of vehicles parked in select parking lots and adjacent roadsides that provide primary access to the Kaaterskill Clove Project Area. The indicator provides a basis to assess parking conditions and corresponding impacts to traffic flow, traffic and pedestrian safety, visitor access, and the quality of visitors' experiences. For this indicator, NYSDEC will monitor VAOT in the parking lots and their adjacent overflow areas listed below and depicted in Figure 7:

- Laurel House Road parking lot
- Schutt Road parking lot
- South Lake Day Use parking lots (North-South Lake Campground and Day Use Area)
- Harding trailhead parking lot

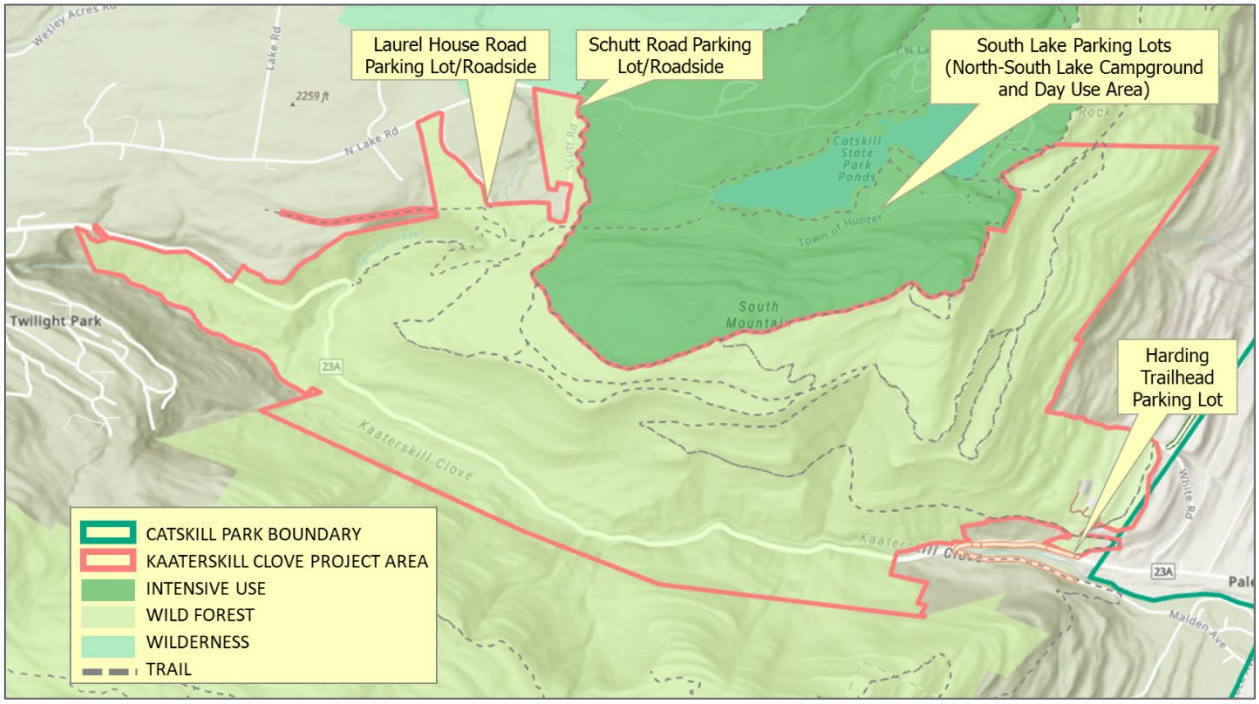

Figure 7. Selected parking lots for monitoring VAOT.

Threshold: The threshold for VAOT in the locations selected for monitoring is as follows:

The daily maximum VAOT at each monitoring location will be no greater than the designated parking supply in that location 99% of sampled days.

Rationale: Input from the NYSDEC Core Team, Stakeholder Working Group, and public suggest that on busy summer days:

- The parking lots on Laurel House Road and Schutt Road fill to and beyond their designated capacities by early to mid-morning.

- When the parking lots on Laurel House Road and Schutt Road fill, a line of traffic forms at the entrance to North-South Lake Campground and Day Use Area where visitors to Kaaterskill Falls are directed to seek overflow parking.
- Other visitors park in private pay-for-parking lots along North Lake Road and then walk alongside moving vehicle traffic on local roads to reach the Kaaterskill Falls trail network.

When these parking conditions occur, traffic circulation in and among the parking areas becomes congested. This traffic congestion impacts emergency vehicle access, negatively affects neighboring residents on North Lake Road, causes visitors to experience stress and confusion, increases public safety risks due to pedestrians walking in or along roadways with moving traffic to access their desired destinations, and places undue pressure on agency staff and local officials. Free-flowing roads and parking areas are essential to public safety, visitor enjoyment, community quality of life, and workforce safety and wellbeing for agency and local staff.

7.2.3 Indicator: Vehicle Traffic Queue Length on North Lake Road

Description: This indicator will be used to measure and monitor the length of vehicle traffic queues that form on North Lake Road while visitors are waiting to enter the North-South Lake Campground and Day Use Area. The indicator provides a basis to assess traffic and visitor access conditions and corresponding impacts to public safety, traffic flow, neighboring residents, and the quality of visitors' experiences. For this indicator, NYSDEC will monitor vehicle traffic queue lengths on the blue-highlighted section of North Lake Road depicted in Figure 8.

Figure 8. Selected location for monitoring vehicle traffic queue length on North Lake Road.

Threshold: The threshold for vehicle traffic queue length on North Lake Road is as follows:

The maximum daily vehicle traffic queue length on North Lake Road will not extend to the junction of North Lake Road and Schutt Road or further west 99% of sampled days.

Rationale: A primary concern expressed during engagement sessions for this project, and particularly among some members of the Stakeholder Working Group, is the line of traffic that forms on North Lake Road while visitors are waiting to enter North-South Lake Campground and Day Use Area. When this occurs, it impacts emergency vehicle access, negatively affects neighboring residents on North Lake Road, causes visitors to experience stress and confusion, increases public safety risks due to pedestrians walking in or along roadways with moving traffic to access their desired destinations, and places undue pressure on agency staff and local officials.

7.2.4 Indicator: Intergroup Encounters Per Hour While Hiking on a section of trail in the Escarpment Subregion

Description: This indicator will be used to measure and monitor the number of encounters visitors have with other groups per hour while hiking on the section of trail[15] located in the Escarpment Subregion. The indicator provides a basis to assess opportunities for visitors to experience tranquility and calm along a less-traveled trail network in the Escarpment Subregion of the Kaaterskill Clove Project Area. For this indicator, NYSDEC will monitor intergroup encounters per hour on the section of trail depicted in Figure 9.

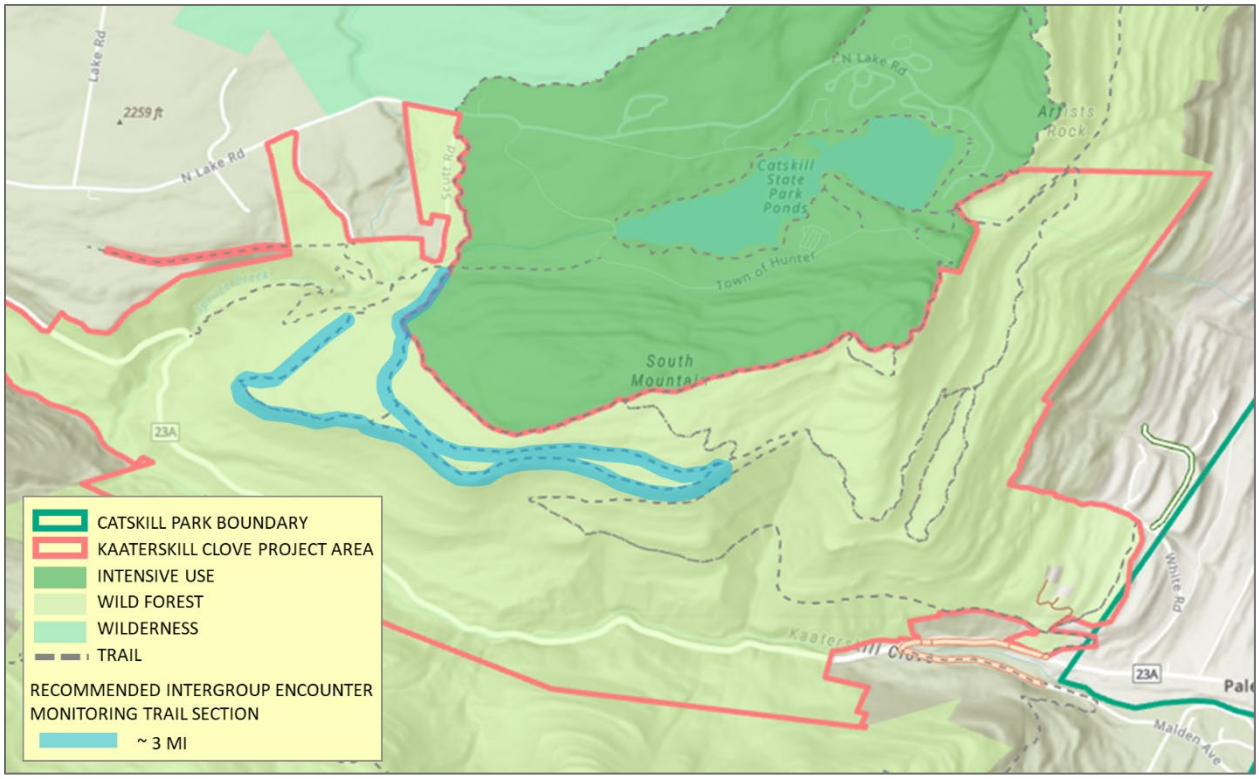

Figure 9. Selected section of trail for monitoring intergroup encounters per hour while hiking in the Escarpment Subregion.

Threshold: The threshold for intergroup encounters per hour while hiking on the section of trail in the Escarpment Subregion is as follows:

[15] This section of trail includes portions of the Escarpment Trail, Yellow Horse Trail, and Schutt Road Trail.

Visitors will have fewer than seven intergroup encounters per hour while hiking on the section of trail in the Escarpment Subregion 90% of sampled hikes.

Rationale: Best practices in outdoor recreation management include providing a diversity of recreation opportunities. Consistent with this practice, the desired conditions for the Escarpment Subregion prescribe a lower-density, less-developed setting and range of experiences for visitors than in the Kaaterskill Falls Subregion. There is substantial precedent for using encounter rates as an indicator of the quality and character of visitors' experiences in trail-based, natural resource recreation settings like the Escarpment Subregion (IVUMC, 2019; National Park Service, 2023).

No data were collected as part of this project to help provide a basis for establishing a threshold for intergroup encounter rates on the section of trail in the Escarpment Subregion. Instead, the threshold for intergroup encounters specified above is adapted from 2021 Draft Management Guidance for Forest Preserve Lands in the Adirondack Park prepared by NYSDEC and the Adirondack Park Agency. The draft guidance specifies a threshold for intergroup encounters within a Wild Forest in the Adirondack Park of fewer than 20 other groups encountered *per day* while hiking on trails. Assuming day hikes on the section of trail in the Escarpment Subregion are typically about three hours in length, the draft guidance translates to a threshold of fewer than seven encounters with other groups *per hour* while hiking.

This threshold is similar in order of magnitude to the standard expressed in the U.S. Forest Service's Recreation Opportunity Spectrum for intergroup encounters in comparable national forest recreation settings – i.e., up to 15 encounters *per day* in Semi-Primitive, Non-Motorized settings (United States Department of Agriculture Forest Service 1990).

7.3 Summary of Selected Indicators and Thresholds

Table 2 presents a summary of the indicators and thresholds selected by NYSDEC to guide long-term monitoring and adaptive management of visitor use in the Kaaterskill Clove Project Area according to desired conditions. As noted, Appendix F reports ideas that were mentioned as potential indicators during meetings with the NYSDEC Core Team, the Stakeholder Working Group, and/or the public, but not selected for adoption by NYSDEC. The monitoring plan for the Kaaterskill Clove Project Area provides guidance and tools for long-term monitoring of the selected indicators (see *Section 10. Monitoring Plan*).

Table 2. Summary of selected indicators and thresholds for the Kaaterskill Clove Project Area.

Indicator	Threshold
PPV in the Middle Pool area	There will be fewer than 24 PPV in the Middle Pool area viewscape 90% of sampled times.
VAOT in select parking lots and adjacent overflow areas	The maximum daily VAOT at each monitoring location will be no greater than the design capacity of the parking lot in that location 99% of sampled days.
Vehicle traffic queue length on North Lake Road	The maximum daily vehicle traffic queue length on North Lake Road will not extend to the junction of North Lake Road and Schutt Road or further west 99% of sampled days.
Intergroup encounters per hour while hiking in the Escarpment Subregion	Visitors will have fewer than seven intergroup encounters per hour while hiking in the Escarpment Subregion 90% of sampled hikes.

8. Current Visitor Use, Impacts, and Capacities

This section presents findings from the data collection, analysis, and engagement components of the project about current visitor use and impacts in the Kaaterskill Clove Project Area. The information provides a basis to assess gaps between current conditions and desired conditions for the project area. The section also presents methods and results to estimate user capacities for the project area. These include estimates of the number of visitors to Kaaterskill Falls who can be accommodated per day without exceeding thresholds for crowding (PPV) and parking (VAOT) indicators.

8.1 Current Visitor Use and Impacts

Key findings from data collection, analysis and engagement about visitor use and impacts in the Kaaterskill Clove Project Area are summarized below.

1. **Visitor use at Kaaterskill Falls is consistently busy all summer long. It is particularly intense on weekend days and holidays.**

   - On weekdays during the period from Memorial Day Weekend through Labor Day 2023, Kaaterskill Falls experienced an average of approximately 860 visitors per day and a maximum of over 1,800 daily visitors (Figure 10).
   - Use on weekend days and holidays during the same period was more than double that of weekdays on average, with an average of approximately 1,850 visitors per day and a maximum of nearly 3,000 daily visitors (Figure 10).

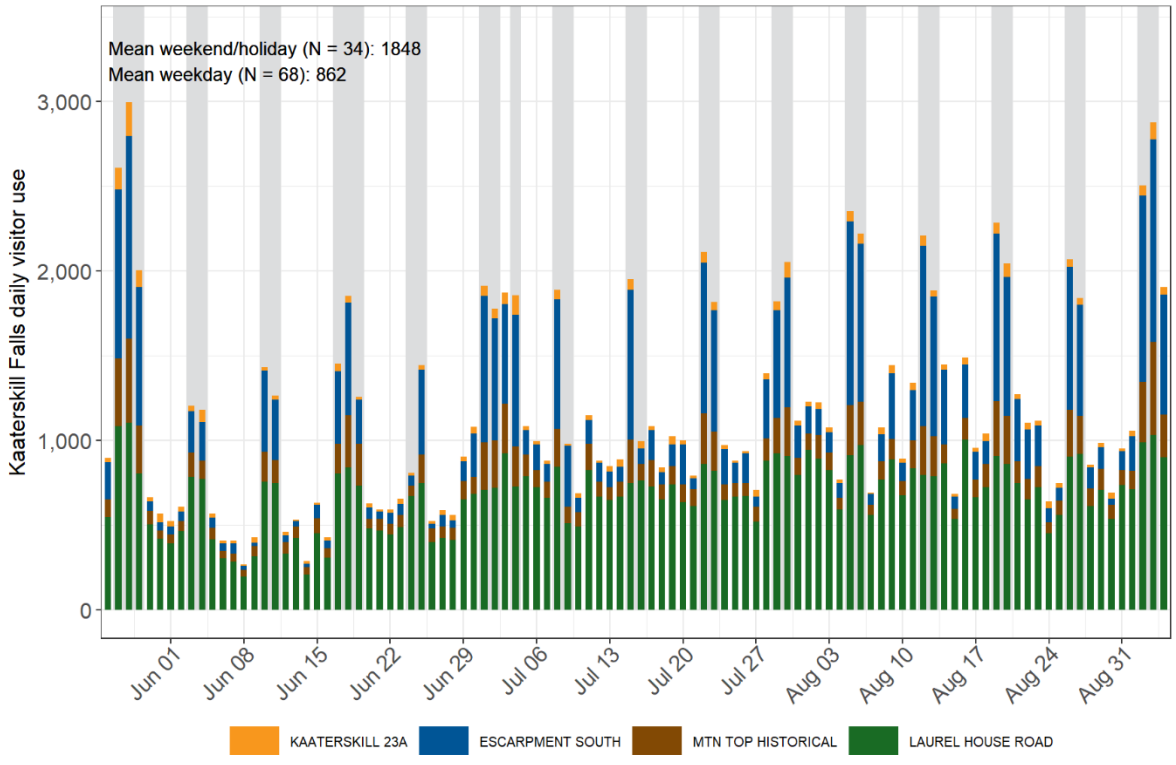

Figure 10. Daily visitor use at Kaaterskill Falls during summer 2023, by point of access.

2. **The overlook platform and the Middle Pool area at the base of the upper fall are the primary visitor attractions at Kaaterskill Falls.**

   - Most (93%) visitors who were administered a GPS device at the Laurel House Road trailhead to track their use patterns in the project area visited the observation platform and/or the Middle Pool area of Kaaterskill Falls.
   - A large majority of them visited the observation platform (80%) and nearly two-thirds of them visited the Middle Pool area of Kaaterskill Falls (64%).

3. **Parking pressure for access to Kaaterskill Falls is intense during the summer season and is particularly problematic on weekend days and holidays. This makes it difficult for visitors to find safe and convenient places to park.**

   - The parking lot on Laurel House Road provides the closest point of access to Kaaterskill Falls and functions as the designated parking for visiting the falls. It provides safe, convenient, and universal access to Kaaterskill Falls. Yet, it is difficult to find parking there, and on weekend days during summer 2023, just over half of all visitors (53%) had to park in more distant overflow lots and walk up to three miles roundtrip to reach the Kaaterskill Falls trailhead (Figure 10).
   - During the data collection period for this project, the parking lot at Laurel House Road was full or nearly full by noon on all but one day, and on that day, it was full by 2:00 p.m. The lot remained full or nearly full every day until 3:00 p.m., and on several days, the lot was still full or nearly full when data collection ended at 5:00 p.m. (Figure 11).

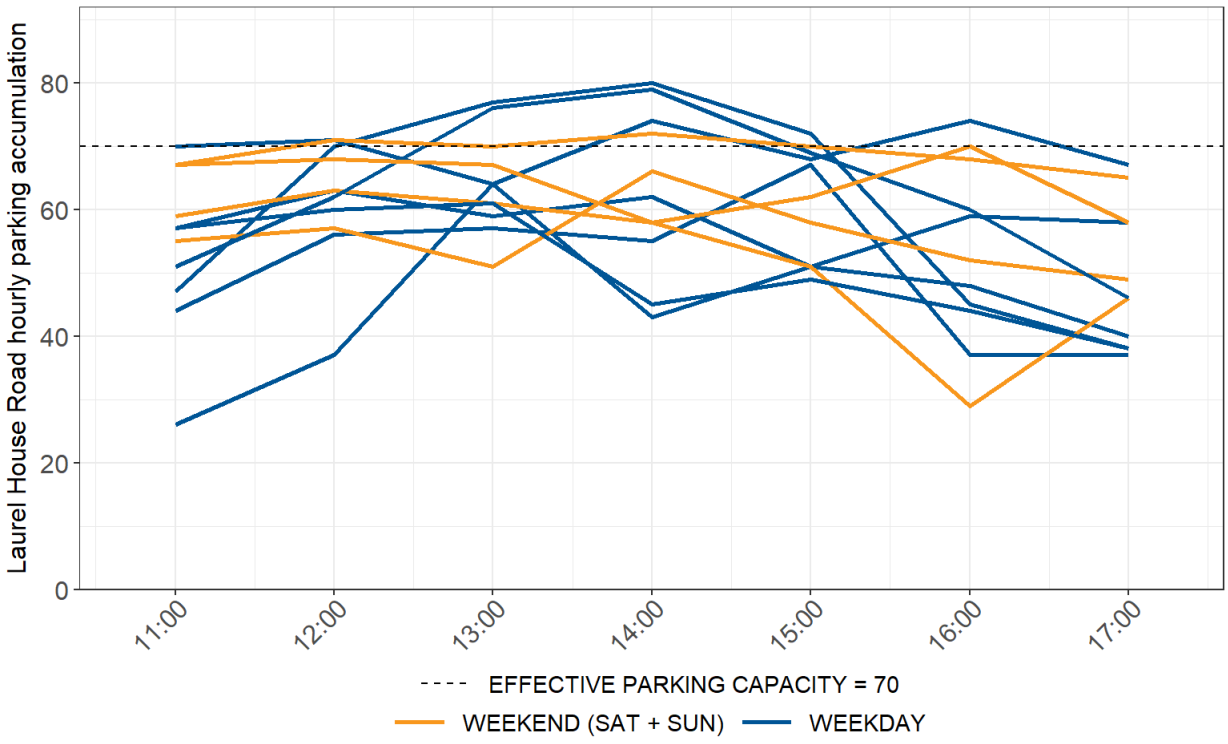

Figure 11. Hourly parking accumulation at the Laurel House Road parking lot, by data collection date and day of week category.

- According to discussions with the NYSDEC Core Team, Stakeholder Working Group, and public, the parking lot on Schutt Road fills with Kaaterskill Falls visitors soon after the parking lot on Laurel House Road fills.[16] Visitors are then directed to additional overflow parking at the Mountain Top Historical Society and in the North-South Lake Campground and Day Use Area.
- The Mountain Top Historical Society parking lot filled to its capacity on all four weekend days when data were collected for this project, and overflow parking on the lawn was observed on three of the four weekend days. From there, visitors must walk three miles roundtrip on the Kaaterskill Falls Rail Trail to reach the Kaaterskill Falls trailhead.
- Key members of the NYSDEC Operations Staff at the North-South Lake Campground and Day Use Area conducted qualitative observations of mid-day parking conditions at the Mountain Top Historical Society, Laurel House Road, and South Lake Day Use parking lots during a busy weekend day in August 2024. They reported that by midday, the parking lots at Laurel House Road and the Mountain Top Historical Society were full, the South Lake Day Use parking lots were nearly full, and the nearby parking for the Mountain House site was full. They reported counting several hundred visitors walking on the trail from the South Lake Day Use parking lots to Kaaterskill Falls between 11:50 a.m. and 3:00 p.m., and that some visitors were having difficulty with the distance and challenge of the hike (Figure 12).
- They also reported seeing many visitors walking in the road from the South Lake Day Use parking lots to the access trail to Kaaterskill Falls, and expressed concern in their report about the pedestrian and vehicle traffic safety issues this creates (Figure 12).

Figure 12. Photo-based observations of visitors walking from South Lake Day Use parking lots to Kaaterskill Falls, August 17, 2024.

- About one-third of visitors surveyed at Laurel House Road on weekend days reported feeling crowded in the parking lot (35%) and reported having difficulty finding a

[16] No parking data were collected for this project in the parking lot on Schutt Road.

convenient place to park (30%). These results exclude visitors who had to park at more distant overflow lots on Schutt Road and in the North-South Lake Campground and Day Use Area and walk to Kaaterskill Falls. Had they been included in the sample, it is reasonable to assume the percentage of weekend visitors who felt that parking conditions negatively impacted their access to and experience of Kaaterskill Falls would be even greater.

4. **Crowding occurs at Kaaterskill Falls throughout the summer and use levels in the Middle Pool area exceed most visitors' self-reported crowding tolerances all afternoon on weekend days.**

- Nearly one-third (31%) of visitors surveyed on weekdays reported feeling crowded during their visit to Kaaterskill Falls, and more than half (52%) of visitors surveyed on weekend days reported feeling crowded. Related, Stakeholder Working Group members stressed that toilets, trash receptacles, and garbage removal are overwhelmed by the amount of visitor use at Kaaterskill Falls. This could be part of the reason why relatively few visitors to Kaaterskill Falls (25%) are repeat visitors.
- Counts of the number of people present in the Middle Pool area viewscape (i.e., PPV counts in the area depicted in Figure 13) were greater than 24 PPV 45% of the time overall and nearly all (96%) of the time on weekend days. This amount of use in the Middle Pool area viewscape (24 PPV) exceeds the self-reported crowding tolerances of nearly two-thirds (64%) of surveyed visitors (Figure 14) and all but one of the members of the Stakeholder Working Group (Figure 15).

Figure 13. Viewscape for monitoring PPV in the Middle Pool area.

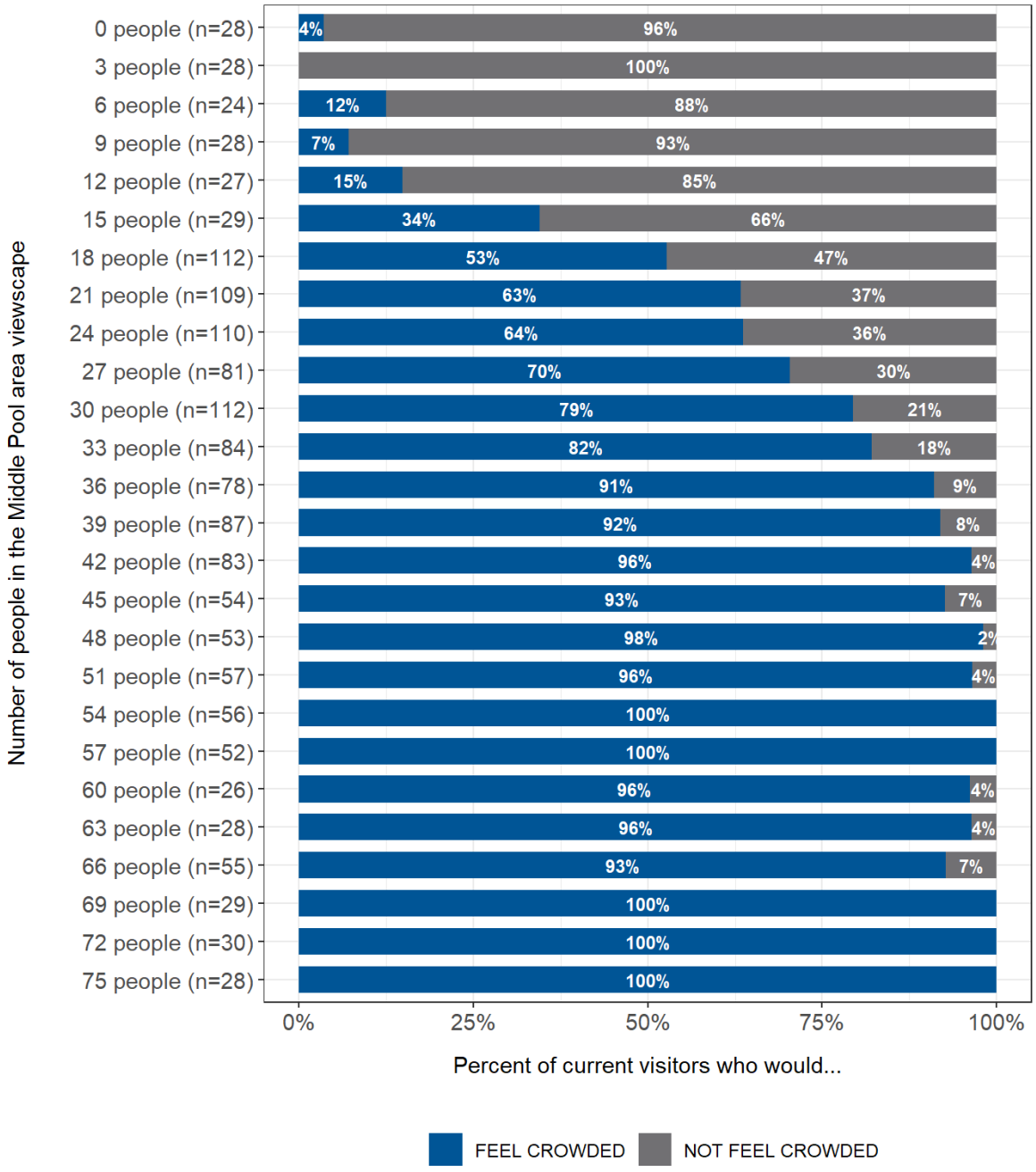

Figure 14. Summary of crowding responses of visitors to photo simulations of PPV in the Middle Pool area, by the number of people depicted in the viewscape.

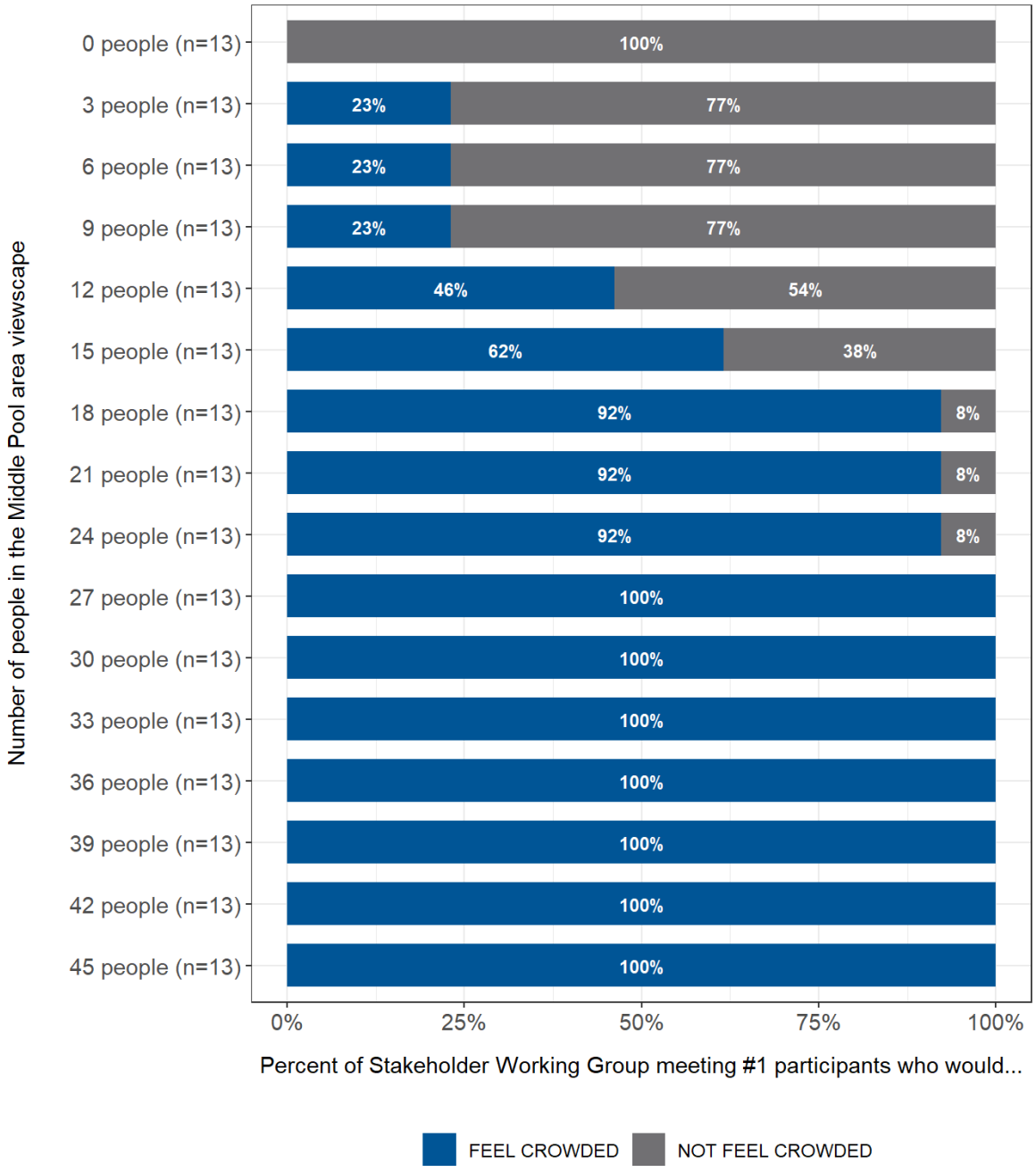

Figure 15. Summary of crowding responses of members of the Stakeholder Working Group to photo simulations of PPV in the Middle Pool area, by the number of people depicted in the viewscape.

- There is evidence from onsite observations at Kaaterskill Falls, including a timelapse video of visitor use produced as part of this project, and input from the NYSDEC Core Team that crowding may cause some visitors to disperse away from trails and other durable surfaces to avoid crowded conditions. There is related evidence of trampling impacts to soils and vegetation, even in areas where high-standard trails, staircases,

and other hardened surfaces have been constructed to sustain high volumes of use while protecting resources. In addition, some of the areas where visitors appear to disperse to avoid crowded conditions are steep, wet, and exposed, which increases the risk of safety incidents.

- A majority of visitors surveyed said they support managing the number of people per day who visit Kaaterskill Falls to prevent crowding in the Middle Pool area (52%), to protect visitors from crowding-related safety incidents (58%), and to reduce environmental impacts (63%).

- Nearly half (49%) of all visitors surveyed and a majority (55%) of those who reported feeling crowded during their visit support requiring advanced reservations to visit Kaaterskill Falls on weekend days and holidays to manage crowding. In contrast, only about one-third (34%) of visitors surveyed believe that visitors should expect and adapt to crowded conditions at Kaaterskill Falls.

5. **Operations and facilities at North-South Lake Campground and Day Use Area are strained on peak summer days by the number of visitors seeking overflow parking and access to Kaaterskill Falls.**

   - On multiple occasions through the course of the project, members of the NYSDEC Core Team and Stakeholder Working Group described significant impacts to operations and facilities at North-South Lake Campground and Day Use Area from visitors seeking overflow parking and access to Kaaterskill Falls. Annual visitor use data for the North-Lake South Campground and Day Use Area document a significant upward trend in day use there, which increased by 54% in the five-year period from 2018 through 2023.
   - As noted, when the parking lots at Laurel House Road and Schutt Road are full, Kaaterskill Falls visitors are directed to overflow parking in the South Lake Day Use parking lots. To access the overflow parking at South Lake, visitors must pass through and pay an entrance fee at the North-South Lake Campground and Day Use Area Entrance Station. When this happens, it creates volumes of traffic that overwhelm staffing, operations, and facilities capacities at the Entrance Station. Consequently, visitors must wait in a line of traffic to pass through the Entrance Station, and the traffic can back up into the residential area on North Lake Road.
   - Traffic from Kaaterskill Falls visitors delays entry for other visitors with campground reservations or plans to visit the day use areas in North-South Lake Campground and Day Use Area.
   - Once visitors pass through the Entrance Station, those that are heading to Kaaterskill Falls park in the South Lake Day Use parking lots, including the nearby lot for the Mountain House site. This creates competition for and crowding in the parking areas designated for access to the beach and other day use amenities in the South Lake area. Members of the operations staff reported that this volume of visitor use also strains toilet facilities and the septic system. Many of the visitors who park at the South Lake Day Use parking lots then walk in or along the road with moving traffic to the access trail to Kaaterskill Falls (Figure 12). This creates additional strain on operations and law enforcement staff to manage parking, traffic, and vehicle and pedestrian safety.

6. **On-the-ground parking and traffic management staff are critical to managing vehicle traffic and parking for Kaaterskill Falls.**

   - Members of the NYSDEC Core Team and Stakeholder Working Group discussed on multiple occasions throughout the course of the project the importance of having on-the-ground staff to manage traffic and parking for Kaaterskill Falls.
   - They reported that in recent years the town of Hunter has deployed traffic and parking management staff on North Lake Road to manage traffic circulation in and among parking areas on Laurel House Road and Schutt Road and to the North-South Lake Campground and Day Use Area entrance.
   - Prior to doing this, visitors would not know when the parking lot on Laurel House Road was full and would travel into and orbit the parking lot even when it was full. This caused backups in the parking lot and on Laurel House Road and North Road and led to extensive roadside parking on Laurel House Road.
   - Now, when the parking lot is full, there is a staff person at the intersection of North Lake Road and Laurel House Road to direct visitors to Schutt Road or North-South Lake Campground and Day Use Area. The same is true for the parking area on Schutt Road.
   - Without the presence of on-the-ground personnel to manage traffic and parking for Kaaterskill Falls, the previous issues would return. Even with the presence of on-the-ground staff, traffic congestion occurs in and among parking areas and at the entrance to North-South Lake Campground and Day Use Area, as noted, due to the sheer volume of visitors on busy summer days.

7. **Shuttle is a potentially underutilized resource to help address parking and traffic impacts and to help stimulate the local economy.**

   - The primary purposes of the existing trolley service are to reduce traffic and parking pressure at Kaaterskill Falls by providing offsite park-and-ride access to Laurel House Road and Molly Smith, and to help stimulate the local economy by locating the park-and-ride access points in town and attracting visitors to these locations. Ridership data from the 2023 summer season and discussions with the NYSDEC Core Team and Stakeholder Working Group suggest these opportunities are not currently being fully realized.
   - During the summer of 2023, approximately 2,144 trolley tickets were purchased either online or in-person (Kaaterskill Trolley Co., 2023). Approximately 40% of riders were dropped off at the Laurel House Road and Molly Smith stops to visit Kaaterskill Falls (Kaaterskill Trolley Co., 2023). This equates to just 2% of all visitors to Kaaterskill Falls during the period from Memorial Day Weekend through Labor Day 2023 who rode the trolley to visit the falls.
   - The trolley operated for seven days during the 2023 onsite data collection period and averaged 60 riders per day (92 riders on average on weekend days and 18 riders on average on weekdays). This equates to an average of just 1% of all visitors to Kaaterskill Falls who rode the trolley on those days during the 2023 data collection period.

8. **Mutually beneficial partnerships with local communities, non-profit organizations, and others are essential to manage visitor use and achieve desired conditions for the Kaaterskill Clove Project Area.**

    - Discussions with the NYSDEC Core Team, Stakeholder Working Group, and public emphasized and acknowledged the essential role of partnerships to achieve desired conditions for the Kaaterskill Clove Project Area. A few examples are described below.
    - As noted, the town of Hunter has had their staff "on the front lines" managing visitor access, parking, and traffic on North Lake Road during busy summer days. This has been instrumental in helping to reduce some of the worst traffic impacts that were occurring in the project area prior to the start of this intervention. Efforts to work together with the town will be important to sustain on-the-ground parking and traffic management there and to address the issues associated with nearby parking on private properties.
    - The Mountain Top Historical Society will continue to be an important partner to help implement effective parking management strategies for access to Kaaterskill Falls.
    - The Catskill Center is an important partner to help share information with visitors as part of an overall visitor use management strategy to shift and otherwise reduce visitor use on busy weekends during the peak summer season. They are also key partners in efforts to educate visitors about ways to minimize their impacts while enjoying Kaaterskill Falls and other parts of the Catskill Park.

9. **Visitors generally do not plan their trips to the Kaaterskill Clove Project Area more than a week in advance, and very few use the NYSDEC website to plan their visits.**

    - A substantial percentage (40%) of visitors surveyed at the Laurel House Road trailhead didn't plan their visit to Kaaterskill Falls until the day of their visit. Few visitors (14%) planned their visit more than a week in advance.
    - Very few of them (1%) used the NYSDEC website as a source of information to help plan their visit. The most common sources of information visitors used to plan their trips to Kaaterskill Falls were personal knowledge about the area (47%) and word of mouth from friends, family, or others who had previously visited the falls (30%).

10. **Actions to manage visitor use on busy summer weekends and holidays could displace visitor use and impacts to lower use times and other nearby locations.**

    - Members of the NYSDEC Core Team, Stakeholder Working Group, and public expressed an awareness that actions to address impacts of visitor use during peak periods at Kaaterskill Falls could have unintended consequences for currently low use days and times at the falls and other outdoor recreation destinations in and around Catskill Park.
    - For example, strategies that aim to redistribute or otherwise reduce visitor use on busy summer weekend days and holidays could cause currently moderate levels of use in the project area on weekdays to increase. This could impact or negate the quality and character of experiences some visitors intentionally seek by avoiding weekends and instead visiting the project area on weekdays.

- Similarly, this could cause visitor use and impacts to shift to locations that currently provide opportunities for visitors who seek low-use outdoor recreation settings and experiences. Use could also shift to other locations that are already experiencing visitation pressure and where strategies have not yet been implemented to actively manage visitor use.

11. Despite a parking ban on Route 23A, pedestrians are still using the shoulder of the highway for unsafe access to Kaaterskill Creek.

- During the 2023 onsite data collection for this project, pedestrians were observed walking in or along the road on Route 23A in the area near Fawn's Leap. Pedestrians were observed in the road corridor 16% of the time observations were recorded on weekdays and 33% of the time observations were recorded on weekend days.
- Pedestrians on Route 23A park in the Harding Road Lot and in Palenville or ride the trolley to stops on Route 23A. The primary destinations for pedestrians on Route 23A are popular swimming holes along Kaaterskill Creek and the trailhead at the hairpin turn on the highway.

12. Traffic on Route 23A has increased steadily and substantially in the last 10 years, which increases the risk of vehicle and pedestrian crashes.

- Route 23A is a primary travel corridor for commuters as well as visitors to Kaaterskill Falls. In the last 10 years, average total daily traffic on Route 23A has increased by 60%, as measured by a permanent traffic counter deployed by NYSDOT on Route 23A just east of the Twilight Park Road junction (Figure 16). This increase in traffic coincides with the timing of infrastructure improvements at Kaaterskill Falls, including a new parking lot, trails, and observation deck. It is possible that these enhancements to the physical capacity of recreation facilities at Kaaterskill Falls, in part, contributed to the increase in vehicle traffic on Route 23A.

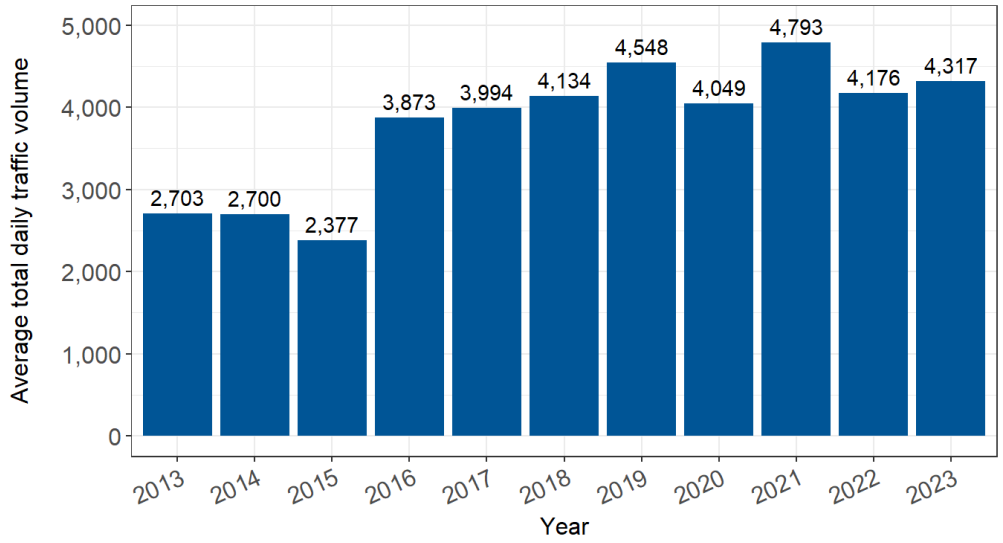

Figure 16. Average annual daily traffic volume on Route 23A at Station ID 1399, 2013-2023. (Source: NYSDOT Traffic Data Viewer)

13. Visitor use-related search and rescue incidents, including fatalities, occur annually in the Kaaterskill Clove Project Area.

- During the nine-year period from 2014 through 2022, NYSDEC responded to an average of 13 search and rescue calls per year at Kaaterskill Falls and an average of two calls per year in the Kaaterskill Clove (Table 3). The maximum numbers of search and rescue calls per year during this time were 22 calls at Kaaterskill Falls in 2018 and six calls in the Kaaterskill Clove in 2020.
- In 2023, NYSDEC designated the area around Fawn's Leap as a restricted area, following a fatal accident and two other incidents there in a two-week period.

Table 3. Annual number of NYSDEC search and rescue responses in the Kaaterskill Clove Project Area, 2014-2022 (Source: Dawson, 2022).

Year	Kaaterskill Falls Calls	Kaaterskill Falls Fatalities	Kaaterskill Clove Calls	Kaaterskill Clove Fatalities
2014	8	2	0	0
2015	6	0	1	0
2016	9	2	3	1
2017	9	0	1	0
2018	22	0	2	0
2019	14	0	2	1
2020	17	0	6	0
2021	17	1	0	0
2022	18	0	2	0

14. Conditions in the Escarpment Subregion have not yet been assessed for impacts to visitors' experiences. This is addressed in the Visitor Use Management Pilot Project Monitoring Plan for the Kaaterskill Clove Project Area, which includes monitoring intergroup encounters on a section of trail in the Escarpment Subregion.

8.2 User Capacities for Kaaterskill Falls

The findings summarized above establish that current levels of visitor use at Kaaterskill Falls are causing traffic, parking, crowding, and public safety conditions that do not align with desired conditions. This section presents the methods and results to estimate the maximum number of visitors that can be accommodated per day at Kaaterskill Falls without unacceptable impacts to crowding (PPV) and parking (VAOT) conditions (i.e., crowding- and parking-related user capacities, respectively).

8.2.1 Crowding-Related Capacity of Kaaterskill Falls

The crowding-related capacity of Kaaterskill Falls is defined as the maximum number of visitors who can be accommodated per day at Kaaterskill Falls without exceeding the crowding threshold for PPV in the Middle Pool viewscape monitoring area (see *Section 7.2 Selected Indicators and Thresholds* for details about the PPV indicator and threshold).

A regression model was developed to estimate the relationship between daily visitor use at Kaaterskill Falls and the number of people in the viewscape for monitoring PPV in the Middle Pool area (Figure 17). There is a strong statistical relationship (R^2 = 0.96) between visitor use at Kaaterskill Falls and PPV in the Middle Pool viewscape monitoring area. This suggests the regression model is an accurate and reliable tool to estimate the crowding-related capacity of Kaaterskill Falls.

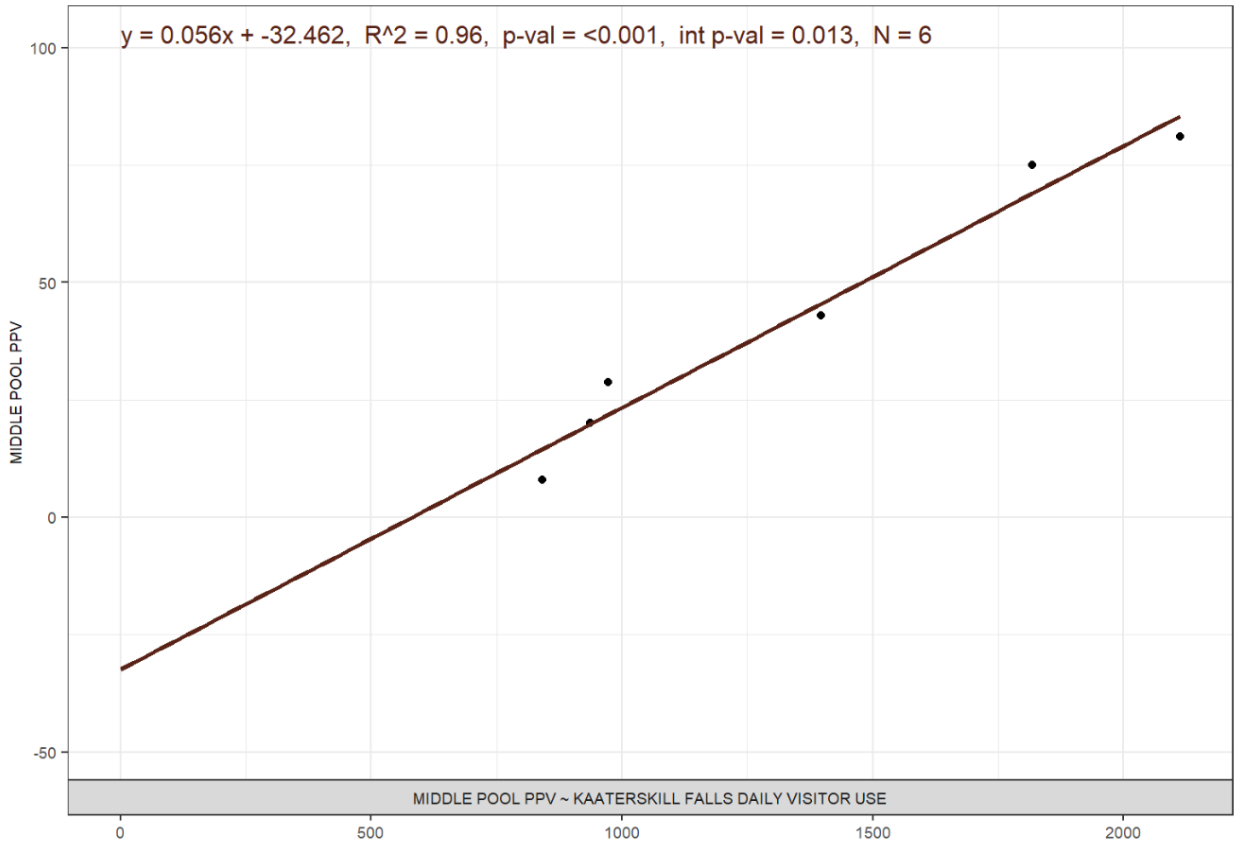

Figure 17. Scatterplot and regression model of the relationship between daily visitor use at Kaaterskill Falls and PPV in the Middle Pool viewscape.

The regression model was used to estimate that a maximum of 1,000 visitors can be accommodated at Kaaterskill Falls per day, without exceeding the crowding threshold for PPV in the Middle Pool viewscape monitoring area (Table 4).

Table 4. Crowding-related indicator, threshold, and user capacity estimate for daily visitor use at Kaaterskill Falls.

Indicator	Threshold	Estimated daily user capacity[17]
PPV in the Middle Pool area of Kaaterskill Falls	There will be fewer than 24 PPV in the Middle Pool area viewscape 90% of the time.	1,000 visitors per day

8.2.2 Parking-Related Capacity of Kaaterskill Falls

The parking-related capacity of Kaaterskill Falls is defined as the maximum number of visitors who can be accommodated per day at Kaaterskill Falls without exceeding the parking congestion threshold for VAOT in parking areas that provide access to Kaaterskill Falls (see *Section 7.2 Selected Indicators and Thresholds* for details about the parking congestion indicator and threshold).

An Excel-based model was programmed to estimate the hourly total number of vehicles parked (i.e., VAOT) for Kaaterskill Falls, based on daily visitor use at Kaaterskill Falls, visitors' hourly vehicle arrival pattern, and their duration of stay at Kaaterskill Falls.[18] The model was further programmed to compare the estimated hourly total VAOT to the total available parking supply for access to Kaaterskill Falls to determine for each hour of the day if VAOT exceeded parking supply. Parking supply was specified in the model as a percentage of the design capacity of each parking area assumed to be available for access to Kaaterskill Falls (Table 5). These design capacities were provided by NYSDEC staff, and the assumptions were developed in consultation with members of the NYSDEC Core Team.

Table 5. Parking capacities and estimated parking supply for Kaaterskill Falls, by location.

Location	Estimated parking capacity (standard spaces)	Percentage of parking for access to Kaaterskill Falls	Parking supply for Kaaterskill Falls (standard spaces)
North-South Lake Campground and Day Use Area: South Lake Day Use parking lots	302	65%	196
North-South Lake Campground and Day Use Area: North Lake parking lot	133	0%	0
Laurel House Road parking lot	68	95%	65
Schutt Road parking lot	60	85%	51
Mountain Top Historical parking lot	62	85%	53

[17] The daily user capacity number has been rounded to reflect that it is an estimate. The user capacity equates to approximately 360 vehicles per day using an average vehicle occupancy of 2.8 people per vehicle.
[18] Visitors' hourly vehicle arrival patterns in the model are based on hourly visitor use patterns measured with trail cameras on the primary access points into Kaaterskill Falls. The model assumes a 3-hour average length of stay at Kaaterskill Falls, based on the results of the GPS tracking study conducted as part of this project and accounting for walking distances and times from parking areas to Kaaterskill Falls. The model also assumes an average of 2.8 people per vehicle to transform estimates of daily vehicle volume to daily visitor use.

The Excel-based model was used to estimate that a maximum of 2,500 visitors can be accommodated at Kaaterskill Falls per day, without exceeding the parking congestion threshold for VAOT in parking areas for Kaaterskill Falls (Table 6).

Table 6. Parking-related indicator, threshold, and user capacity estimate for daily visitor use at Kaaterskill Falls.

Indicator	Threshold	Estimated daily user capacity[19]
Daily maximum number of vehicles parked at one time (VAOT)	The daily maximum VAOT in each parking location for Kaaterskill Falls will be no greater than the designated parking supply in that location 99% of days.	2,500 visitors per day

8.2.3 Summary of Findings Regarding User Capacities for Kaaterskill Falls

The user capacity analysis results suggest that:

- A strategy to manage visitor use according to and up to the limit of available parking supply for Kaaterskill Falls, or to even increase parking supply for Kaaterskill Falls, would perpetuate and intensify, rather than solve, the traffic congestion, parking management, public safety, and crowding issues there.
- The existing supply of parking for Kaaterskill Falls[20] can accommodate approximately 2,500 visitors per day. This is approximately 40% higher than the current (2023) average daily visitor use at Kaaterskill Falls on summer weekend days and holidays. It is nearly as high as the highest day of visitor use (2,993 visitors) recorded at Kaaterskill Falls during the entire 2023 peak summer season.
- At these levels of visitor use, traffic in and among parking areas is congested, lines of traffic form at the entrance to North-South Lake Campground and Day Use Area, town of Hunter police are deployed to manage traffic circulation and public safety on North Lake Road, emergency vehicle access is obstructed, visitors experience stress and confusion, North-South Lake Campground and Day Use Area staff, facilities, and operations are overwhelmed, Forest Rangers experience chronic stress, and the quality and character of visitors' experiences are severely degraded.
- In turn, it is the sheer volume of visitor use and not a lack of parking that is the root cause of the traffic congestion, parking management, public safety, and crowding issues at Kaaterskill Falls. The crowding-related capacity of 1,000 visitors per day at Kaaterskill Falls is the limiting factor. It represents the maximum amount of visitor use that can be accommodated at Kaaterskill Falls per day without unacceptable traffic congestion, parking management issues, public safety hazards, stressors on park operations, and visitor crowding.
- Strategies are needed to substantially reduce the volume of visitor use that occurs on weekends and holidays during the peak summer season.

[19] The daily user capacity number has been rounded to reflect that it is an estimate. The user capacity equates to approximately 890 vehicles per day using an average vehicle occupancy of 2.8 people per vehicle.
[20] This includes the estimated share of parking spaces in parking lots on Laurel House Road and Schutt Road, at South Lake, and at the Mountain Top Historical Society that are currently being used to provide access to Kaaterskill Falls on busy days.

- The change in levels of visitor use required on weekend days and holidays won't be possible with information and education strategies alone. Instead, direct visitor use management is required. This includes an advanced reservation system, on-the-ground parking and traffic management staff, and gate-controlled access to the project area.
- It may be possible to accommodate close to the same number of visitors over the course of the summer season, but not without direct and active visitor use management.
- Current levels of visitor use on weekdays at Kaaterskill Falls are generally consistent with desired conditions for the project area, averaging approximately 860 visitors per day, and could likely even grow to the crowding-related capacity of 1,000 visitors per day without unacceptable parking, traffic, or crowding issues (Figure 18).[21] On weekend days and holidays, however, daily visitor use at Kaaterskill Falls is substantially higher than what can be accommodated without unacceptable parking, traffic, and crowding conditions.

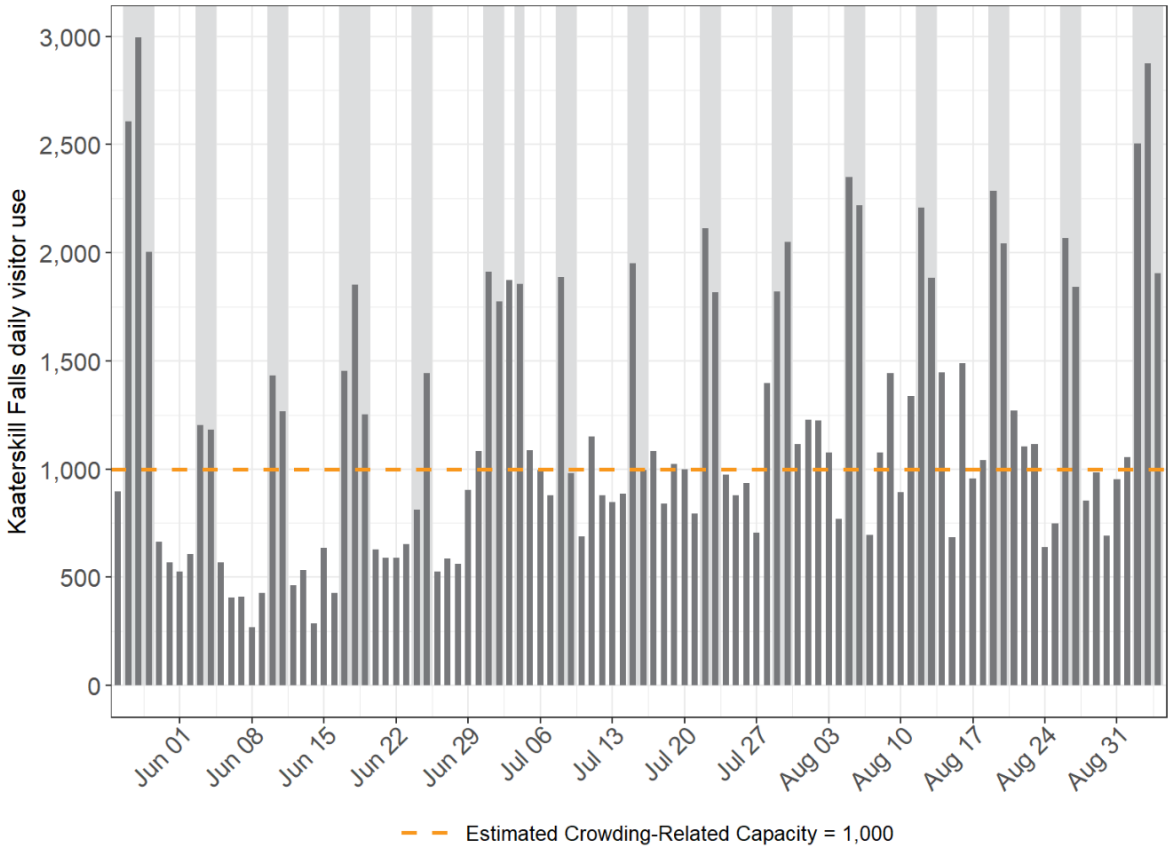

Figure 18. Daily visitor use at Kaaterskill Falls during summer 2023 and estimated daily user capacity for Kaaterskill Falls (gray shading indicates weekend days and holidays).

[21] That said, some weekdays experience more intensive levels of visitor use and corresponding impacts that are common to weekend days and holidays.

9. Management Strategies

This section presents the project team's recommendations to NYSDEC regarding visitor use management strategies and actions that are needed to address persistent traffic, parking, crowding, and public safety issues in the Kaaterskill Clove Project Area. Our recommendations are based on the research, engagement, and planning work presented in this report. They represent our best professional judgment about the actions NYSDEC and its partners should take to restore and maintain desired conditions for the Kaaterskill Clove Project Area.

Our recommendations are organized in this section into 1) a coordinated program of visitor use management strategies and actions; and 2) a phased implementation plan.

9.1 Visitor Use Management Strategies and Actions

We recommend that NYSDEC implement the following visitor use management strategies and actions across the Kaaterskill Clove Project Area:

1. Manage daily visitor use at Kaaterskill Falls to a maximum of 1,000 visitors per day.

As noted, the sheer volume of visitor use at Kaaterskill Falls is the root of parking, traffic, crowding, and public safety issues in the Kaaterskill Clove Project Area. Results of the work conducted in this project suggest that a maximum of 1,000 visitors is the limit of what can be accommodated at Kaaterskill Falls per day without unacceptable impacts to visitors' experiences, public safety, park operations, and traffic conditions on local roads. This number may need to be adjusted by NYSDEC in the future, based on monitoring results after implementing visitor use management strategies.

2. Require an advanced reservation for a timed-entry ticket to visit Kaaterskill Falls from spring through the end of the fall peak season.

Visitor use at Kaaterskill Falls is currently regulated only by the availability of parking to access the falls. The existing supply of parking for Kaaterskill Falls can accommodate approximately 2,500 visitors per day. Continuing to accommodate visitor use at Kaaterskill Falls to the limits of the existing parking supply, or to even increase parking supply or other modes of access for the falls, would perpetuate and intensify, rather than solve, the traffic congestion, parking management, public safety, and crowding issues there.

An advanced reservation system is needed to significantly reduce visitor use at Kaaterskill Falls on weekend days and holidays from current levels to a maximum of 1,000 visitors per day. Compared to a day use pass system, a timed-entry system with tickets issued for entry during specific hours of the day will allow for a greater number of people to visit the falls per day without unacceptable traffic, parking, and crowding conditions.

Our detailed recommendations for implementing a timed-entry system for Kaaterskill Falls are as follows:

- Administer the timed-entry system daily (seven days a week).
- Require an advanced reservation for timed-entry within a specified hour of the day from 7:00 a.m. until 7:00 p.m.
- Allow visitors with a timed-entry ticket to arrive anytime within the hour for which they have a reservation and to stay at Kaaterskill Falls for as long as they'd like once they

enter. Once visitors leave Kaaterskill Falls, they would not be allowed re-entry with the same timed-entry ticket.

- Allow visitors to access Kaaterskill Falls without an advanced reservation before 7:00 a.m. and after 7:00 p.m.
- Provide an exemption to the timed-entry system for visitors with a current camping reservation at North-South Lake Campground.[22]
- Issue a maximum of 25 timed-entry tickets per hour (one ticket per vehicle) to manage the distribution of visitor use across the day.[23]

3. Implement a parking management plan for access to Kaaterskill Falls.

If visitor use at Kaaterskill Falls is managed through a timed-entry system to a maximum of 1,000 people per day, it is estimated that a total of approximately 100 designated parking spaces will be required to accommodate visitor use at the falls. It is further estimated that a maximum of approximately 50 vehicles could be parked at one time in the parking lot at Laurel House Road without impacting traffic circulation there, once other recommended changes to the footprint described below are made. As such, it is estimated that a maximum of approximately 50 vehicles will need to be accommodated in an overflow parking location (i.e., a location other than the lot on Laurel House Road).

When the Laurel House Road parking lot is full, visitors with a timed-entry ticket for Kaaterskill Falls could be directed to park in the South Lake Day Use parking lots (Option 1 for overflow parking). This would equate to a maximum of approximately 200 vehicles entering North-South Lake Campground and Day Use Area *per day* for access to Kaaterskill Falls. This is a significant reduction in the amount of traffic that currently enters North-South Lake Campground and Day Use Area per day on peak summer days for access to Kaaterskill Falls. As such, the timed-entry system would reduce the strain on park operations and facilities at North-South Lake Campground and Day Use Area caused by the current volume of overflow parking that occurs there for access to Kaaterskill Falls. It would also concentrate visitor parking for access to Kaaterskill Falls solely into facilities owned and operated by NYSDEC.

Alternatively, visitors could be directed to park at the Mountain Top Historical Society parking lot when the Laurel House Road parking lot is full (Option 2 for overflow parking). This would require an agreement with the Mountain Top Historical Society and would result in roughly half of the visitor parking for access to Kaaterskill Falls occurring in a facility that is not owned or operated by NYSDEC.

We further recommend that if visitor use at Kaaterskill Falls is managed through a timed-entry system to a maximum of 1,000 people per day, that the parking lot on Schutt Road should no longer be used as overflow parking for access to Kaaterskill Falls. Instead, we recommend the capacity of the parking lot be reduced to only what is necessary to accommodate equestrian and hiking use on trails

[22] It would be necessary to provide camping groups with a ticket, receipt, or similar documentation to carry with them to the access point to Kaaterskill Falls. This would be in addition to the standard camping permit that is required to remain in their vehicles.
[23] This accounts for an estimated maximum of 200 people per day visiting Kaaterskill Falls from the North-South Lake Campground who are exempt from needing a timed-entry ticket. It assumes an average group size of 2.8.

in the Escarpment Subregion of the Kaaterskill Clove Project Area and on the trail leading north of the project area.

We also recommend that NYSDEC work in partnership with the town of Hunter to discontinue parking in private lots on North Lake Road for access to Kaaterskill Falls. As noted, there is a surplus of formal parking available to accommodate visitor use at Kaaterskill Falls. If parking were to continue in private lots on North Lake Road, it would only perpetuate visitor use-related traffic congestion and public safety issues in the local community.

As part of implementing the parking management plan, we recommend that NYSDEC install pavement, striping, curb stops, traffic circulation pavement markings, and signs in the Laurel House Road parking lot.[24] We also recommend that if NYSDEC adopts our recommendation to use the South Lake Day Use parking lots as overflow parking for visitors with timed-entry tickets for Kaaterskill Falls, they make improvements there. Specifically, we recommend NYSDEC design and implement pedestrian access and wayfinding improvements between the South Lake Day Use parking lots and Nordic Ski Trail. We also recommend they design and construct improvements to the Nordic Ski Trail to make travel on the trail easier for visitors with timed-entry tickets to access Kaaterskill Falls from the South Lake Day Use parking lots.[24]

Our recommendations regarding parking management for access to Kaaterskill Falls are depicted in Figure 19.

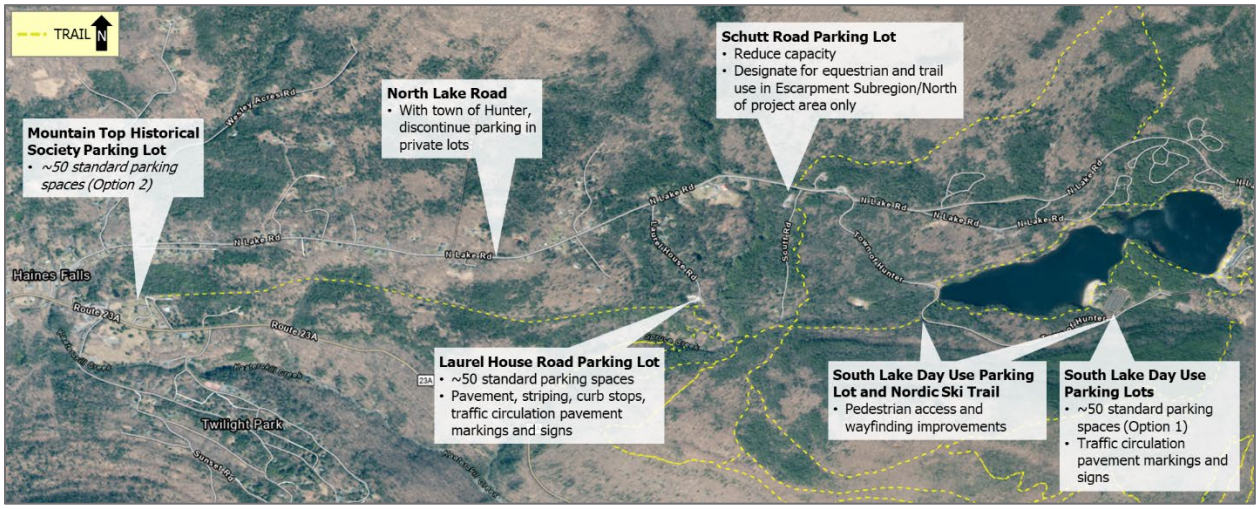

Figure 19. Key components of the recommended parking management plan for access to Kaaterskill Falls.

4. Construct and administer gate-controlled access to Kaaterskill Falls at the following locations:

- Laurel House Road parking lot entrance.
- Escarpment Trail west of its intersection with the Nordic Ski Trail.
- Kaaterskill Rail Trail west of its intersection with the Kaaterskill Falls trail network.

[24] These improvements must be made in compliance with the CPSLMP.

Prior to implementing the timed-entry system, it will be necessary to construct gate-controlled access points at the three locations noted (Figure 20).[24] A booth or similar structure should be constructed at each of the three access points and staffed during the hours of operation of the time-entry system from spring through the end of the fall peak season. Visitors would be required to display a valid timed-entry ticket or campground reservation to enter Kaaterskill Falls. We also recommend the construction of a roundabout in the Laurel House Road parking lot to facilitate traffic circulation and to redirect visitors without a timed-entry ticket (Figure 20).

Figure 20. Recommended locations for staffed gate-controlled access to Kaaterskill Falls and roundabout at Laurel House Road parking lot.[25]

The control point on Laurel House Road will be necessary to prevent visitors without a timed-entry ticket from accessing Kaaterskill Falls on foot from private parking lots on North Lake Road or other nearby parking locations. The control point on the Escarpment Trail will be necessary to prevent visitors without a timed-entry ticket from accessing Kaaterskill Falls on foot from the parking lot on Schutt Road or from North-South Lake Campground and Day Use Area. The control point on the Kaaterskill Rail Trail will be necessary to prevent visitors without a timed-entry ticket from accessing Kaaterskill Falls on foot from the Mountain Top Historical Society parking lot.

[25] The exact locations of control points should be selected according to compliance with the CPSLMP and universal accessibility requirements, administrative feasibility, and access to necessary utilities. Additional control point locations may be necessary depending on monitoring results and/or other factors.

5. Coordinate with the town of Hunter to deploy an on-the-ground traffic and parking management team.

An on-the-ground traffic and parking management team is needed to manage visitor use-related traffic circulation on North Lake Road. In the immediate term, we recommend that NYSDEC work in partnership with the town of Hunter to support them in continuing their current traffic management operations on North Lake Road during busy weekend days and holidays.

Once a timed-entry system is implemented, a dedicated traffic and parking management team will be needed seven days a week from spring through the end of the fall peak season. We recommend NYSDEC work in partnership with the town of Hunter to formulate an operations and communication plan for coordinated traffic and parking management to be implemented in conjunction with the timed-entry system. We recommend that staff be stationed on North Lake Road at Laurel House Road and Schutt Road, in the parking lots on Laurel House Road and at South Lake, and at the intersection of North Lake Road and the road to South Lake in the North-South Lake Campground and Day Use Area (Figure 21).

Staff will need to coordinate and communicate with each other via radio. Their primary duties would be to direct visitors with time-entry tickets for Kaaterskill Falls to designated parking locations and to direct other visitors to alternative destinations. They would also monitor for and prevent unpermitted walk-ins and drop-offs at each location.

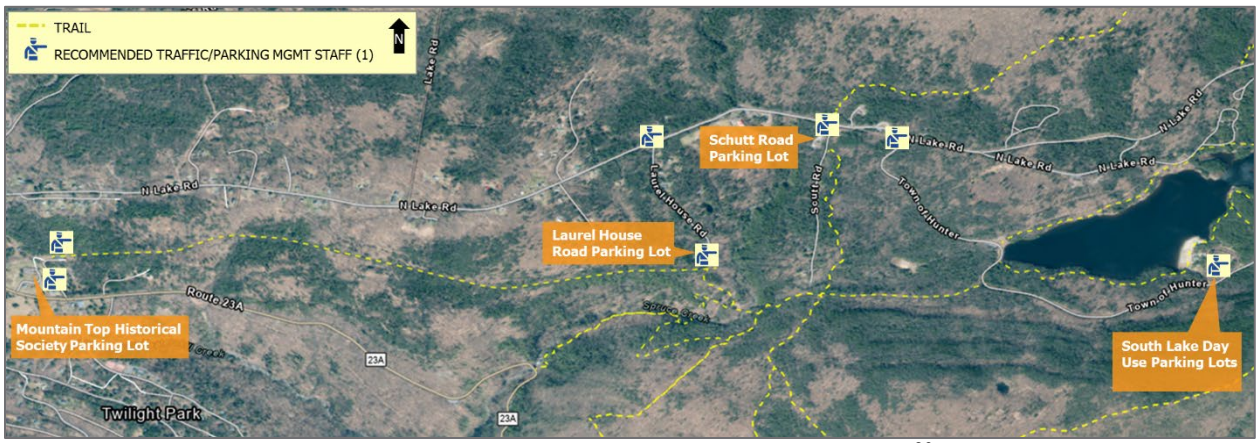

Figure 21. Traffic and parking management team required for timed-entry system.[26]

If visitors with timed-entry permits for Kaaterskill Falls are directed to park at the Mountain Top Historical Society when the Laurel House parking lot is full, a two-person traffic and parking management team will be needed there (Figure 21). In this case, we would recommend that NYSDEC work in partnership with the Mountain Top Historical Society to develop an operations and communication plan for traffic and parking management there.

[26] Deploying traffic and parking management staff at the Mountain Top Historical Society Parking Lot is recommended if the Mountain Top Historical Society parking lot is used as overflow parking for visitors with a timed-entry ticket for Kaaterskill Falls when the Laurel House Road parking lot is full (Option 2 for overflow parking).

6. Evaluate the feasibility of operating shuttle service to improve convenience and safety of access to Kaaterskill Falls.

As noted, it is the sheer volume of visitor use and not a lack of parking that is the root of the traffic congestion, parking management, public safety, and crowding issues at Kaaterskill Falls. Correspondingly, shuttle service is not needed as a tool to support visitor access to Kaaterskill Falls, and in fact, operating a shuttle service for this purpose would perpetuate and intensify, rather than solve, the issues in the project area (Lawson et al., 2017).

That said, operating shuttle service between the South Lake Day Use parking lots and the parking lot on Laurel House Road would make visitor access more convenient and possibly safer for those visitors with a timed-entry ticket to visit Kaaterskill Falls (Figure 22). Alternatively, the service could operate between the Mountain Top Historical Society and the parking lot on Laurel House Road, if overflow parking is staged there instead of at the South Lake Day Use parking lots (Figure 22). In either case, visitors would be required to hold a timed-entry ticket or current reservation for North-South Lake Campground to use the service to access Kaaterskill Falls.

We would recommend that the shuttle not operate on the north side of North-South Lake Campground (e.g., to pick up riders in the campground) to preserve the quiet character and camping-focused experience there and to avoid inducing unsustainable levels of visitation to Kaaterskill Falls from the campground.

We recommend that NYSDEC conduct a feasibility analysis to determine if there would be sufficient ridership to justify operating such a service between the South Lake Day Use parking lots and Laurel House Road. While there is also interest from stakeholders to operate shuttle service from a park-and-ride lot in town to Kaaterskill Falls, this would likely not be an attractive option for visitors to Kaaterskill Falls who could simply park at Laurel House Road or South Lake to access the falls with their timed-entry tickets. That said, the optional route could be included in a shuttle feasibility analysis, along with the "circulator shuttle" between South Lake and Laurel House Road (Figure 22).

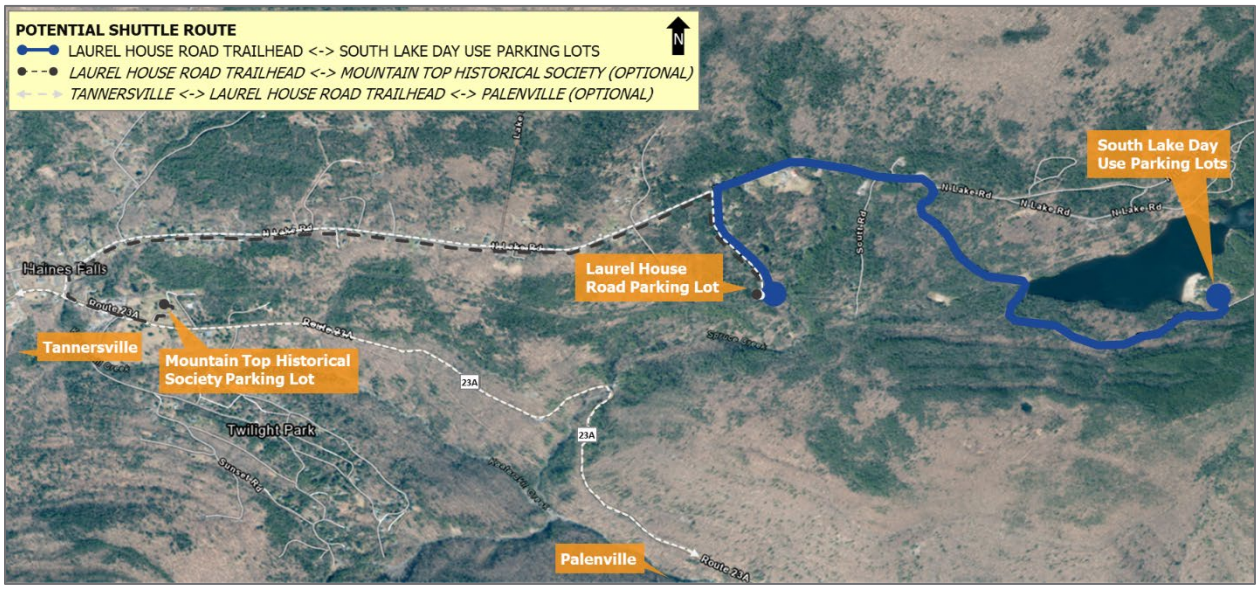

Figure 22. Potential shuttle routes to evaluate to support access to Kaaterskill Falls under a timed-entry system.

7. Evaluate the need to expand processing capacity at the North-South Lake Campground and Day Use Area Entrance Station.

As noted, current levels of visitor use at Kaaterskill Falls on peak summer days create overflow parking and vehicle traffic pressure that overwhelm the physical and operating capacity of the North-South Lake Campground and Day Use Area Entrance Station. It is expected that implementing a timed-entry system for access to Kaaterskill Falls will significantly reduce the amount of traffic at the North-South Lake Campground and Day Use Area Entrance Station, even with the South Lake Day Use parking lots serving as an overflow parking area for access to Kaaterskill Falls.

It is possible that the timed-entry system alone might solve the traffic queueing issues at the North-Sout Lake Campground and Day Use Area Entrance Station, but it will be necessary for NYSDEC to monitor traffic there once the timed-entry system is implemented. If traffic queuing issues persist even with the timed-entry system for Kaaterskill Falls, we recommend that NYSDEC expand the physical and operating capacity of the entrance station, as follows:

- Design and construct a second inbound traffic lane and booth.
- Designate one inbound traffic lane for camping groups, administrative vehicles, emergency vehicle access, and shuttles, if applicable.
- Designate one inbound traffic lane for day use visitors, including visitors with timed-entry tickets for access to Kaaterskill Falls.
- Double entrance station staffing from spring through the end of the fall peak season and staff the entrance station with full-time, professional staff.
- Consider designing and constructing a roundabout to improve traffic circulation for vehicles seeking to turn around at the end of North Lake Road.

Our recommendations regarding improvements to the North-South Lake Campground and Day Use Entrance Station, if they are needed after implementing a timed-entry system for Kaaterskill Falls, are depicted in Figure 23.[27]

[27] It is possible that improvements to the entrance station are required for other reasons and prior to implementation of a timed-entry system for Kaaterskill Falls.

Figure 23. Recommended North-South Lake Campground and Day Use Entrance Station improvements.

8. Implement visitor information and education strategies.

In conjunction with implementing the timed-entry system for access to Kaaterskill Falls, we recommend that NYSDEC implement the following visitor information and education strategies:

- Establish an online reservation and visitor information site to administer the timed-entry system and inform visitors of the requirements for obtaining a timed-entry ticket to visit Kaaterskill Falls.
- Deploy on-the-road message boards to inform visitors arriving to the area that advanced reservations are required to visit Kaaterskill Falls. This will be particularly critical during the initial implementation of the timed-entry system. It is likely in the initial stages of implementation that some visitors will arrive onsite without prior knowledge of the timed-entry system and expecting to visit the falls without having first obtained timed-entry tickets.
- Deploy on-the-road arrival/welcome and wayfinding signage on Route 23A and North Lake Road to provide visitors with a sense of arrival to the Kaaterskill Clove and Falls area, and an improved ability to navigate efficiently and conveniently to their destinations.
- Deploy onsite visitor information and education staff at the parking lots on Laurel House Road and at South Lake to provide visitors with information about the timed-entry system and to promote sustainable visitor use practices including Leave No Trace principles. As part of this strategy, consider developing an internship program and/or partnerships with the Catskill Center and others to hire, train, and deploy onsite visitor information and education staff.

- Offer guided tours to visitors with timed-entry tickets of the Kaaterskill Falls site, its natural resources, and its history in American conservation. Offer similar tours of the Escarpment Subregion for visitors who do not have timed-entry tickets to visit Kaaterskill Falls. Considering working in partnership with the Catskill Center to offer these opportunities for visitors.
- Work in partnership with local communities, advocacy and stewardship groups, and other partners to identify and inform the visiting public about alternative destinations in the Catskill Park and surrounding communities where there is capacity to accommodate additional visitation. Work with these partners to develop and deploy informational signage, brochures, and maps about these other opportunities in the area.

Our recommendations regarding visitor information and education strategies are depicted in Figure 24.

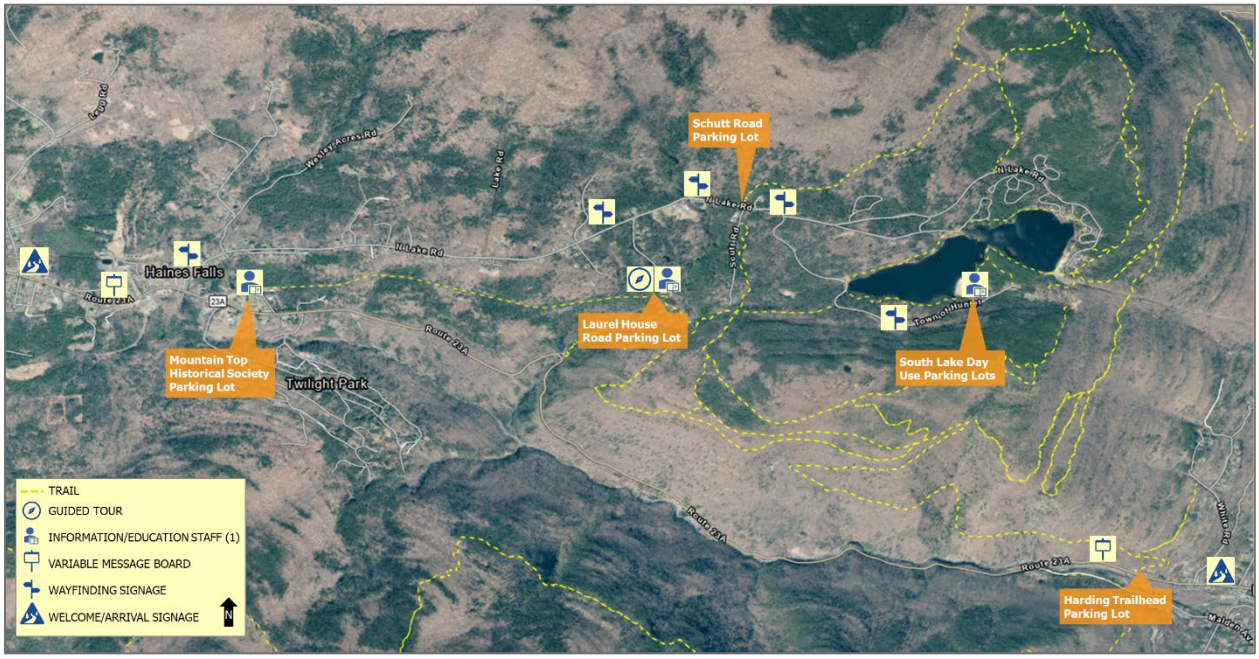

Figure 24. Recommended strategies for visitor information and education.[28]

[28] Deploying information and education staff at the Mountain Top Historical Society Parking Lot is recommended if the Mountain Top Historical Society parking lot is used as overflow parking for visitors with a timed-entry ticket for Kaaterskill Falls when the Laurel House Road parking lot is full (Option 2 for overflow parking).

9. Implement visitor use monitoring for adaptive visitor use management.

We recommend that NYSDEC conduct visitor use monitoring at Kaaterskill Falls on a recurring basis and adapt the management strategies outlined above as necessary based on monitoring results. Refer to the monitoring plan for the Kaaterskill Clove Project Area presented in *Section 10. Monitoring Plan* for detailed monitoring recommendations. Monitoring is an essential element of NYSDEC's commitment to implement the VUMF in the Kaaterskill Clove Project Area. It provides the basis to know whether management actions are effective and/or if they need to be adapted to achieve desired conditions for the project area.

The 2023 onsite data collection provides a baseline that establishes current conditions prior to implementing the visitor use management strategies outlined in this report and/or other strategies. At a minimum, we recommend that the next cycle of monitoring should be conducted in conjunction with the implementation of the timed-entry system.

Results from monitoring during the first year of implementing the timed-entry system should be used to assess and adapt visitor use management, as needed. For example, monitoring results might suggest that the number of timed-entry tickets issued per day can be increased or should be decreased, based on how traffic, parking management, and crowding conditions respond. Similarly, monitoring results might suggest that the amount and/or location of parking designated for access to Kaaterskill Falls needs to be adjusted. In these and similar ways, monitoring will be essential for NYSDEC to validate and/or refine visitor use management actions to achieve desired conditions and avoid unintended consequences of such actions.

10. Work in partnership with the town of Hunter and NYSDOT to take actions to reduce vehicle and pedestrian safety hazards on Route 23A.

We recommend that NYSDEC work in partnership with the town of Hunter and NYSDOT to take the following actions to reduce vehicle and pedestrian safety hazards on Route 23A:

- Permanently prohibit parking in roadside lots and pullouts along Route 23A from spring through the end of the fall peak season.
- Discontinue trolley stops along Route 23A.
- Decommission the Kaaterskill 23A trailhead (including the kiosk, register, and related facilities). Designate the shoulder pull-off at the hairpin turn on Route 23A and the section of the trail between Route 23A and Bastion Falls for administrative and emergency access only.
- Remove pedestrian crossing(s) and related signs along Route 23A and install signs discouraging pedestrians from walking on the road or road shoulders.
- Implement site improvements at Harding trailhead parking lot to clearly delineate parking spaces and prevent overflow parking.
- Reduce the posted speed limit on Route 23A through Kaaterskill Clove.

Our recommendations regarding management strategies for the Route 23A corridor of the Kaaterskill Clove Project Area are depicted in Figure 25.

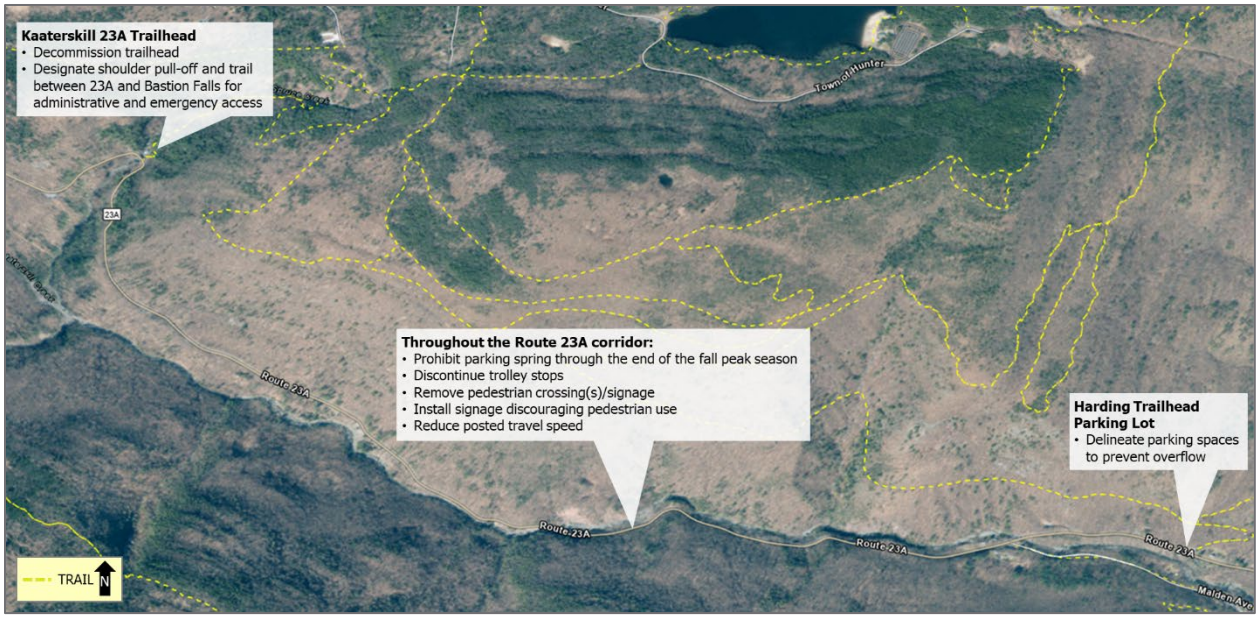

Figure 25. Recommended management strategies for the Route 23A corridor.

11. Conduct a formal assessment of the impacts of recreation use on ecological conditions and select ecological indicators for monitoring and adaptive visitor use management in the Kaaterskill Clove Project Area.

As noted, the scope of this project focused on addressing impacts of intensive visitor use on the quality and character of visitors' experiences and public safety in the Kaaterskill Clove Project Area. As such, the project did not include an assessment of ecological conditions or the selection of ecological indicators to inform adaptive management strategies. As an important next step in developing a comprehensive approach to visitor use management for the Kaaterskill Clove Project Area, we recommend that NYSDEC assess and select indicators for ecological conditions in the project area.

12. Complete the Colgate Lake Wild Forest Unit Management Plan and conduct visitor use monitoring and management planning for nearby areas of the Catskill Park that might be at risk of displacement impacts from managing visitor use at Kaaterskill Falls.

The Kaaterskill Clove Project Area is part of a larger, complex landscape of important local communities, natural landscapes, and outdoor recreation destinations. As such, strategies to manage visitor use in the Kaaterskill Clove Project Area are likely to have effects that extend beyond its boundaries. Visitor use monitoring and management planning efforts for the Colgate Lake Wild Forest, other nearby management units, and community-based destinations will be needed to maximize the benefits of management decisions and minimize the likelihood of unintended consequences. We recommend incorporating the VUMF into these related planning efforts to provide a unifying framework and approach across the landscape.

To summarize and synthesize our recommendations for the Kaaterskill Clove Project Area, Figure 26 provides a system-level view of the program of visitor use management strategies and actions outlined above.

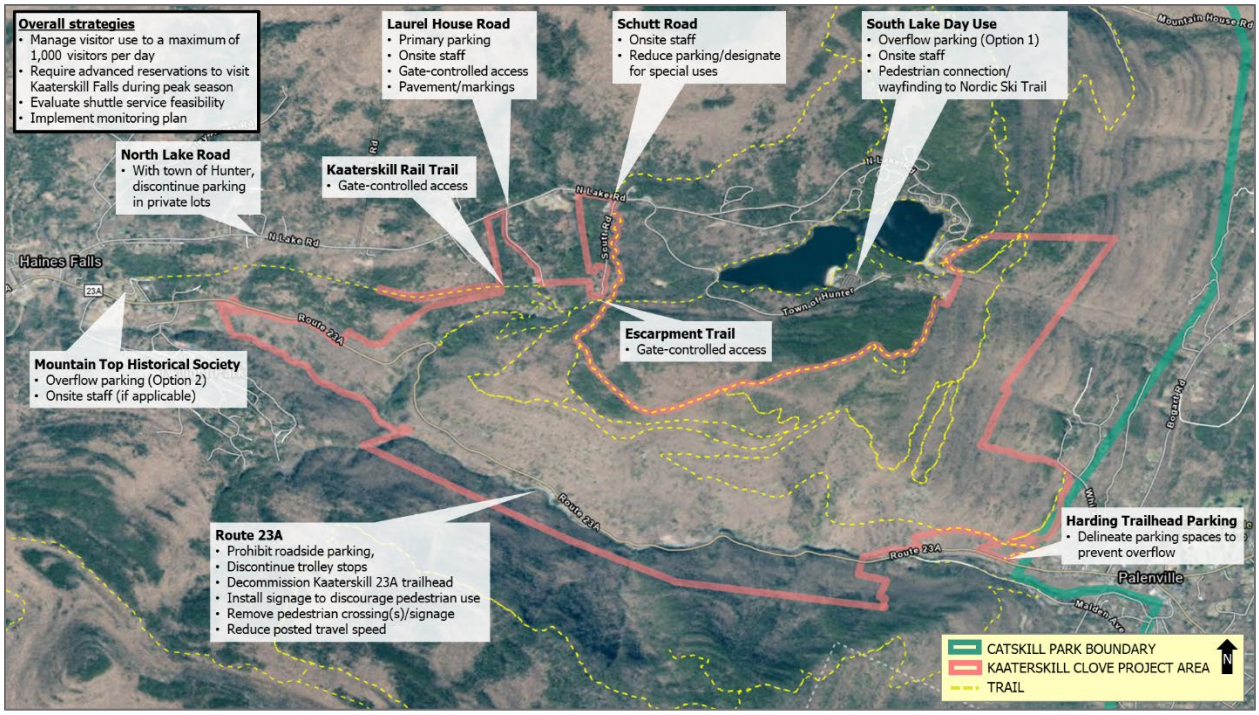

Figure 26. Synthesis of recommended management strategies for the Kaaterskill Clove Project Area.

9.2 Recommendations for Phased Implementation

We recommend that NYSDEC implement the strategies outlined above using a phased approach as follows:

Phase 1 – Calendar Year 2025

- Continue current park operations and management, including coordination with the town of Hunter for traffic and parking management on North Lake Road.
- Formalize plans and assemble the resources required for implementation of visitor use management strategies in the Kaaterskill Clove Project Area.
- Conduct a public information campaign to provide advanced notice of changes that will be implemented to manage visitor use and access for Kaaterskill Falls and Route 23A.
- Develop an operating plan for implementing the timed-entry system.
- Develop design and construction plans for gate-controlled access points and parking lot improvements on Laurel House Road.
- Develop a partnership agreement with the town of Hunter to permanently discontinue parking for Kaaterskill Falls on private property when the timed-entry system is implemented.
- Coordinate with NYSDOT and local partners to develop action plans for visitor information and education strategies that will be delivered in conjunction with implementing the timed-entry system.

- Conduct a shuttle feasibility study for service to visitors with timed-entry tickets for Kaaterskill Falls.
- Work in partnership with NYSDOT and the town of Hunter to enact a permanent ban on parking along 23A from spring through the end of the fall peak season.
- Work with local partners, NYSDOT, and the town of Hunter to discontinue trolley stops along Route 23A.
- Designate with signage the section of the trail between Route 23A and Bastion Falls for administrative and emergency access. Work in partnership with NYSDOT and the town of Hunter to do the same for the shoulder pull-off at the hairpin turn on Route 23A.
- Develop design and construction plans for a trail terminus, viewpoint, and turnaround on the Kaaterskill Falls Trail at Bastion Falls.
- Implement site improvements at Harding trailhead parking lot to delineate parking spaces.
- Work in partnership with NYSDOT and the town of Hunter to reduce the posted speed limit on Route 23A in the Kaaterskill Clove.
- Conduct visitor use monitoring and management planning for nearby areas that could experience displacement impacts from managing visitor use at Kaaterskill Falls.

Phase 2 – Calendar Year 2027

- Continue current park operations and management, including coordination with the town of Hunter for traffic and parking management on North Lake Road.
- Construct new facilities and facility improvements.
- Research/solicit and select reservation system service provider.
- Solicit and select shuttle service provider, if applicable.
- Complete visitor use monitoring and management planning for nearby areas that could experience displacement impacts from managing visitor use at Kaaterskill Falls.

Phase 3 – Calendar Year 2028

- Implement timed-entry system and gate-controlled access.
- Implement visitor information and education strategies.
- Implement shuttle service, if applicable.
- Conduct onsite monitoring according to the Visitor Use Management Pilot Project Monitoring Plan for the Kaaterskill Clove Project Area.
- Implement visitor use monitoring and management plans for nearby areas that could experience displacement impacts from managing visitor use at Kaaterskill Falls.

Phase 4 – Calendar Year 2029

Adapt management strategies as needed based on monitoring results. This could include:

- Increasing or decreasing the supply of timed-entry tickets.
- Increasing or decreasing the supply of parking for access to Kaaterskill Falls.

- Making physical and/or operational improvements to the gate-controlled points of access to Kaaterskill Falls.
- Addressing displacement impacts to pre- and/or post-timed-entry hours and dates of operations and/or to other nearby areas.

10. Monitoring Plan

This section presents a long-term monitoring plan for the Kaaterskill Clove Project Area. The monitoring plan provides guidance and tools to implement the indicators and thresholds selected for long-term monitoring and adaptive management of visitor use according to desired conditions in the Kaaterskill Clove Project Area.

Implementing this monitoring plan is an essential component of determining if visitor use management strategies are effective, and/or if additional strategies are required to achieve desired conditions in the Kaaterskill Clove Project Area. Monitoring is also an essential element of NYSDEC's commitment to implement the VUMF in the Kaaterskill Clove Project Area.

The remainder of this section presents the core monitoring plan components, detailed monitoring protocols, and log forms required to implement the plan.

10.1 Monitoring Plan Components

This section presents the core monitoring plan components, including: 1) monitoring indicators and their thresholds; 2) a sampling plan; 3) an analysis plan; and 4) staffing requirements.

10.1.1 Monitoring Indicators and Thresholds

The indicators and thresholds included in the monitoring plan for the Kaaterskill Clove Project Area are summarized in Table 7. These indicators and thresholds were selected by NYSDEC to guide long-term monitoring and adaptive management of visitor use in the Kaaterskill Clove Project Area. See *Section 7. Indicators and Thresholds* for more detailed information about the process and rationale for selecting these indicators and thresholds for the Kaaterskill Clove Project Area.

Table 7. Monitoring indicators and thresholds for the Kaaterskill Clove Project Area.

Indicator	Threshold
People-per-viewscape (PPV): • Middle Pool area	There will be fewer than 24 PPV in the Middle Pool area viewscape 90% of sampled times.
Vehicles-at-one-time (VAOT): • Laurel House Road parking lot • Schutt Road parking lot • South Lake Day Use parking lot • Harding trailhead parking lot	The maximum daily VAOT at each monitoring location will be no greater than the design capacity of the parking lot in that location 99% of sampled days.
Vehicle traffic queue length: • North Lake Road at North-South Lake Campground and Day Use Area Entrance Station	The maximum daily vehicle traffic queue length on North Lake Road will not extend to the junction of North Lake Road and Schutt Road or further west 99% of sampled days.
Intergroup encounters per hour: • Section of trail[29] in the Escarpment Subregion	Visitors will have fewer than 7 intergroup encounters per hour while hiking on a section of trail in the Escarpment Subregion 90% of sampled hikes.

10.1.2 Sampling Plan

The 2023 onsite data collection conducted as part of the NYSDEC Visitor Use Management Pilot Project provides a baseline that establishes current conditions prior to implementing visitor use management strategies outlined in the Visitor Use Management Pilot Project Recommendations Report for the Kaaterskill Clove Project Area. The first cycle of onsite visitor use monitoring in the Kaaterskill Clove Project Area should be conducted in conjunction with the implementation of the managed access strategies presented in the recommendations report (i.e., timed-entry system and parking management plan) or no later than summer 2027. Subsequently, onsite visitor use monitoring should occur in conjunction with significant changes to visitor use management strategies and no less frequently than every three years. In addition, vehicle traffic and trail use counts should be conducted on an ongoing, permanent basis according to the detailed protocols and procedures presented in *Section 10.2.5 Vehicle Traffic and Trail Use Counts*.

During each monitoring cycle, onsite visitor use monitoring should be conducted according to the sampling plan in Table 8. Over time, the plan may need to be adapted based on monitoring results from previous monitoring cycles and other factors. For each indicator, the sampling plan specifies:

Measurement: The measurement is the type and unit of data to be collected for the indicator. The measurements are described in greater detail in the monitoring protocols for each indicator.

Sampling Interval: The sampling interval specifies the frequency with which measurements are recorded for the indicator. In the case of intergroup encounters, the sampling interval is event-based (i.e., one cumulative observation per hiking patrol). For all other indicators, the sampling intervals are expressed as time intervals between measurements.

[29] This section of trail includes portions of the Escarpment Trail, Yellow Horse Trail, and Schutt Road Trail.

Sampling Days: The sampling plan specifies the minimum number of sampling days during which monitoring data should be collected for the indicator in each monitoring cycle. All monitoring should occur on fair weather days on weekends and holidays and during the period between the Fourth of July Holiday Weekend and Labor Day Weekend.

Sampling Hours: The sampling plan specifies the minimum number of hours per sampling day monitoring data should be collected for the indicator. All monitoring should occur between 9:00 a.m. and 6:00 p.m. For intergroup encounters, there are two discrete sampling periods per day, with one hiking patrol during the morning hours and one hiking patrol during the afternoon hours. For all other indicators, the sampling hours are continuous.

Daily Sample Size: The daily sample size is the number of measurements or observations recorded per sampling day for the indicator. It is a function of the sampling interval and number of sampling hours per day for the indicator. In the case of intergroup encounters, there is a single observation per hiking patrol. For all other indicators there is one or more observations per hour.

Table 8. Sampling plan for visitor use monitoring in the Kaaterskill Clove Project Area.

Indicator	Measurement	Sampling interval	Sampling days	Sampling hours	Daily sample size
People-per-viewscape (PPV)	PPV count	Once every 5 minutes	5 days per cycle	6 hours per day	72 counts per day
Vehicles-at-one-time (VAOT)	VAOT count	Once per hour	10 days per location, per cycle	8 hours per location, per day	8 counts per location, per day
Vehicle traffic queue length	Yes/No queue extends to or beyond Schutt Road	Once per hour	10 days per cycle	8 hours per day	8 observations per day
Intergroup encounters per hour	Number of groups encountered during hiking patrol, total duration of hiking patrol	Once per hiking patrol	5 days per cycle	2 hiking patrols per day (1 each during AM and PM hours)	2 observations per day (1 per hiking patrol)

10.1.3 Analysis Plan

At the completion of each cycle of onsite monitoring, the monitoring data should be analyzed and assessed in relation to the threshold for each indicator. Table 9 summarizes key parameters of an analysis plan for each indicator, including:

Summary Statistic: The summary statistic is the type and unit of measurement of the statistic to compute from the monitoring data to use as a basis of comparison against the threshold value and threshold statistic for the indicator.

Threshold value: The threshold value expresses the quantity component of the threshold for the indicator. It is the value used as the basis to calculate the summary statistic for the indicator.

Threshold Statistic: The threshold statistic expresses the frequency component of the threshold for the indicator. The summary statistic should have a frequency equal to or greater than that of the threshold statistic.

Sample Size for Assessment: The sample size for the assessment is the number of measurements or observations recorded for the indicator during the monitoring cycle based on the sampling plan in Table 8. It is a function of the unit of measurement for the summary statistic, the number of sampling days and hours in the monitoring cycle, and the sampling interval for the indicator.

Table 9. Analysis plan parameters for monitoring indicators for the Kaaterskill Clove Project Area.

Indicator	Summary statistic	Threshold value	Threshold statistic	Sample size for assessment
People-per-viewscape (PPV)	% of PPV counts less than threshold value	24 PPV	90% of PPV counts less than threshold value	360 PPV counts
Vehicles-at-one-time (VAOT)	% of sampling days with daily maximum VAOT no greater than threshold value	Designated capacity of the parking lot	99% of sampling days with daily maximum VAOT no greater than threshold value	10 daily maximum VAOT counts
Vehicle traffic queue length	% of sampling days with maximum daily queue less than threshold value	Queue length to or beyond Schutt Road	99% of sampling days with maximum daily queue less than threshold value	10 daily maximum queue length observations
Intergroup encounters per hour	% of hiking patrols with encounter rate less than threshold value	7 intergroup encounters per hour	90% of hiking patrols with encounter rate less than threshold value	10 hiking patrols

10.1.4 Staffing Requirements

The following staffing resources will be required to implement the monitoring plan for the Kaaterskill Clove Project Area:

Visitor use monitoring program coordinator: A designated visitor use monitoring coordinator will be required to direct and oversee implementation of the monitoring plan. This would likely be a quarter- to half-time commitment, year-round, except during onsite monitoring seasons and the subsequent analysis and reporting periods when it would be a full-time commitment. The visitor use monitoring coordinator role should be assigned to a permanent, professional member of the NYSDEC staff. The duties of the visitor use monitoring program coordinator should be included in the job description/requirements of the assigned staff member, rather than be treated as collateral duty. The monitoring coordinator would be responsible for scheduling, staffing, equipment deployment and maintenance, training, oversight, analysis, and reporting for the monitoring program.

Visitor use monitoring technicians: Visitor use monitoring technicians would be required on a cyclical (e.g., every three years or similar) and seasonal basis to collect onsite monitoring data. Monitoring technicians would be recruited, screened, hired, trained, and managed by the visitor use monitoring program coordinator to meet the requirements and needs for reliable and accurate

monitoring data collection. As part of a staffing strategy for visitor use monitoring technicians, NYSDEC could consider developing an internship program or similar arrangement with its partners. It is anticipated that two to three visitor use monitoring technicians would be required for up to one month per monitoring cycle to conduct onsite monitoring according to the sampling plan in Table 8.

10.2 Monitoring Protocols and Log Forms

The following sections present detailed monitoring protocols and data collection log forms for each of the indicators selected by NYSDEC for the Kaaterskill Clove Project Area and for ongoing, permanent vehicle traffic and trail use counts.

10.2.1 People-Per-Viewscape (PPV) in the Middle Pool area

The protocol and data collection log form for conducting observation-based PPV counts in the Middle Pool area of Kaaterskill Falls are presented below.

Equipment and supplies

The following equipment and supplies are required to complete PPV data collection:

1. PPV data collection log form (1 per sampling day, with backups) and protocol
2. PPV viewscape reference image (laminated)
3. Writing utensil (pen or pencil and pencil sharpener, with backups)
4. Clipboard
5. Hand-held tally counter
6. Watch or cell phone (for current time while collecting data)
7. One-gallon Ziploc bag (to store log forms out of weather)
8. Personal items (e.g., clothing layers, sunglasses, sunscreen, water, food, etc.)

Before starting data collection

1. Arrive at the Middle Pool area of Kaaterskill Falls at least 15 minutes prior to the start of the data collection period and position yourself at the “X” location depicted in Figure 27. The target hours for data collection are 11:00 a.m. to 5:00 p.m. (6 hours total).
2. Complete the header information on the PPV data collection log form (excluding the “Departure Time”).
3. Set the tally counter to zero.
4. Read the instructions below.

Collecting PPV count data

1. You will conduct an instantaneous count once every 5 minutes. Start the first count at the top of the designated hour.

2. At the start of each count, record the hour associated with the count in the "Time" column of the data collection log form.

3. Conduct an instantaneous count of the number of people in the PPV viewscape area depicted in Figure 28 by visually scanning the area from left to right. Include only people in the PPV viewscape area in the count. Use the tally counter to register your count.

4. Once you have completed the instantaneous PPV count, record the count from the tally counter in the "PPV Count" column of the data collection log form for the corresponding count interval.

5. If there were no visitors observed in the PPV viewscape area during a count, record a count of "0" – do not leave the cell blank.

6. Record comments in the "Comments" column of the data collection form, if applicable.

7. Reset the tally counter to zero.

8. Repeat Steps 2 through 7 every 5 minutes through the duration of the data collection period.

9. Record the "Departure Time" in the log form's header field upon completion of your last count for the day and update the weather and special events information as needed.

Additional considerations

1. Do your best to avoid counting visitors who enter the PPV viewscape area after you have already started a count. This is to approximate an instantaneous count of the number of people in the PPV viewscape area "at the moment" the count started.

2. Count every person who is at least partially (e.g., a person with one foot in the viewscape area and one foot outside the viewscape area) or is entirely in the PPV viewscape area during each count.

3. Take bathroom/comfort breaks during the time between count intervals, if possible.

4. Take all necessary safety precautions (e.g., in the event of a thunderstorm or other circumstance that poses risk to your personal safety), even if it means you need to discontinue data collection.

5. Draw a line through the "PPV Count" cell on the log form for any count that is missed. Record in the "Comments" cell the reason the PPV count period was missed (e.g., to take shelter from a thunderstorm, bathroom break, arrived late, left early, etc.).

Figure 27. Schematic diagram of the monitoring location for PPV in the Middle Pool area.

Figure 28. Viewscape for monitoring PPV in the Middle Pool area.

Data collection log form

PPV Count Data Collection Log Form **Initials:** _____
Date: ____/____/_____ (mm/dd/yyyy) **Count Area:** Middle Pool
Arrival Time: _____:_____ (hh:mm; 24-hr.) **Departure Time:** _____:_____ (hh:mm; 24-hr.)
Weather: Sunny / Overcast / Rainy / Stormy (circle one)
Special Event: No / Yes (circle one; *if Yes* describe): _____

Row ID	Time	PPV Count	Comments	Row ID	Time	PPV Count	Comments
1	:00:00			37	:00:00		
2	:05:00			38	:05:00		
3	:10:00			39	:10:00		
4	:15:00			40	:15:00		
5	:20:00			41	:20:00		
6	:25:00			42	:25:00		
7	:30:00			43	:30:00		
8	:35:00			44	:35:00		
9	:40:00			45	:40:00		
10	:45:00			46	:45:00		
11	:50:00			47	:50:00		
12	:55:00			48	:55:00		
13	:00:00			49	:00:00		
14	:05:00			50	:05:00		
15	:10:00			51	:10:00		
16	:15:00			52	:15:00		
17	:20:00			53	:20:00		
18	:25:00			54	:25:00		
19	:30:00			55	:30:00		
20	:35:00			56	:35:00		
21	:40:00			57	:40:00		
22	:45:00			58	:45:00		
23	:50:00			59	:50:00		
24	:55:00			60	:55:00		
25	:00:00			61	:00:00		
26	:05:00			62	:05:00		
27	:10:00			63	:10:00		
28	:15:00			64	:15:00		
29	:20:00			65	:20:00		
30	:25:00			66	:25:00		
31	:30:00			67	:30:00		
32	:35:00			68	:35:00		
33	:40:00			69	:40:00		
34	:45:00			70	:45:00		
35	:50:00			71	:50:00		
36	:55:00			72	:55:00		

Enter the hour value for each PPV count interval using the 24-hr clock (e.g., record "14:10:00" for the interval starting at 2:10 PM).

Enter a ZERO (0) in the appropriate count cell if no visitors were present in the count area during the count period – **do not leave any cells blank.**

Draw a line through the PPV count cell of any count that was missed. Record in the "Comments" cell the reason the PPV count was missed (e.g., to take shelter from a thunderstorm, bathroom break, arrived late, left early, etc.).

Draw a line through any "Comments" cells that are not used – **do not leave any cells blank.**

Draw a line through any rows that are not used – **do not leave any rows blank.**

10.2.2 Vehicles-At-One-Time (VAOT) in Select Parking Lots and Adjacent Overflow Areas

The protocol and data collection log form for conducting observation-based VAOT counts in select parking lots and adjacent roadsides in the Kaaterskill Clove Project Area are presented below.

Equipment and supplies

The following equipment and supplies are required to complete VAOT data collection:

1. VAOT data collection log form (1 per sampling day, with backups) and protocol
2. Writing utensil (pen or pencil and pencil sharpener, with backups)
3. Clipboard
4. Hand-held tally counter
5. Watch or cell phone (for current time while collecting data)
6. Traffic safety vest
7. One-gallon Ziploc bag (to store log forms out of weather)
8. Personal items (e.g., clothing layers, sunglasses, sunscreen, water, food, etc.)

Before starting data collection

1. Arrive at the South Lake Day Use parking lot at least 15 minutes prior to the start of the data collection period. The technician assigned to collect VAOT data will concurrently collect vehicle traffic queue length observations on North Lake Road at the Entrance to North-South Lake Campground and Day Use Area Entrance Station. The protocol and log form for monitoring vehicle traffic queue length are presented in the next section.
2. VAOT count data will be collected hourly for eight hours per sampling day between 9:00 a.m. and 6:00 p.m. and at the following locations[30]:
    a. South Lake Day Use parking lots in the North-South Lake Campground and Day Use Area
    b. Schutt Road parking lot
    c. Laurel House Road parking lot
    d. Harding trailhead parking lot
3. Complete the header information on the VAOT data collection log form (excluding the "Departure Time").

[30] If overflow parking for Kaaterskill Falls continues at the Mountain Top Historical Society in the long term, it would be important to add it as a VAOT monitoring location through a partnership agreement or similar.

4. Read the instructions below.

Collecting VAOT count data

1. On each sampling day, begin the first hour of data collection at the South Lake Day Use parking lot and then continue along the data collection circuit presented in Figure 29 to collect VAOT counts for each of the Schutt Road, Laurel House Road, and Harding trailhead parking lots during the first hour. During the second hour, reverse the direction of the circuit to begin VAOT count data collection at the Harding trailhead and end data collection at the South Lake Day Use parking lot. Continue to travel only a one-way distance of the circuit and reverse your direction of travel each subsequent hour. Concurrently record vehicle traffic queue length observations on North Lake Road each hour of the sampling day using the protocol and data collection log form presented in the next section of the monitoring plan.

2. Start each hourly data collection circuit and count at the top of the designated hour.

3. At the start of each hourly data collection circuit, record the hour of the data collection circuit in the “Time” column of the data collection log form.

4. At each parking lot location on each hourly data collection circuit:

    a. Set the tally counter to zero.

    b. Conduct a roving count of the number of vehicles parked in the parking lot and on adjacent roadsides using the tally counter.

    c. Once you have counted all the parked vehicles, record the count from the tally counter in the appropriate “VAOT Count” column of the data collection log form for the corresponding hour and count location.

    d. If there were no vehicles observed in the count area during a count, record a count of “0” – do not leave the cell blank.

    e. Record comments in the “Comments” column of the data collection form, if applicable.

    f. Move to the next parking lot location along the circuit and repeat Steps 4a through 4e until you have completed the circuit.

5. Repeat Steps 3 through 4f at the top of the next hour and each subsequent hour of the sampling day.

6. Record the “Departure Time” in the log form’s header field upon completion of your last count for the day and update the weather and special events information as needed.

Additional considerations

1. If you park your vehicle within the VAOT count data collection area, do not include your vehicle in the count of parked vehicles.

2. Think of each hourly count as an “instantaneous count”. Do not adjust your VAOT count to discount vehicles that leave after being included in your VAOT count. Similarly, do not adjust your VAOT count to add vehicles that arrive and park in a space that you’ve already passed while conducting your VAOT count.

3. Include all vehicle types in the counts of parked vehicles. Use the “Comments” column on the data collection log form to record information about any unusual circumstances.

4. Take bathroom/comfort breaks during the time between count periods, if possible.

5. Take all necessary safety precautions (e.g., in the event of a thunderstorm or other circumstance that poses risk to your personal safety), even if it means you need to discontinue data collection.

6. Draw a line through the “VAOT Count” cell on the log form for any count that is missed. Record in the “Comments” cell the reason the VAOT count was missed (e.g., to take shelter from a thunderstorm, bathroom break, arrived late, left early, etc.).

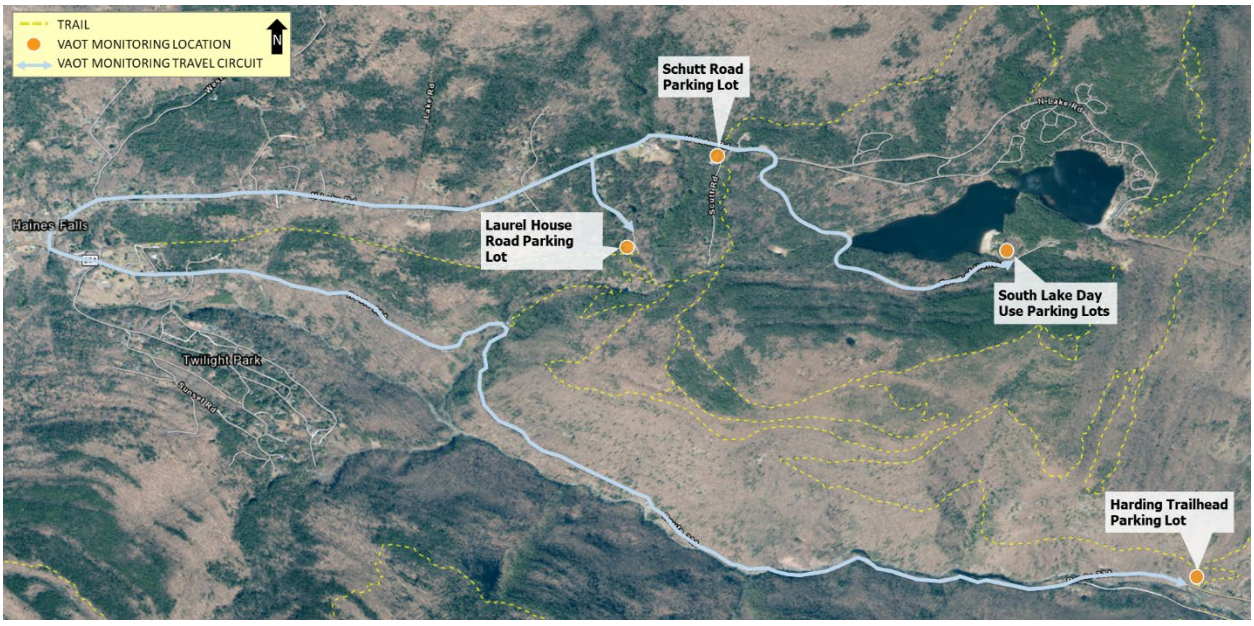

Figure 29. VAOT monitoring locations and travel circuit.

Data collection log form

VAOT Count Data Collection Log Form

Date: ____/____/_____ (mm/dd/yyyy) **Initials:** _____

Arrival Time: _____:_____ (hh:mm; 24-hr.) **Departure Time:** _____:_____ (hh:mm; 24-hr.)

Weather: Sunny / Overcast / Rainy / Stormy (circle one)

Special Event: No / Yes (circle one; *if Yes* describe): _____

Row ID	Time	VAOT Count				Comments
		South Lake Day Use Parking	Schutt Road Parking	Laurel House Road Parking	Harding Trailhead	
1	:00					
2	:00					
3	:00					
4	:00					
5	:00					
6	:00					
7	:00					
8	:00					

Enter the hour value for each data collection circuit using the 24-hr clock (e.g., record "14:00" for the interval starting at 2:00 PM).

Enter a ZERO (0) in the appropriate count cell if there were no parked vehicles during an hourly count period – **do not leave any cells blank.**

Draw a line through the VAOT count cell of any count that was missed. Record in the "Comments" cell the reason the VAOT count was missed (e.g., to take shelter from a thunderstorm, bathroom break, arrived late, left early, etc.).

Draw a line through any "Comments" cells that are not used – **do not leave any cells blank.**

Draw a line through any rows that are not used – **do not leave any rows blank.**

10.2.3 Vehicle Traffic Queue Length on North Lake Road

The protocol and data collection log form for conducting observations of vehicle traffic queue length on North Lake Road at the North-South Lake Campground and Day Use Area Entrance Station are presented below.

Equipment and supplies

The following equipment and supplies are required to complete vehicle traffic queue length data collection:

1. Vehicle traffic queue length data collection log form (1 per sampling day, with backups) and protocol
2. Writing utensil (pen or pencil and pencil sharpener, with backups)
3. Clipboard
4. Watch or cell phone (for current time while collecting data)
5. Traffic safety vest
6. One-gallon Ziploc bag (to store log forms out of weather)
7. Personal items (e.g., clothing layers, sunglasses, sunscreen, water, food, etc.)

Before starting data collection

1. Arrive at the South Lake Day Use parking lot at least 15 minutes prior to the start of the data collection period. The technician assigned to collect vehicle traffic queue length data will concurrently collect VAOT monitoring data at select parking locations and adjacent roadsides. The protocol and log form for monitoring VAOT are presented in the preceding section.
2. Vehicle traffic queue length observations will be recorded hourly for eight hours per sampling day between 9:00 a.m. and 6:00 p.m. as the technician travels the VAOT data collection circuit depicted in Figure 29 in the preceding section.
3. Complete the header information on the vehicle traffic queue length data collection log form (excluding the “Departure Time”).
4. Read the instructions below.

Collecting vehicle traffic queue length data

1. On each sampling day, record an observation of the vehicle traffic queue length each time you pass Schutt Road while traveling on the VAOT data collection circuit.
2. For each hourly observation, record the hour associated with the observation in the “Time” column of the data collection log form and check one box under the “Vehicle

Queue Length Exceeds Threshold?" (see the threshold location in Figure 30) field for the corresponding hour, as follows:

a. Check "*YES"* if there is a vehicle traffic queue that extends from the North-South Lake Campground and Day Use Area on North Lake Road to or beyond its junction with Schutt Road.

b. Check "*NO"* if there are no vehicles in queue at the North-South Lake Campground and Day Use Area Entrance Station or if there is a vehicle traffic queue there but it does not extend to the junction of North Lake Road and Schutt Road.

c. Record comments in the "Comments" column of the data collection form, if applicable. If there is no vehicle traffic queue present during an hourly observation, record this in the "Comments" column for the corresponding hour.

3. Repeat Steps 1 through 2c during the next and each subsequent hour of the sampling day.

4. Record the "Departure Time" in the log form's header field upon completion of your last observation for the day and update the weather and special events information as needed.

Additional considerations

1. Think of each hourly observation as an "instantaneous observation". Do not adjust your vehicle traffic queue length observation to account for vehicle movements that occur after you've conducted your vehicle traffic queue length observation.

2. Take all necessary safety precautions (e.g., in the event of a thunderstorm or other circumstance that poses risk to your personal safety), even if it means you need to discontinue data collection.

Figure 30. Vehicle traffic queue length monitoring location and threshold.

Data collection log form

Vehicle Queue Length Data Collection Log Form **Initials:** _____

Date: ____/____/_____ (mm/dd/yyyy) **Count Area:** North Lake Road

Arrival Time: _____:_____ (hh:mm; 24-hr.) **Departure Time:** _____:_____ (hh:mm; 24-hr.)

Weather: Sunny / Overcast / Rainy / Stormy (circle one)

Special Event: No / Yes (circle one; *if Yes* describe): _____

Row ID	Time	Vehicle Queue Length Exceeds Threshold?		Comments
		YES	NO	
1	:00	☐	☐	
2	:00	☐	☐	
3	:00	☐	☐	
4	:00	☐	☐	
5	:00	☐	☐	
6	:00	☐	☐	
7	:00	☐	☐	
8	:00	☐	☐	

Enter the hour value for each vehicle queue length observation in the "Time" column using the 24-hr clock (e.g., record "14:00" for the interval starting at 2:00 PM).

Record in the "Comments" column for the corresponding hour **if there is no vehicle traffic queue present** during that hourly data collection circuit.

Draw a line through the cell of any observation that was missed. Record in the "Comments" cell the reason the observation was missed (e.g., to take shelter from a thunderstorm, bathroom break, arrived late, left early, etc.).

Draw a line through any "Comments" cells that are not used **– do not leave any cells blank.**

Draw a line through any rows that are not used **– do not leave any rows blank.**

10.2.4 Intergroup Encounters Per Hour While Hiking on a section of trail[29] in the Escarpment Subregion

The protocol and data collection log form for conducting hiking patrol-based observations of intergroup encounters on a section of trail[1] in the Escarpment Subregion of the Kaaterskill Clove Project Area are presented below.

Equipment and supplies

The following equipment and supplies are required to complete intergroup encounters data collection:

1. Intergroup encounters data collection log form (2 per sampling day, with backups) and protocol
2. Writing utensil (pen or pencil and pencil sharpener, with backups)
3. Clipboard
4. Watch or cell phone (for current time while collecting data)
5. One-gallon Ziploc bag (to store log forms out of weather)
6. Personal items (e.g., clothing layers, sunglasses, sunscreen, water, food, etc.)

Before starting data collection

1. Arrive at the Laurel House Road trailhead at least 30 minutes prior to the start of the data collection period and proceed along the trail network to the "Start" position depicted in Figure 9.
2. Intergroup encounters observations will be recorded separately for each of two hiking patrols on the route highlighted in Figure 9. One hiking patrol will occur during the morning hours between 9:00 a.m. and 12:00 p.m. and the other hiking patrol will occur during the afternoon hours between 12:00 p.m. to 6:00 p.m.
3. Complete the header information on the intergroup encounters data collection log form, excluding the "Hike Start Time" and "Hike End Time."
4. Read the instructions below.

Collecting intergroup encounters data

1. At the start of each hiking patrol, start a new data collection log form and record the current time as the "Hike Start Time" on the data collection log form.
2. Hike the designated route at a normal hiking pace, similar to that of a "typical visitor" hiking on the trail.
3. Each time you encounter a group on the trail during the hiking patrol, record the time of the encounter in the "Time" column and the number of people in the group in the "Group

Size" column. Use a separate row on the data collection log form for each encounter, starting with Row ID 1.

4. When you reach the "End" position depicted in Figure 31, record the current time as the "Hike End Time" on the data collection log form and update the weather and special events information as needed. Do not record any more group encounters on the data collection log form after this time.

5. After completing your first hiking patrol, take a 30-minute break to rest, reset, and store your data collection log form.

6. When your break is complete and at the designated time, return to the "Start" position depicted in Figure 31 to start a new hiking patrol.

7. Repeat Steps 1 through 4.

Additional considerations

1. Only record encounters along the highlighted trail section depicted in Figure 31. Do not record encounters along the section of trail between the "Start" and "End" positions.

2. Record an observation for each encounter with a group, including groups you previously encountered during the hiking patrol.

3. Record a group size of "1" for encounters with people who are hiking alone rather than in a group with other people.

4. Include encounters with groups you pass or are passed by while hiking in the same direction or in the opposing direction. If you are unsure if a number of individuals encountered are hiking in one or more groups, use your best judgement to define the group. If you cannot determine the size of an encountered group, record "DK" for "don't know" in the "Group Size" column.

5. Take all necessary safety precautions (e.g., in the event of a thunderstorm or other circumstance that poses risk to your personal safety), even if it means you need to discontinue data collection.

6. Draw a line through any extra rows on the data collection log form that were not used to record intergroup encounters.

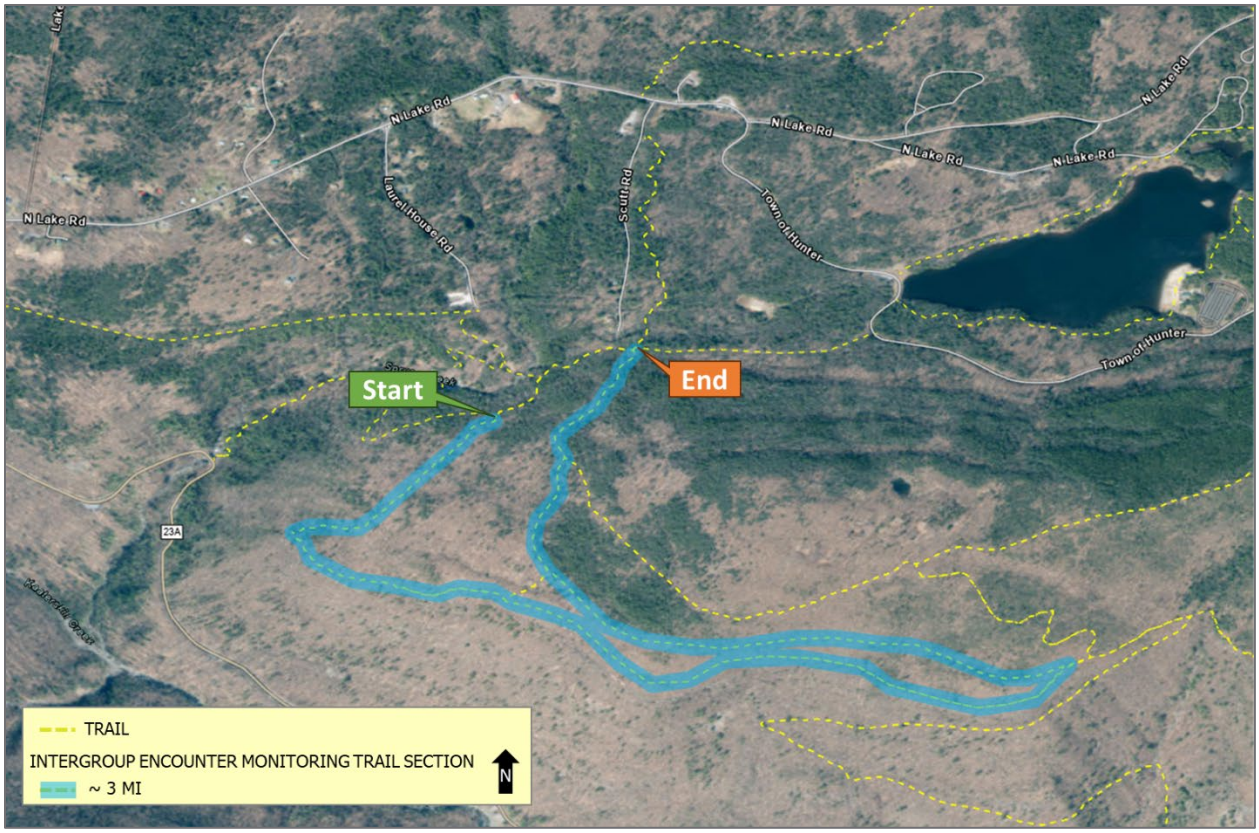

Figure 31. Selected section of trail for monitoring intergroup encounters per hour while hiking in the Escarpment Subregion.

Data collection log form

Intergroup Encounters Data Collection Log Form
Date: ____/____/_____ (mm/dd/yyyy)
Hike Start Time: _____:_____ (hh:mm; 24-hr.)
Weather: Sunny / Overcast / Rainy / Stormy (circle one)

Initials: _____
Trail Segment: Designated Section Escarpment Trail
Hike End Time: _____:_____ (hh:mm; 24-hr.)
Special Event: No / Yes (circle one; *if Yes* describe): _____

Row ID	Time (hh:mm; 24-hr.)	Group Size (# or DK)	Row ID	Time (hh:mm; 24-hr.)	Group Size (# or DK)	Row ID	Time (hh:mm; 24-hr.)	Group Size (# or DK)	Row ID	Time (hh:mm; 24-hr.)	Group Size (# or DK)	Row ID	Time (hh:mm; 24-hr.)	Group Size (# or DK)
1	:		21	:		41	:		61	:		81		
2	:		22	:		42	:		62	:		82		
3	:		23	:		43	:		63	:		83		
4	:		24	:		44	:		64	:		84		
5	:		25	:		45	:		65	:		85		
6	:		26	:		46	:		66	:		86		
7	:		27	:		47	:		67	:		87		
8	:		28	:		48	:		68	:		88		
9	:		29	:		49	:		69	:		89		
10	:		30	:		50	:		70	:		90		
11	:		31	:		51	:		71	:		91		
12	:		32	:		52	:		72	:		92		
13	:		33	:		53	:		73	:		93		
14	:		34	:		54	:		74	:		94		
15	:		35	:		55	:		75	:		95		
16	:		36	:		56	:		76	:		96		
17	:		37	:		57	:		77	:		97		
18	:		38	:		58	:		78	:		98		
19	:		39	:		59	:		79	:		99		
20	:		40	:		60	:		80	:		100		

Draw a line through any rows that are not used – **do not leave any rows blank.**

10.2.5 Vehicle Traffic and Trail Use Counts

As noted, vehicle traffic and trail use counts should be conducted on an ongoing, permanent basis in the locations identified in Figure 32. Vehicle traffic and trail use counts should be recorded in hourly bins. In the case of the vehicle traffic counts, pneumatic tube counters rather than magnetometers should be used to record directional counts and to maximize accuracy. If magnetometers are used to record vehicle traffic counts, they must be calibrated and adjusted to estimate directionality. In the case of trail use counts, infrared trail counters should be used, and the raw counter data should be calibrated and adjusted to estimate directionality.

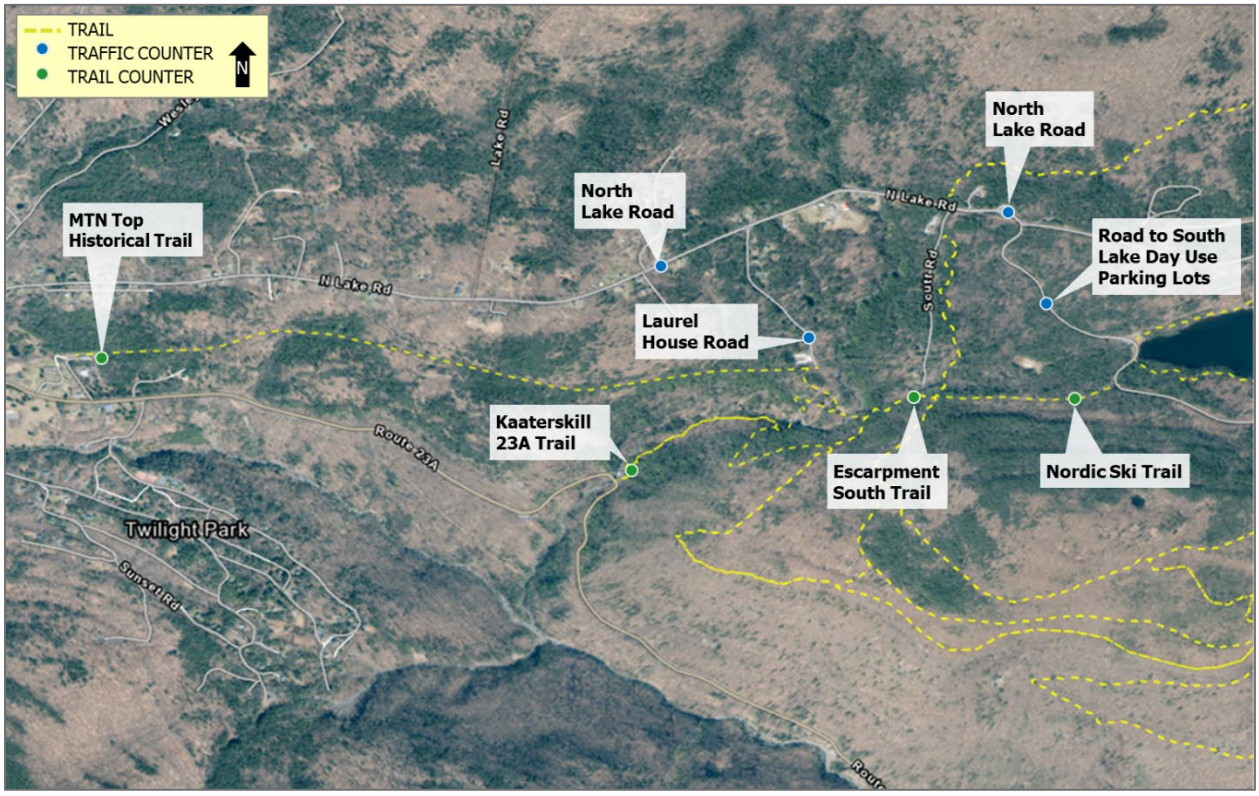

Figure 32. Locations for monitoring vehicle traffic and trail use in the Kaaterskill Clove Project Area.

The calibration results in Table 10 can be applied to calibrate each of the three infrared trail counters listed in the table, assuming they remain deployed and configured as they were during the 2023 onsite data collection conducted for this project[31]. The calibration results in Table 10 for the Laurel House Road magnetometer vehicle traffic counter can be used if it remains deployed and configured as it was during the 2023 onsite data collection. It won't be necessary to calibrate vehicle traffic counts on Laurel House Road once NYSDEC deploys a pneumatic tube traffic counter there instead of a magnetometer.

[31] The following formula is used to calculate calibrated counts from the intercept and coefficient values reported in Table 2: *Calibrated hourly count = intercept + (raw hourly count * coefficient)*.

Table 10. Counter calibration results from the 2023 onsite data collection.

Counter location	Counter type	Intercept	Coefficient	Intercept p-value	Coefficient p-value	R^2	N
Escarpment South Trail	Infrared trail counter	-0.018	1.338	0.992	< 0.001	0.97	20
Kaaterskill 23A Trail	Infrared trail counter	0.516	0.892	0.059	< 0.001	0.98	19
MTN Top Historical Trail	Infrared trail counter	2.771	1.393	0.146	< 0.001	0.75	20
Laurel House Road	Magnetometer vehicle traffic counter	3.311	0.827	< 0.001	< 0.001	0.90	1190

The protocol and data collection log form to conduct trail counter calibration counts at other locations not listed in Table 10, and in the future to update calibration counts at all trail counter locations, are presented below.[32]

Equipment and supplies

The following equipment and supplies are required to complete infrared trail counter calibration counts:

1. Counter calibration log form (1 per sampling day, with backups) and protocol
2. Writing utensil (pen or pencil and pencil sharpener; with backups)
3. Clipboard
4. Two hand-held tally counters
5. Watch or cell phone (for current time while collecting data)
6. Documentation and field grade GPS or cell phone to locate the counter equipment
7. One-gallon Ziploc bag (to store log forms out of weather)
8. Personal items (e.g., camp chair, clothing layers, sunglasses, sunscreen, food, water, etc.)

Before starting data collection

1. Arrive at the counting location at least 15 minutes prior to the start of the data collection period. The target hours for data collection are between 9:00 a.m. and 6:00 p.m.

[32] If magnetometers are used at any of the vehicle traffic count locations, the calibration methods should be adapted and applied to them as well.

2. Station yourself in an out of the way location near but not in front of or directly next to the trail counter where you could inadvertently trigger counts on the trail counter.

3. Complete the header information on the counter calibration log form (excluding the "Departure Time").

4. Read the instructions below.

Collecting trail counter calibration data

1. You will conduct counts in 30-minute time intervals. Start the first 30-minute interval count at the top of the designated hour.

2. At the start of each 30-minute interval count, set the tally counters to zero and record the hour of the count in the "Start" and "End" columns of the trail counter calibration log form.

3. Count the number of people passing the trail counter in the 30-minute time interval, by direction of travel ("Inbound" to the project area or "Outbound" out of the project area). Use one tally counter for inbound counts and the other for outbound counts.

4. At the end of each 30-minute count period, record the counts from the tally counters in the respective "Inbound" and "Outbound" columns of the counter calibration log form.

5. Record comments in the "Comments" column of the data collection form, if applicable.

6. Repeat Steps 2 through 5 every 30 minutes through the duration of the data collection period.

7. Record the "Departure Time" in the log form's header field upon completion of your last count for the day and update the weather and special events information as needed.

Additional considerations

1. If the same person passes the trail counter multiple times, count them each time they pass the counter.

2. Count every person that passes the trail counter, even if multiple people pass the trail counter at the same time.

3. If a person sits or stands in front of the trail counter, record only one tally in the calibration count and note the behavior in the "comments" cell (e.g., one person standing in front of the trail counter for approximately XX minutes). Do not ask the person to move, as you are just an observer. Do nothing to influence the situation.

4. You can conduct observation-based calibration counts for one hour at a time or up to 10 hours at a time. Be sure to complete whole-hour counts in 30-minute intervals so that counts can be compared to the hourly-binned trail counter data.

5. Use the calibration counts and raw trail counter data, paired by date and hour of day to estimate a simple linear regression model. Enter the calibration counts into the model as the dependent variable and the raw trail counter data as the independent variable.

Include an intercept term in the model. Use the resultant regression model intercept term and coefficient to calibrate the full set of raw trail counter data.

6. Estimate directionality by dividing the total daily calibrated count for each date by two, based on the assumption that use at the counting locations is “out and back” day use.

Data collection log form

Trail Counter Calibration Log Form **Initials:** _____
Date: ____/____/_____ (mm/dd/yyyy) **Trail Counter Location Name:** _____
Arrival Time: ____:____ (use 24-hr clock *hh:mm*) **Departure Time:** ____:____ (use 24-hr clock *hh:mm*)
Weather: Sunny / Overcast / Rainy / Stormy / Smoky *(circle one)*
Special Event: No / Yes (circle one; *if Yes* describe): _____

Row ID	Start	End	Inbound	Outbound	Comments
1	:00:00	:29:59			
2	:30:00	:59:59			
3	:00:00	:29:59			
4	:30:00	:59:59			
5	:00:00	:29:59			
6	:30:00	:59:59			
7	:00:00	:29:59			
8	:30:00	:59:59			
9	:00:00	:29:59			
10	:30:00	:59:59			
11	:00:00	:29:59			
12	:30:00	:59:59			
13	:00:00	:29:59			
14	:30:00	:59:59			
15	:00:00	:29:59			
16	:30:00	:59:59			
17	:00:00	:29:59			
18	:30:00	:59:59			

Enter the hour value for each calibration count interval using 24-hr clock (e.g., record "14:00:00" for the interval starting at 2:00 PM).

Enter a ZERO (0) in the appropriate count cell if no visitors passed the counter during a count interval **– do not leave any cells blank.**

Draw a line through the Inbound/Outbound count cells if a count period was missed. Record in the "Comments" cell the reason the count was missed (e.g., took shelter from a thunderstorm, bathroom break, etc.).

Draw a line through any "Comments" cells that are not used **– do not leave any cells blank.**

Draw a line through any rows that are not used **– do not leave any rows blank.**

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Appendix A—NYSDEC Core Team Summary of Engagement

The following summarizes the NYSDEC Core Team engagement activities and timeline (Table A-1).

Table A-1. NYSDEC Core Team engagement activities and timeline for the Kaaterskill Clove Project Area.

NYSDEC Core Team engagement activity[33]	Date
Project Kickoff	January 2023
NYSDEC Core Team Workshop #1: Build the Foundation	February 2023
NYSDEC Core Team Workshop #2: Define the Visitor use Management Direction	May 2023
NYSDEC Core Team Workshop #3: Identify Management Strategies Part I	November 2023
Data Results Workshop I	November 2023
Data Results Workshop II	January 2024
Indicators Facilitated Discussion	March 2024
Thresholds Facilitated Discussion I	April 2024
Thresholds Facilitated Discussion II	June 2024
NYSDEC Core Team Workshop #4: Identify Management Strategies Part II	August 2024

[33] All engagement activities with the NYSDEC Core Team were conducted virtually.

Appendix B—Kaaterskill Clove Visitor Use Management Project Stakeholder and Public Engagement Plan

CATSKILL PARK ▸ KAATERSKILL CLOVE
VISITOR USE MANAGEMENT

Kaaterskill Clove Visitor Use Management Project Stakeholder and Public Participation Plan

Project Description

The New York State Department of Environmental Conservation (NYSDEC) is undertaking a planning process to address visitor use management and visitor capacities. The VUM planning process will focus on the experiential, social, and public safety elements of visitor use management and visitor capacities, to promote sustainable visitor use. Over the next several months, the project team will engage State officials, stakeholders, and the public in outlining desired conditions and management strategies for the project area.

During the latter half of 2023, the process will focus on measuring and analyzing visitor use levels and patterns to determine how closely current conditions in the project area align with desired conditions for visitors' experiences and public safety. The second year of the contract will focus on developing management strategies aimed at helping DEC achieve and maintain desired conditions. The final project report will be provided to DEC that includes recommendations for monitoring and maintaining the effectiveness of the strategies over time.

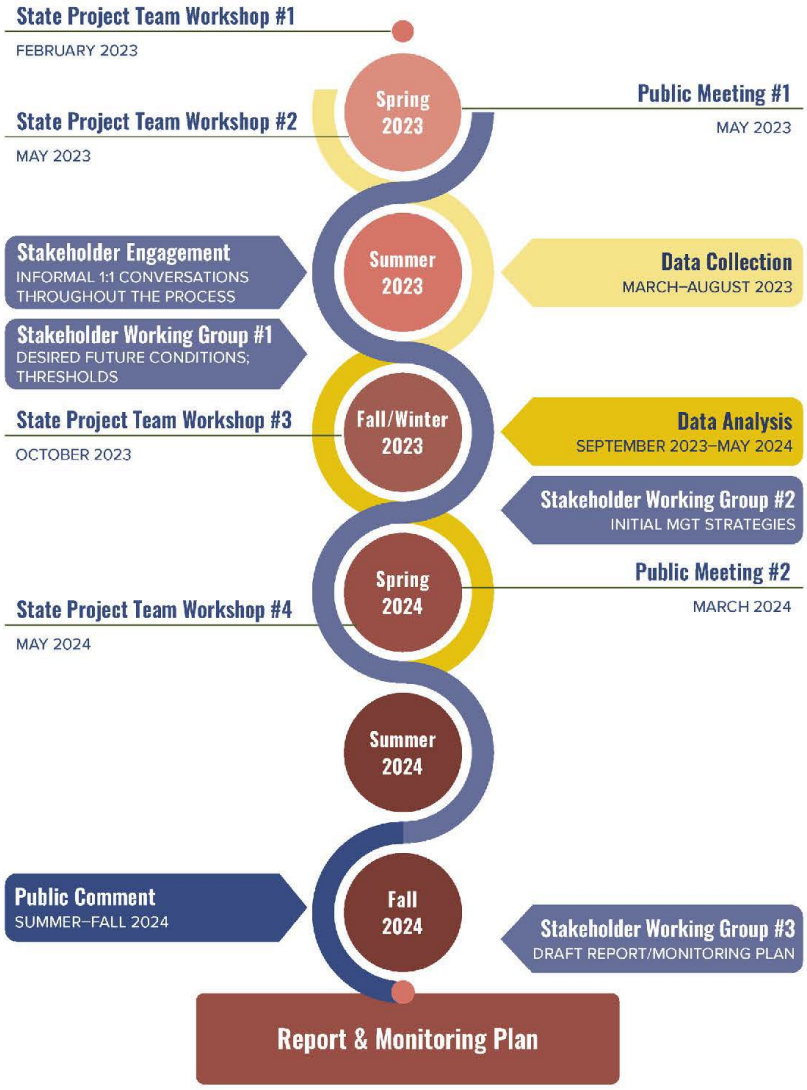
The Stakeholder and Public Participation Plan (Participation Plan) supports the ongoing project data collection and analysis, and describes the objectives and tools for stakeholder and broader public engagement throughout the process. It is based in part on recommendations generated from independent stakeholder conversations convened by the Otak consultant team prior to and following the first Kaaterskill Clove VUM public meeting on May 10, 2023.

Overview of the Process Map

The project is organized by data collection and analysis milestones projected to occur at seasonal intervals. Corresponding communication and stakeholder and public participation opportunities are identified for the projected milestones. This information is summarized below, and visually depicted in Figure 1.

- Spring 2023: Stakeholder Engagement
- Spring 2023: Public Meeting #1
- Summer 2023: Onsite Data Collection
- Fall 2023: Stakeholder Working Group—Meeting #1
- Fall/Winter 2023: Data Analysis
- Spring 2024: Stakeholder Working Group—Meeting #2
- Spring 2024: Public Meeting #2
- Summer 2024: Stakeholder and Public Comment on Draft Report
- Fall 2024: Stakeholder Working Group—Meeting #3
- Fall 2024: Final Report and Monitoring Plan

Figure 1. Process Map



Communication Goals

This plan details the communication goals, audiences, communication and engagement tools, and materials for the Kaaterskill Clove VUM Project. Communications and engagement activities are intended to help achieve the following goals:

- Project roles and responsibilities are clearly communicated to stakeholders and the public.
- Stakeholders and the public understand the project recommendations and decisions they can inform and influence.
    - Provide meaningful, accessible, and equitable opportunities for stakeholders and the public to engage during the study period.
    - Demonstrate how stakeholder and public input informed analysis and recommendations.
- Project milestones and progress are clearly communicated to stakeholders and the public with opportunities for questions and timely follow up responses.
- NYSDEC and the Otak Consultant Team are trusted sources of project information.
    - Keep stakeholders and the public informed about the project to minimize concerns resulting from speculation and misinformation.
    - Communicate information in the clearest, least technical way possible.

Key Audiences

Key audiences are defined as ***public, stakeholders, interagency, and Tribes***. The **public** includes those potentially affected by or interested in the project. ***Stakeholders*** are defined as those with a technical, jurisdictional, and/or representative role who are potentially affected by or interested in the project. ***Interagency*** is defined as those with jurisdictional authority in the study area, and with whom close coordination is critical to the project's success.

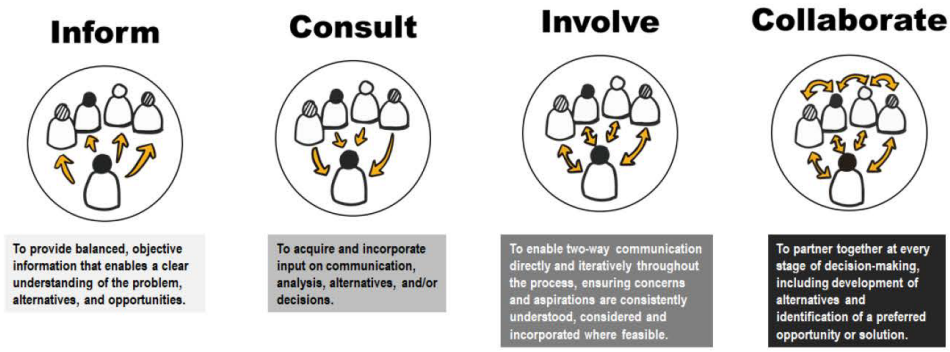
As sovereign governments, ***Tribes*** bring a valuable, indigenous perspective to this project. NYSDEC will serve as the primary contact with Tribes, and will consult with them in-person, in the field, and/or virtually based on the Tribe's preferences.

Appendix 1 contains a list of key audiences by category.

Engagement Methods

The engagement methods identified for this project are consistent with best practices adapted from the International Association for Public Participation's Spectrum, including engagement goals along a spectrum of "Inform" to "Collaborate" (Figure 2). These goals may be applied to any of the key audiences identified for this project. Goals are "cumulative"—for example, if you are 'involving' you are, by definition, 'informing' and 'consulting'.

Figure 2. Engagement Spectrum



The approach for each phase of the spectrum is described with appropriate tools in the table below. Communication materials for each tool are detailed in Appendix 3.

Table 1: Engagement Methods by Engagement Goal

Engagement Goal: INFORM		
Audience Category	Engagement tool	Approach
All	Project webpage	The Kaaterskill Clove VUM project website will be a place to learn about the project, including its goals, schedule, current work, updates, and other information. The webpage will be updated at key project technical milestones and as needed.
	E-distribution	Project updates, announcements of public meetings, and other project news will be periodically distributed through an email distribution list, maintained by the Otak Team, of those who voluntarily provide their email information at public meetings, through communication with the project inbox (vum-facilitators@rossstrategic.com) and through the project website.
	Leveraged outreach opportunities	Capitalize on opportunities to share project information at events convened by others (Appendix C)
Stakeholders	Partner links	The Otak Team will coordinate with stakeholders and encourage them to provide links on their respective social media accounts to the Kaaterskill Clove VUM project

		website, and to other project-related social media postings as information becomes available.
Tribes	Partner links	NYSDEC will coordinate with Tribes and encourage them to provide links on their respective social media accounts to the Kaaterskill Clove VUM project website, and to other project-related social media postings as information becomes available.
Engagement Goal: Consult[1]		
Audience	Engagement tool	Approach
All	Project webpage	The Kaaterskill Clove VUM project website will provide an opportunity to provide comments/feedback at any time.
Public	1:1 Conversations	NYSDEC and Otak Team members will engage in informal 1:1 conversations with local community members and the visiting public as opportunities arise to develop relationships, build authentic and mutual trust, share project information, and receive feedback.
Stakeholders	1:1 Conversations	NYSDEC and Otak technical team members will engage in informal 1:1 conversations with members of the stakeholders working group as opportunities arise to develop relationships, build authentic and mutual trust, share project information, and receive feedback. The VUM Facilitation Team will reach out to stakeholder group members in-between meetings and share input and feedback with the technical team.
Tribes	Informational conversations	NYSDEC will engage in informational conversations with Tribes as opportunities arise to develop relationships, build authentic and mutual trust, share project information, and receive feedback. *Formal, government-to-government consultation will occur as needed and requested, outside of this process.*

[1] Engagement goal of "consult" not to be confused with Tribal/NYSDEC formal government-to-government "consultation."

Engagement Goal: Involve		
Audience	Engagement tool	Approach
Public	Public Meetings	Conduct public meetings to provide updates on the project, respond to questions, and collect feedback. [2]
Stakeholders	Kaaterskill Clove VUM Stakeholder Working Group	The Stakeholder Working Group (SWG), convened by the Otak Team, includes up to 20 people with a technical, jurisdictional, and/or representative role who are potentially affected by or interested in the project. See Appendix 2 for participants). The purpose of the SWG is to inform project recommendations by engaging a diverse group of organizational representatives in focused project-specific discussions, and individually and collectively provide insight, input, values, and feedback. SWG members also serve as a conduit for information to and from affiliated organization members.
Tribes	Government-to-government consultation	NYSDEC will formally meet as needed and requested by the Tribe to develop relationships, build authentic and mutual trust, and share project information.
Engagement Goal: Collaborate		
Audience	Engagement tool	Approach
Interagency	State Project Team (Core Team)	NYSDEC will work with the Otak Team to collaborate on all process decisions throughout the study period.

Communication Mechanisms and Materials

Notifications and other distributions of information will occur through a variety of mediums to keep stakeholders and the public informed of upcoming project milestones and events. The **Otak Team** will also maintain an email distribution list of those who voluntarily provided their email information at public meetings, through communication with the project inbox (vum-facilitators@rossstrategic.com) and through the project website.

[2] The first public meeting on May 9, 2023, was held in Saranac, NY as an in-person meeting only. Public feedback made a strong case to provide virtual opportunities for visitors living outside the area and without reasonable access to in-person meetings held near the study site. A virtual option will be considered for the Spring 2024 public meeting.

The project website, www.kaaterskillclovevum.com, maintained by the **Otak Team** will serve as the primary source of project information, milestones, and notifications of related events. It will also be used as a platform to receive public comment and questions throughout the process.

NYSDEC will use its networks, distribution lists, and social media platforms to help ensure stakeholders and the public receive project information through outlets such as its webpage, periodic e-news, personal contacts, local news outlets, and state and local government updates.

The **Kaaterskill Clove VUM Stakeholder Working Group** members will be equipped with information to share with their members and networks about the project.

Informational and analytical materials developed in association with the project will be used to help meet communication goals. A list of communication materials is included in Appendix 3, and will be periodically updated as the project progresses and based on communication needs.

Appendix 1: Key Audiences[3]

Audience	Organization / Affiliation
Public	Project distribution list (maintained by the Otak Team) Media/social media outlets Communities within/adjacent to the study area
Stakeholders	Adirondack Mountain Club Cary Institute of Ecosystem Studies Catskill Center Catskill Center for Independence Catskill Mountainkeeper Greene County Sheriff Greene County Soil & Water Conservation District Greene County Tourism Hunter Ambulance Service Hunter Mountain Ski Bowl Kaaterskill Trolley Mountain Cloves Scenic Byway Mountain Top Historical Society New York State Department of Transportation New York/New Jersey Trail Conference Town of Hunter Town of Hunter Police Department Federated Sportsmen's Clubs of Ulster, Greene, and Sullivan Counties
Tribes	As determined by NYSDEC's consultation with Tribes

[3] This list will be updated as additional interests emerge.

Appendix 2: Kaaterskill Clove Stakeholder Working Group

Organization	Representative
Adirondack Mountain Club	Cathy Pedler
Cary Institute of Ecosystem Studies	(To Be Determined)
Catskill Center	Jeff Senterman
Catskill Center for Independence	Meghan Staring
Catskill Mountainkeeper	Taylor Jaffe
Greene County Sheriff	Lt. Andrew Overbaugh
Greene County Soil & Water Conservation District	Michelle Yost
Greene County Tourism	Warren Hart
Hunter Mountain Ski Bowl	(To Be Determined)
Kaaterskill Trolley	Ryan Chadwick
Mountain Cloves Scenic Byway	David Kukle
Mountain Top Historical Society	Ryan Penny
New York State Department of Transportation	Greg Wichser or Bob Rice
New York/New Jersey Trail Conference	Myra Romano
Town of Hunter	Sean Mahoney
Town of Hunter Police Department	Sgt. Bob Haines
Federated Sportsmen's Clubs of Ulster, Greene, and Sullivan Counties	Shannon Ryan

Appendix 3: Communication materials

Materials	Timing	Location
1. News releases	Posted same day they are released by NYSDEC	Website
2. Frequently asked questions	Posted as they emerge	Website
3. Process road map	Updated periodically as needed	Website
4. Meeting materials a. Summaries b. Presentations c. Other	As meetings occur. Presentation materials posted the day following each public/stakeholder meeting.	Website
5. Data / analytical reports	Posted as they become publicly available	Website
6. Foundational VUM information	Referenced throughout the duration of project	Interagency VUM Website

Appendix 4: "Leveraged" Outreach Opportunities

(potential opportunities to share project information at events convened by others)

Event Name	Host	Date/Time/Location	Key Audience
To be identified as opportunities arise			

Appendix C—Stakeholder Working Group Members and Summary of Engagement

The following identifies Stakeholder Working Group members for the Kaaterskill Clove Project Area and summarizes the Stakeholder Working Group engagement activities and timeline (Table C-1 and Table C-2).

Table C-1. Stakeholder Working Group members for the Kaaterskill Clove Project Area.

Name	Affiliation
Cathy Pedler	Adirondack Mountain Club
Jeff Senterman, Christina Ricciardelli	Catskill Center
Meghan Staring	Catskill Center for Independence
Taylor Jaffe	Catskill Mountainkeeper
Lt. Andrew Overbaugh	Greene County Sheriff
Michelle Yost	Greene County Soil & Water Conservation District
Warren Hart	Greene County Tourism
Russ Coloton, Trent Poole	Hunter Mountain Resort
Ryan Chadwick	Kaaterskill Trolley
David Kukle	Mountain Cloves Scenic Byway
Ryan Penny	Mountain Top Historical Society
Robert Rice, Greg Wichser, Stephanie Long	NYS Dept of Transportation
Myra Romano	New York/New Jersey Trail Conference
Sean Mahoney	Town of Hunter
Sgt. Bob Haines	Town of Hunter Police Department
Shannon Ryan	Federated Sportsmen's Clubs of Ulster, Greene, Delaware, and Sullivan Counties; NYS Conservation Council

Table C-2. Stakeholder engagement activities and timeline for the Kaaterskill Clove Project Area.

Stakeholder engagement activity	Date
Stakeholder Discussion (virtual)	March 2023
Stakeholder Working Group Meeting #1 (in-person)	October 2023
Data Results Workshop I (virtual)	February 2023
Data Results Workshop II (virtual)	February 2023
Stakeholder Working Group Meeting #2 (in-person)	March 2024
Stakeholder Working Group Meeting #3 (in-person)	July 2024
Stakeholder Working Group 1:1 Conversations (virtual)	Ongoing

Appendix D—Summary of Public Engagement

The following table summarizes the public engagement activities and timeline for the Kaaterskill Clove Project Area (Table D-1).

Table D-1. Public engagement opportunities and timeline for the Kaaterskill Clove Project Area.

Public engagement opportunity	Date
Public Website	May 2023 and ongoing
Public Meeting #1 – in-person	May 2023
Public Meeting #2 - virtual	June 2024

Appendix E—Summary of Onsite Data Collection Effort for the Kaaterskill Clove Project Area

The following data were collected to describe visitor use conditions and related impacts in the Kaaterskill Clove Project Area during the 2023 summer visitor use season (see Figure E-1 for data collection locations):

- **Directional vehicle traffic volumes** were recorded on **Laurel House Road**[34] by a traffic counter deployed by New York State Department of Transportation (NYSDOT). The traffic volume data were recorded 24-hours per day from May 26 through October 31, 2023.
- **Hourly parking accumulation** at the **Laurel House Road parking lot** and the **Harding trailhead parking lot** was recorded as counts of parked vehicles from 11:00 a.m. to 6:00 p.m. on 12 days between July 17 and July 30, 2023.
- **Hourly parking accumulation** at the **Mountain Top Historical Society parking lot** was recorded as categorical observations[35] from 11:00 a.m. to 6:00 p.m. on 12 days between July 17 and July 30, 2023. A separate observation of whether cars were parked on the lawn was recorded each hour during the same time.
- **Hourly parking accumulation** was recorded along the **Route 23A corridor** (starting at the Molly Smith parking lot and ending before the Harding trailhead parking lot) from 11:00 a.m. to 6:00 p.m. on 12 days between July 17 and July 30, 2023. Observations of the number of cars stopped to load or unload in the roadway were also recorded for this same stretch of Route 23A during the same time.
- **Visitor use volumes** were recorded in hourly bins by infrared trail counters permanently installed by NYSDEC at three locations on the trail network that accesses Kaaterskill Falls (**Mountain Top Historical Society Rail Trail, Escarpment South, Kaaterskill 23A**). The trail use volume data were recorded in 24-hour bins per day and are reported for May 26 through September 4, 2023, in this report.
    - Motion-activated trail cameras were also co-located with infrared trail counters to record calibration data. A sample of 20 hours of calibration data were post-processed and used in regression models to derive correction factors (i.e., calibration multipliers) to convert raw hourly trail counter data to estimates of actual visitor use. Hourly estimates were then aggregated at the daily level, divided in half to account for inbound and outbound travel patterns, and presented as daily summaries.
- **Visitor use patterns and durations of stay** were estimated using GPS devices administered to randomly selected visitor groups arriving at the Laurel House Road trailhead from 11:00 a.m. to 6:00 p.m. on five days between July 17 and July 30, 2023 (N=244, 99% response rate).

[34] These data reflect the active management of vehicle traffic along Laurel House Road and visitor parking in the Laurel House Road parking lot that occurred during the 2023 data collection period.
[35] Parking accumulation at the Mountain Top Historical Society parking lot was recorded as one of five categorical observations: 1) no parked vehicles (0%), 2) some parking but no more than a quarter full (25%), 3) more than a quarter full but no more than half full (50%), 4) more than half full but no more than three-quarters full (75%), or 5) more than three-quarters full to full (100%),

- **Visitor surveys** were administered to visitor groups exiting at the **Laurel House Road trailhead** from 11:00 a.m. to 6:00 p.m. on seven days between July 17 and July 30, 2023 (N=248, 84% response rate). The visitor survey included a series of questions to measure visitor-based crowding tolerances using a photo simulation exercise depicting varying numbers of people in the Middle Pool area viewscape. The visitor survey also documented visitors' characteristics, perspectives about their experiences, and support for potential management options.
- **People-per-viewscape (PPV) counts** were conducted via direct observation at the **Middle Pool area viewscape** depicted in Figure 4. PPV counts were recorded on 10-minute intervals from 11:00 a.m. to 6:00 p.m. for six days between July 17 and July 30, 2023.
- **People-at-one-time (PAOT) counts** of the **number of pedestrians in the Route 23A road corridor** were conducted via direct observation from a safe vantage point near Fawn's Leap. PAOT counts were recorded on 10-minute intervals from 11:00 a.m. to 6:00 p.m. for six days between July 17 and July 30, 2023.
- **PAOT counts** of the **number of visitors in Kaaterskill Creek** visible from Route 23A were conducted via direct observation as a roving count along a safe travel route between Fawn's Leap and Moore's Bridge. PAOT counts were recorded on 10-minute intervals from 11:00 a.m. to 6:00 p.m. for six days between July 17 and July 30, 2023.

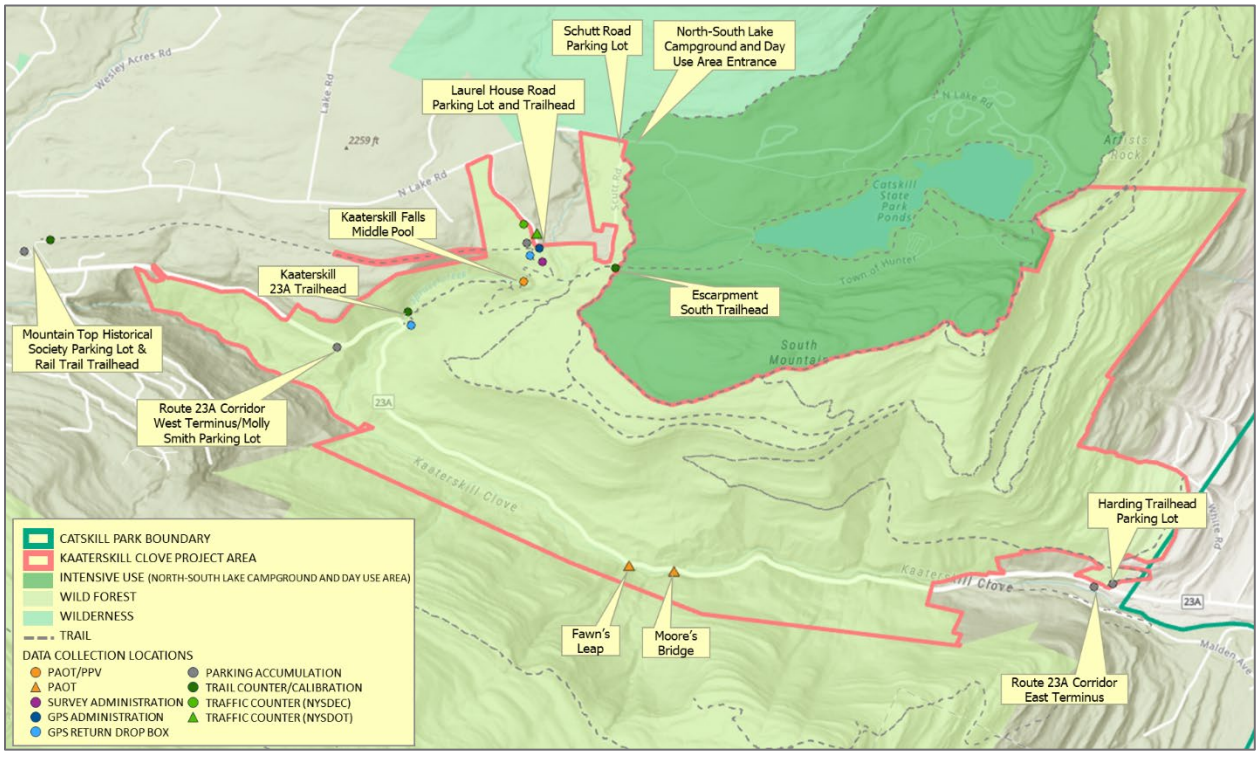


Figure E-1. Types and locations of 2023 onsite data collection in the Kaaterskill Clove Project Area.

Appendix F—Indicators Considered but Not Selected

This Appendix reports ideas that were suggested as potential indicators during meetings with the NYSDEC Core Team, the Stakeholder Working Group, and/or the public but not selected for adoption by NYSDEC. The potential indicators included in this Appendix were not selected for a combination of the following reasons:

- Some of the ideas suggested do not meet the criteria for "good indicators" as described by the US Interagency Visitor Use Management Council. For example, some items are subjective in nature, not specific, and/or not directly related to manageable attributes of recreation use.
- Some of the ideas suggested are potential resource-related indicators, which are not part of the scope of this project.
- After consulting with the National Park Service Visitor Use Management Program, the idea of including an indicator related to search and rescue incidents was removed from the list of selected indicators. The relationship between the number of search and rescue incidents and manageable attributes of recreation use is confounded by several factors, particularly staffing. The National Park Service noted that for this reason, they systematically advise parks not to include a search and rescue indicator as part of their visitor use monitoring plans. That said, NYSDEC will continue to document search and rescue incidents to help inform Forest Preserve management and operations more generally.
- Incidents of pedestrians in or along Route 23A and vehicles-at-one-time (VAOT) along Route 23A were removed from the list of selected indicators. The shoulder width along Route 23A does not meet NYS DOT's minimum standard for use by pedestrians (NYSDOT 2022, Chapter 18 Section 6.2). In addition, the roadway has severely limited sight lines due to the steep, winding nature of the road. Consequently, there should be no pedestrians or parking along Route 23A during the busy summer season. Like with search and rescue incidents, NYSDEC will continue to document incidents of pedestrians in or along Route 23A to protect public safety and work with local partners to enforce parking restrictions in the corridor.

The list of other ideas suggested but not selected as indicators is as follows:

- Search and rescue incidents
- Incidents of pedestrians in or along Route 23A
- Vehicles-at-one-time parked along Route 23A
- Number of visitors per year
- Annual vehicle traffic at North-South Lake Campground and Day Use Area
- Traffic information for all four seasons and annually
- Number of encounters with groups larger than 20
- Number of graffiti/markings on signs, posts, other
- Number of trees with bark carvings/damage
- Number of pieces of litter in the parking area

- Amount of trash taken out of the Clove
- Amount of visitor-to-visitor conflict
- Number of visitor complaints
- Amount of visitor-to-landowner conflict
- Track visitor travel patterns and interaction with local communities
- Observations of bad actors and future limitations
- Organized groups that use the park for more “extreme sports”/higher risk
- Visitor preferences for management rules and regulations
- Resource degradation, especially in high use areas
- Visitor preferences for resource conditions
- Carrying capacity of the land
- Tracking invasive species